STANDARD
SITE CONTAINMENT BACKFLOW PREVENTION

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DOCUMENT INFORMATION

Version history

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Version	Author	Changes	Approved By	Date Approved
1	Victor Prasad	New Standard	Jeremy Bath	25/11/16
2	Greg Heaney	Periodic review	Victor Prasad	20/02/20
3	Greg Heaney (External Consultant)	Section 5: Renamed and updated with more detailed information regarding property owner's responsibilities. 'Low Hazards' water services with a water meter equal to or larger than 32mm require separate low hazard device. Changed Hunter Water required backflow testing notification from physical reports to upload via online app. Section 6: Added residential septic tank and residential sewage treatment as a scenario. Reaffirmed that Hunter Water require minimum 20kPa pressure differential between main line and bypass on DCDA and RPDA devices. This requirement no longer nominated in AS/NZS2845 (2020). Added 'Note 7' regarding device test tap unauthorised use.	Matt Hingston	13/10/23

Document control

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1. Purpose

The purpose of this Standard is to ensure the protection of the drinking water supply system and to safeguard public health as set out in the Hunter Water Corporation Act, Operating Licence and Customer Contract. Hunter Water's area of operations for water supply is shown in Figure 1 below.

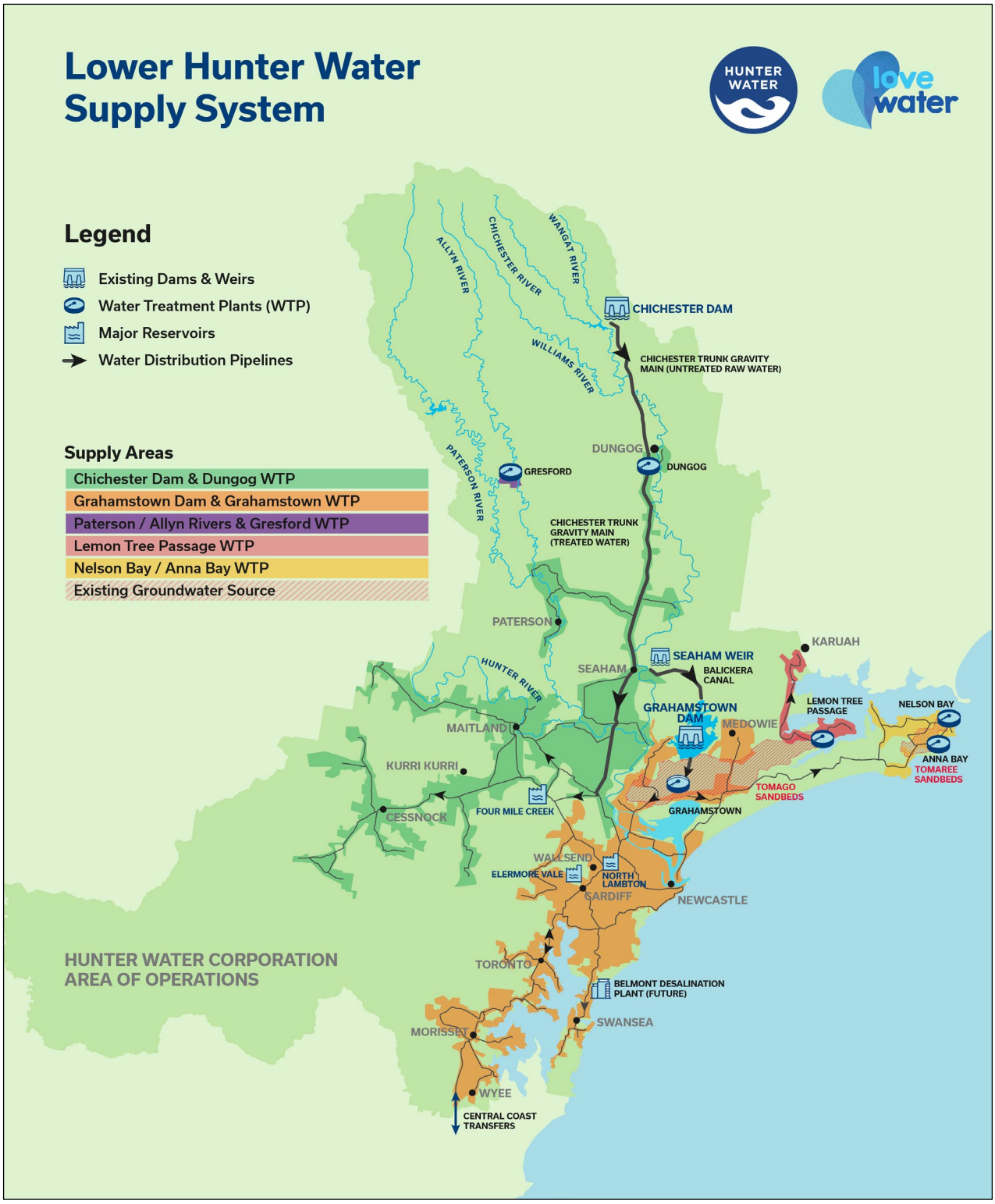

Figure 1: Hunter Water Are of Operations: Drinking Water Supply

2. Scope

This Site Containment Backflow Prevention Standard has been prepared for plumbers, consultants and property owners when designing and installing connections to Hunter Water's water supply. The Standard is applicable to both new and existing water supply connections.

Backflow prevention refers to the control of potentially harmful contaminants entering Hunter Water's water supply from cross connections in a customer's premises or backflow of contaminants into the water supply system.

The installation of an appropriate site containment backflow prevention device is necessary to ensure the drinking water is protected from the unintended cross connection and backflow of possible contaminants into Hunter Water's drinking water supply system.

In Hunter Water's area of operations, the Point of Discharge from the water supply main to the customer's property is the outlet of the Site Containment Backflow Prevention Device. Hunter Water maintains a site containment backflow prevention device register (online "app") to protect the integrity of the drinking water supply and the health and safety of customers.

3. Regulation

The requirement for site containment backflow prevention is nominated in various laws and regulations including:

- Hunter Water Act 1991
- Hunter Water Operating Licence 2022-2027
- Hunter Water Regulation 2015
- Hunter Water Customer Contract 2022-2027
- The Plumbing Code of Australia
