

CITY OF UMATILLA
MANUAL
OF
BACKFLOW PREVENTION
AND
CROSS – CONNECTION CONTROL

PUBLIC WORKS DEPARTMENT

City of Umatilla
State of Florida

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FORWARD

The City of Umatilla's Utility Department Cross Connection Control Program is established by City Ordinance Number 2008 – S in which this “Cross Connection Control Manual” is referenced.

In conjunction with the directives established by the Federal Safe Drinking Water Act, the Federal Occupational Safety and Health Act, the Florida Department of Health and Rehabilitative Services and the Florida Department of Environmental Protection this “Cross Connection Control Manual” has been compiled.

Cross Connections are defined as a direct connection between a known safe potable water source and a source which has the potential to compromise the safe drinking water produced for consumption.

The prevention of Cross Connection is a responsibility which is shared by the water Purveyor, Consumer, City Inspectors, the Federal Occupational Safety and Health Administration, the Florida Department of Health and Rehabilitative Services and the Florida Department of Environmental Protection. The intent of this “Cross Connection Manual” is to aid in the coordination of these responsibilities so that the integrity of the potable water system remains intact.

SECTION 1

INTRODUCTION

A Cross Connection is defined by the American Water Works Association (AWWA) as:

A connection or a potential connection between any part of a potable water system and any other environmental containing other substances in a manner that, under any circumstances, would allow such substances to enter the potable water system. Other substances may be gases, liquids, or solids, chemicals, waste products, steam, water from other sources (potable or non-potable), or any matter that may change the color or add odor to the water. By pass arrangements, jumper connections, removable sections, swivel or changeover assemblies, or any other temporary or permanent connecting arrangement through which backflow may occur are considered to be cross connections.

Backflow, literally a reversal in the normal direction of flow within a water system, is what turns a cross connection into a health hazard. Consequently, cross connections and the chance of backflow must be eliminated to prevent these “unseen hazards” from degrading the quality of water that water purveyors strive to maintain.

1.01 Purpose

The purpose of a Cross connection Control Program is to prevent waterborne diseases and contaminants from entering the potable water distribution system and thus the water we drink. The program is intended to insure that delivered water which has passed beyond the public water system and into the private distribution systems of consumers remains a safe and viable product for consumption. The program aims to protect the Department of Public Works and it's

consumers from those water using establishments which could possibly reduce the quality and safety of the municipal potable water supply through backflow and/or Cross connection.

1.02 Legal Authority

In Florida, the primary responsibility for safeguarding potable water quality on private property historically has been left to local health agencies and building inspection departments. The Safe Drinking Water Act, signed by President Ford on December 16, 1974, created new authority through a chain of laws and regulations that resulted in the State requirements (Florida Safe Drinking Water Act, Sections 402.850 – 403.864, Florida Statutes) for all potable public water systems to have a Cross Connection Control Program. Contained within the Rules of the Florida Department of Environmental Protection (FDEP), Chapter 62-555 Florida Administrative Code (FAC), adopted the following policy:

Community water systems shall establish a routine Cross Connection program to detect and prevent Cross Connections that create or may create an imminent and substantial danger to the public health. Upon discovery of a prohibited Cross Connection, public water systems shall either eliminate the Cross Connection by installing an appropriate backflow prevention device acceptable to the Department or shall discontinue service until the contaminate source is eliminated. (Rules of the Florida Department of Environmental Protection (FDEP), Chapter 62-555 FAC.

1.03 Causes of Backflow

Where Cross Connections exist, protection against backflow is needed to reduce the possibility of contamination. The causes of backflow cannot usually be eliminated completely since backflow is often initiated by accidents or unexpected circumstances. However, some causes of backflow can be partially controlled by good design and informed maintenance. Listed below are the major causes of backflow as outlined under the two types of backflow – backsiphonage and backpressure.

1. Backsiphonage

Backsiphonage is caused by reduced or negative pressure being created in the supply piping. A major cause of backsiphonage is the interruption of the supply pressure. This will allow negative pressures to be created by water trying to flow to a lower point in the system. Another cause is undersized piping. If the water is withdrawn from a pipe at a very high velocity, the pressure in the pipe is reduced and the pressure differential created can cause water to flow into the pipe from a contaminate source. The potable water supply can thus become contaminated due to backsiphonage of contaminants into the potable water supply creating the potential for serious health problems.

The principal causes of backsiphonage are:

1. A line repair or break which occurs at a lower elevation than the service point;
2. Undersized piping;

3. Lowered pressure in a water main due to a high water withdrawal rate such as fire fighting, water main flushing, or water main breaks; and
 4. Reduced supply main pressure on the suction side of a booster pump.
2. Backpressure

Backpressure may cause backflow to occur where a potable water system is connected to a non-potable system of piping, and the pressure in the non potable system exceeds that in the potable system. High pressures may be created by means of pumps, boilers, etc. There is a high risk of non-potable water being forced into the potable water system whenever these types of cross-connections are not properly protected.

The principal causes of backpressure are:

1. Booster pump systems designed without backflow prevention assemblies;
2. Potable water connections to boilers and other pressure systems without backflow prevention assemblies;
3. Connections with a non potable system which may, at times, have a higher pressure; and
4. Non potable water stored in tanks or plumbing systems which, by virtue of their elevation, would create head sufficient to cause backflow if pressure were lowered in the public system.

SECTION 2

OBJECTIVES

The objectives of the City of Umatilla Utility Services Department Cross Connection Control program as follows:

1. To protect the City of Umatilla Public Potable Water Supply from the possibility of contamination by containing within its consumers' private water systems, contaminants or pollutants which could, under adverse conditions, backflow through uncontrolled cross connections into the public potable water system.
2. To eliminate or control existing cross connections actual or potential, between the consumers's on premise potable water system(s) and non potable water system(s) plumbing fixtures and industrial piping systems.
3. To provide a continuing inspection program of cross connection control, this will systematically and effectively control all actual or potential cross connections which exist presently or may exist in the future.
4. To maintain an on-going information program to educate the community on cross

connection control and to encourage citizen cooperation and coordination toward a successful cross connection control program.

SECTION 3

RESPONSIBILITY

3.01 Water Purveyor

Under the Safe Drinking Water Act of 1974 and the Rules of the Florida Department of Environmental Protection (FDEP) Chapter 62-555-360 (FAC), relating to Cross connection, then water purveyor has the primary responsibility of maintaining a cross connection control program to prevent water from unapproved sources, or any other substances, from entering the public potable water system. Failure to implement such a program may result in the withdrawal of the certification of the purveyor's public potable water permit to supply public potable water.

The water purveyor for the City of Umatilla is the Public Works Director in the Public Works Department. Upon detection of a prohibited cross connection, the Public Works Director is directed to either eliminate the cross connection by requiring the installation of an appropriate approved backflow prevention assembly or device or immediately discontinue service until the contaminate source is eliminated.

The specific authorized person to act for the water purveyor of Umatilla in relation to the Cross connection Control Program shall be the Cross Connection Technician in the Public Works Department.

3.02 Building Official

The Building inspection arm of the Building Division has the authority to review site and building plans and inspect plumbing as it is installed. It also has the authority to prevent the design or construction of cross connections in structures within the City's jurisdiction. The Building Official carries this responsibility for the City of Umatilla.

Where the review of site and building plans suggest or detects the potential for cross connections being made an integral part of the plumbing system, the Building Official has the authority under the Standard Plumbing Code to require that such cross connection practices be either eliminated or provided with approved backflow prevention device.

The Building Official's authority begins at the point of service (the downstream or consumer's side of the meter) and carries throughout then entire length of the site and building plans. Clarification should be made about the intended use of water at any point where it is suspected that a cross connection might be made or where one is actually called for by the plans. When cross connection potential is discovered, it is mandatory that a suitable, approved backflow prevention assembly or device be required by the plans and properly installed. Review of site and building plans may include input when necessary, from the Cross Connection Control Technician and Public Works Director to coordinate the proper location and application of approved backflow prevention assemblies and devices.

If a potential cross connection is discovered by the Cross Connection Control Technician on the consumer's side of the meter, emergency action may be deemed appropriate (Refer to Section 5.03 Emergency Procedures).

3.03 Public Health Officer

The Public Health Officer is authorized to promulgate and enforce laws, rules, regulations, and policies to be followed in carrying out an effective Cross connection Control Program. In the State of Florida, the Public Health Officer works for the Department of Health and Rehabilitation Services.

The Public Health Officer has the primary responsibility of insuring that the water purveyor operated the public potable water system free of actual or potential sanitary hazards, including unprotected cross connections. This Officer has the further responsibility of insuring that the water purveyor provides an approved water supply at the point of delivery to the consumer's water system.

The Public Health Officer has the primary responsibility of insuring that the consumer's potable water system is provided with an approved water supply and that the consumer's potable water system(s) is maintained free of sanitary hazards, including unprotected cross connections.

3.04 Consumer

The consumer's responsibility starts at the point of delivery from the public potable water system and includes all of the consumer's water systems. The consumer, at his own expense, is required to install, operate, test and maintain approved backflow prevention assemblies, as directed by the Cross Connection Control Technician in accordance with the City's backflow prevention containment policy. The consumer must maintain accurate records of tests and repairs made to backflow prevention assemblies and provide the Cross Connection Control Technician with two (2) copies of such records. The records are required to be on forms approved or provided by the Cross Connection Control Technician. In the event of accidental pollution or contamination of the public or consumer's potable water system due to backflow on or from the consumer's premises, the consumer shall promptly take steps to confine further spread of pollution or contamination within the consumer's premises, and is required to immediately notify the Cross Connection Control Technician of the hazardous condition.

