BRITISH COLUMBIA
FireSmart™

Guidance for Drinking Water System Infrastructure Vulnerability Assessments

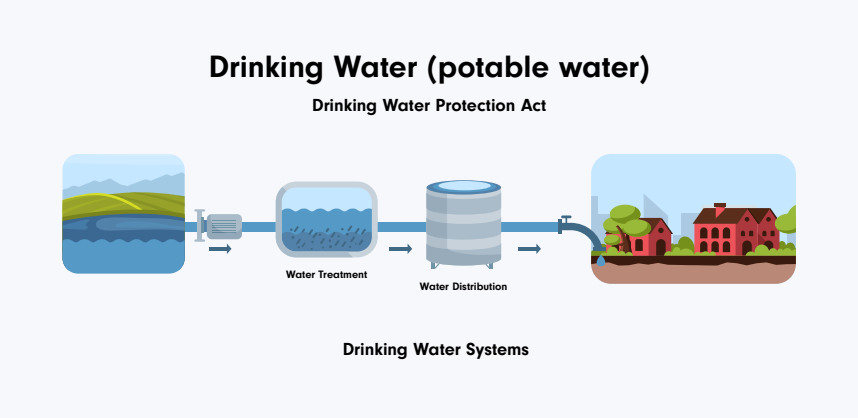
This list of recommendations is intended to guide drinking water system infrastructure assessments for vulnerability to wildfire. These types of assessments may be funded through the UBCM-administered FireSmart Community Funding and Supports, under the eligible activities "FireSmart Projects for Critical Infrastructure" and/or "Community Planning" (see previous year's Program and Application Guide for more information).

This Drinking Water System Infrastructure Assessment does not focus on water quantity or quality for fire suppression (provided by other FireSmart® documentation to be released) nor on watershed-scale assessment (out of scope for FireSmart grants).

It is recommended that the FireSmart® Critical Infrastructure Assessment and Home Partners Program Hub | FireSmart BC is conducted simultaneously with this assessment.

Provincial and federal riparian protection regulations should be considered and followed when FireSmart practices and fuel management are considered in natural areas. For more information visit: Riparian Areas Protection Regulation (RAPR) - Province of British Columbia (gov.bc.ca)

It should be noted that all criteria are presented on a continuum between "more vulnerable" to "less vulnerable". The identification of criteria which may pose risks to water system vulnerability does not compel a water supplier to correct or address the specific issue, as some criteria which pose higher risk may not be physically practical or economically feasible to upgrade. However, mitigation of risk through other avenues (e.g. a more holistic resiliency assessment which includes operational changes, additional fire suppression and approaches consistent with Indigenous ways of knowing) may be recommended if the water system cannot be easily upgraded to reduce vulnerability.



Infrastructure and Facilities

1. Identifying Critical infrastructure

Marking critical infrastructure may allow for aerial crews to target suppression efforts, if properly communicated and documented.

	● Reservoirs and critical water system buildings have clear identification markings for aerial identification: e.g. painting a large water drop on roofs.
	● Reservoirs and critical water system buildings are not clearly identifiable from the air.

2. Water infrastructure and Piping

Plastic components, especially near the ground surface, can be vulnerable to the extreme heat associated with wildfires. Plastic components may also be generally less resilient to flames, leading to damage, potential water pressure loss as well as compromised water infrastructure that may lead to water contamination.

Note: best practices are for distribution components and piping to be buried below regional frost depth, so in general, few shallow-buried components should exist.

	● Reservoirs and critical water system buildings have clear identification markings for aerial identification: e.g. painting a large water drop on roofs.
	● Reservoirs and critical water system buildings are not clearly identifiable from the air.

Noncombustible components prevent a risk: damage through wildfire can lead to water loss and contamination.

	● Non-combustible (e.g. concrete) meter boxes with metal meters
	● Steel or concrete tanks
	● Meter boxes and meters which are combustible or vulnerable to fire damage
	● Tanks made of materials which are combustible or vulnerable to fire damage

3. Critical Infrastructure Assessment

FireSmart's Critical Infrastructure Assessment encompasses vegetation management and fire-hardening critical facilities, as noted in USEPA's Wildfire Incident Action Checklist.

