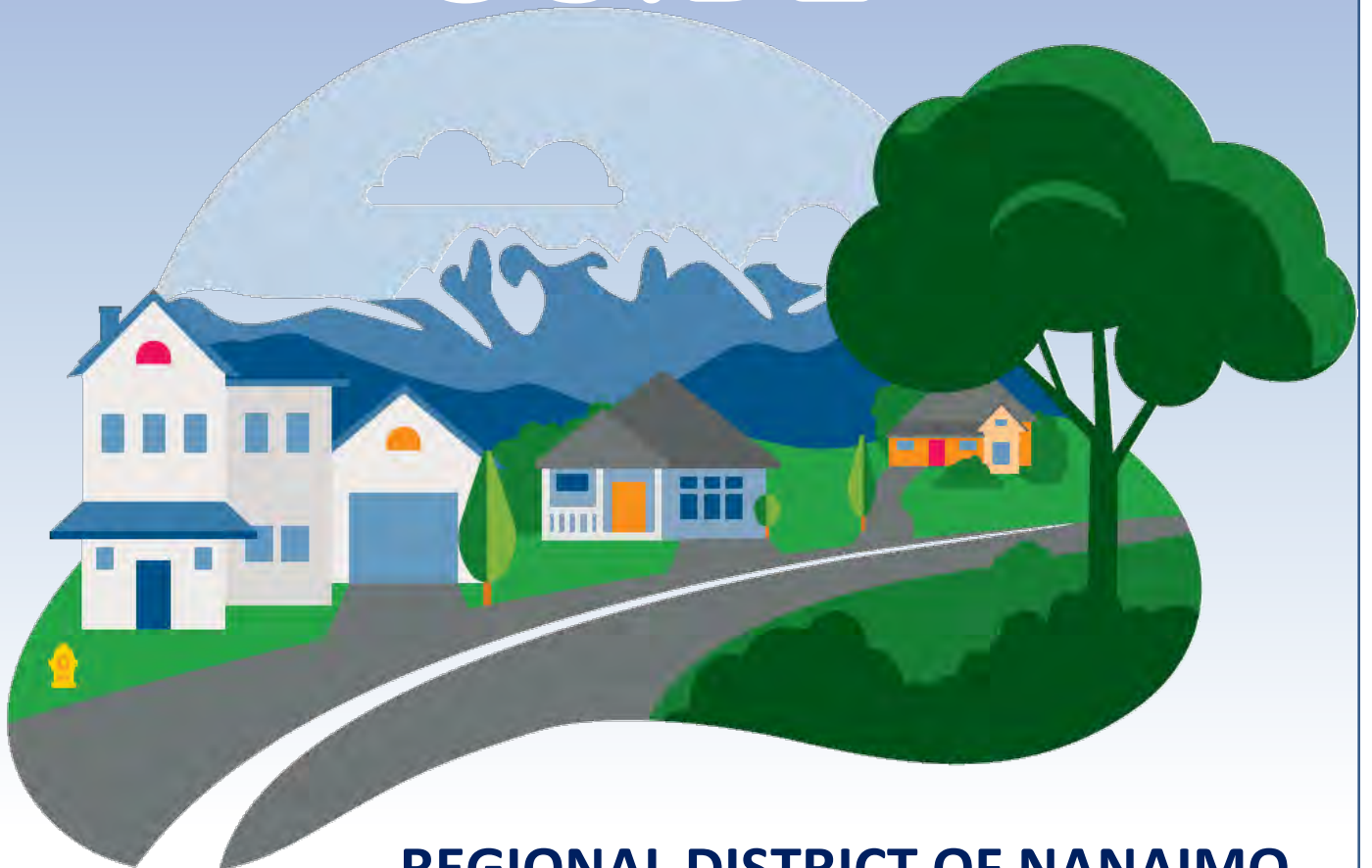


# CROSS CONNECTION CONTROL PROGRAM & GUIDE



REGIONAL DISTRICT OF NANAIMO  
WATER SYSTEMS

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## 1.0 Introduction

The purpose of a Cross Connection Control Program is to protect the public health by reducing the risk of contaminants flowing back into the public water supply.

This guide was developed for small, Regional District of Nanaimo (RDN) owned and operated water systems with less than 3,000 connections. The guide is intended to provide RDN staff with the information and tools they need to implement the Cross Connection Control Program in an ongoing and objective manner, increase potable water protection, and reduce the RDN's exposure to legal liability.

## 2.0 Terms of Reference

It is the consumer's responsibility to ensure that on-site water use practices or processes do not affect RDN Water Systems in a negative manner. This requirement is a condition of water service from the RDN. The type of backflow prevention measures required will depend upon the degree of hazard that exists, the probability of a backflow incident occurring, and the type of circumstance causing potential or actual backflow to occur (back-siphonage or back pressure).

The RDN's responsibility for Cross Connection Control begins at the water supply source. It includes all RDN Water System sources, wells, water treatment, storage and distribution facilities, watermains, fire hydrants, valves (including air relief valves), and ends at the downstream end of the service connection or water meter.

Under the Cross Connection Control Program, the RDN is not responsible for eliminating or controlling cross connections within the customer's water system or on-premise plumbing. This responsibility falls within the jurisdiction of the BC Building Code and the BC Plumbing Code.

The specialized terms and equipment used throughout this Cross Connection Control Program Guide are highlighted in ***bold and italicized*** font. A glossary of these terms is attached in Schedule 'A'.

The Cross Connection Control Program is structured to allow for updates. The RDN may, from time to time, develop bulletins that will be posted and/or distributed to apprise the general public and contractors of the requirements for Cross Connection Control that may or may not be specifically addressed in the RDN's Cross Connection Control Regulation Bylaw.

In the case of a discrepancy between the industry standards and a bulletin of the RDN's Cross Connection Control Program, the intent of the bulletin will prevail.

### 3.0 Key Objectives

The provincial Ministry of Health supports a **multi-barrier approach** to safe drinking water. Water purveyors are already tasked with source water protection, water treatment, secondary disinfection, water storage (reservoirs), water distribution, water quality monitoring, operation by qualified personnel, and emergency planning. Although Cross Connection Control is only one of the multiple barriers to protect water quality, it is one of the most important barriers. Without a Cross Connection Control Program, the water distribution system may become the “weak link” in the multi-barrier approach to public health protection. The key objective of the Cross Connection Control Program is to protect the public health by ensuring that the potable water supply provided by the RDN Water Systems is not contaminated due to **backflow**.

The RDN does not receive or distribute **reclaimed water**. Additionally, the RDN prohibits the intentional return of **used water** to the public water system by any connection to the water system. All water supplies other than those owned by the purveyor are considered **unapproved auxiliary supplies**. The RDN will impose **premise isolation** at the service connection to any customer having an unapproved auxiliary supply on the premises, whether or not there is a physical connection between the unapproved auxiliary supply and the purveyor’s water system.

### 4.0 Basic Principles of a Cross Connection

A **cross connection** exists when there is an actual (or potential) physical connection between a public water system and any source of non-potable liquid, solid, or gas, that could contaminate the public water system by flowing back into the public water supply.

- **Backflow** is the flow of water (or other solid, liquid, or gas from any source) back into the potable water supply. Backflow may be due to back-siphonage or back pressure.
- **Back-siphonage** is backflow caused by a negative pressure (vacuum) in the supply piping. Back-siphonage occurs when water system pressure is reduced to below atmospheric pressure.



*Back-siphonage conditions could occur in a public water system when a watermain is shut down to repair a leak. If a garden hose was submerged in a hot tub nearby, the non-potable water from the hot tub could be siphoned back through the submerged hose (a cross connection) into the household plumbing, and then into the watermain.*

- **Back pressure** is backflow caused by pressure in the customer’s plumbing being greater than the pressure in the watermain. The higher pressure may be from a customer’s booster pump, heating boiler, or irrigation system.



*Back pressure could be introduced into the public water system by a customer’s irrigation pump while low-pressure conditions exist in the watermain (due to fire flows, or a watermain shut down).*

The RDN's Cross Connection Control Program addresses these cross connection threats by establishing operating policies and procedures, as well as backflow preventer selection, installation, testing, and maintenance practices & procedures.

## 5.0 Enforcement Authority

The Cross Connection Control Program receives its authority from *Regional District of Nanaimo Cross Connection Control Regulation Bylaw No. 1788, 2019*, and the *British Columbia Building Code, Part 7*, which requires that potable water be protected from contamination.

No pump, booster or other device shall be employed by a consumer for the purposes of or having the effect of, increasing service line water pressures to higher than normal, without prior written authorization from the Regional District of Nanaimo, pursuant to *Regional District of Nanaimo Water Use Regulation Bylaw No. 1654, (2012)*.

The Regional District of Nanaimo will take appropriate corrective action within its authority if:

- A cross connection exists that is not controlled **commensurate** to the degree of hazard, as assessed by the RDN; or
- A consumer fails to comply with the RDN's requirements regarding the installation, inspection, testing, maintenance, or repair of approved backflow preventers required by the RDN Cross Connection Control Program.
- Where the customer refuses to install an approved backflow assembly on an existing water connection, the RDN will install an assembly at the property line (imposing premise isolation) **as soon as possible** after the need for a preventer is identified, and the customer may have to bear the cost associated with the installation.
- The RDN is able to invoice the property owner directly for time and expenses to have a backflow assembly installed, or may add these charges to a building permit (where applicable). Charges that are unpaid by the property owner by December 31 of the year in which the work was done will be added to taxes in arrears or collected as debt.

## 6.0 Administrative Authority

The Regional District of Nanaimo *Manager of Water Services* has been designated as the Cross Connection Control Manager. This Cross Connection Control Manager is responsible for the overall management and administration of the Cross Connection Control Program. This person must be knowledgeable about the regulatory requirements for a public water system, basic industry practices, and the public health aspects of cross connection control. This person does not necessarily need to be a certified **backflow assembly tester or inspector**.

The Cross Connection Control Manager will coordinate and provide information to the local building and plumbing officials, in a timely manner, any of the following:

- A requirement imposed on a residential customer for the installation of a DCVA or an RPBA on the water service, with a description of the cross connection hazard identified;
- An upgrade of the premise isolation backflow preventer (i.e. from a DCVA to an RPBA);
- Any action taken to discontinue water service to a customer; and
- A backflow incident known by the purveyor to have contaminated the public water supply or a customer's on-premise plumbing system.

All correspondence, plans, hazard surveys, and test reports should be routed through the Cross Connection Control Manager. When technical issues arise, the Cross Connection Control Manager may contact the local health authority for regulatory interpretation questions and/or seek the advice of another experienced Cross Connection Control professional.

A Cross Connection Control Program Decision Summary table is given in Schedule 'B' to help answer policy questions in the event that someone challenges the Cross Connection Control Program. However, the Cross Connection Control Manager will make the final hazard assessment decisions.

## 7.0 Personnel, Training and Certification

The Cross Connection Control Manager may be knowledgeable about the principles of the RDN Cross Connection Control Program. However, other Water Services staff members will be involved in cross connection control issues. All Water Services personnel involved with the operation and administration of the Cross Connection Control Program will take Cross Connection Control training appropriate for their role, as recognized by industry standards.

## 8.0 Methods of Backflow Prevention

The greatest health risk to consumers served by public water systems lies in the introduction of a contaminant into the public water system. By design, the water distribution system is an efficient means of transporting drinking water to consumers. However, the distribution system can also become the conduit for the spread of a contaminant to a large population.

Backflow can be prevented in two ways:

- 1) Through the installation of an **air gap**, which provides a physical separation between the contaminant and the drinking water supply; or
- 2) Through the installation of a **mechanical device** or **assembly** that prevents backflow from occurring.



*The Cross Connection Control Manager must ensure that the backflow preventer is suitable for the expected backflow application conditions, and be commensurate with the degree of health hazard posed by the customer's plumbing system.*

Backflow preventers that are not testable are called **backflow devices**, whereas **backflow assemblies** are designed for in-line testing and repair. Backflow assemblies include isolating valves and test ports.

For premises that are not considered a high-hazard, the purveyor may rely on a mechanical device, such as a dual check valve, to protect contaminants from entering the public water system. Backflow prevention devices and/or assemblies installed by the RDN **shall not be removed by the customer for any reason.**

It is important that backflow assemblies are installed in a manner that will facilitate their proper operation, maintenance, inspection, and in-line testing. An unsafe or inaccessible location reduces the likelihood of an assembly being regularly inspected, tested, and maintained. The orientation of the assembly is critical to its proper operation. Additionally, freezing or high temperatures, or hazardous environments may allow contaminants to enter the assembly through the test ports, relief ports, or air inlets thereby damaging the assembly.