3.05 Backflow Prevention Assembly Installers

The installer's responsibility is to assure proper installation of backflow prevention assemblies in accordance with the manufacturer's installation instructions and those furnished by the Cross Connection Control Technician. The installer is also responsible for conducting a test of the assembly when it is installed, and is required to furnish the following vital data to the Cross Connection Control Technician immediately after a Reduced Pressure Principal Backflow Prevention Assembly (RPBA), Double Check Valve Assembly (DCVA), or Pressure Vacuum Breaker (PVB) assembly is installed:

1. Service address where assembly is located
2. Owner
3. Description of assembly's location

4. Date of Installation
5. Type of assembly
6. Manufacturer
7. Model number
8. Serial number
9. Initial test report
10. Water meter number

Testing at the time of installation for all RPBA's, DCVA's, and PVB's shall be performed by a certified backflow prevention assembly technician (reference Section 6 for definition and explanation of Backflow Prevention Assembly Tester – Certified). Test results are to be provided immediately to the Cross Connection Control Technician.

SECTION 4

POLICY

The City of Umatilla has the continuing authority to inspect all industrial and commercial users of potable water, where pollution, health, or system hazards may exist or be created; where materials dangerous to health are handled in tanks, piping systems, or other vessels on the premises, or where the water system is unstable and cross connections may be installed. The following policies to cross connections will apply:

1. Should the connection be between two approved public potable water suppliers, common gate or check valves may be used, provided this has the approval of both water suppliers, and the Florida Department of Environmental Protection.
2. Should this connection between an approved public potable water supply and a service or other water supply which has, or may have, any material in the water dangerous to health that is, or may be, handled under pressure, subject to negative pressures, protection shall be by an approved air-gap separation (AG). The air-gap shall be located as close as practicable to the service cock or other connection to the approved supply. All piping between such connection and approved air-gap shall be entirely visible. If these conditions cannot reasonably be met, the public potable water supply shall be protected alternatively with an approved reduced pressure principle backflow prevention assembly (RPBA), provided the alternative is acceptable to the Public Works Director and the Florida Department of Environmental Protection.

SECTION 5

INSPECTIONS

5.01 Frequency

Due to changes in models or components of equipment, methods of manufacturing and additions to plants, buildings, ect., water use requirements undergo continual change. As a result, new cross connections may be installed and existing protection may be by-passed, removed or made otherwise ineffective; therefore, an annual, biennial, or more frequent detailed inspection by the Cross Connection Control Technician of all water usage is required. In addition, all new building construction shall also be plan checked and inspected during the installation by the Building Official and/or Cross Connection Control Technician to insure conformance with the City's cross connection control (containment and isolation) requirements.

5.02 New Construction

All new construction plans and specifications for individual or commercial facilities shall be submitted to the Utility Services Department through the Development Review Committee (DRC) process. The Utility Services Department shall review the plans to determine what degree of possible cross connection hazards are posed to the public potable water supply and what approved backflow prevention assemblies or devices are required to insure conformance with cross connection control (containment) requirements. Evaluation shall include input from the Cross Connection Control Technician to coordinate the proper location and application of approved backflow prevention assemblies as necessary. Backflow prevention and cross connection control shall be accomplished by a combination of plans review and field inspections.

Upon completion of plans evaluation, the consumer will be notified through the DRC process of Utility Services Department cross connection control requirements.

If adequate plans and specifications are not available and no realistic evaluation of proposed water uses can be made, the consumer shall be advised that the installation of backflow prevention assemblies or other controls shall be necessary.

In conjunction with its inspection and testing of all new plumbing, the Building Official will inspect and require testing and approve or disapprove the completed backflow preventer installation. Field inspections during construction or immediately after will also serve to identify hazards that were not apparent during plan reviews or were introduced during construction. The Building Official is responsible for field inspection to determine compliance with plumbing regulations. The Cross Connection Control Technician will assist the Building Official, as necessary, to insure compliance and field testing.

After final approval of the installation and satisfactory test results, in accordance with plumbing codes and cross connection rules and regulations, a report will be completed and filled by the rules and regulations; a report will be completed and filed by the Cross Connection Control Technician with the concurrence of the Building Official. This report will include size, model, location, and all other pertinent details of the installation including satisfactory test results attested to by a certified tester.

All non-residential construction of any building to be served by the City water system shall be plan-checked and inspected by the Building Official for compliance with the City's cross connection control (isolation) requirements prior to connection to the City potable water main.

For containment purposes, the following types of buildings shall have an approved backflow-prevention assembly or device at the water service connection;

1. All buildings over (3) three stories
2. Hospitals
3. Medical or Research Buildings
4. Morgues, Mortuaries and Autopsy Facilities
5. Chemical related industries
6. Wastewater Plants
7. Metal Plating Facilities

5.03 Emergency Procedures

If a consumer discovers a hazardous situation where contaminants are actually in the process or suspected of entering the distribution system of the public potable water supply, the consumer shall immediately notify the water resources superintendent of the City of Umatilla of the hazardous situation and the need for flushing the contaminant out of the system.

The Cross Connection Control Technician, acting for the water resources superintendent, is authorized to take immediate steps he deems necessary to correct a hazardous condition; which shall include but be limited to the right to immediately discontinue potable water service to premises where a hazardous condition may be occurring. Such emergency steps, including discontinuance of potable water service, may be taken without advance notice to the consumer. The consumer shall be notified as soon as possible thereafter if potable water service has been discontinued; and the matter simultaneously brought to the attention of the City Attorney's Office and the Office of the City's Director of Utility Services.

SECTION 6

DEFINITIONS

Air-Gap Separation – The term air-gap separation shall mean a physical separation between the free flowing discharge end of a potable water supply pipeline and an open or non pressure receiving vessel. An approved air-gap separation shall be a distance of at least two (2) times the diameter of the supply pipe measured vertically above the top rim of the vessel – with a minimum distance of one (1) inch.

Approved – The term approved, as herein used in reference to a water supply, shall mean potable water supply that has been approved by the Florida Department of Environmental Protection. The term approved as herein, used in reference to air-gap separation, a double check valve assembly, or a reduced pressure principle backflow prevention assembly shall mean as approved by the City of Umatilla. (See Backflow Prevention Assembly Approved). Other backflow prevention devices or methods may be approved on an individual basis.

Auxiliary Intake – The term auxiliary intake shall mean any piping connection or other device whereby water may be secured from a source other than that normally used.

Backflow – The term backflow shall mean the undesirable reversal of the flow of water or other liquids, mixtures, gases, or other substances into or towards the distribution piping of a potable supply of water from any source or sources.

Backflow Prevention Assembly – Approved – The term approved backflow prevention assembly shall mean an assembly that has been investigated and approved by City of Umatilla and has been shown to meet the design and performance standards of the University of Southern California/Foundation for Cross Connection Control and Hydraulic Research (USC/FCCHR) and/or the American Water Works Association (AWWA). The approval of backflow prevention assemblies testing laboratory, recommending such an approval. An approved backflow prevention assembly is comprised of one or more approved body components including shutoff valves and is used to prohibit the backflow of water into the potable public water system.

Backflow Prevention Assembly Tester – Certified – The term certified backflow prevention assembly tester shall mean a person who has proven his/her competency to the satisfaction of the City of Umatilla. Each person who is certified to make competent tests or to repair, overhaul and make reports on backflow prevention assembly shall be conversant with applicable laws, rules and regulations, have had at least (2) two years of experience under a licensed plumber or have other qualifications which in the opinion of City of Umatilla Utility Services Department are equivalent. They shall have attended and successfully completed the TREEO (Training, Research, and Education for Environmental Occupations) Certification Program for Backflow Prevention Assembly Testers, or other USC/FCCHR or FDEP approved program.

Backflow Prevention Device – Approved – The term approved backflow prevention device shall mean a device that has been investigated and approved by the City of Umatilla and has been shown to meet the design and performance standards of the American Society of Sanitary Engineers (ASSE) and/or the American National Standards Institute (ANSI).

Backpressure – Backpressure shall mean any elevation or pressure in the downstream piping system (by pump, elevation of piping, or steam and/or air pressure) above the supply pressure at the point of consideration which would cause or intend to cause a reversal of the normal flow through a backflow prevention assembly.

Backsiphonage – Backsiphonage shall mean a reversal of the normal direction of flow in the pipeline due to a negative pressure (vacuum) being created in the supply line with the backflow source subject to atmospheric pressure.

Consumer – Any person, firm or corporation using or receiving water from the City's potable water system.

Containment – The term containment practice of installing an approved backflow prevention assembly at the service connection or terminal end of the public potable water system. The Cross Connection Technician is responsible for enforcement of cross connection control as it pertains to containment.

Contamination – The term contamination shall mean an impairment of the quality of the City potable water supply by sewage, industrial fluids or any other foreign substance to a degree which creates an actual hazard to the public health through the potential spread of disease or toxic materials.

Critical Level – The term critical level shall mean the marking on a vacuum breaker which determines a minimum elevation above the flood level rim of the fixture or receptacle served at which the device may be installed.