	● Buildings - water treatment plant, pump stations, etc. - which have low hazard rating scores FireSmart® Critical Infrastructure Assessment
	● Buildings - water treatment plant, pump stations, etc. - which have high hazard rating scores on FireSmart® Critical Infrastructure Assessment

4. Backup power capable of running critical infrastructure

During wildfire conditions, the water system may be put under extreme demand. A conventionally sized generator may perform well under normal operating conditions or during a single structure fire response but may not be adequate for extreme demand conditions. Note that this requires documenting power requirements for facilities under normal as well as extreme demand.

	🟢 Additional generators that account for peak demand under wildfire conditions, or ability to quickly obtain and install temporary generators at key locations (e.g. pump stations).
	🔴 No back-up generators, or generators which only operate portions of infrastructure during emergency

5. Redundant water source connections or backup water source connections

Primary water source connections can become damaged during wildfire. Redundant/back-up source connections can allow for continuation of service.

	🟢 Access to a back-up source water (e.g. back-up wells, interconnection with nearby water supply)
	🔴 No back-up source water

6. Sediment filtration for surface water sources

Surface water near fire-affected areas may have increased sediment or floating debris.

	🟢 Surface water intake includes sediment traps or other debris barriers.
	🔴 No additional protection for surface water intake.

7. Structure protection sprinkler systems

Most relevant for infrastructure which is otherwise vulnerable to wildfire (e.g. has high hazard rating score in FireSmart's Critical Infrastructure Assessment). Structure protection sprinkler system design and installation requires considerable knowledge and expertise. FireSmart BC recommends consulting structure protection specialists and experts: FireSmart BC Structure Protection Sprinklers and Water Usage

	🟢 Manual or automatic irrigation systems to provide wetting of components and groundcover for vulnerable areas (e.g., chlorine storage, control equipment buildings, fuel storage for generators).
	🔴 No additional protection of vulnerable areas (e.g., chlorine storage, control equipment buildings, fuel storage for generators).

8. Backflow prevention

Backflow prevention is recommended as a reasonable countermeasure to prevent VOC contamination.

	🟢 Local government has an active cross-connection control program which includes backflow prevention device testing, and ensures installation of backflow prevention devices where a cross-connection control hazard has been identified within the property of an existing building or building under construction (in accordance with the BC Building Code and the Building Act).
	🔴 No cross-connection control program.

9. Essential data backup

Access to essential data should be ensured even if physical access to water treatment facilities is impeded.

	● Essential records and data are backed up, and stored in a fireproof safe, offsite facility, or with secure cloud-based storage.
	● Essential records and data are stored onsite without back-up.

10. Ability to flush water system end to end

A system that can be flushed from one end to the other ensures that after a wildfire event water infrastructure can be quickly flushed and reactivated.

	● Drinking water infrastructure is designed to flushed from one to the other in the event that the system in compromised or contaminated.
	● Drinking water infrastructure cannot be flushed from one to the other.

Policy and Procedures

11. Emergency Response Plan

Having a clearly defined Emergency plan in place ensures that all parties know and understand their roles as well as the procedures to follow during an emergency.

	● Updated and currently Emergency Response plan in place, roles and responsibilities are clearly outlined and all personnel are briefed and up to date. ERP practices regularly (annually) through tabletop exercises.
	● No Emergency Response Plan in place

12. Emergency drinking water supply plans

Having established back up plans are in place ensures services and utilities can restore operation as quickly as possible after a wildfire incident.

	● Established and current Emergency Drinking Water Supply plan. Coordinated plan with Emergency Operations Centre and water utilities.
	● No Emergency Drinking Water Supply Plan

13. Local mutual aid agreements

Having established Mutual Aid Agreements in place helps to limit supply and personnel shortfalls while also facilitating knowledge transfer, best practices and lessons learned between utility providers.

	● Local/Regional Mutual aid agreements between water utilities to provide not only supplies and resources during an emergency but also personnel and knowledge.
	● No Mutual Aid Agreements in place

References

FireSmart Critical Infrastructure Assessment. Accessed from https://firesmartbc.ca/resource/firesmart-critical-infrastructure-assessment/ on June 16, 2022.

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