Up-to-date lists of approved backflow preventers and installation standards that protect a public water system from contamination via cross connections can be found in:

- The *Manual of Cross Connection Control* as published by the University of Southern California's Foundation for Cross Connection Control and Hydraulic Research (USCFCCCHR); and
- The *Cross Connection Control Manual, Accepted Procedure and Practice*, as published by the Pacific-Northwest Section of the American Water Works Association (AWWA-PNWS).

When selecting a backflow preventer for a specific situation, the Cross Connection Control Manager will consider whether the preventer is to be used for **premise isolation** or **fixture protection**.

- **Premise isolation** is used to isolate the customer's plumbing system from the public water system. Premise isolation is required for all high-hazard premises, such as hospitals, dentist offices, dry cleaners, hotels, marinas, wastewater lift stations, car washes, and more.
- **Fixture protection** is used to prevent backflow at fixtures only, such as boilers, in-flooring heating systems, and outdoor taps.



*Diagrams of backflow preventer installations are shown in Schedule 'C' of this guide.*

## 9.0 Program Elements

While utilizing good public health and good engineering practices, a municipal Cross Connection Control Program is comprised of the following elements:

- 1) Legal authority established by adopting a Cross Connection Control bylaw.
- 2) Procedures and schedules developed for evaluating risks from new and existing water service connections;
- 3) Hazard assessments undertaken, and risks listed (known or suspected);
- 4) Backflow preventers installed to protect the public water system;
- 5) Qualified personnel provided;



- 6) Cross connection record-keeping system established;
- 7) Tracking program in place for test results, and person performing tests/inspections;
- 8) Quality assurance and quality control (QA/QC) initiatives in place;
- 9) Backflow incident response plan in place; and
- 10) Public education initiated.

## 10.0 Program Implementation

The Regional District of Nanaimo will endeavour to prevent the contamination of the water distribution system through the ongoing implementation of the Cross Connection Control Program. The program applies not only to industrial, commercial, and institutional consumers, but also to residential consumers with auxiliary water systems, yard hydrants, underground irrigation systems, booster pumps, and where other high-hazard backflow situations may be present.

The Cross Connection Control Program applies equally to all new and existing water connections. The Cross Connection Control Manager will coordinate and interact with the local building and plumbing officials in all matters pertaining to cross connection control. The Cross Connection Control Program is intended to provide the highest level of public health and safety where the Cross Connection Control Manager believes the building and/or plumbing code does not provide protection that is commensurate with the assessed degree of hazard. A copy of the RDN Cross Connection Control Program has been provided to the RDN Building and Bylaw Services Department.

The RDN may implement the Cross Connection Control Program, or any portion thereof, directly or by means of a contract with another agency or party acceptable to the Cross Connection Control Manager.

The water purveyor has two options to ensure that cross connections between the distribution system and a consumer's water system are eliminated (or at least, controlled):

- Implement a **Premise Isolation Program**, where all backflow preventers that protect the public water system are located at the property line; or
- Implement a **Combination Program**, where premise isolation backflow preventers are installed for high-hazard facilities, and for other types of facilities backflow preventers are installed for fixture protection (or fixture isolation) within the customer's premises.

The RDN supports a **Combination Program**, where the purveyor has the opportunity to work with the customer to determine an affordable type of backflow prevention that is suitable to the degree of hazard.



*A restaurant may be permitted to install small, fixture, or zone isolation assemblies at a much lower expense than installing a large premise isolation assembly at the property line.*

To protect the public water system from contamination, the water purveyor (the RDN) will take corrective action when they become aware of unprotected cross connections and/or customers fail to comply with the purveyor's Cross Connection Control Program requirements. Corrective actions may include:

- Denying or discontinuing water service to the non-complying customer;
- Requiring the customer to install an approved backflow preventer at his/her expense, to the satisfaction of the RDN Cross Connection Control Manager; or
- Installing an approved backflow preventer for premise isolation at the RDN's expense.

The RDN supports the latter two choices of above-noted corrective actions. There are liabilities associated with shutting off a customer's water service, such as sickness or death from poor sanitation, and liability to public safety from shutting off a fire supply line. A temporary water service shut-off may, however, still be appropriate under emergency conditions.

The RDN will document, on a case-by-case basis, the reason(s) for exempting the installation of a backflow preventer on a high-hazard service connection, and will copy such documentation to the local health authority. A summary of the existing properties where a backflow preventer has been exempted from a high-hazard use premise is attached in Schedule 'D' of this guide.

## 11.0 Assessment and Re-Assessment of Risk

RDN staff will utilize information available in public directories, home-based business registries, zoning maps, and the RDN water billing register to determine where industrial, commercial, institutional, multi-family, and other high-hazard backflow situations may exist.

The RDN will conduct a periodic re-evaluation of the customer base to confirm that the appropriate backflow preventers are in place. The recommended schedule of risk assessment is given in the table below.

Task	Schedule
Re-assessment of entire customer list for high-hazard premises	Every 12 months
Re-assessment of residential connections with special plumbing	Every 12 months

A Water Use Questionnaire (attached in Schedule 'E') is to be completed by the customer, upon request, for the purpose of establishing the purveyor's minimum requirements for the protection of the public water system. Additionally, the RDN will consider and mitigate the risks from the following water service connections:

- Where the in-premise plumbing system may have been changed by the customer without the purveyor's knowledge and/or the approval of the building/plumbing inspector;

- Where the customer has failed to test, maintain, and/or repair the backflow preventers that the purveyor relies on to protect the public water system;
- Where a home-based business may have started or ceased operation without the purveyor’s knowledge;
- Where the customer has a repeat history of cross connections being established; and
- Where the BC Building Code and/or BC Plumbing Code fails to meet public health standards for backflow prevention as determined by the Cross Connection Control Manager.

## 12.0 Location and Ownership of Backflow Assemblies

The Cross Connection Control Program is in place to ensure that once a high-hazard premise has been identified, an approved backflow preventer is installed **as soon as possible** after the need for a preventer is identified. The RDN will communicate openly with all customers in an effort to meet the objectives of the Cross Connection Control Program. Example correspondence letters are attached in Schedule ‘E’ for reference. The recommended schedule for installation of backflow preventers is given in the table below.

Task	Schedule
Installation of approved backflow preventer on new service	Before water service is turned on
Installation of approved backflow preventer on any existing service	As soon as possible, and within 90 days of notice given

### Premise Isolation Assemblies

- If premise isolation assemblies are owned by the RDN, they will be installed along with a water meter, within the public right-of-way or in a utility easement.
- If premise isolation assemblies are installed on the customer’s side of the property line, they are owned by the customer. No connections may exist between the water meter and the backflow assembly.



*An advantage to the purveyor owning the premise isolation assembly is the increased reliability of the assembly that protects the water system.*

### Fixture / Zone Isolation Assemblies

Since fixture isolation and zone isolation assemblies are located on the customer’s premises, the RDN will endeavour to protect public water system as follows:

- The RDN will determine what plumbing hazards (fixtures) must be isolated with approved backflow assemblies that would provide the same level of protection to the public water system as premise isolation;

- If the backflow assembly is installed on-premises (on private property), the RDN will require proof that the backflow assembly is commensurate with the degree of hazard, is approved by the USC FCCCHR, and is installed, inspected, tested, maintained, and repaired to the equivalent level of protection that would be provided by a premise isolation backflow assembly.
- The RDN may require a contract or service agreement be established with the customer that stipulates the provision of water service subject to the terms and obligations spelled out in the agreement. A service agreement template is attached to this guide in Schedule 'E'.
- The customer will have the option of permanently eliminating the cross connection in lieu of installing a backflow preventer.



*An advantage to a customer-owned fixture isolation assembly is that the RDN would avoid the cost of purchase, installation, maintenance, repair, replacement, and the accompanying liability for assembly failure.*

- Where the customer refuses to install an approved backflow assembly on an existing water connection, the RDN will install an assembly at the property line (imposing premise isolation) **as soon as possible** after the need for a preventer is identified, and the customer may have to bear the cost associated with the installation.

## 13.0 Backflow Assembly Testing

The RDN will endeavour to have a **certified backflow assembly tester** on staff at all times. Having a certified backflow assembly tester on staff increases the quality of control over testing, decreases potential liability from a backflow incident, has less administrative costs than hiring a contractor, and better serves the public because the customer is relieved of this onerous annual task.

All backflow assemblies installed at the request of the Cross Connection Control Manager or the Plumbing/Building Inspector on behalf of the RDN, shall be tested in accordance with the *CSA-B64.10 (or most current edition) Manual for the Maintenance and Field Testing of Backflow Prevention Devices* by a certified backflow assembly tester when the assembly is installed, repaired or relocated and then annually thereafter, or more frequently if required by the Cross Connection Control Manager.

All air gaps and atmospheric vacuum breakers shall be inspected, respectively, at the request of the Cross Connection Control Manager.

In the event an assembly fails a test, the assembly must be repaired or replaced within fifteen (15) calendar days of the initial test date or other time agreed to by the Cross Connection Control Manager. The assembly must then be tested again to ensure that it is in proper working order. The test result must be submitted, within thirty (30) calendar days of the initial test date, to the RDN Cross Connection Control Manager. After review and acceptance of the test report, the assembly is considered in proper working order if it passes the applicable test in accordance with the CSA-B64.10 standard listed above.

The RDN is not authorized to enter private premises for the purposes of testing backflow preventers without permission, prior authorization, or contract-agreement, and therefore may provide the customer, upon request, with an up-to-date list of certified backflow assembly testers. However, an RDN Bylaw Enforcement Officer has the authority to enter at all reasonable times a customer's property in order to ascertain whether the requirements of the *Regional District of Nanaimo Cross Connection Control Regulation Bylaw No. 1788 (2019)* are being met or observed.

If a cross connection is found or suspected to exist that poses a potential risk of backflow within the customer's in-premise plumbing system, the customer will be notified of the risk. However, the purveyor is only responsible for the potable water supply delivered to the customer's water meter.

On private property (such as a strata complex, or mobile home park), where the potable water supply is distributed to numerous customers after the water meter, the jurisdiction to protect public health lies with the provincial health authority. Additionally, the BC Plumbing Code applies within the customer's premises, and within all structures intended for occupancy. The purveyor is not responsible for repairing or reporting any circumstances under the control of the customer (i.e. beyond the meter).

### **Test Report Form**

The RDN has developed a test report form for all testable backflow assemblies that are installed in RDN Water Systems. All test results must be submitted on an approved RDN backflow assembly test report form (attached in Schedule 'E'). Test gauge values must be indicated on the test report for each test result.

### **Test Report Acceptance**

The RDN retains the right to accept or reject submitted backflow preventer test reports based on errors, discrepancies and/or omissions. This process will be complete within thirty (30) calendar days from the receipt of the test record. If consecutive errors or omissions are noted on test forms submitted by a certified backflow assembly tester, the RDN reserves the right to refuse recognition of the tester as certified.

### **Test Tag**

A tag or label must be securely attached to every assembly. It is the responsibility of the certified backflow assembly tester to ensure that this tag is fully completed after each test with a **permanent waterproof pen**. A copy of an approved RDN test tag is attached in Schedule 'E'.

### **Test Schedule**

A schedule for testing backflow preventers in RDN Water Systems shall be as follows:

<b>Task</b>	<b>Schedule*</b>
Testing backflow preventer where RPBA is installed for premise isolation	Every 12 months
Testing backflow preventer where DCVA is installed for premise isolation	Every 12 months

Auditing dual check valve devices used in premise isolation	100 units/year
Testing RDN-owned assemblies in RDN Water Systems	Every 12 months
Testing RDN-owned assemblies in non-RDN Water Systems	Every 12 months

\*Or sooner: after a repair, reinstallation, relocation, or re-plumbing, or after a backflow incident has occurred.

## 14.0 Fire Hydrant & Temporary Use

Pursuant to *Regional District of Nanaimo Water Use Regulation Bylaw No. 1654 (2012)*, the Regional District of Nanaimo requires that a Fire Hydrant Use Permit Application be completed and approved for temporary use of water through a Regional District fire hydrant connection to prevent contamination of the water distribution system. Fire Departments are exempt from this permit process.

Only an RDN-owned backflow prevention assembly installed by RDN staff shall be used during a temporary connection to an RDN fire hydrant. A copy of the Fire Hydrant Use Permit Application Form is attached in Schedule 'E'.

## 15.0 Backflow Incident Response Plan

An Emergency Response Plan has been developed in accordance with *the Drinking Water Protection Regulation - Section 15* (or most current), and includes any incident arising from a backflow occurrence.