Cross Connection – The term cross connection shall mean any unprotected connection between any part of a water system used or intended to supply water for drinking purposes and any source or system containing water or substances that is contaminated or cannot be approved as safe, wholesome and potable for human consumption. By-pass arrangement, jumper connections, removable sections, swivel or change over devices and other temporary or permanent devices through which or because of which “backflow” can or may occur are considered to be cross connections.

Double Check Valve Assembly – The term approved double check valve assembly shall mean an assembly of at least (2) two independently acting, approved, spring and weight loaded check valves with resilient discs for the intended purpose of preventing back pressure backflow in a water supply line. Assemblies shall be furnished with test cocks for field testing the tightness of the check valves. Some assemblies include a “vacuum breaker” to admit atmospheric air downstream of the assembly. The unit shall include tightly closing ball type or resilient seated shutoff valves located at each end of the assembly.

Dual Check Valve (DLC) – The term dual check valve shall mean a device consisting of two independent check valves which have been approved by the City of Umatilla for use to protect the public potable water system at the single family customer’s service(s) where there is also a reclaimed water system service and no other backflow hazards exist. Such valves must meet the requirements of A.S.S.E. 1024.

Fire Sprinkler System – A sprinkler system, for fire protection purposes, is an integrated system of underground and overhead piping designed in accordance with fire protection and engineering standards. The installation includes one or more water supplies.

Flood Level Rim – The edge of the receptacle from which water overflows is the flood level rim.

Hazard – Degree of – The term degree of hazard is a qualification of what potential and actual harm may result from cross contaminations within a water using facility. Establishing the degree of hazard is directly related to the type and toxicity of contaminants that could feasibly enter a “pollutional” (non-health) or a “contamination” (health) hazard.

Hazard – Health – The term health hazard shall mean an actual or potential threat of contamination or pollution of physical or toxic nature to the public potable water system or the consumer’s potable water system to such a degree or intensity that there would be a danger to health.

Hazard – Plumbing – The term plumbing hazard shall mean a plumbing type cross-connection in a consumer’s potable water system that has not been properly protected by an approved

vacuum breaker, air-gap separation or other approved assembly or device. Unprotected plumbing type cross connections are considered to be a health hazard. They include, but are not limited to, cross connections to toilets, sinks, laboratories, wash trays, domestic washing machines, and lawn sprinkler systems. Plumbing type cross connections can be located in many types of structures, including homes, apartment houses, hotels, commercial and industrial establishments. Such a connection, if permitted to exist, must be properly protected by an appropriate approved types of cross connection control assembly or device.

Hazard – Pollution – The term pollution hazard shall mean an actual or potential threat to the physical properties of the water system or the potability of the public or the consumer’s potable water system, but would not constitute a health or system hazard, as defined. The maximum degree of intensity of pollution to which the potable water system could be degraded under this definition would cause a nuisance, or be aesthetically objectionable, or could cause minor damage to the system or its appurtenances.

Hazard – System – The term hazard system shall mean an actual or potential threat of severe danger to the physical properties of the public or the consumer’s potable water system, or of a pollution or contamination which would have a protracted effect on the quality of the potable water system.

Health Agency – The term health agency shall mean the Florida State Department of Health and Rehabilitative Services (DHRS).

Hospital – The term hospital shall mean an institution, place, building, or agency which maintains and operates organized facilities for one or more persons, for the diagnosis, care and treatment of human or animal illness, including convalescence care during and after pregnancy, or which maintains and operated organized facilities for any such purposes, and to which persons may be admitted for an overnight stay or longer. “Hospital” includes sanitarium, nursing home, maternity home, and veterinarian facilities.

Industrial Fluid – The term industrial fluid shall mean any fluid or solution which may be chemical, biologically or otherwise contaminated or polluted in a form or concentration, such as would constitute a health, system, pollution or plumbing hazard if introduced into an approved potable water supply. This may include, but not be limited to: polluted or contaminated used water; all types of process waters and “used water” originating from the public potable water system which may deteriorate in sanitary quality; chemicals in fluid form; plating acids and alkalies; circulated cooling water connected to an open cooling tower and/or cooling waters that are chemically or biologically treated or stabilized with toxic substances; contaminate natural waters such as from wells, springs, streams, rivers, bays, harbors, seas, irrigation canals or systems, etc; oils, gases, glycerine, paraffins, caustic and acid solutions and other liquid and gaseous fluids used industrial or other process or for fire fighting purposes.

Industrial Piping System – Consumer’s – The term consumer’s industrial piping system shall mean any system used by the consumer for transmission of or to store any fluid, solid, or gaseous substance other than an approved water supply. Such a system would include all pipes, conduits, tanks, receptacles, fixtures, equipment and appurtenances to produce, convey, or store substances which are or may be polluted or contaminated.

Inlet – The open end of water supply pipe through which the water is discharged into the plumbing fixture shall be the inlet.

Isolation – The term isolation shall mean the practice of installing an approved backflow prevention assembly or device at the source of the potential contamination (e.g., installing an approved vacuum breaker on a flush valve water closet).

Internal Protection – See Isolation.

Laboratory – Approved Testing – Reference to an approved testing laboratory shall mean the University of Southern California/Foundation for Cross Connection Control and Hydraulic Research (USC/FCCHR), or any other laboratory having the equivalent facilities for both the laboratory and field evaluation of the assemblies or devices approved by the American Water Works Association or American Society of Sanitary Engineers.

Plumbing Official – the term Plumbing Official shall mean the individual, board, department, or agency established and authorized by state, county, city, or other political subdivision created by law to administer and enforce the provisions of the Standard Plumbing code as adopted or amended.

Plumbing System – The term plumbing system includes the potable water supply and distribution pipes; plumbing fixtures and traps; soil, waste and vent pipes; building drains; and building sewers; including their respective connections, devices, and appurtenances within the property line of the premises; and water treating or water using equipment.

Point of Delivery – see Service Connection.

Pollution – Pollution shall mean an impairment of the quality of the water to a degree which does not create an actual hazard to the public health, but which does adversely and unreasonably affect it for domestic use.

Premises Isolation – Premises isolation shall mean the practice of installing an approved backflow prevention assembly or device on a potable water main at the point where the main crosses the property line of any multi family, public, commercial, office or industrial/warehouse development.

Professional Management – The term professional management refers to the management of the consumer's plumbing system. The Utility Services Department shall evaluate the consumer's management capabilities and declare that the consumer's property is either professionally managed or not professionally managed. The Utility Services Department will consider, but is not necessarily limited to, the following criteria in making the determination of management capability:

1. the consumer's professional certifications;
2. the consumer's annual testing report history for backflow prevention assemblies;
3. the consumer's history of cross connection violations and avoidance of cross connections.

Reduced Pressure Principle Backflow Prevention Assembly (RPBA) – The term approved Reduced Pressure Principle Backflow Prevention Assembly (RPBA) shall mean an assembly containing within its structure a minimum of two independently acting, approved check valves, together with an automatically operating pressure differential relief valve located between the two check valves. The first check valve reduces the supply pressure a predetermined amount, so that during normal flow and at cessation of normal flow, the pressure between the checks shall be less than the supply pressure. In case of leakage of either check valve, the differential relief valve, by discharging to the atmosphere, shall operate to maintain the pressure between the checks less than the supply pressure. The unit shall include tightly closing ball types or resilient seated shutoff valves located at each end of the assembly and each assembly shall be fitted with properly located test cocks.

Service Connection – The term service connection shall mean the terminal end of the public potable water system, where the water purveyor loses jurisdiction and sanitary control over the water at its point of delivery to the consumer’s water system. If a meter is installed at the end of the service connection, then the service connection shall mean the downstream end or consumer’s side of the meter. There shall not be unprotected takeoffs from the service line ahead of any backflow prevention assembly or device located at the point of delivery to the consumer’s potable water system.

Vacuum Breaker – Non Pressure (Atmospheric) Type – An approved vacuum breaker – non pressure type is a vacuum breaker which is designed for use where it will not be subject to static line pressure.

Vacuum Breaker – Pressure Type – An approved vacuum breaker- pressure type is a vacuum breaker designed to operate under conditions of static line pressure. The unit shall include tightly closing ball type or resilient seated shutoff valves located at each end of the assembly.

Water – Potable – The term potable water shall mean water from any source which has been investigated by the Florida Department of Environmental Protection and which has been approved for human consumption by the health authority having jurisdiction. Potable water is water of excellent quality intended for drinking, cooking, and cleaning uses. This grade of water would conform to the water quality requirements of state and federal regulatory agencies.

Water Purveyor – The term water purveyor shall mean the utility owner or operator of the public potable water system supplying an approved potable water supply to the public. The utility shall be one that is operating under a valid permit from the Florida Department of Environmental Protection. As used herein the terms water purveyor and Water Resources Division for the City of Umatilla Utility Services Department are the same.

Water Supply – Approved – The term approved water supply shall mean the City of Umatilla’s potable water system or any public potable water supply which has been investigated and approved by the Florida Department of Environmental Protection (FDEP). The system must be operating under a valid health permit. In determining what constitutes an approved water supply, the FDEP has reserved final judgment as to its safety and potability.

Water Supply – Auxiliary – The term auxiliary water supply shall mean any water supply available to the premises other than the purveyor’s approved public potable water supply. These auxiliary waters may include water from another purveyor’s public potable water supply or any

natural source such as well, spring, river, stream, etc., or “used water” or “industrial fluids”. They may be polluted or contaminated or objectionable and constitute an unacceptable water source over which the water purveyor does not have sanitary control.