- Australian Standard – Plumbing and Drainage – AS/NZS 3500:1 – Water Supply
- Australian Standard – Backflow Prevention Devices – AS/NZS

4. Installation Requirements Determined by Hazard Rating

The type of site containment backflow prevention device that is required on a property is dictated by the potential hazard that may arise from particular types of businesses or uses operating on that property ("risk activities"). Hunter Water reserves the right to increase the hazard rating requirement for the property upon individual review.

- All properties with a water connection that presents a medium or high hazard rating must install, maintain and test annually, an appropriate backflow prevention device at the property boundary for site containment protection purposes in accordance with AS/NZS 2845 and this Standard.
- All properties with a water connection that presents a low hazard rating must install and maintain an appropriate backflow prevention device at the property boundary for site containment protection purposes in accordance with AS/NZS 2845 and this Standard. The exception to this requirement is where the property water connection incorporates a Hunter Water issued 20mm or 25mm water meter which contains an "integral" low-hazard backflow prevention device.
- Property owners with a water meter sized 32mm or larger, that would otherwise be classified as a low hazard, are automatically classified as medium hazard and must install a testable backflow prevention device at the property boundary that satisfies the requirements in this standard.
- Where the hazards are unknown for commercial, industrial, rural or mixed development, the hazard rating will default to "high", requiring the installation of a device appropriate for that hazard rating.

- Where multiple risk activities occur on-site, the site containment backflow prevention device will be based on the risk activity with the highest hazard rating Hunter Water recognises a Reduced Pressure Zone Device (RPZD), as a high hazard backflow prevention device.
- If the use, and hence the site containment hazard rating, of a premise changes, the customer must install the appropriate site containment backflow prevention device for the new hazard.
- The site containment hazard rating of all properties connected to the water infrastructure must be determined by an accredited person.

5. Responsibilities of Property Owners

5.1. General Requirements

All properties connected to the water infrastructure within Hunter Water's area of operations must comply with this Standard and the relevant standards and regulations as listed herein.

For properties with a Medium or High Hazard rating, the customer is responsible for the installation, maintenance and testing of the site containment backflow prevention device in accordance with this Standard. Testing certification for these devices must be uploaded by an accredited backflow tester to Hunter Water's online "app" annually, at the property owners' cost.