The backflow incident response plan includes, but is not limited to:

- Notifying the affected users;
- Notifying the local health authority as soon as possible, but no later than the end of the next business day;
- Identifying the source of the contamination;
- Isolating the source of contamination and the affected area(s);
- Providing a temporary, alternate supply of drinking water;
- Cleaning, flushing, and taking other measures to mitigate and correct the problem;
- Applying corrective action(s) to prevent future backflow occurrences;
- Documenting details of the backflow incident; and
- Including a summary of backflow incidents in the Annual Water System Reports submitted to the local health authority.

## 16.0 Consumer Education

The Regional District of Nanaimo will develop educational tools to inform consumers of what constitutes a **cross connection**, common conditions that could result in a backflow hazard, and how to eliminate the hazard.

As the water purveyor, the RDN will distribute with water bills or some other means, at regular intervals, public education brochures to water system customers. For residential customers, such brochures will describe the cross connection hazards in the home and the recommended backflow assemblies or devices that should be installed by the homeowner to reduce the hazard to the public water system. The education program will emphasize the responsibility of the customer in preventing the contamination of the public water supply. The information distributed by the purveyor will include, but not be limited to, the following subjects:

- Cross connection hazards and corrective actions, in general;
- Irrigation system and fire sprinkler cross connection hazards;
- Booster pump and auxiliary water supply hazards;
- Thermal expansion hazards; and
- Importance of annual inspection and/or testing of backflow preventers.

The RDN may also inform its customers about the Cross Connection Control Program by:

- Distributing a brochure to new customers with their application for water service;
- Including a statement in the Annual Water System Reports to Island Health;
- Creating a webpage with visual examples and links to local resources;
- Distributing brochures to hardware and plumbing stores serving the area;
- Participating in fairs, exhibitions, and other community events; and
- Hosting special education sessions for irrigation contractors, fire sprinkler contractors, and local backflow assembly testers, etc.

Bulletins, changes in policy, and related program announcements will be distributed to consumers immediately, as well as pertinent municipal departments, engineering consultants, contractors, and other commercial service providers. In the case of a discrepancy between the industry standards and a bulletin of the RDN's Cross Connection Control Program, the intent of the bulletin will prevail.

## 17.0 Program Funding

For small water systems with primarily residential customers, the administration of a Cross Connection Control Program adds only a small amount to the system's existing workload. However, with multiple separate, small water systems, the RDN will provide a line item in its annual budgets to administer the Cross Connection Control Program effectively. To reduce and/or recover the costs of the Program, the RDN may:

- Assess the general administrative costs of the cross connection program to all customers through the use of consumption charges, monthly charges, or supplemental charges based on the size of the backflow assembly; or
- Require that each customer directly bear the costs of the hazard surveys, as well as the costs associated with the purchase, installation, testing, maintenance, repair, or replacement of any backflow assemblies; or

- Use a combination of consumption charges along with a flat-rate assessed to a specific class of customers (i.e. Commercial).

As the Cross Connection Control Program grows and changes, the method of cost recovery may be adapted as determined by the Manager of Water Services.

## 18.0 Record Keeping

An inventory will be made of all identified cross connection risks along with the approved methods used to eliminate or control the cross connections. All records will be maintained in hard copy and, where applicable, in an electronic database.

The type of records and data to be maintained in the RDN Cross Connection Control Program are:

- Name/address of all service connections;
- Assessed degree of hazard;
- Required backflow preventer to protect the public water system;
- Air gap location, installation and inspection dates, inspection results, and name of person conducting inspections;
- Backflow assembly location, description (type, manufacturer, make, model, size and serial number), installation, inspection and test dates, test results, and person performing tests;
- Information on AVBs used for irrigation system applications, including manufacturer, make, model, size, dates of installation and inspections, and person performing inspections;
- Customer notification and correspondence;
- Customer agreements/contracts;
- Backflow incidents and investigations;
- Enforcement actions taken; and
- Staff training and (re)certification records.

## 19.0 Quality Assurance and Quality Control (QA/QC)

The purpose of a Quality Assurance and Quality Control program (QA/QC) is to ensure consistency and reliability in the testing of backflow assemblies that protect the public water supply. Although not fail-proof, the QA/QC program will help prevent and/or reduce some of the problems encountered with **backflow assembly tester** performance. The QA/QC program will help identify and eliminate the submission of incomplete or false test reports, use of incorrect test procedures, and testing errors made due to improperly calibrated equipment.

The RDN will ensure that only a BCWWA-certified backflow assembly tester tests all backflow assemblies that protect the RDN's Water Systems from contamination. The RDN will employ one or more BCWWA-certified backflow assembly testers, and ensure that the backflow assembly testers maintain their certifications in good standing. Further, the RDN will ensure that all testing equipment is of the appropriate type and is verified for accuracy and calibrated at least once annually.

The RDN's backflow assembly tester(s) will review within 30 days of receipt, the inspection/test report forms submitted by any third party backflow assembly tester, and follow up on any reports that are found to be deficient in any way.



## 20.0 Safety

The Regional District of Nanaimo will provide programs to help ensure the safety of personnel involved in the Cross Connection Control Program (i.e., WorkSafe BC).

## 21.0 Standards & Guidelines

### **British Columbia Building Code**

All new construction and renovations undertaken in the Regional District of Nanaimo are subject to the requirements of B.C. Plumbing Code, Division B, Part 2, 2.6.2 "Protection from Contamination". The Code requires backflow prevention and in Section 2.6.2.1(3) states that "Backflow preventers shall be selected and installed in conformance with the Canadian CSA B64.10 Manual for the Selection and Installation of Backflow Prevention Devices".

### **CSA B64.10/B64.10.1 - Manual for the Selection and Installation of Backflow Prevention Devices**

This standard shall be used for the selection and installation of backflow preventers and methodology of backflow prevention. This standard may not address every application of backflow protection, or may be subjective or require further clarification. Therefore, the Regional District of Nanaimo may, from time to time, issue a bulletin as an extension of the Cross Connection Control Program. In case of a discrepancy between the accepted CSA standard and a bulletin of the Regional District of Nanaimo Cross Connection Control Program, the criterion of the bulletin will prevail.

### **CSA B64 Series - Backflow Preventers and Vacuum Breakers**

This standard is used in conjunction with other B64 series standards and ultimately determines the requirements that backflow devices must meet in order to be used in plumbing systems. All backflow preventers installed in the Regional District of Nanaimo shall be approved in accordance with CSA standard B64 Series. The backflow preventers must be approved for the application for which they are being used.

### **CSA B128.1 - Design and Installation of Non-Potable Water Systems/Maintenance & Field Testing of Non-Potable Water Systems**

This standard specifies the minimum plumbing requirements for non-potable water systems and provides guidelines for identification of non-potable system piping and outlets, and procedures for cross connection testing of the non-potable water systems.

### **CSA B214 Installation Code for Hydronic Heating Systems (Radiator-based or in-floor piping)**

This Code establishes the minimum required provisions regarding the installation of hydronic heating systems.

### **American Water Works Association (AWWA) Cross Connection Control Manual and the British Columbia Water & Waste Association (BCWWA)**

These associations are the accepted agencies for Certification of the Procedures & Practices for testing backflow preventers and Cross Connection Control inspection of facilities.

**University of Southern California Foundation for Cross Connection Control and Hydraulic Research (USCFCCCHR)**

The USCFCCCHR is the authorized approval agency that provides a list of approved Backflow Prevention Assemblies by manufacturer and model number as tested and approved by the USCFCCCHR.

**Chemigation Guidelines for British Columbia - a British Columbia Ministry of Agriculture and Food (BCMAF) publication**

The Chemigation Guidelines for British Columbia provide information on backflow prevention requirements for all types of water supplies and additional safety information pertaining to chemigation. Producers obtaining water from streams or other natural sources are not under the authority of a water supplier. The chemigation manual should be used by agricultural producers as a chemigation standard in instances where a higher authority has not established a standard.

## 22.0 Contact Information

The Regional District of Nanaimo Cross Connection Control Manager can be contacted as follows:

Agency: Regional District of Nanaimo  
 Attention: Manager of Water Services  
 Address: 6300 Hammond Bay Rd, Nanaimo BC, V9T 6N2  
 Phone: 1-877-607-4111 or (250) 390-6560  
 Fax: (250) 390-1542  
 Email: [rcu@rdn.bc.ca](mailto:rcu@rdn.bc.ca) Web: [www.rdn.bc.ca](http://www.rdn.bc.ca)

## 23.0 Program Amendments

<u>Date of Change</u>	<u>Update or Amendment</u>
February 25, 2019	First Draft to go with Bylaw Introduction in 2019
June 10, 2019	Update issued when CCC Bylaw adopted by the Board
December 16, 2019	Spacing errors corrected for upload to web
March 16, 2023	Updated some text, contact info, and defined Inspector

## Schedule 'A'

### Glossary of Terms

**Air break-** the unobstructed vertical distance through air between the lowest point of an indirect drainage system (i.e., the vent port of the backflow preventer) and the flood level rim of the fixture or device into which it discharges.

**Air gap-** the unobstructed vertical distance through air between the lowest point of the water supply outlet and the flood level rim of the fixture or device into which the outlet discharges. The recommended vertical air gap shall be at least twice the inside diameter of the water supply inlet but never less than 25mm. Obstructions in close proximity to the air gap such as a wall, may restrict air flow into the outlet pipe rendering the air gap ineffective and thus becoming susceptible to back siphonage. When airflow is restricted, the air gap must be increased to a minimum of three times the inside diameter of the discharge end of the water supply inlet.

Air gaps less than 25mm should be approved only as a permanent part of a listed device that has been tested under back siphonage conditions with a vacuum of a minimum of 62.5 cm of mercury. Side walls, ribs or similar obstructions may affect the air gap if within a distance of three times the diameter of the effective opening for a single wall, or four times the effective opening for intersecting walls. If the supply line is cut at an angle, measure the gap distance from the bottom of the angle. Hoses are not allowed.

A manufactured air gap fitting(s), such as one that has holes cut into the sides of a tube, may not meet the dimension criteria of an "approved" air gap and, thus, may not perform as required to break a vacuum. Any air gap fitting used in place of an approved backflow assembly should meet the dimension criteria stated above. A properly maintained approved air gap is the best means available for protection against backflow. However, an air gap is not always practical, and it is vulnerable to bypass arrangements that nullify its effectiveness. In addition, use of an air gap often exposes the water to dust, debris, airborne bacteria, and other contaminants and pollutants.

**Approved Backflow Prevention Assembly-** a backflow preventer designed to be tested and repaired while in service and to meet the design and installation criteria requirements of CSA Standard B64.

**Approved Backflow Prevention Device-** a non-testable Approved Backflow Preventer that meets the design and installation criteria requirements of CSA Standard B64.

**Atmospheric Vacuum Breaker (AVB)-** Vacuum breaker designed to be under pressure only when water is being drawn from the system and for short, intermittent periods of time.

**Auxiliary / Alternate Water Supply-** any water supply on the premises, or available to the premises, other than the purveyor's approved public water supply that is not approved for human consumption by the health authority or is otherwise not acceptable to the purveyor. The auxiliary water may include water from any natural source, such as a well, pond, lake, spring, river, stream or another purveyor's water supply; auxiliary water may also include used waters or industrial fluids.

**Backflow-** means the undesirable reversal of flow of water or other liquids, gases or solids through a cross connection into the public water supply or the consumer's plumbing system.

**Backflow Assembly Tester-** means a person holding a valid certificate from the American Waterworks Association, British Columbia section (BCWWA) for testing backflow prevention assemblies.

**Backflow Assembly Test Report** means a record, in the form provided or approved for use by the RDN Manager of Water Services, which contains all pertinent information and test data resulting from a Backflow assembly test conducted by a certified Backflow Assembly Tester in accordance with the provisions of this Bylaw.

**Backflow Preventer** means an apparatus that is installed in a water system so as to prevent Backflow of Contaminants into the RDN Water System, and includes Backflow Prevention Assemblies and Backflow Prevention Devices.

**Backflow Prevention Assembly** means a CSA Standard B64-approved apparatus that is installed in a water system to stop the flow of water or other liquids, gases or solids from flowing in the reverse direction back into the Consumer's plumbing system or the RDN Water System. A Backflow Prevention Assembly is equipped with an inlet and outlet shut-off valve, and test cocks that allow it to be tested and repaired while in service.

**Backflow Prevention Device** means a non-testable apparatus that is installed in a water system to stop the flow of water or other liquids, gases or solids from flowing in the reverse direction. A Backflow Prevention Device is not equipped with an inlet and outlet shut-off valve, or test cocks that would allow its functionality to be tested or determined.

**Back pressure-** a pressure (caused by a pump, elevated tank or piping, boiler, or other means) on the consumer's side of the service connection that is greater than the pressure provided by the public water system and which may cause backflow.

**Back siphonage-** means backflow due to a reduction in pressure in the public water system and/or the consumer's water system.