Water Supply –Unapproved – The term unapproved water supply shall mean a water supply which has not been approved for human consumption by the health agency having jurisdiction.

Water System – Consumer’s – The term consumer’s water system shall include any water system located on the consumer’s premises whether supplied by the public potable water system or an auxiliary water supply. The system or systems may be either a potable water system or an industrial piping system.

Water System – Consumer’s Potable – The term consumer’s potable water system shall mean that portion of the privately owned potable water system lying between the point of delivery and point of use. This system will include all pipes, conduits, tanks, receptacles, fixtures, equipment, and appurtenances used to produce, convey, store or use potable water.

Water System – Dual – The term dual water system shall mean water distribution facilities that distribute two grades of water to the same service area, one potable and the other reclaimed. The quality, quantity, and pressure available in each system are functions of the sources and intended uses for each grade of water.

Water System – Public Potable – The term public potable water system shall mean any publicly or privately owned water system operated as a public utility, under a recent health permit, to supply water for domestic purposes. This system will include all sources, facilities, and appurtenances between the source and the point of delivery such as valves, pumps, pipes, conduits, tanks, receptacles, fixtures, equipment, and appurtenances used to produce, convey, treat, or store potable water for public consumption or use.

Water – Reclaimed – The term reclaimed water means water which, as a result of treatment of domestic wastewater, is suitable for a direct beneficial use or a controlled use that would not otherwise occur. Reclaimed water is also known as reuse water.

Water Supervisor – The term water supervisor shall mean the consumer or a person on the premises appointed by the consumer charged with the responsibility of maintaining the consumer’s water system(s) on the property free from cross connections and other sanitary defects, as required by regulations and laws. A certified backflow prevention assembly tester may not act as a water supervisor unless he is a full time employee of the consumer having the day to day responsibility for the installation and use of pipelines and equipment on the premises and for avoidance of cross connections.

Water – Used – The term used water shall mean any water supplied by a water purveyor from a public potable water system to a consumer’s water system after it has passed through the point of delivery and is no longer under the control of the water purveyor.

SECTION 7

Applicable Standards and Descriptions for Backflow Prevention Assemblies and Devices

7.01 Applicable Standards

The following specifications or requirements of approving agencies are recognized by the City of Umatilla. All backflow prevention assemblies and devices and conditions of cross connection control shall be in compliance with the standards set forth by one or more of the following agencies. The City reserves the right to state which standards apply if and when conflicts between standards arise.

ANSI - American National Standards Institute - #A112.1.2.

AWWA - American Water Works Association - #C510-89 and manual M14- 1990 edition.

ASSE - American Society of Sanitary Engineers - #1001, #1011, #1012, #1013, #1015, #1020, #1024, #1032, and #1035.

USC/FCCHR - University of Southern California/Foundation for Cross Connection Control and Hydraulic Research Manual of Cross Connection Control, Eighth Edition, June 1988.

SBCC/SPC Southern Building Code Congress/Standard Plumbing Code.

The Cross Connection Control Supervisor will maintain a list of approved assembly and device manufactures for use within the City of Umatilla's potable water service area. This list shall be as specified by the USC/FCCHR.

7.02 Abbreviations for Protective Assemblies and Devices

AG	Approved Air Gap
AVB	Approved Atmospheric Vacuum Breaker
ABP/IAV	Approved Backflow Preventer with Intermediate Atmospheric Vent
DLC	Approved Dual Check Valve
DCVA	Approved Double Check Valve Assembly
DCV/LF	Approved Check Valve Assembly with Laboratory Faucet
DDCV	Approved Double Detector Check Valve Assembly
HBVB	Approved Hose Bibb Vacuum Breaker
PVB	Approved Pressure Vacuum Breaker Assembly
RPBA	Approved Reduced Pressure Principle Backflow Prevention Assembly

7.03 Types and Descriptions of Backflow Prevention Assemblies and Devices

The following definitions apply to hazard conditions existing at a site where backflow prevention assemblies and devices may be required.

<u>Degree of Hazard</u>	<u>Definition</u>
LOW	A condition where a polluting substance may come in contact with potable water aesthetically affecting the taste, odor, or appearance, but not hazardous to health (non toxic), (e.g., pollution hazard).
MODERATE TO HIGH	A condition where a contaminating substance may come in contact with potable water creating a health hazard, causing sickness or death (toxic), (e.g., system hazard, plumbing hazard, health hazard).

Appendix A, page 56, lists the types and applications of backflow prevention assemblies and devices, a brief description of each assembly or device, typical installation conditions, and applicable standards.

Refer to Appendix A, for backflow prevention assembly and device components and typical installation details.

7.04 Typical facilities Requiring Backflow Prevention Assemblies

1. All Hospitals shall have an approved RPBA installed on all the service connections supplying potable water to such premises.
2. Medical Buildings, Sanitariums, Veterinarian Facilities, Morgues, Mortuaries, Autopsy Facilities, Nursing and Convalescent Homes and Clinics shall have an approved RPBA and DCVA, depending upon the degree of hazard, installed at the service connection. The hazards normally to be found in a facility of this type include cross connections between the consumer's water system and contaminated or sewer connected equipment such as bedpan washers, flush valve toilets and urinals, autoclaves, specimen tanks, sterilizers, pipe tube washers, cuspidors, aspirators, autopsy and mortuary equipment.

NOTE: It has been found that in the type of Facilities listed under numbers 1 and 2 above, little or no attention is given to the maintenance of air gap separations or vacuum breakers. It is customary to bridge an air gap separation by means of a hose section. It should also be noted that in multi-story buildings, the supply line to the toilets, urinals, lavatories, laboratory sinks, etc., on the lower floors may be taken off of the suction side of the house pump. As a result, sewage or other contaminated substances may be drawn into the house supply line.

3. All Properties, Buildings, Plants, or other structures having a source of unapproved water piped into such properties, buildings, plants, or other structures with the potential of being interconnected to the public supply, shall have an approved RPBA installed at the service connection.
4. All Buildings, Hotels, Apartment Houses, Public and Private Buildings, or any other structures having unprotected cross connections shall have an approved RPBA or DCVA, depending upon degree of hazard, installed at the service connection to the premises. Where multi storied public buildings such as hotel, apartment house, office or loft building are operated or maintained if the buildings have unprotected cross connections, auxiliary water supplies, or other like sources of contamination which could create a potential hazard to the public water system, then an approved backflow prevention assembly consistent with the degree of hazard must be installed at the service connection to the premises. All buildings or any structures which contain a sewage pumping station or other similar potential health hazard shall have an approved RPBA installed at the service connection to the building. Also, an approved backflow prevention assembly should be installed at the service connection to any premises where there are existing cross connection or where potential cross connections exist or where it is expected that the consumer may make piping or equipment changes which would result in the installations of a cross connection.
5. All Waterfront Facilities and Industries shall have an RPBA or DCVA, depending upon the degree of hazard, installed at their service connection to any premises where there are piers docks, industries, or other waterfront facilities where water from a river, stream, irrigation, ditch or canal, lake, etc., is available to be used on the premises. Backflow protection may not be required on services to cafes, private residences, concessions, administration buildings, comfort stations, and other similar facilities. Backflow protection may not be required on services to facilities which do not have outlets available for supplying water to docks or facilities which have not been used for such auxiliary water supplies as irrigation, fire protection, air conditioning, cooling, swimming pool supply or other such purposes.
6. All Chemical Plants, Oil and Gas Production or Transmission Properties, Dye Works, Film Laboratories, Plating Facilities, or similar establishments manufacturing, storing, handling, or transmitting chemicals which are toxic shall have an RPBA installed on the main potable water service lines serving the facility.
7. All sewage Treatment Plants shall have an RPBA installed on main potable water service lines serving such plants.
8. Dairies and Cold Storage plants shall have an RPBA or DCVA, depending upon the degree of hazard, installed on the service connection to any premises where a dairy, creamery, ice cream plant, cold storage, or ice manufacturing plant is operated or maintained provided such a plant has on the premises an auxiliary water supply, industrial fluid system, sewage handling facilities or other similar source of contamination which if cross connected to, would create a hazard to the public system. The hazards normally to be found in a plant of this type include cross connections between the consumer's water system and reservoirs, cooling towers and circulating systems which may be heavily contaminated with bird droppings, vermin, algae, bacterial slime, or toxic water treatment compounds.

9. Schools and Colleges shall have a DCVA or RPBA installed at the service connection where water is used to supply chemical, bacteriological and biological laboratories; or systems; or where there are unprotected sewer cross connections.

Note: This hazard is critical because little or no attention is given to the maintenance of vacuum breakers and frequently they are removed from the line; steam generating facilities and lines are frequently contaminated with boiler compounds such as pentachlorophenol, cyclohexamine, etc. A very particular hazard is the possibility of steam getting back into the domestic system, causing either a system or health hazard.

10. In Commercial Car Washing Installations, potable make-up water lines to reclaim water pits shall have an AG separation. All potable water connections to fluids such as bug cleaner, tire cleaner, and wax and soap solution make-up tanks shall have an AG separation. If this is not possible due to the design of the equipment, a RPBA shall be installed on the main water service connection.
11. All Building or Premises where security requirements or other prohibition restrictions make it impossible or impractical to make a complete inside cross connection survey, the public water system shall be protected against backflow from the premises or building by RPBA installed on the main service connection (s) serving the building or premises.
12. All industrial, commercial, or residential properties (including all multi or single family residences) having an irrigation system which utilizes chemical siphoning or injection.

