1. Background

Backflow into the reticulation network presents a public health risk to drinking water supplies. Backflow is the undesirable reverse flow of water from a potentially polluted or contaminated source to Council’s potable water supply system. Backflow is typically caused by cross-connections or a failure of backflow prevention devices. Backflow may allow the ingress of pathogens, chemical contaminants or detritus into the reticulation network, and increases the health risks for all customers.

The management of backflow prevention requires both the identification of risk associated with a customer’s premises as well as monitoring of backflow prevention devices.

2. Policy

2.1 Objectives

The objectives of this policy are to:

- Ensure the integrity of the potable water distribution system by minimising the risk of backflow from customers’ properties.
- Specify when testable backflow prevention devices are required to be installed at properties, i.e. for medium and high hazard ratings.
- Provide information to members of the public, plumbers and other stakeholders about Council’s requirements and role on backflow prevention.
- Ensure that non-complying properties are brought into line with the requirements of this procedure, Plumbing Code of Australia and the Australian Standard AS 3500 Part 1.
- Maintain backflow records/register.
- Ensure backflow prevention containment devices are fit for purpose.
- Ensure annual testing is carried out by an Authorised Person, where required, and information is added to the Council backflow register.
- Investigate non-compliance and ensure enforcement of this policy/procedure.

2.2 Purpose

This policy deals with the prevention of backflow of water from customers’ properties back into Greater Hume Council’s potable water distribution system. This policy is not intended to provide guidance regarding the prevention of hazardous backflow within a customer’s service.

2.3 Scope

This policy includes the prevention of backflow of water into Council’s potable water distribution system, including responsibilities of Council and the customer. Council operates two drinking water supply systems:

- Culcairn supply
- Villages supply (Jindera, Burrumbuttock, Brocklesby, Gerogery, Gerogery West)

Other townships within the Council area are supplied drinking water by Riverina Water. Customers serviced by Riverina Water should consult the Riverina Water Backflow Prevention Policy on their website for guidance.
2.4 Principles of Backflow Prevention

The drinking water distribution system operated by Council relies on appropriate backflow prevention as one of the important measures to maintain the safety of the water supply to all consumers.

Backflow prevention may be provided by a number of layers, depending on the hazard:

- **Individual Protection**: Used to protect a water service from a specific hazard from a fixture, appliance or other device
- **Zone Protection**: Used to protect the water supply within a residential or commercial service from backflow from one or more hazards within the facility
- **Containment Protection**: Used to protect Council’s drinking water system from backflow hazards from connected services.

In addition to containment protection to protect Council’s water distribution system, backflow prevention using zone protection or individual protection should be applied within customer boundaries as required based on the level of risk to maintain the safety of the service (refer Figure 1).

![Figure 1 Layers of Backflow Prevention](image)

To determine the required backflow prevention within a service, customers should:

- Identify hazards that may affect water safety within their service network, property and adjacent properties
- Assess the level of risk associated with each hazard
- Select and locate backflow prevention devices to isolate hazards both within their service and to isolate all hazards from Council’s supply system.

It is important to protect Council’s water distribution system against all hazards. Individual or zonal protection should be used in combination with containment protection for all customer connections.
Backflow Prevention Policy

This policy relates specifically to the protection of Council’s water distribution system against backflow from customer connections (containment protection). For further information on protection services against backflow within a customer premise, refer to AS3500.1 Plumbing and Drainage – Water Services and the National Construction Code Part 3 – Plumbing Code of Australia.

2.5 Levels of Hazard

Cross-connections are rated using three degrees of hazard:

- **High**: Any condition, device or practice which has the potential to contaminate Council’s water distribution system and cause death.
- **Medium**: Any condition, device or practice which has the potential to contaminate Council’s water distribution system and cause illness.
- **Low**: Any condition, device or practice which would be a nuisance but does not endanger public health.

Hazards to a water service generally consists of conditions, devices or practices conducted at a customers’ premises, however a hazard assessment should consider premises in close proximity to any outlets, taps or other means of ingress from spraying hazards such as irrigation systems.

A list of common types of premises and typical cross-connection hazard is provided in Appendix A. Council should be contacted where customers, building consultants or licensed plumbers are uncertain of the hazard rating of a property. A site assessment may be required to allow the property hazard rating to be correctly determined.