**Building Inspector-** a person or persons appointed from time to time by the Regional District of Nanaimo Board as a building inspector.

**Bylaw Enforcement Officer-** a person or persons appointed from time to time by the Regional District of Nanaimo Board as a bylaw enforcement officer, or any other person appointed as such by the Board for the purposes of administering, enforcing or carrying out the Cross Connection Control Regulation Bylaw.

**Commensurate-** means suitable in amount or quality compared to something else; equivalent; corresponding; comparable; or proportionate.

**Consumer/Customer-** any person who is the owner or occupier, or agent for the owner or occupier, of any Premises or equipment to whom water is supplied by an RDN Water System.

**Consumer Supply Line** means the pipe that conveys water from an RDN Water System to the Consumer's building or property being served.

**Contaminant**- any physical, chemical, biological or radiological substance or matter in water which may render the water non-potable, according to the *Drinking Water Protection Act, Chapter 9*.

**Critical level (CL)**- the level of submergence at which a vacuum breaker ceases to prevent back siphonage.

**Cross Connection**- means any existing or potential physical connection whereby an RDN Water System is connected, directly or indirectly, with any Non-Potable or unapproved Private Water System, or any sewer, drain, conduit, well, pool, storage reservoir, pond, boiler, plumbing fixture, or any other device which contains or may contain contaminated water, liquid, gases, sewage, or other waste, of unknown or unsafe quality, capable of introducing Contaminants into the public water supply as a result of Backflow. Bypass arrangements, jumper connections, removable sections, swivel or changeover devices, or any other temporary or permanent connecting arrangements through which backflow may occur are considered to be Cross Connections.

**Cross Connection Control Manager**- shall be the RDN's Manager of Water Services, or designated alternate.

**Cross Connection Control Program (CCCP)**- means the administrative and technical procedures the water purveyor (the Regional District of Nanaimo) implements to protect the public water system from contamination via cross connections.

**CSA and CAN/CSA**- the Canadian Standards Association.

**Double Check Valve Assembly (DCVA)**- a backflow preventer consisting of two force-loaded, independently acting check valves, including tightly closing resilient-seated shut-off valves located at each end of the assembly and fitted with properly located resilient-seated test cocks. This device is designed for use under continuous pressure.

**Double Check Valve Assembly for Fire system (DCVAF)**- a DCVA that is specifically designed for use only on water supplies to fire sprinkler and standpipe systems.

**Dual Check Valve (DuC)**- a backflow preventer consisting of two independently acting, force-loaded, soft-seated check valves in series. This device does not have a relief port or test cocks. This device is designed for use under continuous pressure.

**Dual Check Valve for Fire system (DuCF)**- a DuC that is specifically designed for use on water supplies to residential fire sprinkler systems.

**Dual Check Valve with Atmospheric Port (DCAP)**- a backflow preventer consisting of two independently acting check valves separated by an intermediate chamber with an atmospheric port. A chamber pressure higher than the supply pressure is required to open the port when there is a positive pressure on the supply side. This device is designed for use under continuous pressure.

**Dual Check Valve with Atmospheric Port for Carbonators (DCAPC)**- a carbonated beverage backflow preventer consisting of two independently acting check valves biased to normally closed positions and separated by an intermediate chamber with an atmospheric port. A chamber pressure higher than supply pressure is required to open the port when there is a positive pressure on the supply side. An integral strainer at the inlet ensures that debris does not foul the device's check valves or enter the carbonator unit. This device is designed for use under continuous pressure.

**Dual Check Valve with Intermediate Vent (DuCV)**- a backflow preventer consisting of two independently acting check valves biased to a normally closed position. Between the check valves there is a relief port that is biased to a normally open position. This device is designed for use under continuous pressure.

**Fire Protection System (class types)**- refer to CSA B64.10-01.

- **Residential "full flow through" type fire sprinkler system**- an assembly of pipe and fittings that conveys water from the water service pipe to the fire sprinkler outlets and that is fully integrated into the potable water system to ensure a regular flow of water through all parts of both systems.
- **Residential "partial flow through" system**- an assembly of pipe and fittings that conveys water from the water service pipe to the fire sprinkler outlets and in which flow (during non-functional periods of the fire system) only occurs through the main header to a water closet located at the farthest point of the system.
- **Class 1 system**- an assembly of pipe and fittings that conveys water from the water service pipe to the fire sprinkler outlets and that has direct connections only from public water main, has no pumps, tanks, or reservoirs, and has all sprinkler drains discharging to atmosphere, dry wells, or other safe outlets.
- **Class 2 system**- an assembly of pipe and fittings that conveys water from the water service pipe to the fire sprinkler outlets, that is the same as a Class 1 system but also includes a booster pump in the connection from the street mains.
- **Class 3 system**- an assembly of pipe and fittings that conveys water from the water service pipe to the fire sprinkler outlets and that has direct connections from the public water supply mains, elevated storage tanks (either open or closed), fire pumps taking suction from aboveground covered reservoirs or tanks, and pressure tanks. In Class 3 systems, storage facilities are only filled from, or connected to, the public water supply, and the water in the tanks is maintained in a portable condition. Class 3 systems resemble Class 1 systems in all other respects.
- **Class 4 system**- an assembly of pipe and fittings that conveys water from the water service pipe to the fire sprinkler outlets and that has direct connections from public supply mains (similar to Class 1 and Class 2 systems) and an auxiliary water supply dedicated to fire department use and available to the premises, such as an auxiliary supply located within 518 m (1700 ft) of the pumper connection.
- **Class 5 system**- an assembly of pipe and fittings that conveys water from the water service pipe to the fire sprinkler outlets and that has direct connections from public supply mains and that is also interconnected with an auxiliary water supply.

- **Class 6 system-** an assembly of pipe and fittings that conveys water from the water service pipe to the fire sprinkler outlets and that is a combined industrial and fire protection system and is supplied from the public water supply mains only, with or without gravity storage or pump suction tanks.

**Fire Service Pipe-** a pipe that conveys water from a public water main or private water source to the inside of a building for the purpose of supplying a fire sprinkler or standpipe system.

**Fixture Isolation-** protection provided at the connection to a fixture or appliance.

**Grey/Gray Water / Greywater-** untreated household wastewater that has not come in contact with toilet waste, and includes wastewater from bathtubs, showers, clothes washers and laundry tubs, but excludes toilets, urinals, bidets, kitchen sinks, and dishwashers.

**Hazard-** refers to one of three levels of hazard: minor, moderate, and high (or severe) as determined by the Cross Connection Control Manager.

**High health cross connection hazard-** means a cross connection which could impair the quality of potable water and create an actual public health hazard through poisoning or spread of disease by sewage, industrial liquids or waste.

**Horizontal-** a plane perpendicular to a plumb line ( $\pm 2$  deg.).

**Hydrant-** a device equipped with special threaded connections owned and maintained by the Regional District within a highway, right of way, easement or on Regional District property, connected to a water main to supply water for fire protection purposes.

**Individual protection-** protection provided at the connection to a fixture or appliance.

**Inspect-** an on-site review of the water use, facilities, meters, piping, equipment, operating conditions and maintenance records for the purpose of evaluating for conformity with the terms and conditions of the Cross Connection Control Program.

**Inspector-** means a person holding a valid certificate from the American Waterworks Association, British Columbia section (BCWWA) for inspecting facilities on behalf of the RDN's cross connection control program.

**Low health cross connection hazard-** means a cross connection that could cause an impairment of the quality of potable water to a degree that does not create a hazard to the public health, but does adversely and unreasonably affect the aesthetic qualities of such potable water for domestic use.

**Manager of Water Services-** the person appointed to the position of Manager of Water Services of the RDN Regional and Community Utilities Department, and shall include any person designated by the Board to act on behalf of the Manager of Water Services.

**Potable Water-** water that is fit for human consumption as defined in the *Drinking Water Protection Act*.

**Potable water system materials-** any material acceptable under the British Columbia Building Code for use in a water distribution system.

**Potable water system materials, not acceptable-** any material that is not acceptable under the British Columbia Building Code for use in a water distribution system.

**Premise isolation-** a method of protecting the RDN Water System by installation of approved air gaps or approved backflow prevention assemblies at or near the service connection or alternative location acceptable to the RDN, to **isolate** the Consumer's water system from the RDN's Water System. This type of protection does not provide protection to personnel on the premises.

**Premise/Premises-** means any real property and all buildings and improvements thereon.

**Private Water System-** any water system available on or to a premise originating from a source or system not owned or operated by the Regional District of Nanaimo.

**Rainwater-** precipitation water collected from rooftops or other manmade above-ground collection surfaces, that is typically stored in a cistern.

**RDN Water System-** any water system owned, operated and maintained by the Regional District of Nanaimo or its authorized agent, and any and all parts thereof.

**Reclaimed Water-** means effluent derived in any part from sewage from a wastewater treatment system that has been adequately and reliably treated, so that as a result of that treatment, it is suitable for beneficial use or a controlled use that would not otherwise occur, and it is no longer considered wastewater.

**Reduced pressure principal assembly (RP) or (RPBA)-** a backflow preventer consisting of a mechanically independent acting, hydraulically dependent relief valve located in a chamber between two independently operating, force-loaded check valves, the intermediate chamber pressure always being lower than the supply pressure when there is a positive pressure on the supply side. The unit includes properly located resilient-seated test cocks and tightly closing resilient-seated shut-off valves at each end of the assembly. This device is designed for use under continuous pressure.

**Reduced pressure principal assembly for fire system (RPF)-** an RP that is specifically designed for use only on water supplies to fire sprinkler and standpipe systems.

**Residential-** means all single-family dwellings, duplexes, townhouses, condos, row housing and apartments intended for occupancy as defined in the British Columbia Building Code.

**Service Connection Point-** the point of physical connection between the RDN Water System and the Consumer. Typically the Service Connection Point is at the downstream side of the water meter and /or is located at or near the Consumer's property line.

**Survey-** means a complete formal review of the potable water systems(s) located within a building or property to determine the presence of any existing backflow preventers, their installation & conditions and/or the existence of cross connections that could pose a health risk to occupants or the RDN Water System.



**Used Water-** any Potable Water which is no longer in the RDN Water System, including Potable Water that has moved downstream or past the Service Connection valve and/or the property line to the Premises. This includes water used for heating or cooling purposes and water that has the potential to flow back into the distribution system from the consumer.

**USCFCCCHR-** University of Southern California Foundation for Cross Connection Control and Hydraulic Research; an agency relied upon for industry standard Cross Connection Control testing and guidance.

**Vacuum Breaker-** a device that will prevent backflow when pressure in the system upstream of the device falls below atmospheric pressure. Air is only admitted downstream of the device.

**Vacuum Breaker, Atmospheric type (AVB)-** Vacuum breaker designed to be under pressure only when water is being drawn from the system and for short, intermittent periods of time.

**Vacuum Breaker, Hose Connection Dual Check type (HCDVB)-** a vacuum breaker consisting of two independently acting check valves, forced-loaded or biased to a normally closed position. Located between the checks is a means of venting to atmosphere that is forced-loaded or biased to a normally open position. If there is no flow through the device, the check valves are closed and the vent is open. The device is designed to be under pressure only when water is being drawn from the system and for short intermittent periods of time. The device incorporates a means to manually test the operation of the downstream check valve. The device is designed to be used where the backpressure generated by an elevated hose is 3 m (10 ft) of head pressure or less.

**Vacuum breaker, Hose Connection type (HCVB)-** a vacuum breaker consisting of a single force-loaded check valve biased to a normally closed position. Downstream of the check valve is a means of automatically venting to atmosphere; the device is forced-loaded or biased to a normally open position. If there is no flow through the device, the check valve is closed and the vent is open. The device is designed to be under pressure only when water is being drawn from the system and for short, intermittent periods of time.

**Vacuum Breaker, Laboratory Faucet type (LFVB)-** a vacuum breaker consisting of two independently acting check valves force-loaded or biased to normally closed position. Between the check valves there is a relief port that is force-loaded or biased to a normally open position. When the laboratory faucet is off, the check valves are closed and the port is open; when the faucet is on, the check valves are open and the port is closed.

**Vacuum Breaker, Pressure type (PVB)-** an assembly containing an independently acting check valve forced-loaded or biased to a normally closed position, and an independently operating air inlet valve forced-loaded or biased to a normally open position and located on the discharge side of the check valve. The assembly is equipped with properly located resilient-seated test cocks and tightly closing resilient-seated shut-off valves located at each end of the assembly. The device is designed for use under continuous pressure.

**Vault-** a room or space that is constructed to house a backflow preventer and that is capable of being entered by a person.

