General Guidance for Water Treatment Professionals on Proper Maintenance of Treatment Systems as Shelter-in-Place Orders are Lifted

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Introduction

This document provides general guidance and information for water treatment professionals who may be called upon to assist customers with bringing vacant buildings back online, such as when the Shelter-In-Place orders due to COVID-19 are lifted. It addresses the activities necessary to bring the potable water supply treatment systems (treatment systems) in the building back online and suggests appropriate strategies to fit those activities into the overall recommissioning plan. The document makes the assumption that the building is a commercial or industrial building that has fairly complex premise plumbing, the potential for various treatment systems to be present, and that the building has been completely vacant for an extended period of weeks or months. However, water treatment professionals should take similar precautions when dealing with buildings that were only partially vacant, or residences left vacant for whatever reason.

Who is this for?

This document is intended for water treatment professionals, but can also be used as a resource by building owners and operators. Examples include restaurant and coffee shop owners, small businesses and retail establishments, commercial facilities, industrial sites and manufacturing facilities that need to safely restore operations.

Customer Outreach

Water Treatment Professionals should engage with clients early in the process, before a Shelter-In-Place order is lifted, to begin planning how to bring their treatment systems back online in a safe and sanitary manner. It will make the job of properly maintaining and sanitizing systems a lot easier if building owners proactively engage and plan with water treatment professional before turning faucets on and bringing treatment systems back in operation. Water treatment professionals should keep in mind that building owners may be facing economic challenges due to the shut-down and should be sensitive to their financial situations and have an open dialog about what is pragmatic and affordable while still achieving the goal of properly recommissioning water treatment systems. This is a good time to find out if the entire building has been vacant, or if portions of it may still be occupied. Portions of the building that have been occupied, were not subject to complete stagnation and had water

flowing through those areas may have contained adequate flushing and disinfectant to prevent the buildup of microorganisms. All these factors should be considered as water treatment professionals and building owners make plans to bring the treatment systems back online.

Recommissioning the Building, Be Part of the Plan

This document assumes that the building owner is working with other qualified professionals to establish a formal plan to bring all systems in the building online, including water and sewer services. The building owner should consult with state/local authorities on recommissioning the building as they may provide general guidance on any associated regulations. Local water utilities may also be able to assist with recommendations and may be willing to temporarily raise disinfectant levels to accommodate periods of high flushing.

This document does not attempt to address a comprehensive flushing plan for the building. An overall flushing plan should be established by experienced professionals and may also need to be planned in collaboration with local authorities to prevent low pressure conditions caused by simultaneous flushing of buildings. Special safety precautions to reduce water splashing and aerosolization of contaminated water during flushing may be necessary. Coordination with a waste disposal expert may be needed if the flushing activities would otherwise risk overwhelming the sanitary system capacity or operation. A more comprehensive guide to recommissioning, and all the potential pitfalls, is referenced at the end of this document[1].

Don't Turn on the Treatment Systems First

Where possible, place all water treatment systems in bypass. Remember that the pipes are probably full of water that has been stagnant for a long period of time. Any residual disinfectant in the water most likely disappeared quickly when the water became stagnant[1]. The stagnant conditions, and lack of disinfectant, have created ideal conditions for growth of bacteria and other microorganisms. This stagnant water should not be drawn through a water treatment system. Doing so would flush the highly contaminated water through the device, making the job of sanitizing the treatment system that much more difficult.

Work with the building owner and the other professionals who are conducting the flushing activities to encourage them to start by flushing the service line first (e.g., using outdoor spigots), then to flush the premise plumbing as much as possible using toilets, bathroom sinks and other taps that do not contain treatment devices. You can also use the bypass on any point-of-entry treatment equipment to prevent it from being further contaminated by the initial flushing activities. Also be aware that the drain traps in floor drains and sink basins may have dried out, leading to foul odors. These drains are a potential source of contamination that you will want to avoid working around as you sanitize the water treatment systems.

After Flushing, Service and Sanitize the Treatment Systems

After fresh water flushing of the premise plumbing has been completed by the building owner or their professionals, you can begin servicing and sanitizing the treatment systems.

Replaceable filter cartridges and other potentially spent or contaminated consumables should be changed out wherever possible. Membrane modules may have dried out and cracked or become fouled with bacterial growth. And don't forget to check UV systems to see if the lamp needs to be replaced, especially if the system has remained on the entire time with no flow. Work within the constraints of what the customer can afford to do, while still achieving the goal of properly recommissioning water treatment systems.

Sanitation Procedures

WQA recommends that you follow the treatment system manufacturer's instructions on sanitation, if provided. If the manufacturer does not provide instructions on sanitation of their product, try contacting the manufacturer or its distributor directly and try checking with the disinfectant manufacturer. Many companies that sell disinfectants have begun issuing instructions on how their product can be used with water appliances and water treatment systems. Again, consult with the treatment system manufacturer to avoid any unintended consequences or damage to the system.

WQA has also provided water treatment professionals with technical guidance, following recommendations set forth by OSHA and the CDC, on how to avoid contributing to the spread of COVID-19 during these service calls. You can find a WQA water treatment professional in your area by going through the WQA website. All of these water treatment providers have agreed to uphold and abide by WQA's Code of Ethics for the Water Quality Improvement Industry, which includes avoiding the use of false or misleading statements that are intended to scare consumers into a purchase.

