



PESTICIDE MANAGEMENT DIVISION
OLYMPIA OFFICE: PO BOX 42560, OLYMPIA, WA 98504-2560, Phone: (360) 902-2047

Rules Relating to Fertigation Effective November 9, 2001

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PART 1 GENERAL PROVISIONS

WAC 16-202-2001 What is the purpose of this chapter? The purpose of this chapter is to establish performance standards for fertigation that are protective of existing and future uses of surface water and ground water quality. (WSR 01-113-063, Effective November 9, 2001)

WAC 16-202-2002 How are specific terms and phrases defined in this chapter?

Terms as defined in this section are applied throughout this chapter.

(1) "Air gap" means an unobstructed physical separation between the free-flowing discharge end of a supply pipe and the overflow rim of an open or nonpressurized receiving vessel. The separation must be at least four times the diameter of the supply pipe measured vertically from the overflow rim of the receiving vessel, and in no case be less than 25 mm, or one inch.

(2) "Alternative technology" means any device or concept that meets the performance standards contained in this chapter.

(3) "Antipollution safety device" means any equipment or device effectively designed, constructed, and maintained that is used in the event of malfunction or shutdown to prevent backflow of a chemical or treated water into the water supply, or to reduce human exposure or hazard to the environment. Equipment or devices may include, but are not limited to, the irrigation line check valve, vacuum relief valve, low-pressure drain, inspection port, metering device, chemical injection closure device, and system interlock.

(4) "Application depth" means the amount of irrigation water applied to a given unit area during an irrigation set, and is usually expressed in inches or gallons.

(5) "Application season" means the period during which product is injected into an irrigation system for crop protection, plant growth, or soil preparation.

(6) "Application tank" means a product container and appurtenances used for the storage of product that is dedicated for use with and functionally connected to an irrigation system.

(7) "Applicator" or "operator" means any individual who has assumed responsibility or is considered principally responsible to ensure that the fertigation system functions properly and conforms with the provisions of this chapter.

(8) "Approved backflow prevention assembly" means a reduced pressure backflow assembly, reduced pressure detector assembly, double check valve detector assembly, or double check valve assembly of a make, model, and size that is approved by the department of health pursuant to WAC 246-290-490.

(9) "Approved reduced pressure backflow assembly" or "reduced pressure detector assembly" means backflow prevention assemblies of make, model, and size approved by the department of health pursuant to WAC 246-290-490.

(10) "Aquaculture" means the cultivation of water-based plants or animals.

(11) "Backflow" means the reversal of fluid flow due to backpressure or backsiphonage.

(12) "Backflow prevention device" or "backflow safety device" means antipollution safety devices that prevent the flow of water from the irrigation water distribution system back to the water source or to the product source.

(13) "Barometric loop" or "gooseneck" means a raised section of pipe where the bottom of the loop is at least two feet above the highest water emitting device or any portion of the irrigation application system which has a vacuum relief valve installed on the top of the loop.

(14) "Check valve" means a certified device designed and constructed to provide automatic, quick-acting, and absolute closure that creates and maintains a watertight seal. The device prevents flow in the opposite direction of that desired when operation of the irrigation system or chemical injection unit fails or is shut down.

(15) "Chemical" or "product" means a commercial fertilizer, soil amendment, system maintenance compound, or other materials such as reclaimed water or animal effluent.

(16) "Commercial fertilizer" means a substance containing one or more recognized plant nutrients and which is used for its plant nutrient content and/or which is designated for use or claimed to have value in promoting plant growth, and shall include limes, gypsum, and manipulated animal and vegetable manures. It shall not include unmanipulated animal and vegetable manures and other products exempted by the department by rule.