2.6 Types of Backflow Prevention Devices

A number of different types of BFPDs are available, with different devices providing different types of protection, redundancy and testability. Common BFPDs are listed in Table 1.

### Table 1 Types of Backflow Prevention Device.

<table>
<thead>
<tr>
<th>Device</th>
<th>Hazard Suitability</th>
<th>Testable?</th>
<th>Backpressure Protection</th>
<th>Back-Siphonage Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered Break Tank</td>
<td>High/Med/Low</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Registered Air Gap</td>
<td>High/Med/Low</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Reduced Pressure Zone Device (RPZD)</td>
<td>High/Med/Low</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Double Check Valve Assembly with test ports (DCV)</td>
<td>Med/Low</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Pressure Type Vacuum Breaker with test ports (PVB)</td>
<td>Med/Low</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Dual Check Valve Assembly without test ports</td>
<td>Low</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Air Gap</td>
<td>Low</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Break Tank</td>
<td>Low</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Vacuum Breaker without test ports</td>
<td>Low</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Single Check Valve with test ports (SCVT)</td>
<td>Low (Fire Services Only)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Single Check Valve without test ports</td>
<td>Not a backflow prevention device</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
2.7 Selecting the Correct Device

A number of backflow prevention devices exists. Backflow prevention devices can be classified into:

- Registered testable devices
- Non-testable devices.

Non-testable devices should only be used for low cross-connection hazards. All medium and high cross-connection hazards should be contained with registered testable devices.

Backflow prevention devices should be selected as appropriate to the hazard, considering whether protection against backpressure is required or whether only back-siphonage is required. Table 1 provides a reference of common BFPDs, suitability for protection against hazards as well as back-pressure/back-siphonage.

A list of typical hazard ratings and backflow prevention devices is provided in Appendix A. Council should be contacted where customers, building consultants or licensed plumbers are uncertain of the hazard rating of a property. A site assessment may be required to allow the property hazard rating to be correctly determined.

2.8 Installation Requirements

Backflow prevention devices should be installed as per AS3500.1 Plumbing and Drainage – Water Services and the National Construction Code Part 3 – Plumbing Code of Australia.

Installation of BFPDs is considered ‘plumbing and drainage work’ under Plumbing and Drainage Act 2011 in all circumstances, including work conducted by an owner/occupier. Backflow prevention devices must only be installed by an Authorised Person.

Prior to installing the BFDP, Council may require a plumbing application to be submitted prior to the commencement of works. Any application should be made using an Application for Development/Construction Form available from Council’s website.

A number of specific requirements relating to the installation of BFPDs should be noted:

- BFPDs should be located to allow regular inspection and maintenance
- BFPDs must always be located above ground level and protected against vandalism, weather and other damage
- BFPDs must be installed as close as practical and downstream of the water meter for the site
- the BFPD must not be bypassed, and no connections are permitted between the water meter and the BFPD
- line strainers must be installed prior to the following devices:
  - pressure type vacuum breakers
  - double check valves
  - reduced pressure zone devices
- isolation valves should be provided before and after all testable BFPDs
- where a strainer is fitted to a BFDP, the inlet isolation valve should be located before the strainer.

After installation is completed, customers must ensure that all testable BFPDs are commissioned by an Authorised Person, and a certificate of test is submitted to Council. Council may require that the works are inspected, and a 48-hour notice period should be considered where an inspection is required.
2.9 Authorised Persons

Backflow prevention devices must only be installed, commissioned and tested by an Authorised Person. Under the Plumbing and Drainage Act 2011, an Authorised Person is someone who:

- Holds a contractor licence or supervisor certificate endorsed for Plumbing or Water Plumbing.
- Works under the immediate supervision of the holder of the contractor licence or supervisor certificate.

3. Responsibilities

3.1 Council Responsibilities

Council will operate a system of compliance to ensure that customers comply with this policy/procedure. In the absence of any site-specific information, Council will assign a hazard rating to a property based on Council's assessment of the primary activities being undertaken on site.

Council may update the rating from time to time, as required. A customer can request for a review of the hazard rating by providing more site-specific information.

Council will keep records of the backflow hazard rating of all properties. Council may ask customers to test and/or certify their backflow prevention devices periodically. Council requires that the commissioning, testing and certification is carried out by Authorised Personnel.

