



Restoring Water Quality When Re-opening Schools and Childcare Facilities During COVID-19

AUGUST 5, 2020 CHE WEBINAR

ELIN BETANZO, SAFE WATER ENGINEERING LLC

What water quality risks can develop over an extended school shutdown?

Stagnant
Water/Loss of
Disinfectant

Disinfection
Byproducts

Microbial
Growth/Biofilms

Legionella

Lead, Copper
and Other
Corrosion

Mold

Why is water quality in schools different this time around?

- ▶ This is an unprecedented pandemic
- ▶ Extended Shutdown
- ▶ Water use this summer was not normal
- ▶ New information daily, lack of standard protocol, lack of resources
- ▶ Vulnerable populations

Water needs to keep moving in any building

- ▶ Flushing addresses many of the shutdown water quality risks
- ▶ Flushing needs vary based on plumbing configuration in buildings:
 - ▶ Age of building and plumbing materials
 - ▶ Water temperature
 - ▶ Layout of building (one floor, many floors)
 - ▶ Branching of plumbing system and plumbing complexity
 - ▶ On-site water treatment, number and location of hot water tanks, water using appliances (ice makers, dishwashers, etc.)
 - ▶ Maintenance practices during shutdown
- ▶ Success improves with availability of facilities staff and familiarity with the school plumbing systems.



The longer the water shutdown, the longer it takes to restore water quality in schools and child care facilities.

Consider Who is Using the Water and Where They Are Using the Water

- ▶ Restricted building use:
 - ▶ Food preparation
 - ▶ Child care
 - ▶ Athletics
 - ▶ Phased or staggered opening
- ▶ Quality of water depends on maintenance practices during shutdown
- ▶ Consider bringing water from home to drink and use school water for handwashing and non-potable uses

Flushing can be used to meet a range of different goals and steps vary in intensity

- ▶ Uni-Directional Flushing
 - ▶ Requires the most planning and attention, 2x per year
- ▶ Refresh water in the entire building
 - ▶ Requires planning but less accuracy, weekly
- ▶ Simulate typical use
 - ▶ Requires the most repetition - daily, can use auto-flushers



Water Quality Restoration for Different School Re-Opening Plans

Return to School

- Uni-directional flushing
- Keep the water moving
 - Ongoing use may be enough
- Consider water quality before drinking

Hybrid Program

- Uni-directional flushing
- Keep the water moving
 - May need to simulate normal water use
- Consider water quality before drinking