- (17) "Contact name" means a person or company responsible for placement and operation of an application tank.
- (18) "Decommissioned" means rendering an application tank unusable for product containment.
- (19) "Deep percolation" means the movement of water downward through the soil profile below a plant's effective rooting zone.
- (20) "Department" means the Washington state department of agriculture.
- (21) "End gun" means an intermittent, high volume water-emitting device located at or near the end of an irrigation application system.
- (22) "Environment" means any plant, animal, natural resource, surface water (including underlying sediments), ground water, drinking water supply, land surface or subsurface strata, or ambient air within the state of Washington or under the jurisdiction of the state of Washington.
- (23) "Fertigation" means the application of any commercial fertilizer, nutrient, soil amendment, or reclaimed water with irrigation water intended for plant or soil biota growth and development or for soil conditioning or reclamation.
- (24) "Fertigation operation" means all activities and equipment associated in preparing for, performing, and concluding a fertigation application, which includes, but is not limited to, calibrating, mixing, loading, starting up, operating, monitoring or shutting down a fertigation system.
- (25) "Fertigation system" means the chemical injection system as well as the irrigation water distribution system.
- (26) "Homemade" means devices not otherwise commercially available for sale or not manufactured for the purpose of commercial sale.
- (27) "Hydroponic" means the practice of growing plants in an aqueous solution, moist inert material, or otherwise in the absence of a mineral-based medium.
- (28) "Imminent danger" means a threat to human health or the environment that is likely to happen during the current application.
- (29) "Injection system" means all components used to supply, deliver, meter, and inject a substance into an irrigation system. This includes devices and components located between and inclusive of the application tank and the point of product discharge into the irrigation water, including components of the system interlock.
- (30) "Inspection port" means an orifice or other viewing device from which the low pressure drain and irrigation line check valve may be assessed for proper operation.
- (31) "Irrigation application system" means the physical components of an irrigation system that begins at the first water emitting device and ends with the last water emitting or purging device.
- (32) "Irrigation season" means that period of time during which supplemental water is applied to aid in plant development, soil conditioning, temperature modification, or other such purposes.
- (33) "Irrigation system" means all components used in diverting, supplying, distributing, and applying irrigation water.
- (34) "Irrigation water distribution system" means all components inclusive of the irrigation water supply system and the irrigation application system.
- (35) "Irrigation water supply system" means the water conveyance system, which begins at the point of diversion from the irrigation water source and ends with the first water emitting device.
- (36) "Metering device" means a positive displacement injection pump, venturi device, or gravity feed device capable of being calibrated and used to gauge chemical placement into the irrigation water distribution system.

(37) "Nonpressurized water delivery system" means a method of irrigation in which water is distributed over the soil surface by gravity flow, such as rill, border, gated pipe, or spigotted pipe.

(38) "Off-site application" means the application or movement of product from the target site.

(39) "Operator" means the individual who is performing a fertigation operation.

(40) "Outtake" means an opening that provides a source of untreated water.

(41) "Reclaimed water" means process water discharge from food processors and from wastewater treatment facilities, which is applied to land or plants with the intention of recovering water and nutrients.

(42) "Rinsate" means the liquid produced from the rinsing of any equipment or container that has come in direct contact with any fertilizer or soil amendment.

(43) "Runoff" means surface water leaving the target site.

(44) "Sensitive area(s)" means schools, parks, dwellings, occupied buildings or structures, public roadways, waters of the state, or other areas in which off-target movement may endanger humans, animals, crops, or the environment.

(45) "Soil amendment" means any organic or inorganic substance, other than a commercial fertilizer as defined in WAC 16-200-695, that is intended to improve the physical characteristics of the soil or to make the growth medium more suitable for the establishment, growth, and production of plants.

(46) "Source water" or "water source" means an aquifer or surface water body, including a stream, stream system, lake, reservoir, or off-farm irrigation water ditch or conveyance system, and any spring water or underground water that is part of or tributary to the surface water body or aquifer.

(47) "System interlock" means the arrangement or interconnection of the irrigation pump or a pressure or flow sensing device with the chemical injection unit or other pumps in such a manner that shutdown of the fertigation injection system will occur in the event of any component malfunction or failure that substantially impacts the application rate.

(48) "Vacuum relief valve" means a device that automatically relieves or breaks a vacuum, thereby preventing backsiphoning.

(49) "Washwater" means the liquid produced from the rinsing of the exterior of any equipment or containers that have or may have come in direct contact with any fertilizer or soil amendment.

(50) "Waters of the state" means, but is not limited to, lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, irrigation canals, and reservoirs.
(WSR 01-23-018, Effective November 9, 2001)

WAC 16-202-2003 What are the general requirements in performing a fertigation operation? The applicator and fertigation system must comply with the following performance requirements to protect human health, source water, and the environment. The fertigation operator is responsible for safe application and for the proper operation of the fertigation equipment.

(1) A fertigation system must be designed, constructed, installed, operated, and maintained in accordance with the provisions of this chapter.

(2) Substituted alternative technology not otherwise identified in this chapter must be evaluated by the department to determine if the provisions of this chapter have been fulfilled.

(3) All commercial fertilizers used for fertigation must meet Washington state fertilizer standards. This does not prohibit fertigation systems from being used to apply other products such as reclaimed water, animal effluent, or similar substances provided that the appropriate antipollution devices are present and the provisions of this law are met.

(4) During a fertigation application, an irrigation system and injection system are considered one unit, and the applicator is responsible for their proper operation.