Note: Any device, equipment, or situation not covered by cross connection policy where water is connected or used, which may constitute a potential health hazard will be handled at the discretion of the Cross Connection Control Technician.

7.05 Typical Plumbing Arrangements Requiring Backflow Prevention Assemblies or Devices

1. Fixture Inlets or Valved Outlets with hose attachments, which may constitute a cross connection, shall be protected by the proper approved vacuum breaker (PVB, HBVB, etc.) installed at least six (6) inches above the highest point of usage and located on the discharge side of the last valve. Fixtures with integral vacuum breakers manufactured as a unit may be installed in accordance with their approved requirements.
2. Industrial Fluid or Processed Water – Potable water pipelines connected to industrial piping systems or to equipment containing industrial fluid, sewage, used or processed water, or any other potentially contaminated liquid shall be protected by installing an RPBA in the interconnecting lines or by an AG separation.
3. Air Condition Cooling Tower – Potable water inlet shall have an AG separation of twice the inside diameter of the inlet line or a minimum of two inches above the flood level rim.

4. Aspirators and Ejectors – Shall have a PVB, depending upon the degree of hazard, on the faucet from which these devices are attached or operated.
5. Automatic Film Processors – Potable water lines connected directly to an automatic film processor shall be protected by an AG or an RPBA.
6. Bath tub with Hose Attachments - Shall have a PVB at faucet.
7. Bedpan Washer – Shall have a PVB installed in accordance with the Standard
8. Plumbing Code.
9. Boiler Connection – Potable water connection to boiler feed water system which contains conditioning chemicals shall either be made through an AG at make-up tank, or have an RPBA, or DCVA, depending upon the degree of hazard. Feed connections to steam and hot water heating boilers, heat exchangers, etc. which do not contain chemical additives shall have either an AG, DCVA.
10. Booster Pumps – All booster pumps shall be provided with a low pressure cut-off unless other acceptable provisions are made to prevent the creation of low or negative pressures in the piping system.
11. Colonic Irrigators or Douche Attachments – Shall have a PVB installed.
12. Dark Rooms (Photographic) – All threaded faucets shall be protected with a PVB or HBVB.
13. Dishwashing Machine – Shall be connected with a PVB on both hot and cold supply lines in accordance with the Standard Plumbing Code.
14. Dip Tanks and Vats – Potable water inlet shall have an AG separation twice the inside diameter of the inlet or a minimum of two inches above the flood level rim.
15. Drinking Fountains – Shall have an AG separation.
16. Garbage Disposer – Potable water supply lines connected directly to garbage disposer shall be equipped with a PVB or BPW/IAV.
17. Fire Sprinkler Drains – Shall have an AG separation to sewer.
18. Flushing Floor Drains – Shall have a PVB installed.
19. Flush Valve Water Closets, Urinals, and Bidets – Shall have a vacuum breaker installed in accordance with the Standard Plumbing Code.
20. Foot and Sitz Bath – Shall have an AG separation or a PVB installed.
21. Hydro Therapy Baths – Shall have a PVB installed at water connection.
22. Janitors, Mop of Slop Sink – With threaded hose faucet shall be equipped with an AVB before faucet.
23. Lawn Sprinkler Systems – Shall have a PVB or RPBA or DCVA installed depending on degree of hazard. A RPBA shall be installed on any system that includes the injection of fertilizer, chemical or hazard into the water.
24. Pipette Water – Shall have a PVB installed or AG separation installed on faucet.
25. Properties With Alternate Water Sources – such as private wells, lakes, rivers, etc. (excluding reclaimed water) shall have an RPBA installed at the service connection. Private wells shall not be interconnected or physically linked in any way, with or without a protective assembly, to the public potable water supply.
26. Potable Water Make-up Line – To chill water loops, heating loops, purge units, condensers, converters, and condensate tanks should be equipped with DCVA, or RPBA, depending upon degree of hazard.
27. Serrated Faucets – Shall be equipped with a PVB at the Faucet. If goose neck faucet is used “laboratory faucet type vacuum breaker” is acceptable.
28. Shampoo Basin Hose Rinse – Shall have an AVB installed.
29. Sinks and Bath top Faucets – Shall have an AG separation above flood level rim.

30. Sterilizers – Shall have an AG separation or PVB installed.
31. Stills – Shall have an AG separation.
32. Swimming Pool Fill Line – Shall have an AG separation above flood level rim or a DCVA.
33. Wash-up Sinks with Threaded Faucets – Shall have a PVB or HBVB installed.
34. Washdown Hose Faucet – Shall have a PVB or HBVB installed on faucet.
35. Washing Machine Drain Lines – Shall have an AG separation to sewer.
36. Water Supply Inlets – In pits, tanks, trenches, tubs, vats, or any other place that could become flooded with contaminated liquids shall have an AG separation above the flood level rim.
37. Water Operated Presses, Elevators, or other similar Pressure producing equipment – shall have an RPBA installed.
38. X-ray Developing Tank – Shall have an AG separation or a PVB.

NOTE: Any device, equipment, or situation not covered by this cross-connection policy, which may constitute a potential health hazard, will be examined for appropriate treatment by the Department of Public Works or authorized agent.

SECTION 8

TESTING AND MAINTENANCE OF BACKFLOW PREVENTERS

8.01 General Requirements

As part of a complete cross connection control program, it shall be the duty of the non single family customer-user at any premises where Reduced Pressure Principle Backflow Prevention Assemblies (RPBA), Double Check Valve Assemblies (DCVA), and Pressure Vacuum Breakers (PVB) are installed to have a through inspection and operational test at the time of installation and at least once a year, or more often in those instances where inspections indicate a need. Proper field test procedures with calibrated gage equipment must be used by certified personnel (reference Section 6 for definition and explanation of a Backflow-Prevention Assembly Tester Certified). The cost of inspection, testing, maintenance and repair of backflow prevention assemblies at non single family residences shall be borne by the non-single family customer user.

The single family residence customer user shall be responsible for the cost of the initial installation, inspection, and testing of any backflow prevention assembly connected to a potable water irrigation system. The costs and scheduling of inspections and tests thereafter performed at single family residences shall be the responsibility of the property owner; any maintenance or repair required as a result of the test shall be at the expense of the customer user and shall be performed by the assembly tester (reference Section 6 for definition and explanation of a Backflow Prevention Assembly Tester – Certified).

Irrigation systems are required to have a RPBA or DCVA to prevent backflow to the public water supply. The responsibility of installing, repair or replacement of backflow prevention assembly will lie with the property owner. Single-family water customers installing new irrigation systems will be required to purchase, install, and perform the initial test for new backflow preventer at their own expense. Annual testing and inspection of ~~PVB's~~ the backflow prevention assembly for all single family customers will be performed by the property owner at the property owner's expense.

All assemblies failing to meet the latest performance standards set forth by the American Water Works Association (AWWA 506), American Society of Sanitary Engineers (ASSE 1013), or the Foundation for Cross Connection Control at the University of Southern California (Manual of Cross Connection Control), shall be repaired and retested promptly. Assemblies which are found to have a history of not meeting these performance standards should be placed on a semi-annual or quarterly testing schedule. Assemblies repeatedly found not to meet the standards are to be replaced with new assemblies. If such testing indicates wear or other malfunction, the assembly shall be overhauled. Such an overhaul should consist of the replacement of all seats, diaphragms, gaskets, etc., which are subject to wear, and any other parts found to be worn or otherwise in questionable condition.

8.02 Parallel Installations

All backflow prevention assemblies with test cocks are required to be tested with a minimum frequency of once per year. Testing requires a water shutdown usually lasting five (5) to twenty (20) minutes. For facilities that require an uninterrupted supply of water, and when it is not possible to provide water service from two separate meters, provisions shall be made for a “parallel installation” of backflow prevention assemblies.

Multi story buildings which have a number of flushometer toilets should be equipped with parallel assemblies. Experience has shown if the water supply is shut off to this type of building, flushometers may have to be manually reset.

During testing one assembly is left on while the other is being tested. Usually the two assemblies are sized one assembly size smaller than the service line, e.g., one 2 inch assembly or two 1 ½ inch assemblies, one 8 inch assembly or two 6 inch assemblies.

The City of Umatilla will not accept an unprotected bypass around a backflow preventer when the assembly is in need of testing, repair or replacement.

Installations Requiring Continuous Service and a Parallel Installation of Backflow Prevention Assemblies are listed as follows:

1. Aircraft and Missile Plants
2. Automotive Plants
3. Auxiliary Water Systems
 - a. Private Water Supply
 - b. Used Water and Industrial Fluids
4. Beverage Bottling Plants
5. Breweries
6. Buildings – hotels, apartment houses, public and private buildings or any other structures having unprotected cross-connections.
7. Canneries, Packing Houses, and Reduction Plants
8. Chemical Plants – Manufacturing, Processing, and Compounding or Treatment
9. Hospitals, Medical Buildings, Sanitariums, Morgues, Mortuaries Autopsy Facilities, Nursing and Convalescent Homes and Clinics
10. Laundries and Dye Works
11. Paper and Paper Product Plants

12. Power Plants
13. Restricted, Classified or other closed Facilities
14. Schools and Colleges

8.03 Preparation

As a prelude to each of the field test procedures, it is essential that the certified tester follow some basic steps:

1. **Notify** – Appointment and introduction procedures shall be followed similar to that used for inspections. The owner of the assembly shall be notified that water service will be shut off during test procedures. Special arrangements may have to be made so that interruption of service will not create a hardship on the user.
2. **Identify** – Make sure that proper assembly is being tested by checking identification tag for make (manufacturer), model, and serial number. All information and test data shall be recorded on proper forms before leaving the location.
3. **Inspect** – Inspect the assembly for the required components for the field test procedure – i.e., upstream and down stream shut-off valves, properly placed test cocks, etc.
4. **Observe** – Carefully observe area around the assembly for telltale signs of leakage – i.e., moss or algae growth, plant life, or soil erosion. This should supply the tester with additional information regarding the condition of the assembly before the test is performed. Example: Wet spot under relief valve port of reduced pressure principle backflow prevention assembly is an indication of relief valve activity, possibly from pressure fluctuations or fouling of the assembly. Proper testing will define the problem.