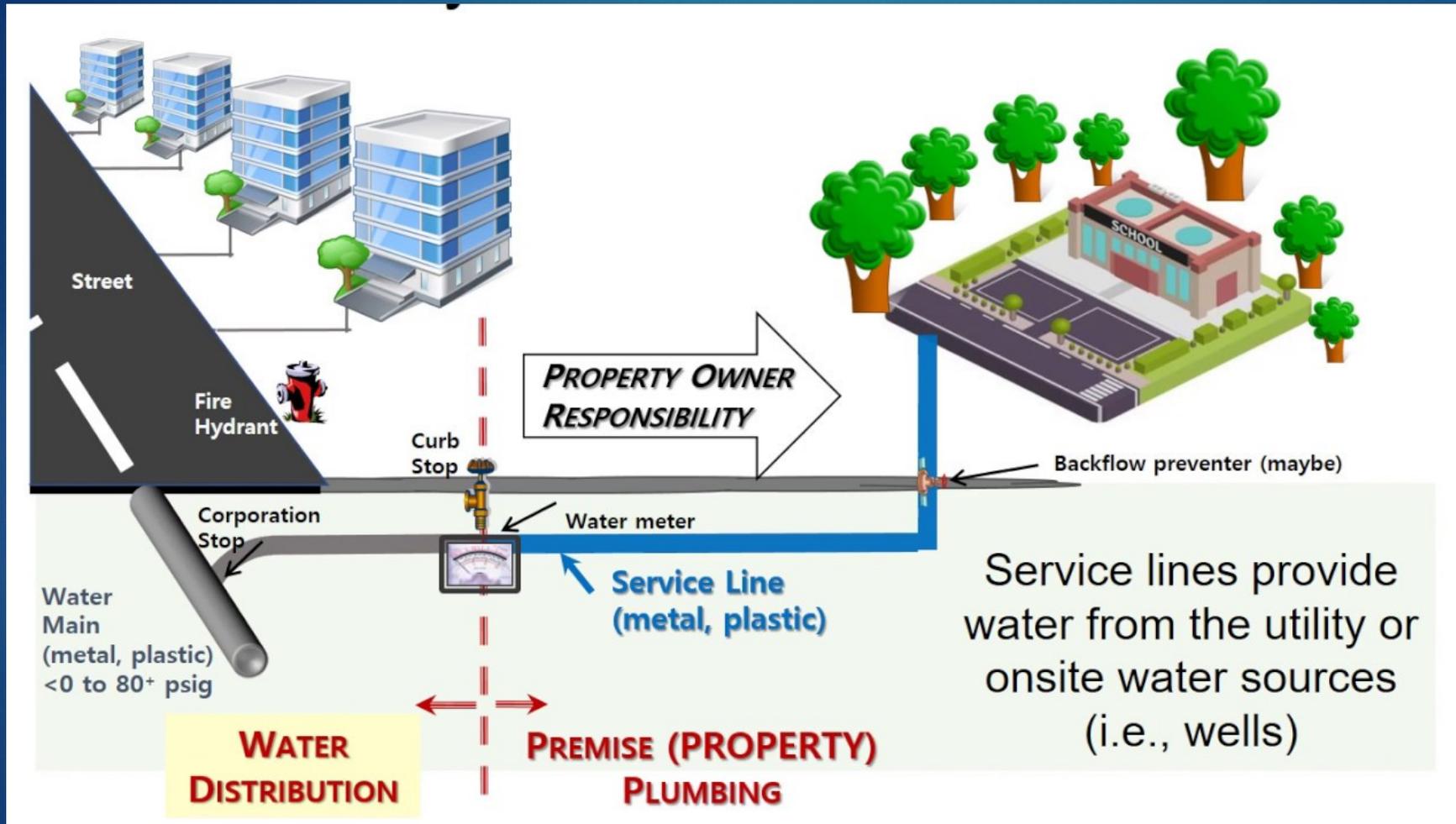
All Virtual Instruction

- Uni-directional flushing
- Keep the water moving
 - Maintain weekly turnover
- Repeat Uni-directional flushing prior to return to school

Overview of Water Restoration Steps

1. Check plumbing integrity.
2. Fill all drain traps with water if they have dried out.
3. Map or sketch the plumbing layout.
4. Bring fresh water to the building by flushing the service line.
5. Flush the cold water plumbing with fresh water by zone. Remove aerators and run every cold water tap.
6. Drain and/or maintain hot water tanks and flush hot water plumbing.
7. Run all water using appliances (e.g., water softeners, dishwashers, refrigerator water dispensers, ice makers).
8. Replace all filters.
9. Maintain all non-drinking water systems according to manufacturer's specifications (e.g., sprinkler systems, eye-wash stations, water features, cooling towers).