(5) All applicable fertilizer laws, in addition to those contained in this chapter, pertain to fertigation.

(6) A fertigation system cannot draw water from any water supply unless that supply is protected from contamination. The fertigation operator must verify that backflow cannot occur.

(7) The application must be continuously monitored whenever sensitive areas are at risk of being exposed to drift, runoff, or overspray.

(8) All fertigation systems and system components must allow for adequate visual, physical, and manual inspection.

(9) A fertigation system must be flushed out and rinsed off after an application.

(10) All components must be chemically compatible with injected materials, water containing injected materials, and system pressure.

(11) Equipment must be calibrated and maintained in a manner to prevent misapplication or off-site application of any product.

(12) Safety devices and injection equipment must be installed, operated, and maintained in accordance with the manufacturer's specifications, established industry standards, and department rule. (WSR 01-23-018, Effective November 9, 2001)

PART 2 GENERAL REQUIREMENTS FOR FERTIGATION OPERATIONS

WAC 16-202-2004 What are the identification requirements for application tanks?

The purpose of identification requirements is to minimize the potential for human exposure and to facilitate remediation in the event of component malfunction or a contamination event.

(1) An application tank must:

(a) List tank contents, using the industry-accepted identifier for the principal product(s);

(b) Display its maximum net capacity;

(c) Display a contact name and telephone number; and

(d) Display an owner-derived numeric or alphanumeric tank identifier.

(2) This information must be visibly recorded and securely affixed to each application tank. The distinguishing information shall be designed to remain intact and legible throughout the active use of the container.

(3) Lettering that displays the contact name, telephone number, and tank identifier shall be a minimum of two inches in height and in a color contrasting to the background. (WSR 01-23-018, Effective November 9, 2001)

WAC 16-202-2005 What are the placement requirements for application tanks?

Application tanks cannot be located in an area or placed in such a manner to contaminate water or to endanger human health, sensitive areas, or the environment.

(1) Application tanks should be positioned downgradient from wellheads, public waterways, off-farm irrigation supply ditches or conveyance systems, or sensitive areas.

(a) If downgradient placement is not feasible, earthen berms or other structures of sufficient design must be constructed to divert spillage, leakage, or surface flow away from such areas.

(b) An application tank cannot be placed closer than twenty feet from wellheads, public waterways, off-farm irrigation supply ditches or conveyance systems, or sensitive areas.

(c) Mixing or loading activities cannot occur within twenty feet of a sensitive area, wellhead, public waterway, off-farm irrigation supply ditch or conveyance system, and irrigation water source.

(d) Alternative technology that provides substantially equal protection such as a secondary containment facility that complies with the structural design requirements in the secondary and operational area containment rules (chapter 16-201 WAC) will fulfill the requirements in paragraphs (a), (b), and (c) of this subsection.

(e) Overflow from an irrigation pond contaminated with product cannot enter a public waterway, off-farm irrigation supply ditch or conveyance system, or sensitive area.

(2) Application tanks must be positioned to prevent leaks, spills, or structural damage.

(a) Application tanks must be placed on a rigid, sound understructure or on stable ground to prevent tipping, spillage, puncturing, or breakage.

(b) Application tanks and the injection system must be protected against reasonably foreseeable risks of damage by implements, trucks or other moving vehicles, or objects.

(3) Application tanks should be sited as close as reasonably possible to the injection point.

(4) Tank outlet ports must be fitted with manual shutoff valves. (WSR 01-23-018, Effective November 9, 2001)

WAC 16-202-2006 Under what conditions is an application tank exempt from the secondary and operational area containment rules? Application tanks functionally connected to and dedicated solely for use with a fertigation operation may be exempt from the secondary and operational area containment rules (chapter 16-201-WAC). The following conditions determine whether a tank that is a component of a fertigation system is subject to the secondary and operational area containment rules.

(1) Time-in-place.

(a) Product can remain in an application tank for a period not to exceed nine consecutive months during an irrigation or application season. If the nine-month period is exceeded, the tank is deemed a storage facility and is therefore subject to the secondary and operational area containment rules.

(b) An application tank containing product during the nonapplication or nonirrigation season is subject to the secondary and operational area containment rules regardless of tank size.

(c) The application tank must be removed at the end of the irrigation or application season, whichever is shorter, but not to exceed nine months. At the end of this period, the application tank must be emptied, cleaned, visually inspected for integrity, and serviced. The tank must be removed from the site, or the tank must be decommissioned and clearly tagged with the words "out-of-service," or the tank must be managed as a permanent storage facility (chapter 16-201 WAC).

(2) Tank size.