**Vertical-** a plane parallel to a plumb line ( $\pm 2$ deg.).

**Water Purveyor-** the owner or operator of a drinking water system.

**Water Distribution System-** a system for the collection, transmission, treatment, storage and distribution of water from source to consumers.

**Water Supplier-** referred to as the Regional District of Nanaimo in this document.

**Water Service Pipe-** a pipe that conveys water from a public water main or private water source to the inside of the building.

**Zone or Area Protection-** Protection provided for sections of a piping system within a building of facility with no potable connections downstream of a backflow preventer.

## Schedule 'B'

### Cross Connection Control Program Decision Summary Table

Decision Item	Decision
<b>1. Type of Program</b>	
a) Premise isolation only	
b) Premise isolation and in-premises protection (combination program)	✓
<b>2. Extent of Coordination with Building/Plumbing Officials</b>	
a) Information exchange	
b) Interaction	✓
c) Joint program	
<b>3. Relationship with Customer</b>	
a) Signed service agreement or contract	✓
b) Bylaw resolution; implied service agreement	✓
<b>4. Enforcement of Corrective Action</b>	
a) Rely upon shut-off of water service	
b) Rely upon purveyor-installed premise isolation	✓
<b>5. Assessment and Re-assessment of Hazard</b>	
a) By purveyor's staff or equivalent	✓
b) By backflow assembly tester employed by customer, reviewed by RDN	
<b>6. Location and Ownership of Premise Isolation Assembly</b>	
a) On purveyor's service line	✓
b) On customer's service line	
<b>7. Backflow Assembly Tester</b>	
a) Ensure purveyor's staff member(s) is certified	✓
b) Inter-agency agreement or use of other agency's tester	
c) Contract with a 3 <sup>rd</sup> party backflow assembly tester	
<b>8. Testing of Assemblies</b>	
a) Purveyor's equipment tested by purveyor's own staff	✓
b) Customer's equipment tested by customer-chosen contractor	✓
<b>9. Cost Recovery</b>	
a) Borne by all customers (general water rates)	✓
b) Assessed to a specific class (i.e. commercial water meters)	
c) Each customer directly bears cost (as directed by Mgr of Water Services)	✓



## Schedule 'C' Sample Installation Diagrams

### Air Gap

A safe air gap must be twice the diameter of the inlet pipe, and never less than one inch in diameter. Figure 1 shows a safe air gap arrangement for makeup tanks, sinks and drain lines.

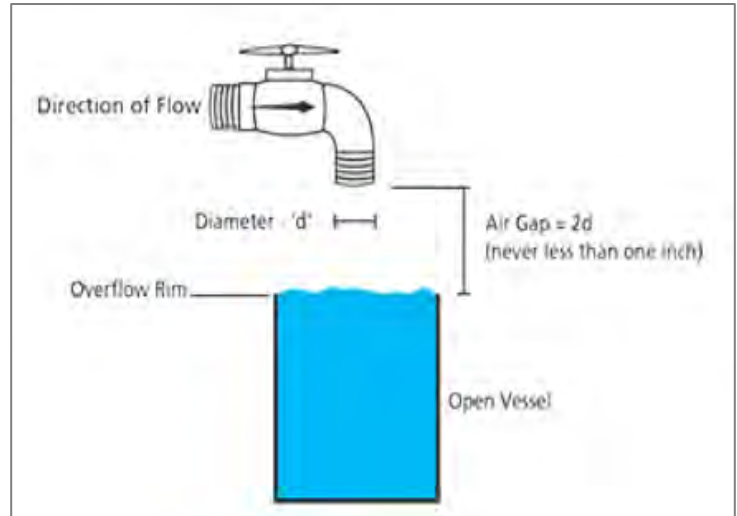


Figure 1

### Booster Pump

Backpressure can result from an increase in the downstream pressure created by pumps, boilers, and elevation differences. An air gap is used in Figure 2 below to prevent backflow into the municipal water supply.

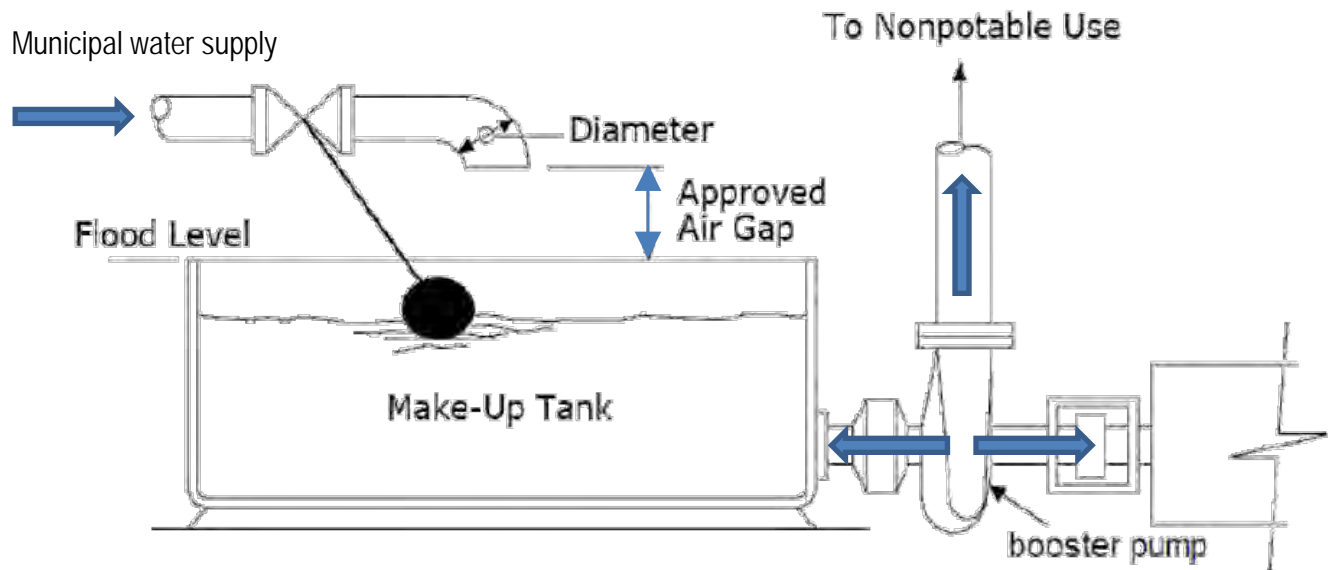


Figure 2

# Atmospheric Vacuum Breaker (AVB)

An AVB allows air to enter the water supply line when the pressure in the public water system is reduced to zero or below. During normal flow, the valve is open and a float within the device is pushed up which seals the air inlet. When a backsiphonage condition develops, as shown in Figure 3 below, the float drops, closes the valve, and allows air to enter through the air inlet, preventing backflow (backsiphonage).

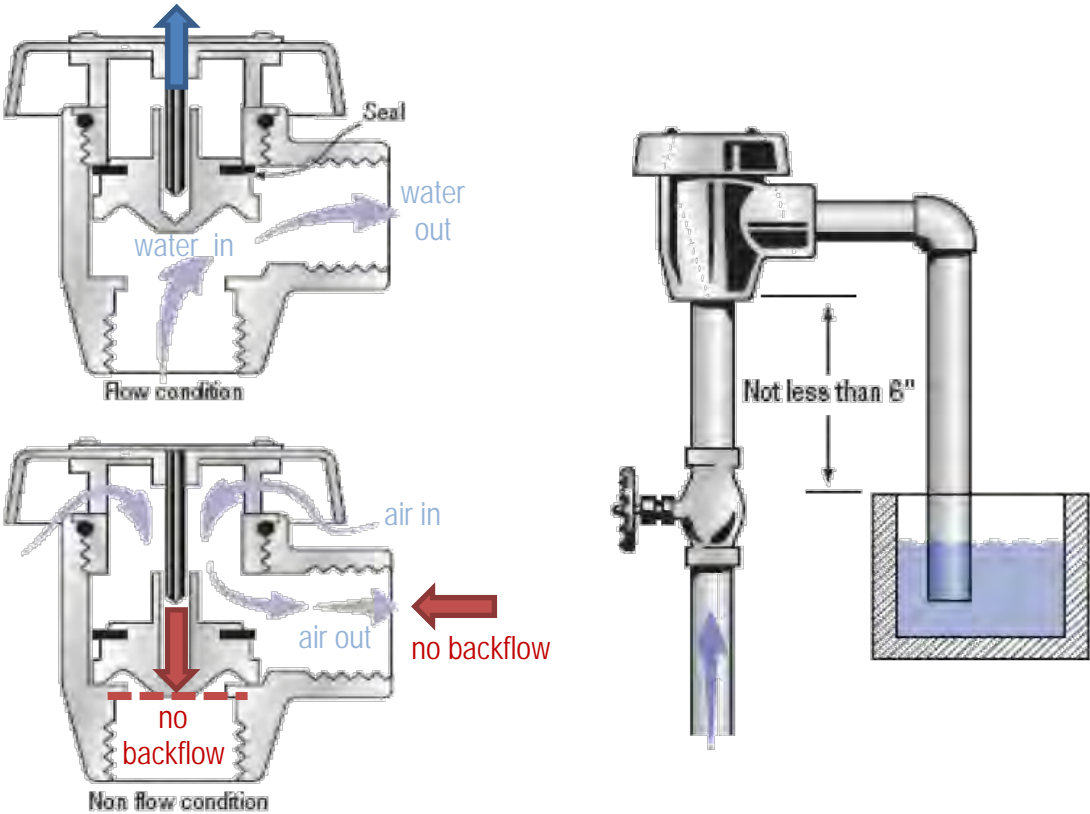


Figure 3

# Pressure Vacuum Breaker (PVB)

A PVB is similar to an AVB, in that it prevents backsiphonage by allowing air in through a vent. The PVB consists of a spring loaded check valve, spring loaded air inlet valve, test cocks and two shutoff valves forming an assembly (see Figures 4 and 5 below). Because of the spring loading, a PVB can be installed where it will be under continuous pressure for long periods. PVBs are testable assemblies.

Figure 4

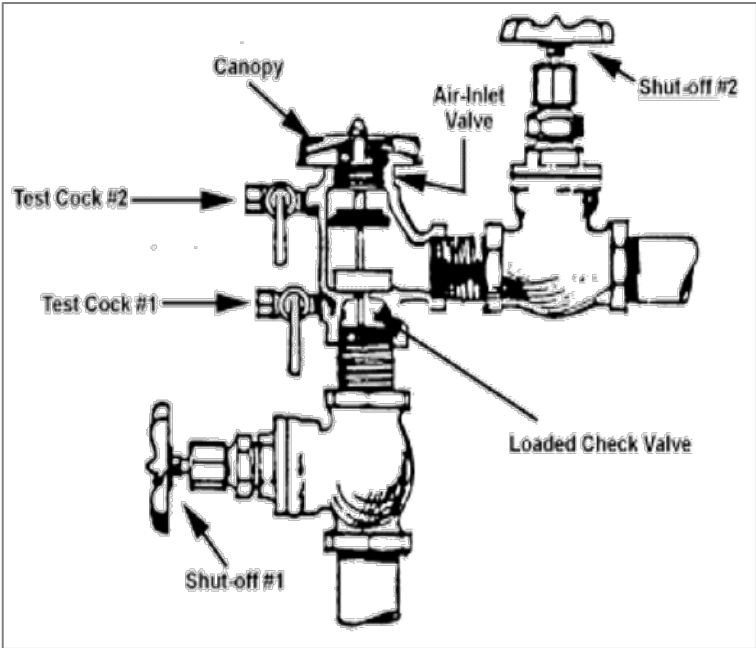
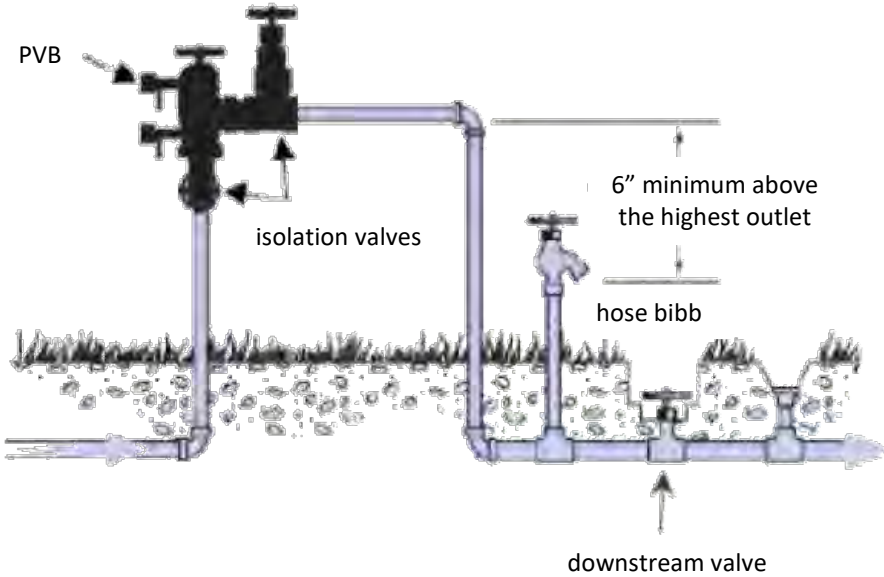


Figure 5



# Reduced Pressure Backflow Assembly (RPBA)

A reduced pressure backflow assembly consists of two independently acting, spring loaded check valves with a relief valve placed between the two check valves designed to prevent backflow. The pressure in Zone 1 is the same as the public water supply. If the water pressure in Zone 2 becomes greater than the pressure in Zone 1, the second check valve will stop the reversal of flow. However, if the second check valve fails to seat properly, water will be discharged through the relief port, thereby protecting the municipal supply from backflow (see Figures 6 and 7 below) .