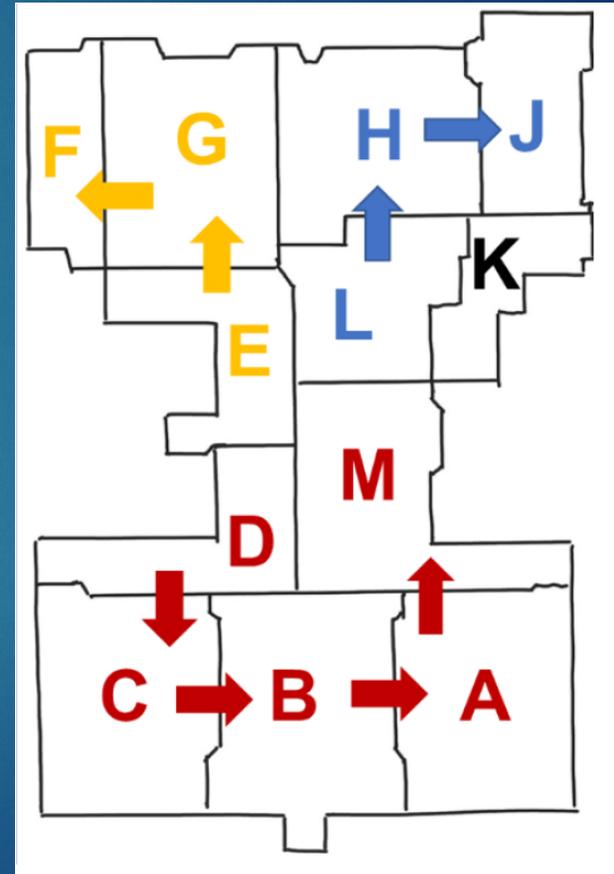
Bring Fresh Water to the Building



Source: Purdue University Center for Plumbing Safety

Bring in Fresh Water By Zone

- ▶ Plumbing layouts will vary widely – mapping your building is important
- ▶ Use fresh water to push out the old water
- ▶ Remove aerators
- ▶ Flush cold water first then hot water

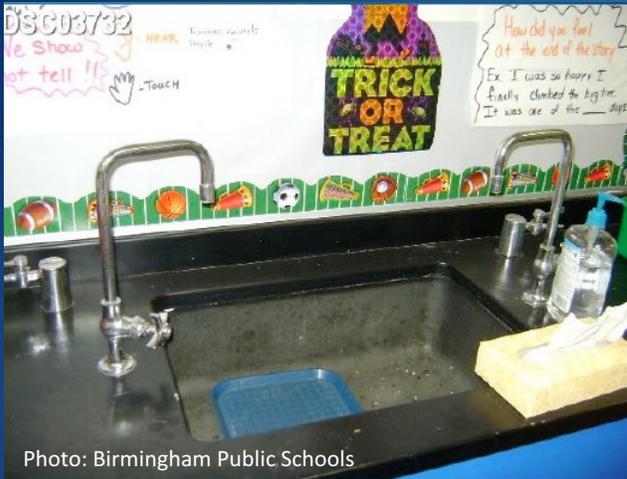


Legionella and Hot Water Tanks

- ▶ Drain and fill hot water tanks. Bring temperature to 140 degrees Fahrenheit.
 - ▶ Be prepared to deal with sediment buildup in the tank
- ▶ Temperature at the tap should be 120 degrees to kill Legionella.
- ▶ Consider scalding risk and temperature maintenance after hot water lines are flushed. Check with health department for requirements.
- ▶ In high risk situations with vulnerable communities consider
 - ▶ Testing
 - ▶ Chlorination with a building plumbing expert



Lead in Water



- ▶ Most school plumbing contains lead, especially schools built prior to 2014
- ▶ Corrosion control needs regular water use to work as designed. Once water use restarts can take 12 weeks or more of regular water use to return to effective control.
- ▶ Lead release is sporadic. One time tests are not conclusive for revealing lead risk.