8.04 Records

The Cross Connection Control Technician will notify the customer user when tests are required and shall supply the necessary test forms when requested. These forms will be completed and returned to the Cross Connection Control Supervisor by the date indicated. A full report on the test of each assembly giving pertinent test data and indicating what, if any repairs were made are to be delivered promptly to the Cross Connection Control Technician.

Records are to include, but not limited to:

1. Reports of inspections, recommendations, re-inspections, and corrective action taken.
2. Correspondence between the Cross Connection Control Technician, Customer, Health agency, or Building Official, etc., concerning corrective action.
3. A master list of all backflow protection devices and assemblies in use or proposed for use in the service area.
4. Vital data on each protective assembly.
5. Test and maintenance reports for each protective device and assembly.
6. A file system to call to the attention of the Cross Connection Control Technician when testing is due or when re-inspections of premises are needed.

The Cross Connection Control Technician shall utilize a computerized system, if possible, to tabulate all records. Cross referencing of the cross connection control records with the existing utility billing system may be helpful. As applicable, the Cross Connection Control Technician shall encourage meter readers to perform a cursory inspection of backflow prevention assemblies during their rounds and record their findings accordingly.

8.05 Testers

To ensure continued satisfactory operation of a backflow prevention assembly, testing shall be performed by individuals who are certified and understand the design and intended operation of the assembly (reference Section 6 for definition and explanation of a Backflow Prevention Assembly Tester – Certified). A program to train individuals in the testing of backflow preventers is available regionally and nationally. The Cross Connection Control Technician will have the necessary information on how to register and participate in these programs. Only certified assembly testers will be accepted by the Cross Connection Control for fulfillment of customer user obligations regarding the testing of their backflow prevention assembly. It will be necessary for a certified tester to make spot checks on assemblies in the system as well as to perform tests on all of the backflow prevention assemblies owned by the service City owned facilities.

8.06 Maintenance

Maintenance of backflow prevention assemblies installed on potable or reclaimed systems serving single family, multi-family, or commercial developments shall be the responsibility of the property owner. Maintenance of backflow prevention assemblies installed on reclaimed irrigation systems serving single family dwelling units shall be the responsibility of the property owner. (Refer to Section 11.08). Maintenance of backflow prevention assemblies and devices, which are exposed and located above ground surface, shall include the protection of such assemblies and devices from the effects of freezing temperatures.

Backflow prevention assemblies and devices shall be maintained in accordance with the recommendations of the assembly or device manufacturer. The painted exterior surfaces of backflow prevention assemblies, including valves and piping, shall be maintained in good condition without evidence of chipping, peeling and other deformations of the coating. The color and coating system shall be in accordance with the requirements found in the following table:

TABLE 8.06.01

BACKFLOW PREVENTER MAINTENANCE TABLE

	<i>FIRE</i>	<i>SYSTEMS POTABLE</i>	<i>RECLAIMED</i>
1. SHALL BE PAINTED RED.	X		
2. SHALL BE PAINTED TO MATCH THE SURROUNDING ENVIRONMENT.		X	X
3. IDENTIFICATION TAGS SHALL NOT BE PAINTED.	X	X	X
4. TEST COCKS SHALL NOT BE PAINTED AND PLUGS SHALL BE INSTALLED.	X	X	X
5. SHUT OFF VALVE STEMS SHALL BE LUBRICATED AND EXERCISED ONE TIME A YEAR.	X	X	X
6. IDENTIFICATION TAG SHALL BE ATTACHED AS TO POTABLE OR NON POTABLE	X	X	X

SECTION 9 RESULTS OF NON COMPLIANCE

9.01 Discontinued Service

1. A consumer's health hazard surveillance report listing all cross connections found during inspection will be sent to the owner or authorized agent of the owner of the building or premises, stating that corrections should be made and setting a time for compliance.
2. The Public Works Director shall cause discontinuance of water service if a reduced pressure principle backflow prevention assembly has been by passed by the City of Umatilla and/or policy statements contained in this manual. Upon discontinuance of service, the City Attorney's Office and the Office of the Utility Services Department shall be notified.
3. The Public Works Director shall cause discontinuance of water service if an air-gap separation system is compromised or if, in the opinion of the Public Works Director, a hazardous condition cannot be immediately corrected.
4. Upon discontinuance of water service for non compliance with provisions of this manual, water service to such property shall not be restored until the service has been brought into full compliance, and a written order to reconnect has been issued by the Public Works Director.

9.02 Violation Liability

1. Any person or customer found guilty of violating any of the provisions of this Manual or any written order of the City of Umatilla pursuant thereto, shall be punishable in accordance with Section 82-102 of the Code of Ordinances. In addition, such person or customer shall pay all costs and expenses involved in the case, including attorney's fees.
2. Notice of such violation shall be given by delivery of same to the premises and a copy thereof mailed to the billing address as it appears on the City's billing records.
3. Each day upon which a violation shall occur shall be deemed a separate and additional violation.
4. Any person or customer in violation of any provisions of this manual shall also be liable to the City for any expense, loss of damage incurred by the City by reason of such violation to include attorney's fees.
5. In addition to any penalty provided by law, the City may bring suit in the appropriate court to enjoin, restrain or otherwise prevent the violations of any of the provisions of this Chapter.
6. The Special Master shall have concurrent jurisdiction to hear and decide violations of this manual and to impose appropriate finds. The jurisdiction of the Special Master shall not be exclusive. Judicial remedy may be pursued at the option of the City.

SECTION 10

FIRE SYSTEMS

10.01 Classes of Fire Systems and Recommended Protection for Each

Fire systems shall be divided into the following six (6) classes for the purpose of review. These classes and *RECOMMENDATIONS* are as adopted in the AWWA No. M14 “Recommended Practice for Backflow Prevention and Cross Connection Control” (Second Edition) and as endorsed by the National Automatic Sprinkler and Fire Control Association.

Class 1 – Direct connections from public water mains only; no pumps, tanks, or reservoirs; no physical connection from other water supplies; no anti-freeze or other additives of any kind; all sprinkler drains discharging to atmosphere, dry wells, or other safe outlets.

Recommended Protection for:

Class 1 - Class 1 Fire protection systems generally and ordinarily do not require an approved backflow prevention assembly at the fire system user connection in order to protect the public water system. Therefore, the installation of and a single check and an alarm check, per City Fire Codes is acceptable. However, it is recognized that special conditions may exist on the site of Class 1 fire sprinkler systems such that actual or potential contamination hazards are presented to the domestic or public potable water supply. Under these special conditions, an approved backflow prevention assembly at the user connection for the fire sprinkler system is warranted. Some examples of special conditions include:

1. Underground fire sprinkler pipelines parallel to and within 10 ft. (3m) horizontally of sewer pipelines or other pipelines carrying significant toxic materials.
2. When water is supplied to a site or an area from two or more services of a water utility or from two different water utilities, flow problems should be evaluated.
3. Occupancies (or changes in occupancies) that involve the use, storage, or handling of types and quantities of material in a manner that could present a significant health hazard to the domestic supply.
4. Premises with unusually complex piping systems (usually these premises will have an approved backflow prevention assembly on their domestic service piping).
5. Systems with pumper connections in which corrosion inhibitors or other chemicals are added to tanks of fire trucks, or where the water purveyor cannot be assured of the potability of the input to the pumper connection.

Class 2 - Same as Class 1, except that booster pumps may be installed in the connections from the street mains. (Booster pumps do not affect the potability of the system; it is necessary, however, to avoid drafting so much water that pressure in the water main is reduced below 20 psi.)

Recommended Protection for Class 2: Same as Class 1.

Class 3 – Direct connection from public water supply mains, plus one or more of the following: elevated storage tanks; fire pumps taking suction from above ground covered reservoirs, or tanks; and pressure tanks. (all storage facilities are filled or connected to public water only, the water in the tanks to be maintained in a potable condition. Otherwise, Class 3 systems are the same as Class 1).

Recommended Protection for Class 3: Class 3 systems will generally require minimum protection (approved double check valve assembly) to prevent stagnant waters from backflowing into the public potable water system.

Class 4 – Directly supplied from public mains, similar to Class 1 and Class 2, with an auxiliary water supply dedicated to Fire Department use and available to the premises, such as an auxiliary supply located within 1700 ft. of the pumper connection.

Recommended Protection for Class 4: Class 4 systems will normally require backflow protection at the service connection. The type (air-gap), reduced pressure principle backflow prevention assembly, or double check valve assembly) will generally depend on the quality of the auxiliary supply.