Council will keep records and ensure that minimum requirements for Testable Devices are carried out. These are:

- All testable backflow devices must be registered with Council and tested on installation.
- All testable devices with medium or high hazard rating must be tested at intervals no greater than 12 months and testing is to be carried out by an Authorised Person.
- Council will advise customers of the date when the device must be tested by, and the test results should be forwarded to Council within 20 working days of testing.

Council will apply this policy/procedure to BFPD requirements (installation and annual testing) to the services it maintains (e.g. sewerage treatment plants).

3.2 Customer Responsibilities

The customer is responsible for installation of the appropriate backflow prevention devices including containment protection, on their property that has a high or medium hazard rating.

The customer must engage an Authorised Person to install the backflow device. In the case of existing water services, the customer must assess the hazard rating (advice from Council can be sought) and, where required, provide certification of the backflow device by an Authorised Person to Council in a timeframe agreed by Council.

In the case of a new water service, the customer must provide certification of the backflow device by an Authorised Person prior to Council making water services available.

The customer is responsible for the ongoing maintenance and certification of the backflow device. Upon advice from Council on the need to do so, the customer must submit certification of the satisfactory operation of the backflow device to Council within 20 days of the issue of the advice.
Where the customer fails to provide the certification by the due date, Council may do one or more of the following:

- Test and certify the device and charge a fee to the customer
- Issue reminder notice(s) to the customer and charge an administrative fee to the customer.
- Disconnect the water service if Council believes that the hazard presented by the activities on the property presents an unacceptable risk to the water supply and charge a fee for the disconnection/reconnection.

Except with the written approval of Council, the property owner/occupier shall not alter in any form the installation or operation of the device referred to in the original approval, including replacement or removal of the backflow devices.

Where the hazard rating for new commercial and industrial developments is unknown, a testable BFPD must be installed.
# Backflow Prevention Policy

## 4. Flow Chart for Installation of a New BFPD

### Requirement
- Requirement for a new or upgraded service identified by the Customer.

### Assess Risks
- Hazards identified and assessed by Customer or Customer’s Consultant.

### Submit Application
- The Customer submits an Application for Development/Construction, including documentation of the backflow plumbing works.

### Application Assessment
- Council assesses the application for the backflow protection system.

#### Application Approved
- Council assesses the backflow protection system as satisfactory and advises that installation may proceed.

#### Application Not Approved
- Council assesses the backflow protection system as unsatisfactory and requests review and resubmission.

### Installation
- The Customer engages an Authorised Person to install the backflow prevention device.

### Notice of Deficiency
- Council provides advice to the Customer where the installation does not comply with the application or is not fit for purpose.

#### Council Inspection
- Council elects to inspect the BFPD installation.
  - Council advises within 24 hours of the notification of test if an inspection is required and the date of inspection.

### Notification of Test
- The Customer provides notification of a planned test to Council no later than 48 hours prior commissioning.

### No Objections
- Where Council provides no objection to the installation, commissioning may proceed.

### Commissioning
- An Authorised Person commissions the backflow prevention device and provides the Customer with a test certificate.

#### Commissioning
- The Customer provides the test certificate to Council within 10 working days of commissioning.

### Registration of BFPD
- Council accepts the device and registers the BFPD and advises the Customer of the annual test due date.
5. Annual Flow Testing Chart

6. Glossary

**Authorised Person:** A person authorised under the *Plumbing and Drainage Act 2011* to perform plumbing works on water systems.

**Backflow:** Backflow is the unintended reversal of flow in a water pipeline whereby water from the customer's pipeline system returns to the Council's water supply.

**BFPD:** Backflow prevention device.

**Testable BFPD:** A backflow prevention device with appropriate testing ports as defined by AS3500.1 and registered with Council.