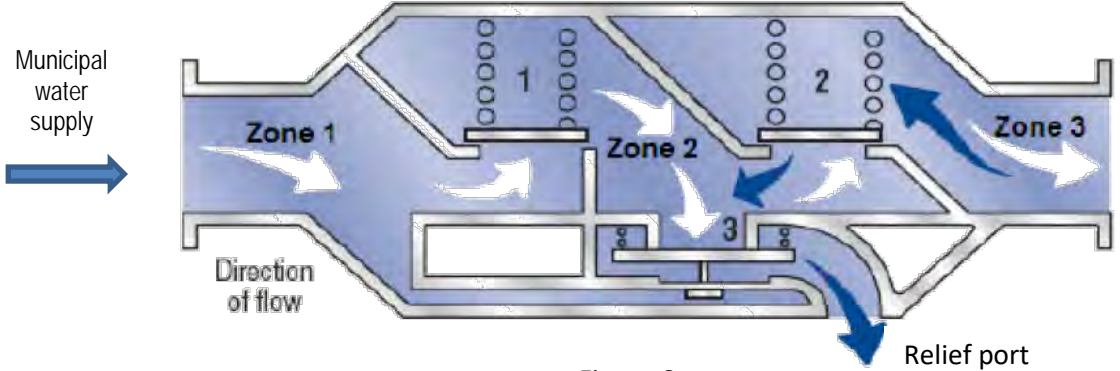


Figure 6

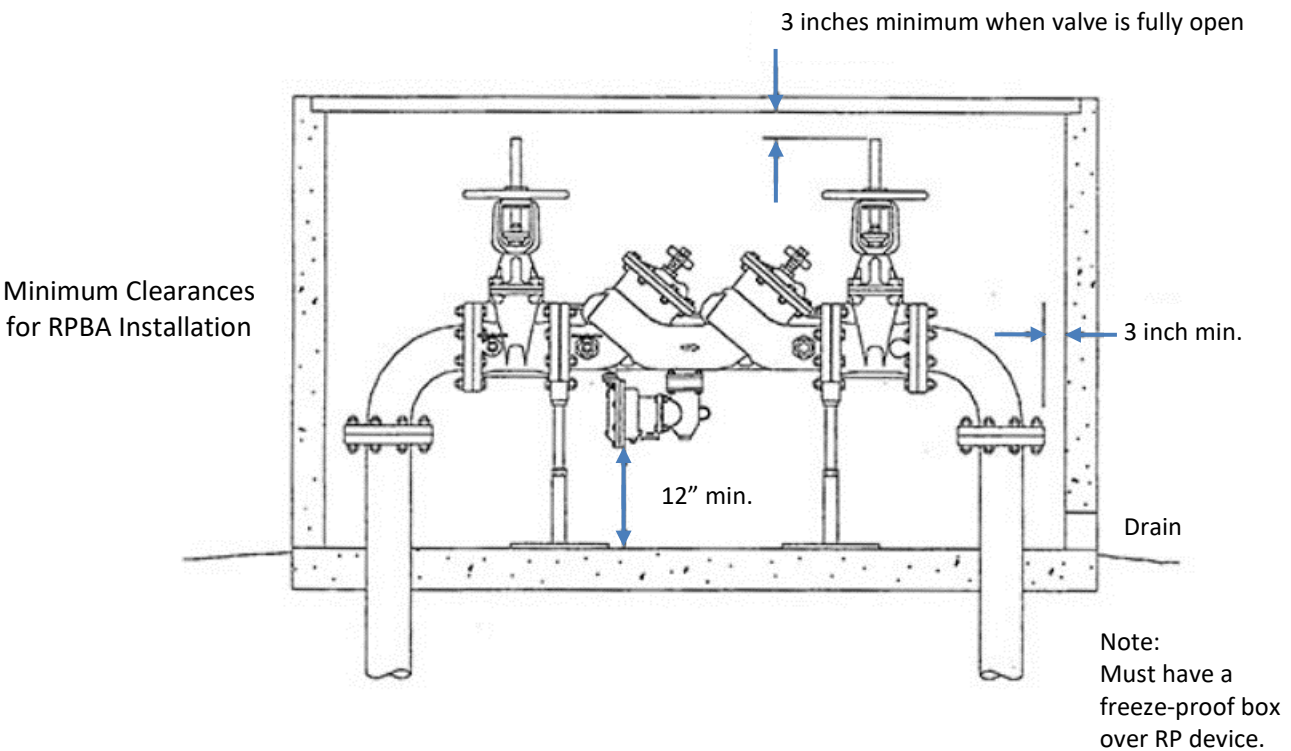


Figure 7  
RBPA above ground installation



# Dual Check Valve Assembly (DCVA)

A DCVA provides some degree of protection against backflow, but does not have the same “failsafe” relief port as an RPBA. Therefore, a DCVA may only be used to protect the public supply from aesthetic or non-health hazards. A DCVA consists of two loaded check valves, test cocks, and shutoff valves forming an assembly (see Figures 8 and 9 below). A DCVA may be used under continuous pressure and protect against backflow from both backpressure and backsiphonage. A DCVA is a testable assembly.

Figure 8

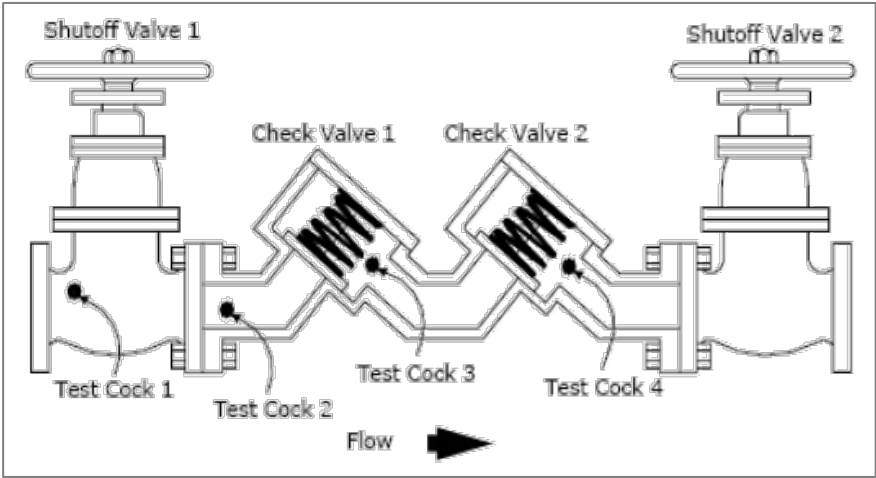
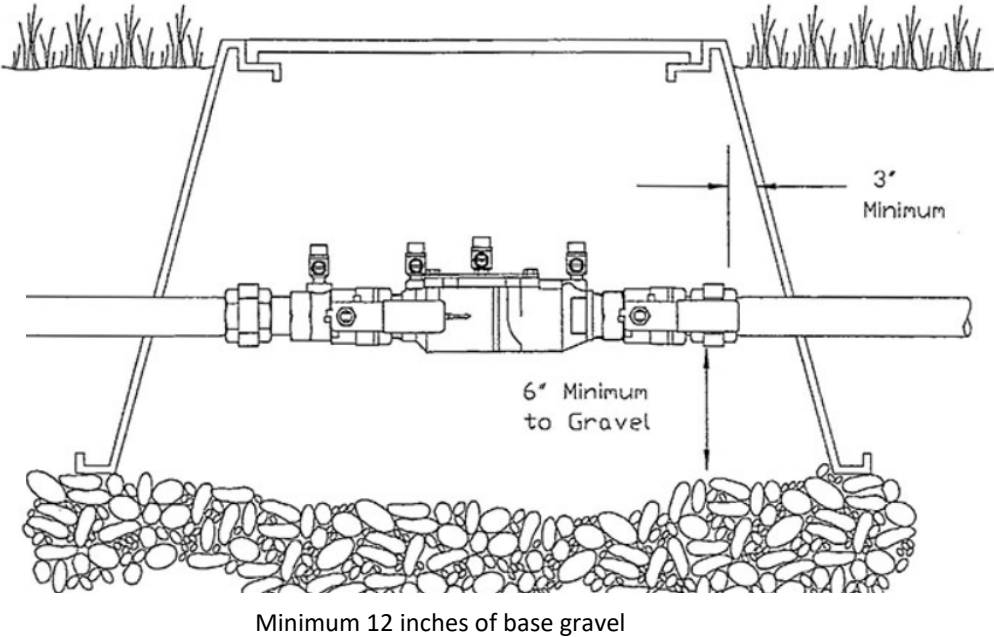


Figure 9

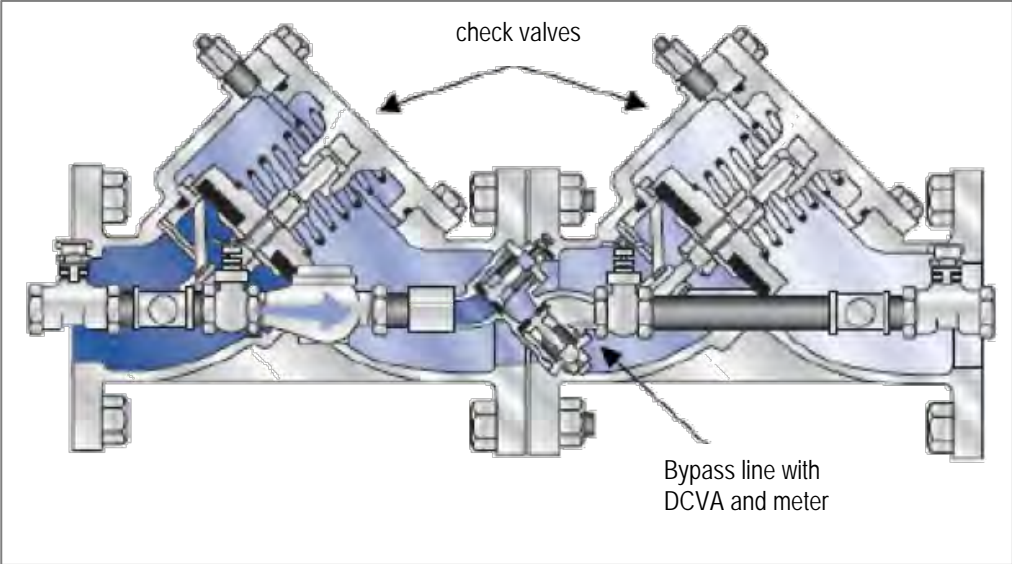
A small DCVA commonly used in sprinkler systems. (Below ground installation)



## Double Check Detector Check

A Double Check Detector Check is a variation of a DCVA that is commonly used to protect the water supply from untreated fire protection systems. The Detector Check has a bypass line which also has a DCVA and a water meter which measures very low fire line flows (Figure 10 below).

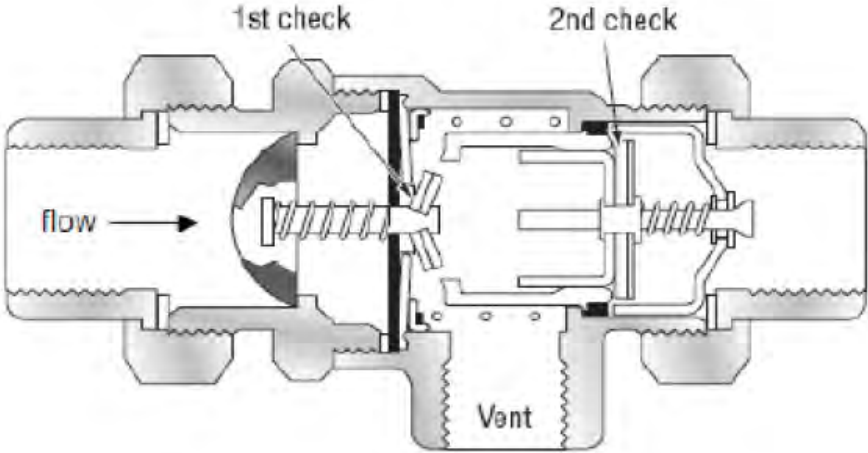
Figure 10



## Double Check Valve with Intermediate Vent

A Double Check Valve with Intermediate vent is used on ¼ inch, ½ inch or ¾ inch pipes to protect against both backpressure and backsiphonage in low hazard situations. A vent located between the two check valves provides extra backflow protection (see Figure 11 below). This type of device can be used on carbonated beverage machines to prevent the backflow of carbon dioxide gas and carbonated water into the public water supply.