Where Hunter Water supplies a customer with an alternative water supply such as recycled water, the customer must install a site containment backflow prevention device on the drinking water supply system in accordance with AS/NZS 3500 and this Standard.

Hunter Water's water meters sized 20mm and 25mm (only) incorporate a low-hazard integral backflow prevention device. Most single-lot residential properties are serviced by either a 20mm or 25mm meter.

If Hunter Water reasonably determines that the site containment backflow prevention for a premise is unsatisfactory, a notice will be issued requiring the customer to repair, test, replace or install a suitable site containment backflow prevention device. The customer must, at their expense, engage an accredited person to comply with the notice within the time specified in the notice.

If the customer fails to meet the conditions as specified in a notice issued by Hunter Water, Hunter Water may in accordance with the Customer Contract, disconnect the water supply system until the customer has complied with the notice.

5.2. Device Installation Requirements

Only a licensed plumber who holds current accreditation for Backflow device is permitted to install, test and maintain backflow prevention devices. Devices are required to be located immediately downstream of the property's water meter. For all site containment testable devices, Water Marked approved resilient seated isolating valves shall be installed immediately upstream of the line strainer (where fitted for drinking water services) and/or immediately upstream of the water meter, and immediately downstream of the device where the device and meter are located in the one assembly. Devices should not be buried in the ground or installed in a pit or chamber. All other device installation must comply with Australian Standard AS/NZS3500.1 section 4 and AS/NZS2845.

5.3. Device Testing Requirements

The device must be tested after initial installation and on an annual basis by an accredited backflow prevention device tester and registered with Hunter Water online via the Backflow App. Backflow devices have internal seals, springs and moving parts that are subject to failing, wear or fatigue; therefore, ongoing annual testing and reporting is required. Property owners must have the site containment backflow prevention device (for high or medium properties) tested annually as required in AS/NZS2845.3 Water Supply – Backflow Prevention Devices and AS/NZS3500 Plumbing and Drainage.

Testing is to be undertaken by a backflow tester who is accredited with Hunter Water. The details of the Site Containment Backflow Prevention Device(s) annual test are to be uploaded to Hunter Water's "online app" by the accredited backflow tester.

5.4. Other Responsibilities

The property owner is also responsible for:

- Ensuring zone and individual back flow prevent devices are maintained.
- Preventing potential drinking water contamination conditions.
- Safe water supply within their own property boundaries.

6. Site Containment Backflow Prevention Scenarios

Table 1 below provides a list of scenarios covering a representative range of operations and configurations. Note that Hunter Water has the right to amend and/or require increased site containment backflow prevention on an individual property basis.

Table 1: Site Containment Backflow Prevention Scenarios

SITE CONTAINMENT BACKFLOW PREVENTION STANDARD SCENARIOS		
Premise Type/Category	Examples (not limited to)	Hazard
Alternative Water Supply **'No interconnection with Hunter Water's drinking water supply permitted**	Bore Water Dams Reclaimed stormwater Recycled Wastewater (black or grey water reuse)	High
Below Ground Rainwater Tank	Fully buried Partially buried Commercial Industrial >2 residential strata units - >25mm water service	High
Premise with Restricted Access	Defence Force Heavy Industry Universities Chemical plant / processing or similar Petroleum processing plants or similar Radioactive reactor / processing or similar Major shopping centres Private network utilities Power stations and sub stations Coal mines Metal recyclers Water Treatment Works Prisons and corrective centres Airports	High
Water Front Facilities	Piers Docks Marinas Fishing co-ops	High

SITE CONTAINMENT BACKFLOW PREVENTION STANDARD SCENARIOS		
Premise Type/Category	Examples (not limited to)	Hazard
	Oyster / prawn / fish farms	
Sewerage Treatment / Disposal / Recycling	Sewerage treatment works Sewage lift stations Sewage lift stations residential (with well washers) Sanitary depots Recreational vehicle sewerage dump points Effluent reuse plant	High
Automotive	Petrol stations Vehicle maintenance (mechanical, panel beater) Vehicle, plant and plan equipment washing Caravan parks with sanitary dump point	High
Health Facilities	Hospitals Mortuaries Funeral parlours with embalming Day surgery premises Pathology laboratories General laboratories Dental surgeries – with direct water connection to dental chairs Nursing homes with dirty utility rooms – sterilisers, pan washing Medical/dental – autoclaves, sterilisers Bidets – residential / commercial / industrial	High
Food Processing and Preparation	Abattoirs and meat processing All other food processing	High
Metal Finishing	Galvanising Electro plating Chrome plating Zinc plating Powder coating	High
Agricultural / Animal	Drinking troughs (livestock) Crop farms Hydroponic operations Organic Veterinary surgeries Pet boarding facilities Pest control facilities	High
Trade Waste	Oil separator (process, wash bay) Prison sanitary grinder system Dilution pit Commercial laundries Industrial silt trap	High