**Un-Testable BFPD:** Any backflow prevention device that is not a testable BFPD.

**Water Distribution System:** Network of pipes leading from a water treatment plant to customers' plumbing systems.

7. Records

- Record all medium and high-risk customers on the *Annual Backflow Testing Register*, including risk rating and testing due date.
- When a customer advises that backflow testing is complete, file the certificate of test on the Council drive and record the certification on the *Annual Backflow Testing Register*. 
8. Related Documents

<table>
<thead>
<tr>
<th>Document Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS3500.1</td>
<td>Plumbing and Drainage – Water Services</td>
</tr>
<tr>
<td>POL-2.1</td>
<td>Riverina Water Backflow Prevention Policy</td>
</tr>
<tr>
<td>REC-18-258</td>
<td>Annual Backflow Testing Register</td>
</tr>
<tr>
<td>N/A</td>
<td>Application for Development/Construction Form</td>
</tr>
<tr>
<td>N/A</td>
<td>Fact Sheet – Plumbing Applications and Permits</td>
</tr>
<tr>
<td>N/A</td>
<td>National Construction Code Part 3 – Plumbing Code of Australia</td>
</tr>
</tbody>
</table>

Appendix A

Hazard Ratings and Backflow Prevention Devices for Common Premise Types

Legend:

RBT: Registered break tank
RPZD: Reduced pressure zone device
RPDA: Reduce pressure detector assembly
DCV: Double check valve
DCDA: Double check detector assembly

<table>
<thead>
<tr>
<th>Type of Premises</th>
<th>Typical Hazard Rating</th>
<th>Backflow Prevention Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premises with an alternative water supply (excluding rainwater tanks)</td>
<td>High</td>
<td>RBT or RPZD</td>
</tr>
<tr>
<td>Premises where inspection is restricted</td>
<td>High</td>
<td>RBT or RPZD</td>
</tr>
<tr>
<td>Hospitals, mortuaries, clinics</td>
<td>High</td>
<td>RBT or RPZD</td>
</tr>
<tr>
<td>Piers, docks and other waterfront facilities</td>
<td>High</td>
<td>RBT or RPZD</td>
</tr>
<tr>
<td>Sewage treatment plants and pump stations</td>
<td>High</td>
<td>RBT or RPZD</td>
</tr>
<tr>
<td>Factories using, processing or manufacturing toxic chemicals</td>
<td>High</td>
<td>RBT or RPZD</td>
</tr>
<tr>
<td>Petroleum processes or storage plants</td>
<td>High</td>
<td>RBT or RPZD</td>
</tr>
<tr>
<td>Car and plant washing facilities</td>
<td>High</td>
<td>RBT or RPZD</td>
</tr>
<tr>
<td>Abattoirs</td>
<td>High</td>
<td>RBT or RPZD</td>
</tr>
<tr>
<td>Chemical laboratories</td>
<td>High</td>
<td>RBT or RPZD</td>
</tr>
<tr>
<td>Pathology laboratories</td>
<td>High</td>
<td>RBT or RPZD</td>
</tr>
<tr>
<td>Type of Premises</td>
<td>Typical Hazard Rating</td>
<td>Backflow Prevention Device</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
<td>-----------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Sanitary depots</td>
<td>High</td>
<td>RBT or RPZD</td>
</tr>
<tr>
<td>Universities</td>
<td>High</td>
<td>RBT or RPZD</td>
</tr>
<tr>
<td>Food and beverage processing plants</td>
<td>Medium</td>
<td>Testable device</td>
</tr>
<tr>
<td>Caravan parks</td>
<td>Medium</td>
<td>Testable device</td>
</tr>
<tr>
<td>Marinas</td>
<td>Medium</td>
<td>Testable device</td>
</tr>
<tr>
<td>Premises with greywater re-use systems</td>
<td>Medium</td>
<td>Testable device</td>
</tr>
<tr>
<td>Public swimming pools</td>
<td>Medium</td>
<td>Testable device</td>
</tr>
<tr>
<td>Premises with reticulated and disinfected reclaimed water systems</td>
<td>Medium</td>
<td>Testable device</td>
</tr>
<tr>
<td>Premises with rainwater tanks</td>
<td>Low</td>
<td>Non-testable device</td>
</tr>
<tr>
<td>Premises with reticulated recycled water systems</td>
<td>Low</td>
<td>Non-testable device</td>
</tr>
<tr>
<td>All premises – fire services</td>
<td>Low</td>
<td>SCVT or SCDAT</td>
</tr>
<tr>
<td>All premises – fire services</td>
<td>Medium</td>
<td>DCV or DCDA</td>
</tr>
<tr>
<td>All premises – fire services</td>
<td>High</td>
<td>RBT, RPZD or RPDA</td>
</tr>
</tbody>
</table>

**Document Author**
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