



Backflow Prevention Overview

April 9, 2024



Why are we concerned about backflow?

- Key is to safeguard the City's drinking water and the City has a duty to the public
- Cross-connections between the water supply and source of contamination can result in:
 - Contamination, Health and Safety concerns, Boil Water Advisories
- Cross-Connection Control Program is intended to minimize 'actual or potential' hazards
 - Eg . Pressure differential – chemicals drawn into system, water line break, use of fire hydrants
- Backflow prevention only allows water to move in one direction



History

- Waterworks Bylaw 2007 and before – mention of backflow prevention and refers to standards
- 2009 Water Distribution Assessment
 - Recommendations for backflow prevention (Ag & ICI)
 - Ag represented the largest unprotected area
- 2010 Report to Council, Cross-Connection Control Policy C022, and webpage and brochure creation
- Cross-connection letters sent out to Ag properties to bring into compliance



A few principles

- Backflows installed on private property as close to property line as practical:
 - Location is required to provide 'premise' isolation
- Backflow type is based on degree of hazard (actual or potential):
 - **Severe** Risk – **RPBA** (tested annually), above ground and heated
 - **Moderate** Risk – **DCVA** (tested annually), below ground
 - **Minor** Risk - Dual Check Valve (**DCV**) (not testable)

There are other types/low level – which are often on faucets, hoses, etc (fixture isolation)
- In general, required for Industrial, Commercial, Institutional (ICI) and Agricultural properties, and other uses (could include some residential)



Examples of Severe Risk Activities

- Agricultural activities, including the growing of any commodity, presence of livestock equipment, poultry barn, food processing plant or other
- Irrigation system with chemical sprayer or injection
- Storage of chemicals
- Laundromat with dry cleaning
- Dentistry
- Landscape and/or soil stock piling
- Auto repair shop or car wash
- Golf course
- Mortuary equipment
- Film development equipment
- Hospital, Surgical Clinics or laboratories
- Industrial fluid system or other industrial processes
- Oil refinery
- Asphalt, concrete, manufacturing, pulp or paper plant
- Garbage transfer station
- Sewage pump station



Standards

- Drinking Water Protection Act
 - Water purveyor required to protect water from foreseeable circumstances
- FCM – Methodologies for Cross Connection Programs
- BC Building and Plumbing Codes
- Canadian Standards Association (CSA) B64.10 – Selection, Installation and Maintenance of backflows preventers
- AWWA Canadian Cross Connection Control Manual
- BC Waste Water Association – Best Management Practices for Cross Connection
- City's Waterworks Bylaw and Cross Connection Control Policy

Table 6.1 Fixture/Source of Contamination Hazard Classification Guide, continued

Fixture or Source of Contamination	Degree of Hazard
Detergent or soap dispenser	Severe
Dipper well in ice cream parlour or restaurant	Moderate
Dish rinse unit with flex hose	Moderate
Dishwasher (commercial)	Moderate
Dishwasher (residential)	Minor
Dormer or pit	To be installed upstream of backflow preventer
Emergency eyewash/shower unit	Severe
Film or photo development equipment	Minor to severe
Flexible shower head with rinse hose	Severe
Floor drain with water flushing rim	Moderate
Flush tank	Moderate to severe
Flushing equipment device	Severe
Fountain, ornamental	Moderate to severe
Fountain, ornamental (chemicals added)	Severe
Fume hood	Severe
Garbage can washer	Severe
Garbage disposal or waste pulper unit	Minor to severe
Heat exchanger	Moderate to severe
Hose connection (other than residential)	Minor to moderate
Hose connection (residential)	Severe
Hospital (active treatment area)	Moderate
Hot tub or spa	Moderate
Hot water systems (all types — direct heating of water supply)	Minor
Humidifier	Moderate
Humidifier with pump and chemicals	Severe
Hydronic heating systems	Minor to severe
Hydrotherapy bath and wand	Moderate
Ice machine for commercial restaurant	Moderate to severe
Ice making plant for sports arena	Severe
Industrial fluid system	Severe
Irrigation system (chemical injector pump or aspirator)	Severe
Irrigation system (no injector pump or aspirator)	Moderate
Lab bench equipment (not listed)	Minor
Lab bench equipment (twice)	Severe
Lab faucet	Moderate to severe
Laboratory	Severe
Laundry machine	Moderate
Livestock equipment	Severe
Medical macerator	Severe



Amendments

- Amendments are being proposed in the Waterworks Bylaw, which will allow for the implementation of two compliance pathways, instead of requiring the highest level backflow device for all rural properties:
 1. Ag properties with active Ag activities or other severe risks: RPBA
 2. Ag properties with no active Ag activities or other severe risks (generally a moderate risk SFD): DCVA with annual declaration
- Both of these devices are tested annually, to ensure they are in good working order. Lower level devices are not testable.
- Another proposed amendment is for the City to have the ability to conduct the work and back-charge the Owner through taxes, should they not comply with the bylaw. This would be preferable to disconnecting any service.



Clarifications

- Significant freezing concerns (RPBA)
 - Low probability event: would need a major cold snap and a lengthy power outage. Unit is insulated/residual heat and infrastructure in place today without issues
- Significant flow concerns
 - Small impact with 90° bends
 - Can implement transitions at corner to further minimize
 - There are flow issues in the north, totally separate from backflows
- Two backflows on a property
 - If farming and have irrigation or other, likely in that Owner's best interest to have two (protect themselves), but that is optional
 - Purpose of this program is to protect the City's system for all users
- Average costs less than previously stated
- Second letters planned to be mailed out shortly



Recommend that Council:

- A. Endorse the approach to addressing the requirement for installation of backflow devices and continued implementation of the City's Cross-Connection Control Program, as presented at the April 9, 2024 Regular Council Meeting; OR
- B. Other.