SITE CONTAINMENT BACKFLOW PREVENTION STANDARD SCENARIOS		
Premise Type/Category	Examples (not limited to)	Hazard
	DAF unit / collection tank with pH correction and/or coagulant dosing	
Fire Control	Hydrant with chemical injection Hydrant with high hazard area Fire hose reel(s) within high hazard area Sprinkler with chemical injection Below ground hydrants (existing only)	High
Sporting / Recreational	Golf course Irrigation with pump system or fertiliser / chemical injection Irrigation with below ground sprinkler heads ('pop up')	High
Local Government – Council, Public Utility	Public swimming pool – with chemical storage (chlorine etc) Works depot Waste disposal facilities – garbage dumps	High
Development Construction (includes vacant development lots)	Temporary construction water services for 3+ residential units, commercial and industrial developments (RPZD to be registered with Hunter Water upon connection and unregistered with Hunter Water upon disconnection)	High
Local Government – Council, Public Utility	Public swimming pool – no chemical storage Mixed use buildings – offices, etc. Secondary school laboratories – dilution pit Spas Fountains	Medium
Food Processing and preparation	Food and beverage processing plants	Medium
Fire Control	Commercial / industrial premises with sprinkler services Commercial / industrial premises with hydrant service Commercial / industrial premises with fire hose reel(s) Residential fire services identified as medium risk	Medium
Recreational	Caravan parks without sanitary dump sites	Medium
Residential Irrigation – pop up sprinklers	≥3 Strata units / multiple occupancy units, residential ≥25mm water meter	Medium
Trade Waste	Grease trap Silt trap	Medium
Above Ground Rainwater Tank	≥3 Strata units / multiple occupancy units	Medium
Below Ground Rainwater Tank *** Accepting Roof Water Only** *** Adequate Vermin Proofing** *** Require inlet and outlet**	Single residential stand-alone dwelling 20mm water service	Medium

SITE CONTAINMENT BACKFLOW PREVENTION STANDARD SCENARIOS		
Premise Type/Category	Examples (not limited to)	Hazard
Sewage Treatment – Residential *** Sewerage Lift Station**	Single residential stand-alone dwelling 20mm water service (no internal well washers and with or without potable water flushing via an external air gap)	Medium
Alternative Water Supply (Single Residential – under 1500m^2) *** No interconnection with Hunter Water's drinking water supply permitted**	Single residential stand-alone dwelling 20mm water service Residential bore water Residential reclaimed storm water	Medium
Septic Tank / Transportation Area Treatment System	Properties with 20mm and 25mm water meters only	Low
Above Ground Rainwater Tank	Single stand-alone residential dwelling Strata duplex	Low
Hairdresser	Hairdresser's basin or troughs	Low

* Vented Dual Check Valve)

Table 2: Site Containment Backflow Device Requirements

Minimum Site Containment – Backflow Requirements	
32mm water meter	Testable device – minimum double check value (DCV)
40mm water meter	Testable device – minimum double check value (DCV)
50mm water meter	Testable device – minimum double check value (DCV)
80mm water meter	Testable device – minimum double check value (DCV)
100mm water meter	Testable device – minimum double check value (DCV)
150mm water meter	Testable device – minimum double check value (DCV)
200mm water meter	Testable device – minimum double check value (DCV)
Single check detector assembly	Not to be used within Hunter Water's area of operations (without formal approval)

NOTE:

1. Where multiple processes occur on a site, the site containment backflow hazard rating will be equal to, or greater than, the highest identified hazard.
2. The nominated listings above may be varied if the onsite operations have been clearly identified. In these cases, the hazard rating will be considered "high" until proven otherwise.
3. Hunter Water only recognises "mechanical" site containment backflow prevention devices.
   a. Low Hazard – Dual Check Valve (minimum)
   b. Medium Hazard – Testable Double Check Valve (minimum)
   c. High Hazard – Testable Reduced Pressure Zone Device (minimum)
4. AS2845.3.2020 requires site containment backflow prevention devices to be certified by an accredited backflow prevention device tester on an annual basis, with the certification reports submitted to "the relevant authority having jurisdiction" – Hunter Water.