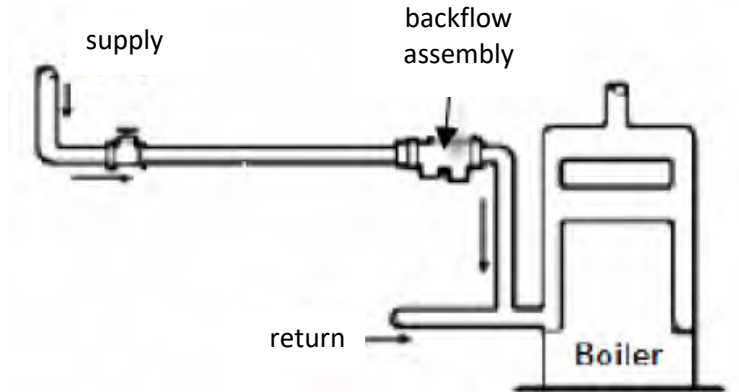
Figure 11



## **Boiler Installation (risk of thermal expansion)**

In many buildings, potable water is used as a source of water for boilers. A boiler is a closed vessel in which water or other fluids is heated under pressure. The fluid is then circulated out of the boiler for use in various processes or heating applications. The pressures within boilers can become much greater than the system pressure at the point of connection. In many cases, chemicals of varying toxicity are added to boilers to reduce corrosion or scaling. Since boilers can cause backflow by backpressure, it is necessary to protect the water supply by installing a backflow assembly on the makeup or feed line to the boiler as noted in Figure 12 below.

Figure 12





## Schedule 'D'

### Exceptions to Premise Isolation

Complete an entry for each location where a premise-isolation backflow assembly exception was granted for a high-hazard use premises.

Address / Use	Date / Reason / Description
<i>Example: 1234 Something Rd Dental Clinic</i>	<i>Feb 6, 2019 - RDN staff visually verified that an AVB was installed on every faucet at the dental clinic. It was determined that a dual check valve at the curb is sufficient for premise isolation at this time. To be reviewed again in Feb 2020.</i>



Other types of high-hazard premises where exceptions may be considered:

- A medical/health facility that doesn't have a laboratory or blood/urine collection activities;
- A "bottling plant" without bottling processes, i.e. warehousing only;
- A laundry or dry cleaning business with no cleaning processes on the premises, i.e. drop off only;
- A marina/dock facility for small boat moorage (where no water or sewage facilities are on board);



## Schedule 'E'

### Sample Forms and Letters



## Letter Requesting Customer To Complete Water Use Questionnaire

Residential

Date:

Dear Property Owner:

File No.: 5500-22-24

**Re: Backflow Prevention in RDN Water Service Areas**  
**ADDRESS, CITY, PROV**

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The Regional District of Nanaimo (RDN) is looking for your support to help protect public health by reducing the risk of contaminants flowing back into the public water supply. As the water purveyor, the RDN is responsible for protecting the public water supply on an on-going basis after a building permit has been completed and all inspections have passed.

Some customers have special uses of water on their premises (i.e. a booster pump, irrigation system, private well, or fish pond, etc.). These customers' water connections are considered an increased health risk to other water system customers because of the potential for backflow, back-pressure, and/or back-siphonage to occur into the community water system.

While the BC Building Code and the BC Plumbing Code stipulate the type of backflow prevention equipment required on a water service connection, backflow incidents can occur when a backflow prevention valve fails to operate as intended, or has been removed by the customer or contractor without permission. With the recent adoption of the RDN's Cross Connection Control Regulation, a cross connection hazard survey is being conducted of all residential water system customers.

Please complete the attached questionnaire by checking the applicable boxes and return the form to the RDN by May 31, 2021. Working together to explore options for backflow prevention will help us ensure the highest level of public health and safety. Thank you in advance. If you have any questions, please do not hesitate to contact me at 250-390-6560.

Yours truly,

Manager of Water Services

**Please complete the attached questionnaire and  
return by mail, fax, or email to:**

Murray Walters  
Regional District of Nanaimo, Water Services Dept.  
6300 Hammond Bay Road, Nanaimo, BC V9T 6N2

Email: [rcu@rdn.bc.ca](mailto:rcu@rdn.bc.ca)  
Fax: 250-390-1542

---

6300 Hammond Bay Road, Nanaimo, BC V9T 6N2

[www.rdn.bc.ca](http://www.rdn.bc.ca)





## Water Use Questionnaire Residential Customers

Name: \_\_\_\_\_ Ph. \_\_\_\_\_  
 Site Address: \_\_\_\_\_ Cell: \_\_\_\_\_  
 Mailing Address: \_\_\_\_\_ Email: \_\_\_\_\_

Please indicate whether the special plumbing or activities listed below apply to your premises:

Yes	No	Plumbing or Activity Present on Customer's Premises
		Underground sprinkler system
		Booster pump
		Water softener (or other water treatment system)
		Residential fire sprinkler system
		Solar heating system
		Heat exchanger (heated floors, geothermal heat exchange)
		Private well (or other supply, whether it's connected to the in-home plumbing or not)
		Sewage pumping system or grey water system
		Boat moorage with water supply
		Hobby farm
		Animal watering troughs
		Swimming pool or spa (hot tub)
		Greenhouse
		Decorative or fish pond
		Photo lab or dark room
		Home-based business (i.e., hair/beauty salon, dog grooming, machine shop)
		Sani-dump
		Rainwater collection cistern

**Note to Customer:** This form is used for preliminary assessment only. The water purveyor may require more information at a later date.

This form was completed by (print name): \_\_\_\_\_ Date: \_\_\_\_\_

Please return completed form by \_\_\_\_\_ (date) and send to:

Murray Walters  
 Regional District of Nanaimo, Water Services Dept.  
 6300 Hammond Bay Rd, Nanaimo, BC V9T 6N2  
 Email: [rcu@rdn.bc.ca](mailto:rcu@rdn.bc.ca)  
 Fax: 250-390-1542



## Letter Requesting Customer To Complete Water Use Questionnaire

**Commercial**

Date:

Dear Business Owner:

File No.: 5500-22-24

**Re: Backflow Prevention in Regional District of Nanaimo Water Service Areas**  
**BUSINESS NAME, ADDRESS, CITY, PROV**

The Regional District of Nanaimo (RDN) is looking for your support to help protect public health by reducing the risk of contaminants flowing back into the public water supply. As the water purveyor, the RDN is responsible for protecting the public water supply on an on-going basis after a building permit has been completed and all inspections have passed. Some existing businesses pose a concern because of the age or complexity of their plumbing systems, and/or special uses of water on the premises (i.e. car washes, hotels, laundromats, nurseries, etc.). These customers' water connections are considered an increased health risk to other water system customers because of the potential for backflow, back-pressure, and/or back-siphonage to occur into the community water system.

While the BC Building Code and the BC Plumbing Code stipulate the type of backflow prevention equipment required on a water service connection, backflow incidents can occur when a backflow prevention valve fails to operate as intended, or has been removed by the customer or contractor without permission. With the recent adoption of the RDN's Cross Connection Control Regulation, a cross connection hazard survey is being conducted of all commercial water system customers.

Please complete the attached questionnaire by checking the applicable boxes and return the form to the RDN by May 31, 2021. Working together to explore options for backflow prevention will help us ensure the highest level of public health and safety. Thank you in advance. If you have any questions, please do not hesitate to contact me at 250-390-6560.

Yours truly,

Manager of Water Services

**Please complete the attached questionnaire and  
return by mail, fax, or email to:**

Murray Walters

Regional District of Nanaimo, Water Services Dept.  
6300 Hammond Bay Road, Nanaimo, BC V9T 6N2

Email: [rcu@rdn.bc.ca](mailto:rcu@rdn.bc.ca)

Fax: 250-390-1542

6300 Hammond Bay Road, Nanaimo, BC V9T 6N2

[www.rdn.bc.ca](http://www.rdn.bc.ca)



# Water Use Questionnaire

## Commercial Customers

Business Name and Contact: \_\_\_\_\_

Description of Business: \_\_\_\_\_

Site Address: \_\_\_\_\_

Ph. \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Cell: \_\_\_\_\_

\_\_\_\_\_

Email: \_\_\_\_\_

**Is the type of business or premise included in the table below? (check all that apply)**

<input type="checkbox"/>	Agricultural (farm or dairy)
<input type="checkbox"/>	Beverage bottling plant
<input type="checkbox"/>	Car wash
<input type="checkbox"/>	Chemical plant
<input type="checkbox"/>	Commercial laundry or dry-cleaners
<input type="checkbox"/>	Having reclaimed water and potable water provided
<input type="checkbox"/>	Film processing facility or laboratory
<input type="checkbox"/>	Food processing plant
<input type="checkbox"/>	Hospital, medical center, nursing home, veterinary, medical or dental clinic, or blood plasma centre
<input type="checkbox"/>	Having irrigation system using purveyor's water and adding chemicals, i.e., a golf course

<input type="checkbox"/>	Metal plating industry
<input type="checkbox"/>	Mortuary
<input type="checkbox"/>	Petroleum processing or storage plant
<input type="checkbox"/>	Pier or dock
<input type="checkbox"/>	Site access denied or restricted
<input type="checkbox"/>	Radioactive material processing plant or nuclear reactor
<input type="checkbox"/>	Wastewater lift station or pump station
<input type="checkbox"/>	Wastewater treatment plant
<input type="checkbox"/>	Unapproved auxiliary water supply interconnected with the public water supply
<input type="checkbox"/>	Military Base

**Other potential cross connection concerns:**

<input type="checkbox"/>	Irrigation system
<input type="checkbox"/>	Swimming pool

<input type="checkbox"/>	Fire sprinkler system <input type="checkbox"/> with <input type="checkbox"/> without chemicals or antifreeze
<input type="checkbox"/>	Other (describe)

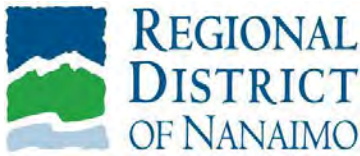
**Note to Customer:** This form is used for preliminary assessment only. The water purveyor may require more information at a later date.

This form was completed by (print name): \_\_\_\_\_ Date: \_\_\_\_\_

Please return completed form by \_\_\_\_\_ (date) and send to:

Murray Walters  
Regional District of Nanaimo, Water Services Dept.  
6300 Hammond Bay Rd, Nanaimo, BC V9T 6N2

Email: [rcu@rdn.bc.ca](mailto:rcu@rdn.bc.ca)  
Fax: 250-390-1542



## Letter Requesting Customer To Install a Backflow Prevention Assembly

Date:  
Name  
Address  
Address

File No.: 5500-22-24

Dear: \_\_\_\_ (Name)

**Re: Backflow Testing Agreement – (Address)** \_\_\_\_\_

The Regional District of Nanaimo (RDN) has adopted a cross connection control program pursuant to current drinking water regulations. A cross connection control program helps protect public health by preventing contamination of the drinking water supply from potential backflow occurrences.

The provincial building and plumbing codes generally provide adequate protection to the public water system from cross connections. However, a few customers pose a special concern because of the complexity of their plumbing system and/or special uses of water on the property (i.e. decorative ponds, irrigation systems, fire suppression systems, etc.).

The property located at \_\_\_\_ (address) is considered an increased health risk to the community water system because of the potential for backflow to occur from the installation of:

- \_\_\_\_ (type of system)

Based on submissions to \_\_\_\_ (RDN staff or department), the RDN understands that a double check valve assembly (DCVA) will be required to be installed on the \_\_\_\_ (type of system) at \_\_\_\_ (address). The installation of the DCVA must meet the installation requirements of the *Canadian Standards Association B64.10* (or most current edition) and be approved by the RDN. Annual testing is required by the homeowner to ensure that the backflow prevention assembly is functioning properly. Written proof of annual testing results must be submitted to the RDN by the property owner on an ongoing basis.