You can also go through WQA's website to find a certified professional in your area. This will return only professionals who have:

- Completed a nearly year-long course of study;
- Successfully passed a comprehensive exam;
- Completed 20-30 hours of continuing water treatment education every three years (depending on credential); and
- Agreed to uphold and abide by WQA's Code of Ethics for the Water Quality Improvement Industry.

As building owners make plans to get everyone back to work, WQA recommends that they keep water treatment devices in mind and reach out to a WQA water treatment professional to help ensure that water treatment systems are brought back online safely.

Physical Cleaning versus Rinsing and Flushing

Whenever possible, physically clean devices instead of relying solely on a chemical disinfectant rinse followed by flushing. Scrubbing accessible surfaces with a disinfection solution will be far more effective than just flushing a chemical disinfectant through the treatment system. For example, using a bottle brush doused with a chemical disinfectant to clean the inside surface of water-dispensing spouts and faucets will be far more effective than just a disinfectant flush. These brushes are available in a wide variety of sizes, for very little cost, and will allow you to scrub down otherwise inaccessible surfaces where bacteria and microorganisms may have built up during the period of vacancy.

Figure 1. Bottle Brushes

Special Considerations by Technology Type

Point-of-Use Filters

Replace removable cartridges with fresh filters. Sanitize the entire treatment system, including the dispensing faucet or dispensing spout. Flush at least two unit-volumes of water through the treatment system after sanitizing.

Point-of-Use RO systems

Replace all pre and post filters. Consider that the membrane module itself may need to be replaced because it may have been damaged by drying or may have been fouled with microbial growth. If the treatment system contains a storage tank, drain it. Sanitize the entire treatment system, including the dispensing faucet or dispensing spout.

Softeners

Sanitize the entire treatment system, including the brine tank. Force at least one regeneration cycle and check for hardness in the treated water. Calcium and magnesium may still be bleeding off the bed due to the prolonged stagnation. If there is hardness bleed, force a second regeneration cycle.

Whole-house filters

Sanitize the entire treatment system. Force at least one backwash cycle and check treated water quality.

UV systems

Sanitize the entire treatment system. Be aware that the lamp may need replacing or the system may have become damaged if the lamp was lit during the entire vacancy with no flow. Follow the manufacturer's instructions to check that the treatment system is operating normally before putting it back into service.

Don't Forget Water-Using Appliances

Remember that water-using appliances, such as coffee makers and ice makers, also could have been fouled with bacteria during the vacancy. Beyond the obvious safety concerns, this may contribute to ongoing taste & odor problems that will make your customer believe the treatment systems are not working properly. Discuss these appliances with your customer to make them aware of the potential problem.

Be Alert for Signs of Corrosion

The prolonged period of stagnation may have caused corrosion problems where they may not have existed before[1,2]. Watch for signs of corrosion issues, such as colored water, or consider offering lead and copper testing for your customer just to be sure.

Choice of Disinfectants

A list of disinfectants approved under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) for use against viral pathogens like the COVID-19 virus is available through the U.S. EPA:

https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2

A great resource on limitations of various disinfectants is available through the CDC:

https://www.cdc.gov/infectioncontrol/guidelines/disinfection/disinfection-methods/chemical.html

Additional Precautions due to COVID-19

In addition to all the normal steps you would take to ensure a safe and sanitary work environment, keep in mind that special precautions to prevent the spread of COVID-19 should still be exercised as the Shelter-In-Place orders are lifted. The following guidelines, adapted from OSHA and CDC, will help protect your customers and employees from exposure to COVID-19.[5,6]

- Frequently wash hands with soap and water for at least 20 seconds
- When handwashing is unavailable, use a hand sanitizer with at least 60% alcohol
- Avoid touching your eyes, nose, and mouth
- Avoid close contact with people who are sick
- Maintain a distance of at least 6 feet from other people
- Stay home if you're sick, except to get medical care
- Cover coughs or sneezes with the inside of your elbow
- Wear a cloth face covering (the cloth face cover is meant to protect other people, so you should NOT use a facemask meant for a healthcare worker)
- Clean and disinfect surfaces you touch frequently with an EPA-approved disinfectant for the COVID-19 virus

If you have further questions, contact us at wqa@wqa.org.

References and Links to Additional Information Sources:

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2. Shutoffs and Return to Service Guidance, 2020. AWWA https://www.awwa.org/Resources-Tools/Resource-Topics/Coronavirus#10681543-shutoffs-and-return-to-service-guidance

3. Start-up Procedure for Seasonal Public Water Systems, April 2019, revision 5.0. Minnesota Department of Health. https://www.health.state.mn.us/communities/environment/water/docs/ncom/startup.pdf

4. Guidance for Premise Plumbing Water Service Restoration, March 2020. Ohio Environmental Protection Agency, Division of Drinking and Ground Waters, https://epa.ohio.gov/Portals/28/documents/pws/guidance-for-premise-plumbing-water-service-restoration.pdf, retrieved April 30, 2020.

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