5. For the purpose of this Standard, “residential” is defined as suburban style lots sized <1500 square meters (excludes rural, commercial, industrial or mixed-use lots).
6. Hunter Water requires that Double Check Detector Assemblies (DCDA) and Reduced Pressure Detector Assemblies (RPDA) be configured to have 20kPa differential between the primary device and the bypass device. This requirement allows “low flow” water usage to be registered on the metered bypass.
7. Test taps on backflow prevention devices are to be used for testing purposes only. Connection to test taps for permanent or temporary water supply (irrigation, garden tap use, etc) is not allowed.

   Unauthorised connections will be immediately disconnected. Such connections compromise the protection of the drinking water supply and may ultimately result in the disconnection of the water supply to the property.

7. Definitions, Acronyms and Abbreviations

Term	Definition
Accredited person/tester	A licensed plumber who holds accreditation from a Registered Training Organisation (RTO) for backflow prevention device commissioning and certification.
AS/NZS 2845 Parts 1, 2 and 3	Australian / New Zealand Standard 2845 (1,2 & 3) specifies requirements for the materials, design, performance and testing of mechanical backflow prevention devices that are used for the protection of water supplies.
AS/NZS 3500	Australian / New Zealand Standard 3500 for Plumbing and Drainage Part 1 – Water Supply
Backflow	Backflow is the unintended flow of water from any domestic, industrial or institutional piping system into Hunter Water’s drinking water supply system. Backflow can be caused by a loss of pressure in the drinking water supply main or by the flow from a pressurised system through an unprotected cross connection.
Backflow prevention device	A device to prevent the reverse flow of water from a potential contaminated source, into the drinking water supply.
Cross connection	Any connection or arrangements between the systems, connection to the water main or any fixture that may enable non-drinking water or other containment to enter the system.
Customer	The property owner within Hunter Water Corporation's area of operation that is connected to a water infrastructure.
Drinking water supply	The supply system into which Hunter Water Corporation delivers drinking water.
Maintenance	Includes repairs and replacement, and where relevant testing and inspections.
Main Tap	A valve located where the property service connects to the water main to control the flow of water through the property service.
Meter Tap	A valve located upstream of and adjacent to the water meter to control the flow of water from the property service through the water meter.
Meter	Device used to measure the water use on the property.
Owner	A person who holds ownership title to the property, as defined by the Hunter Water Act 1991.

Term	Definition
Property	An individual dwelling or premises used for any purpose, or Land, whether built or not (excluding public land), or a lot in a strata plan that is registered under the Strata Schemes (Freehold Development) Act 1973 or Strata Schemes (Leaseholder Development) Act 1986 that is connected to, or for which a connection is available, to Hunter Water's water supply system or wastewater system.
Property Service	The pipes and fittings used or intended to be used for the supply of water to a property, from the water main up to and including the water meter assembly.
Recycled Water	Highly treated wastewater that can be used in industrial processes, to irrigate agriculture, urban parks and landscapes, and in the home for flushing toilets, car washing and watering gardens. It is not used for drinking or personal use.
Site containment	The installation of a backflow prevention device on the water supply system at the property boundary, to prevent backflow from within the property entering the supply system.
Standard Connection (water)	A connection to Hunter Water's reticulated water main where: • The property has direct frontage to the water main; and • The water main is a reticulation main
Residential	For the purposes of this Standard, residential is defined as suburban-style lots sized <1500 square meters (excludes rural, commercial, industrial or mixed-use lots).
Water Main	A conduit or pipeline vested in the water authority or controlled and maintained by a network utility operator and constructed to convey potable water supplied by that authority.

8. Associated Regulations / Related Documents

Type	Title
Standard	Water Services Connections (Hunter Water)
Standard	Wastewater Services Connections (Hunter Water)
Standard	Australian and New Zealand Standard for Backflow Prevention Devices Parts 1, 2 and 3 (AS/NZS 3500)
Standard	Australian and New Zealand Standard for Plumbing and Drainage – Part 1 (AS/NZS 3500)
Code	Plumbing Code of Australia