Class 4 systems normally would need maximum protection (air-gap or reduced pressure principle backflow prevention assembly) to protect the public potable water system.

Class 5 – Directly supplied from public mains and interconnected with auxiliary supplies, such as pumps taking suction from reservoirs exposed to contamination, or rivers and ponds, driven wells, mills or other industrial water systems; or where anti-freeze or other additives are used.

Recommended Protection for Class 5: Same as Class 4.

Class 6 – Combined industrial and fire protection systems supplied from the public water mains only, with or without gravity storage or pump suction tanks.

Recommended Protection for Class 6: Class 6 system protection would depend on the requirements of both industry and fire protection and could only be determined by a survey of the premises.

A meter (compound or detector check) should not normally be permitted as part of a backflow prevention assembly. However, an exception may be made if the meter and backflow prevention assembly are specifically designed for that purpose.

At any time where the fire sprinkler system piping is not an acceptable potable water system material, there shall be a backflow prevention assembly isolating the fire sprinkler system from the potable water system. There are also chemicals, such as liquid foam concentrates used for fighting certain types of fires that are toxic and therefore, require maximum protection.

NOTE: Where backflow protection is required on an industrial domestic service that is located on the same premises, backflow protection should be provided on the fire system and fire systems in Classes 3, 4, 5, and 6 should have adequate protection for the highest degree of hazard affecting either system.

10.02 Low Pressure Cut-Offs

All sprinkler system fire pumps drawing suction from City water mains shall be equipped with low pressure cut-off devices or other means to prevent the reduction of City main pressure below given 20 psi pressure as established by the Public Works Director or his designee. The fire system designer shall be required to furnish to the Public Works Director or his designee calculations used to determine the pressure setting of the low pressure cut-off switch.

10.03 Special considerations for the installation of backflow prevention assemblies on fire systems.

Mechanical backflow prevention assemblies need pressure loss to function properly. Before installing an assembly on a fire system, new or existing, this pressure loss should be factored into the system design to ascertain what effect it will have on system performance. Current assembly standards for sized 4" through 10" permit pressure loss up to 14 psi for RPBA's and 10 psi for DCVA's (and DDCV's). Specific pressure loss information is readily available from all assembly manufactures.

Manufacturer's installation instructions must be followed to ensure proper operation and to protect the equipment's warranty. General installation guidelines are as follows:

1. The assembly should be installed in a horizontal position and have at least 12" between the bottom of the assembly and final grade or floor.
2. Lateral clearance around the assembly must be provided to facilitate testing, maintenance and replacement.
3. Two assemblies should be installed in parallel for facility that must have uninterrupted flow during assembly testing or repair (e.g., hospitals).
4. Though not recommended, assemblies may be installed in pits that are well drained; no part of an assembly should ever be under water.
5. If an assembly is installed inside a building, a floor drain is helpful to eliminate spillage caused by testing or flushing.
6. Since the relief valve on a FPBA will periodically drip or spit and may dump, the relief vent may be fitted with a drain line if spillage is objectionable or hazardous (e.g., electrical hazards). The end of the drain line must terminate 12" above ground or flood level and be clearly visible and accessible.
7. The assembly should be protected against freezing.
8. Shut-off valves should be of the OS and Y type, strainers should not be used.
9. The assembled piping should be thoroughly flushed before installing the assembly.
10. The assembly should be adequately supported.
11. Water meters shall not be placed on dedicated fire protection lines.

SECTION 11

RECLAIMED WATER SYSTEMS

11.01 Introduction

The City of Umatilla's reclaimed water system is regulated by the FDEP under Chapter 62-610 of the Florida Administrative Code (FAC) Chapter 62-610 FAC prohibits cross connections between reclaimed water and potable water.

FDEP's policy is to encourage each public water system to make its own determination, consistent with American Water Works Manual 14 (AWWA M14), about the health risks related to actual or potential cross connections with reclaimed water.

As defined in Section 6.0 of this manual, a cross connection is:

Any unprotected connection between any part of a water system used or intended to supply water for drinking purposes and any source or system containing water or substances that is contaminated or cannot be approved as safe, wholesome and potable for human consumption.

Backflow (the undesirable reversal of the flow), for the purposes of this section, shall mean the flow of reclaimed water into the potable water system. Backflow cannot occur unless a cross connection exists. Therefore, the preferred method for protection of the potable water system from potential hazards is to have an effective cross connection control program. Such a program is described herein and includes judicious inspection, testing, enforcement and education. This section shall address backflow prevention for those premises that, without the presence of reclaimed water, would not be required by this manual to have backflow prevention assemblies or devices installed on any part of the premises' potable water supply.

It is recognized that while cross connections are prohibited by this manual, illicit cross connections may not be detected even with the inspection, testing and enforcement measures contained herein. Backflow prevention in accordance with this manual will be practiced on premises that are served by the reclaimed water system. The backflow prevention requirements contained herein were determined based on a hazard analysis conducted in accordance with FDEP policy.

11.02 Cross Connection Prevention

The prevention of cross connections is the most important ingredient of an effective cross connection control program. The preferred way to protect the potable water system from potential hazards such as reclaimed water is to prevent the cross connection from being made. The Utility Services Department prevents cross connections with the reclaimed water system in the following ways:

1. Consumer Education: Instructional/educational materials are provided to the customer-users of reclaimed water that advise them of the proper and improper uses of reclaimed water and that no cross connections shall be authorized between the reclaimed water and the potable water systems. Customer-users receive these materials at the time of application for reclaimed water service and when the service is activated.
2. Identification: In accordance with Chapter 62-610 FAC, reclaimed water facilities are colored coded and or marked to differentiate them from potable water facilities.
3. Inspection: Plan checks and inspections of new construction will be done by the Building Official in accordance with Section 5.0 of this Manual.

11.03 Cross Connection Detection and Removal

If a cross connection has been made illegally between the reclaimed and potable water systems, then it is the City's intention to find the cross connection and disconnect it. The cross connection detection and removal program consists of the following measures:

1. Inspections: In accordance with Section 5.0 of this manual, inspections of premises that receive reclaimed water will be conducted. The frequency of these inspections will be determined by the Cross Connection Control Technician.
2. Testing: A testing procedure will be followed that involves a curtailment of reclaimed water use and a sequential isolation of the reclaimed water system. Following isolation, the pressure within each test section will be reduced. A cross connection will be suspected, if the test section shows a recovery in pressure following isolation. A test section showing a suspected cross connection will be further subdivided into test sections in order to identify the location of the cross connection.
3. Removal: The Cross Connection Control Technician will remove a cross connection in accordance with Section 5.03 of this manual.

11.04 Hazard Analysis

The purpose of the hazard analysis is to identify the backflow prevention assemblies or devices required for premises based on the risk factors associated with the producer and user of reclaimed water. Reclaimed water producers must conform to certain quality control standards and operational requirements in accordance with Chapter 62-610 FAC to minimize the risk of providing substandard reclaimed water.

The ability of a wastewater treatment facility to consistently produce reclaimed water of acceptable water quality is often influenced by the quality of the raw wastewater. Generally, the risk of producing substandard reclaimed water increases with the increasing variability of raw

waste water quality. Being primarily a residential community, the City's raw wastewater is relatively consistent in quality.

The risk of health hazards caused by a cross connection with reclaimed water is further mitigated by the following:

1. The Utility Services Department administers both the potable and reclaimed water systems providing a single source of responsibility.
2. The Utility Services Department has implemented a Comprehensive Cross Connection Control Program through this Manual.

The risk of health hazards due to a cross connection with reclaimed water at the premises of the user is influenced by the following:

1. The Utility Services Department administers both the potable and reclaimed water systems providing a single source of responsibility.
2. The Utility Services Department has implemented a Comprehensive Cross Connection Control Program through this manual.

The risk of health hazards due to a cross connection with reclaimed water at the premises of the user is influenced by the following:

1. The risk is considered lower where the premises are professionally managed. The risk is considered higher where the premise lacks professional management or where property owners may be inclined to conduct amateur plumbing work such as single family residences.
2. Greater risk is assigned to properties that have reclaimed water facilities within a building.
3. Risk increases with the complexity of the uses of water facilities are less visible for inspection and therefore the ability to detect cross connections is limited.
4. Greater risk is assigned to premises where the reclaimed water facilities are less visible for inspection and therefore the ability to detect cross connections is limited.
5. The risk is considered higher where additives such as fertilizers are injected into the reclaimed water.

11.05 Testing

The Utility Services Department will follow the testing procedures listed below for the backflow prevention devices (dual check valves) installed on the potable water services of single family homes.

1. The Utility Service Department will inspect dual check valves before installation. Experience has shown that this procedure substantially mitigates the failure rate of these devices following installation.
2. The Utility Services Department will replace dual check valves no later than five years after installation or when more than five (5) percent of the installed devices have exhibited failure, whichever occurs sooner. Failure rates will be determined

through the residential inspection program administered by the Cross Connection Control Technician.

For all other backflow prevention assemblies or devices, inspection and testing will be conducted in accordance with the applicable sections of this manual.

11.06 Use of Reclaimed Water

The use of reclaimed water is regulated by Chapter 62-610 FAC.