A water service agreement is attached for your review. Water service to \_\_\_\_ (address) will not be connected until the RDN receives a signed water service agreement, in accordance with *Regional District of Nanaimo Cross Connection Control Regulation Bylaw No. 1788 (2019)*.

Thank you in advance for helping the RDN protect the public drinking water supply. If you have any questions, please feel free to contact me at ph. 250-390-6560.

Yours truly,  
  
Manager of Water Services



# Sample Water Service Agreement

Registered Owner: \_\_\_\_\_ Site Address: \_\_\_\_\_  
Legal Description: \_\_\_\_\_ Mailing Address: \_\_\_\_\_

1. The undersigned applicant hereby applies for a water connection to the above-described property.
2. The applicant is the owner of the described property, or the authorized agent of the owner.
3. As a condition of the Regional District of Nanaimo \_\_\_\_ (name of) Water Service Area, hereinafter referred to as the Purveyor, providing and continuing service to the above described property, the property owner, by signing this application agrees to comply with:
  - a) All provisions of the attached *Regional District of Nanaimo Cross Connection Control Regulation Bylaw No. 1788, 2019*, including amendments thereto; and
  - b) Other such current (attached) and future rules and regulations that govern the Purveyor's water system.
4. The property owner specifically agrees:
  - a) To install and maintain at all times his plumbing system in compliance with the most current edition of the British Columbia Plumbing Code as it pertains to the prevention of potable water system contamination and prevention of pressure surges and thermal expansion in his/her water piping (for thermal expansion, it shall be assumed that a dual check valve is installed by the Purveyor on the water service pipe);
  - b) Within 30 days of the Purveyor's request (or alternate schedule acceptable to the Purveyor):
    - i) To install, maintain, test and repair in accordance with the Purveyor's cross connection control standards all premises isolation backflow prevention assemblies required by the Purveyor to be installed to protect the public water system from contamination; and
    - ii) To report to the Purveyor the results of all assembly tests and/or repairs to the premises isolation backflow assemblies.
  - c) As a condition of the Purveyor waiving the requirement for premise isolation by a reduced pressure backflow assembly on the property owner's side of the water meter:
    - i) To authorized the Purveyor to make periodic water use surveys of the premises;
    - ii) Within 30 days of the Purveyor's request, to install, test, maintain, and repair in accordance with the Purveyor's cross connection control standards (copy received with this application) all in-premises backflow prevention assemblies that provide equivalent protection for the Purveyor's distribution system;
    - iii) To report to the Purveyor within 30 days of obtaining the results of all tests and repairs to the aforementioned backflow prevention assemblies; and
    - iv) To report to the Purveyor any change to the plumbing system.
  - d) Not to make a claim against the Purveyor or its agents or employees for damages and/or loss or production, sales or service, in case of water pressure variations, or the disruption of the water supply for water system repair, routine maintenance, power outages, and other conditions normally expected in the operation of a water system.
  - e) To pay his/her water bill within 30 days from the date of billing.

After 30 days of the Purveyor mailing a written notice to the property owner of his/her breach of this agreement, the Purveyor may terminate water service. In the event legal action is required and commenced between the parties to this agreement to enforce the terms and conditions herein, the substantially prevailing party shall be entitled to reimbursement of all its costs and expenses including but not limited to reasonable attorney's fees as determined by the Court.

Applicant's Signature \_\_\_\_\_ Date \_\_\_\_\_

- Attachments received:
- RDN Water Regulation Bylaw No. 1654 \_\_\_\_\_
  - RDN Water Rates & Fees Bylaw No. 1655 \_\_\_\_\_ [customer to initial]
  - RDN Cross Connection Control Reg. Bylaw No. 1788 \_\_\_\_\_



## Letter Requesting Customer To Submit a Backflow Test Report

Date:

File No.: 5500-22-24

Name(s)  
Address  
City, Prov

Dear:

**Re: Letter Requesting Backflow Test Report Submission**

---

Our records indicate that a backflow prevention assembly was installed on your water service and/or within your plumbing system to protect the public water supply from backflow, back-pressure, and/or back-siphonage. As part of the Regional District of Nanaimo’s (RDN) Cross Connection Control program, annual testing is required to ensure that the backflow prevention assembly is still in-place and functioning properly.

The purpose of this letter is to request that you arrange for the annual testing of the \_\_\_\_ (type of backflow assembly) described below:

- \_\_\_\_ (name of backflow assembly) associated with \_\_\_\_ (type of system) located at \_\_\_\_ (address).

Please make arrangements to have the assembly inspected and tested by a **certified backflow assembly tester**. Test results should be sent to the address below by \_\_\_\_ (date). A Cross Connection Control Test Report form is attached for your convenience. The test form must be properly completed and signed before being returned to the Regional District of Nanaimo. The RDN will review the completed test report within thirty (30) days and determine if further action is required.

Your cooperation is appreciated to ensure the highest level of public health and safety. If you have any questions, please contact me at ph. 250-390-6544.

Yours truly,

Engineering Technician



## Cross Connection Control Test Report

Address of Device:		Contact:		Phone number:	
Owner: RDN Water Services		Owner Address: #8-1065 Herring Gull Way Parksville BC V9P 2N1		Phone number:	
Serial Number:		Size: 50mm		Install Date 2018 01 11	
Replaces Serial Number:		Installed on: <input type="checkbox"/> Domestic <input type="checkbox"/> Fire <input type="checkbox"/> Irrigation		<input type="checkbox"/> Other	
Tester's Name:		Tester's AWWA Number:		Diff. Pressure Gauge Serial Number:	
Business Address: #8-1065 Herring Gull Way		Postal Code: V9P 2N1		Phone Number: 250-248-4914	
<input type="checkbox"/> AGG (2x dia) <input type="checkbox"/> RP/RPF Assembly <input type="checkbox"/> Relief valve failed to open Pressure diff across 1st check valve (no flow) <input type="checkbox"/> Opened, opening point of relief valve ( $\geq 2$ psi) Buffer ( $\geq 3$ psi) A-B=C		<input type="checkbox"/> DCVA, DCVAF, SCVAF Check Valve 1 <input type="checkbox"/> Leaked <input type="checkbox"/> Closed tight A _____ psi B _____ psi C _____ psi A-B=C		<input type="checkbox"/> PVB/SRVAF Assembly Air inlet Valve Check Valve <input type="checkbox"/> Leaked <input type="checkbox"/> Closed tight _____ psi	
Static inlet line pressure at time of test _____ psi		Test Result <input checked="" type="checkbox"/> Passed <input type="checkbox"/> Failed		Test Date (YYYY/MM/DD):	
If the device fails the initial test for any reason, complete the sections below, noting the repairs and retest results.					
Check applicable valve(s) <input type="checkbox"/> Relief Valve <input type="checkbox"/> Check Valve # 1 <input type="checkbox"/> Check Valve # 2 <input type="checkbox"/> Air Inlet Valve <input type="checkbox"/> Shut off Valve					
Check applicable repair <input type="checkbox"/> Cleaned; replaced <input type="checkbox"/> Disc <input type="checkbox"/> Spring <input type="checkbox"/> Seat <input type="checkbox"/> Diaphragm <input type="checkbox"/> Guide <input type="checkbox"/> O-rings <input type="checkbox"/> Poppet <input type="checkbox"/> Repair Kit					
<input type="checkbox"/> AGG (2x dia) <input type="checkbox"/> RP/RPF Assembly <input type="checkbox"/> Relief valve failed to open Pressure diff across 1st check valve (no flow) <input type="checkbox"/> Opened, opening point of relief valve ( $\geq 2$ psi) Buffer ( $\geq 3$ psi) A-B=C		<input type="checkbox"/> DCVA, DCVAF, SCVAF Check Valve 1 <input type="checkbox"/> Leaked <input type="checkbox"/> Closed tight A _____ psi B _____ psi C _____ psi A-B=C		<input type="checkbox"/> PVB/SRVAF Assembly Air inlet Valve Check Valve <input type="checkbox"/> Leaked <input type="checkbox"/> Closed tight _____ psi	
Static inlet line pressure at time of test _____ psi		Test Result <input type="checkbox"/> Passed <input type="checkbox"/> Failed		Retest Date (YYYY/MM/DD):	
Tester's Signature:					

# BACKFLOW PREVENTER INSPECTION TAG

DATE	BY	NEXT DUE

ULINE 5-10744 1-800-298-5510, uline.com





**WATER SERVICES DEPARTMENT  
FIRE HYDRANT USE PERMIT  
APPLICATION FORM**



APPLICANT'S NAME: \_\_\_\_\_

MAILING ADDRESS: \_\_\_\_\_ Postal Code \_\_\_\_\_

TELEPHONE: \_\_\_\_\_ CELL: \_\_\_\_\_ FAX: \_\_\_\_\_ EMAIL: \_\_\_\_\_

- This application is for use of the fire hydrant located at \_\_\_\_\_
- Anticipated for the period \_\_\_\_\_ to \_\_\_\_\_
- For the following uses: \_\_\_\_\_
- Project Description: \_\_\_\_\_
- RDN Water Service Area: \_\_\_\_\_

I understand and agree to the following:

- Application fee is \$50.00
- Fire hydrant use fee/deposit in the amount of \$500.00.
- The fire hydrant may not be used until this Permit has been issued and the RDN staff have installed backflow prevention devices.
- Fire hydrant use is restricted to only the above-noted uses that have been accepted by the Manager.
- The Applicant may not leave the hydrant and associated equipment unattended.
- The permit may be revoked by the RDN at any time, where deemed necessary.
- On completion the RDN will inspect and maintain the hydrant as required, deduct a \$125 fee, any repair costs and water consumption fees from the \$500 deposit, and refund/invoice the balance to the Applicant.

SIGNATURE OF APPLICANT: \_\_\_\_\_ DATE: \_\_\_\_\_

Personal information collected on this form is collected for the purpose of processing this application and for administration and enforcement. The personal information is collected under the authority of the Local Government Act and RDN bylaws. If you have any questions about this collection, contact the Manager of Water Services at 6300 Hammond Bay Road in Nanaimo or by phone at 390-6560. Personal information or business information submitted on this form is not considered to be supplied in confidence. Applicant's initials \_\_\_\_\_

*Water Services Department Use Only Below This Line*

Permit Approved  Permit Denied for the following reasons: \_\_\_\_\_

Date: \_\_\_\_\_ Hydrant # \_\_\_\_\_ Permit # \_\_\_\_\_

*Manager of Water Services*

Meter Reading at Start: \_\_\_\_\_ (m<sup>3</sup>)      Meter Reading at Completion: \_\_\_\_\_ (m<sup>3</sup>)

Application Fee (a) \$50.00 (11-\_\_-\_\_98-00)

Damage Deposit (b) \$500.00 (14-35-00-00-00)

Refund equals the Damage Deposit less,  
Less RDN inspection/maintenance fee (\$125) (c) \$125.00 (11-\_\_-\_\_98-00)

Less costs for any damages (d) \$ \_\_\_\_\_

(12% HST) \_\_\_\_\_

Less water consumption at \$2.00/cubic meter

Consumption m3 \_\_\_\_\_ x \$2.00 = (e) \$ \_\_\_\_\_

Amount to refund or invoice (b minus c+d+e) \$ \_\_\_\_\_ (11-\_\_-\_\_98-00)

Refund/Invoicing Approved by \_\_\_\_\_ Date: \_\_\_\_\_

*Manager of Water Services*



# Backflow Incident Response Form

Fill out the following information as completely as possible, and forward to the Manager of Water Services within 24 hours of the incident.

Responding Operator:	Date:
Incident Name/Address:	
<b>CALLER INFORMATION</b>	
Date Call Received:	Time Call Received:
Caller's Name:	Caller's Address:
Agency:	City:
Phone #:	Email:
<b>INCIDENT DESCRIPTION</b>	
Date of Incident: _____	Time of Occurrence: _____
Type of Business: _____	
Backflow Originated From ( <i>booster pump, etc.</i> ): _____	
Cause of backflow ( <i>main break, fire flow, etc.</i> ): _____	
<b>DESCRIPTION OF CONTAMINANT</b>	
Contaminant ( <i>attach MSDS sheet if available</i> ): _____	
Colour, odour, bubbles, sediment: _____	
Number of persons affected: _____	Illness or physical irritation reported: _____
<b>CORRECTIVE ACTIONS TAKEN</b>	
Flushing, cleaning, disinfection: _____	
Additional backflow prevention required/recommended: _____	
<b>NOTIFICATIONS</b>	
<i>(Customers, Health Authority, RDN Manager, Communications Coord., Media)</i>	
<b>MANAGER FOLLOW-UP</b>	
Extent of Damage:	Feedback from Community:
Costs Involved:	Additional Follow-up Required:

## Schedule 'F'

# List of Certified Backflow Assembly Testers

(Current as of March 16, 2023)