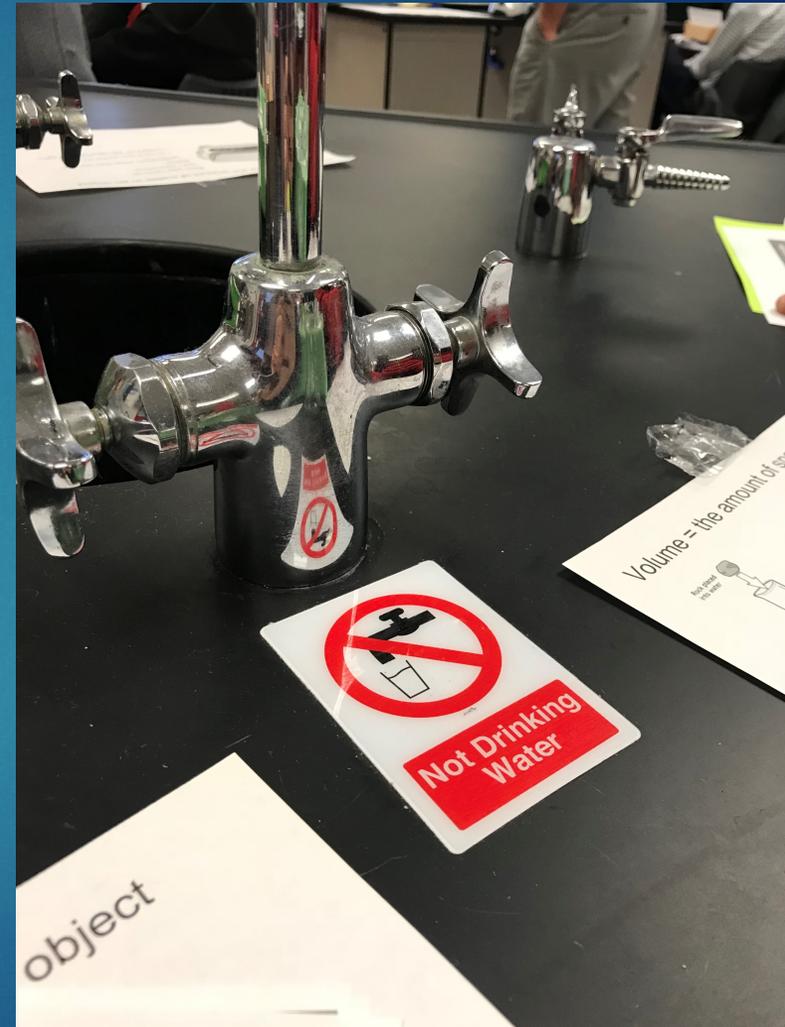
Bottle Fillers, Filters, and Hands-Free Water

- ▶ Bottle fillers with a bottle sensor allow for hands-free drinking water
- ▶ Schools can provide bottles for drinking water
- ▶ Must replace and maintain all filter cartridges to ensure lead reduction
- ▶ Some hands-free faucets do not meet lead-free requirements for drinking water



Consider this an Opportunity!

- ▶ Collect school plumbing and water quality data:
 - ▶ Take an inventory of water outlets,
 - ▶ Identify plumbing materials,
 - ▶ Map the system,
 - ▶ Develop a sampling plan
- ▶ Develop a Water Quality Management Plan and Program
- ▶ Communications Protocols
- ▶ Signage on water taps
- ▶ Filter strategies



Questions to Ask Your School/School District

- ▶ Does the school/school district have a water quality management plan or program? Who is implementing? Can you share a copy?
- ▶ Has the school building been in use since the shutdown (e.g., food preparation, child care, access during athletic practice)? What water quality maintenance procedures have been used during this time?
- ▶ What water use and/or flushing procedures has the school/school district implemented since schools were shut down?

Questions to ask about water testing

- ▶ Has the school done any water quality sampling in preparation for returning to school?
- ▶ If so, what protocols were used, what contaminants were analyzed?
- ▶ Where have results and testing protocols been posted?
- ▶ Note: Testing results may not be conclusive regarding water quality

Questions to ask about how kids are using water at school

- ▶ Does the school offer touch free drinking water e.g., water bottle filling stations? Have all filters been replaced?
- ▶ If the school has not had capacity to maintain its water systems during the shutdown and students will attend class in person, what kind of outreach and accommodations will the school provide to inform students to bring their own drinking water to school or provide bottled water for those who cannot bring their own?
- ▶ Are you relying on students to flush their own water prior to drinking?
- ▶ Are you labeling untested/unflushed faucets for handwashing only?

Schools are dealing with a lot of difficult decisions right now. Clear communication is key.

- ▶ If water maintenance has not been happening, communicate to staff and families:
 - ▶ Bring your own drinking water (or provide bottled water)
 - ▶ Don't drink the water in the school until the school says its okay
 - ▶ Wash your hands
- ▶ If water maintenance has been ongoing during the shutdown, communicate to staff and families:
 - ▶ Describe what the school has been doing to maintain water quality
 - ▶ Use (designated outlets/bottle fillers) for drinking water at school
 - ▶ Feel free to bring your own water
 - ▶ Wash your hands