These regulations allow reclaimed water to be used for the following purposes:

1. Irrigation of certain edible crops.
2. Toilets flushed in commercial or industrial facilities or buildings and in motels, hotels, apartment buildings or condominiums where the guest or resident does not have access to the plumbing system for repairs or modifications.
3. Fire Protection, either through street hydrants or sprinkler systems. Reclaimed water may be used for fire protection by means of sprinkler systems only if the guest or residents do not have access to the plumbing system for repairs or modifications and the plumbing system is professionally managed. Sprinkler systems connected to the reclaimed water system shall not also be connected to the potable water system.
4. Control of dust at construction sites.
5. Aesthetic purposes such as decorative fountains, ponds and lagoons.
6. Other uses as specifically approved by the FDEP.

11.07 Prohibited Uses of Reclaimed Water

The regulations in Chapter 62-610 FAC specifically prohibit the use of reclaimed water for filling swimming pools, hot tubs, wading pools. In addition, reclaimed water lines are specifically prohibited from entering a dwelling unit or a building which contains a dwelling unit except for a specifically approved use.

Cross connections between reclaimed water lines and potable water lines are prohibited. Therefore, backflow prevention assemblies or devices will be required on potable water lines when reclaimed water is delivered to a property served by the City's potable water system.

The following defines backflow prevention assembly and device requirements on the reclaimed system. Other sections of the "Manual of Cross Connection Control" should be referred to for specific information regarding backflow prevention assembly or device installation and testing.

11.08 Single Family Dwelling Units (Class A)

Backflow prevention assemblies or devices will not be required on a single family reclaimed water service with either a hose bib connection or an irrigation system which is connected to the reclaimed system. However, the City does require that a backflow prevention assembly (RPBA) be installed on a reclaimed water service connection when a chemical injection system or other special hazard is proposed or detected. The homeowner will be required to maintain the assembly in these situations.

Where a backflow prevention assembly or device has been installed on an irrigation service connection to the potable water system, that assembly or device may be eliminated by City Personnel (or City Contractor), when the reclaimed system replaces the potable service connection. However, the assembly or device must be transferred to the reclaimed water service connection if the irrigation system includes injection of fertilizer or other chemicals or hazard. The degree of hazard of the existing irrigation system will be a determining factor in deciding whether the existing assembly or device may be transferred or whether a different type of backflow prevention assembly or device must be provided. The homeowner will be required to maintain the assembly or device in these situations. If the assembly or device is eliminated it remains the property of the homeowner.

For those irrigation systems that are connected to groundwater wells, the well must be appropriately abandoned prior to receiving reclaimed water. If the homeowner demonstrates a justified need to maintain the groundwater well, then the Cross Connection Control Technician may permit the well to stay in service, provided the well is isolated by an air-gap or an approved RPBA. The homeowner will be required to furnish, install, and maintain the assembly in these cases.

11.09 Multi Family Developments (Class AM)

Backflow prevention assemblies or devices will not be required on a reclaimed water service connection to an irrigation system except where a chemical injection system or other special hazard is proposed or detected. In such a situation, a backflow prevention assembly (RPBA) must be installed on the reclaimed water system connection to the irrigation system.

Where a backflow prevention assembly or device has been installed on an irrigation system connected to the potable water system, that assembly or device may be eliminated by City Personnel (or City Contractor) when the reclaimed water system replaces the potable service connection. However, the assembly or device must be transferred to the reclaimed water service connection if the irrigation system includes injection of fertilizer or other existing irrigation system will be a determining factor in deciding whether the existing assembly or device may be transferred or whether a different type of backflow prevention assembly or device must be provided. If the assembly is eliminated it remains the property of the facility owner.

Reclaimed water may be used in multi-family developments for flushing of toilets and for fire protection by means of sprinkler systems only if the guest or residents do not have access to the plumbing system for repairs or modifications and the plumbing system is professionally managed. Sprinkler systems connected to the reclaimed water system shall not also be connected to the potable water system.

Reclaimed water may also be supplied to hydrants in multi-family developments for fire protection. Backflow prevention assemblies or devices shall not be installed on any reclaimed water lines which supply hydrants in multi-family developments.

The property owner of multi family units is responsible for maintaining all backflow prevention assemblies or devices on the reclaimed system.

11.10 Public, Commercial Office, Industrial/Warehouse (Class B)

Backflow prevention assemblies or devices will not be required on a reclaimed water service connection to an irrigation system unless a chemical injection system or other special hazard is proposed or detected. In such a situation, a backflow prevention assembly (RPBA) must be installed on the reclaimed water system connection to the irrigation system.

Where a backflow prevention assembly or device has been installed on an irrigation system connected to the potable water system, that assembly may be eliminated by City Personnel (or City Contractor) , when the reclaimed water system replaces the potable service connection. However, the assembly or device must be transferred to the reclaimed water service connection if the irrigation system includes injection of fertilizer or other chemicals or hazard. The degree of hazard associated with the existing irrigation system will be the determining factor in deciding whether a different type of backflow prevention assembly or device must be provided. If the assembly or device is eliminated it remains the property of the facility owner.

Reclaimed water may be used in public, commercial, office, or industrial/warehouse developments for flushing of toilets and for fire protection by means of sprinkler systems only if the guests or residents do not have access to the plumbing system for repairs or modifications and the plumbing system is professionally managed. Sprinkler systems connected to the reclaimed water system shall not also be connected to the potable water system.

Reclaimed water may also be supplied to hydrants in public, office, commercial or industrial/warehouse developments for fire protection. Backflow prevention assemblies or devices shall not be installed on any reclaimed water lines which supply hydrants in public, office, commercial or industrial/warehouse developments.

The property owner is responsible for maintaining all backflow prevention assemblies or devices installed on the reclaimed system.

11.11 Other Uses (Class O)

The “Other Uses” class includes all uses of reclaimed water other than those discussed above.

1. Irrigation of landscape areas with tank trucks shall be permitted only if:
 - a) The truck used to transport and distribute the reclaimed water is not used to transport potable water that is used for drinking water.
 - b) The truck used to transport and distribute the reclaimed water is not used to transport waters or other fluids that do not meet the requirements of Part II of Rule 62-610 FAC unless the tank truck is first drained and then cleaned prior to the addition of the reclaimed water.
2. Conversion of an agricultural irrigation system from the potable water system to the reclaimed water system shall require the installation of backflow prevention assembly on the potable water service(s) to the premises and could

potentially require the installation of a backflow prevention assembly on the reclaimed water service. The City will evaluate the hazards and determine the type and location of required backflow prevention assemblies.

11.12 Installation Requirements

The following rules shall be followed in the installation of all reclaimed water systems.

1. All reclaimed water lines shall be installed so that a minimum horizontal separation of five feet (center to center) or three feet (outside to outside) is maintained between the reclaimed water line and potable water or sewage collection lines.
2. The minimum vertical separation required between reclaimed water lines and potable water or sewage collection lines is 18 inches (invert to crown). If such separation is not achievable, the reclaimed water line may be encased in concrete so that the distance between any two (2) joints is at least 1 (one) feet.
3. Above ground hose bibs shall not be connected to the reclaimed water system. All standard hose bibs (spigots or other hand operated connections) connected to the reclaimed water system shall be located in approved, lockable, below grade valve boxes which are clearly labeled as being of non-potable quality. An alternative to the requirement for lockable valve boxes is the use of hose bibs which can only be operated with a special tool. These alternative hose bibs must also be located in an approved marked below grade valve box except that the valve box need not be lockable.
4. All reclaimed water valves and outlets shall be appropriately tagged or labeled to warn the public and employees that the water is not intended for drinking.
5. All reclaimed water piping, pipelines, valves and other outlets shall be color coded, or otherwise marked, to differentiate reclaimed water from potable or other water. All such coding or marking shall comply with appropriate City requirements.
6. Reclaimed water may not be used for irrigation on any property that is within 75 feet of potable water well.
7. Hydrants supplied with reclaimed water shall be color coded to differentiate them from hydrants supplied by the potable water system. In addition, such hydrants shall have tamper proof hold down nuts and shall be capable of being operated only with a special wrench.

11.13 Surface Water Supplies to Supplement Reclaimed Water

Surface waters shall not be used to supplement reclaimed water, unless approval from such a supplemental supply is obtained from the Utility Services Department. The surface water supply must be isolated by an air-gap or an approved RPBA. In addition, the reclaimed water service shall have an approved RPBA. The customer shall be required to furnish, install and maintain the assemblies in these cases.

Table 11.04.01

SUMMARY OF BACKFLOW PREVENTION REQUIREMENTS

Use of Property	Isolation With DLC	Premises Isolation With DCVA	Premises Isolation With RPBA	Building Isolation With DCVA	Building Isolation With RPBA
Residential	X				
Multi Family					
a. Properties will have Professional Management		X(1)	(2)	X(1)	(2)
b. Properties will lack Professional Management			X		
c. Reclaimed water will be used inside buildings			X		
d. Reclaimed facilities will be difficult to inspect			X		
e. Additives will be injected into the reclaimed water			X		
Public, Commercial, Office, Industrial, Warehouse					
a) Properties will have Professional Management		X(1)	(2)	X(1)	(2)
b) Properties will lack Professional Management			X		
c) Reclaimed water will be used inside buildings			X		
d) Reclaimed facilities will be difficult to inspect			X		
e) Additives will be injected into the reclaimed water			X		

- 1) **The Cross Connection Control Technician has the option of requiring professionally managed properties to have either building or premises isolation depending on an elevation of potential hazards. However, should conditions c, d, or e also apply to the property, then those conditions shall take precedence.**

In accordance with Section 7.0 the Cross Connection Control Technician may require the use of RPBA based on an evaluation of potential hazards.