(a) An application tank must have a rated capacity of six thousand five hundred gallons or less.

(b) An application tank with a rated capacity exceeding six thousand five hundred gallons is deemed a permanent storage facility.

(c) Multiple tanks positioned at an injection site with a cumulative capacity exceeding ten thousand gallons are also deemed a permanent fertilizer storage facility.

(d) Cumulative tank capacity cannot exceed ten thousand gallons per application system.

(3) Monitoring.

(a) Tanks containing product must be inspected at least every seven days.

(b) Tanks must be inspected each time a fertigation operation is performed.

(WSR 01-23-018, Effective November 9, 2001)

WAC 16-202-2007 How should rinsate from equipment or backflush water from a filtration device be handled? (1) Water used to rinse, flush, or clean equipment or containers is considered rinsate. It must be applied onto a target site or disposed of properly.

(2) Contaminated backflush water from a filtration device cannot contaminate ground water or surface water, or adversely impact sensitive areas. (WSR 01-13-063, Effective November 9, 2001)

PART 3 SAFETY REQUIREMENTS FOR FERTIGATION SYSTEMS

WAC 16-202-2008 What are the general antipollution safety device requirements for a fertigation system? All systems must have antipollution safety devices that include a backflow prevention system, a metering device, injection device, and system interlock to prevent backflow into the irrigation water source or chemical supply system. (WSR 01-13-063, Effective November 9, 2001)

WAC 16-202-2009 What measures must be used to prevent backflow into the irrigation water source? Backflow prevention is a requirement on all irrigation systems used for fertigation except when alternative technology is applied.

(1) Pressurized irrigation system.

(a) At least one irrigation mainline check valve must be correctly installed, properly operated, and adequately maintained to prevent contamination of the water source. The check valve must be located upstream from the injection point. The check valve must be automatic, quick-closing, and capable of forming and maintaining a watertight seal.

(b) An inspection port or a direct access point must be positioned immediately upstream of the check valve to allow visual and manual inspection of the check valve and the low pressure drain. The inspection port or access point must have a minimum diameter of four inches. If a four-inch inspection port or access point is not feasible, an alternative system must be devised.

(c) An inspection port or access point is not required with an approved backflow prevention assembly.

(d) A vacuum relief valve must be located upstream of the irrigation line check valve, installed at the top of the irrigation pipeline and adequately sized to prevent backsiphoning. The orifice size must comply with current American Society of Agricultural Engineers (ASAE) standards.

(e) An automatic low pressure drain or similar mechanism must be placed upstream of the irrigation line check valve and at the lowest point in the bottom of the pipeline. The low pressure drain must be of adequate size and properly positioned to intercept and purge leakage away from the water source.

(f) Product-treated water cannot be discharged through a water outtake.

(2) Nonpressurized water delivery system.

(a) System design must prevent the introduction of treated water into the water source.

(b) Backflow prevention may be achieved with a hydraulic discontinuity in source water flow or by a sufficient hydraulic gradient.

(c) Backflow devices for nonpressurized systems may include a weir box, drop structure, ASAE approved air gap, batch tank, or similar device that can function to prevent backflow into the source water.

(d) Injection must occur downstream from the water diversion point.

(3) Cross-connection to municipal or public water system. Backflow prevention devices must be approved by the Washington state department of health in accordance with WAC 246-290-490. (WSR 01-13-063, Effective November 9, 2001)

WAC 16-202-2010 What alternative methods may be used to prevent backflow into the irrigation water source? The application of alternative technology in achieving backflow prevention must be accomplished either by a backflow system or by system design to fulfill the provisions of this chapter. The operator must be able to demonstrate that backflow cannot occur. Alternative technology must provide substantially equal or greater protection than the provisions of this chapter.

(1) System design. If a system's configuration will provide substantially equal or greater protection due to the physical laws of gravity and water hydraulics, components of a backflow prevention system may be waived by the department.

(2) Barometric pipe loop.

(a) Barometric loops can only be used on systems pumping from a surface water source.

(b) The barometric pipe loop must be located in the main water line immediately downstream of the irrigation water pump.

(c) A barometric pipe loop must be designed with sufficient elevation differential to compensate for backflow.

(d) The bottom of the barometric loop apex must be at least thirty inches above the highest water-emitting device or of any portion of the irrigation application system.

(e) The barometric loop must contain a vacuum relief device at the loop apex that allows air into the pipeline immediately upon loss of pressure. The orifice size must comply with current American Society of Agricultural Engineers (ASAE) standards.

(f) The chemical injection port must be located downstream of and at least thirty inches below the bottom of the pipe loop apex.

(3) The department will recognize alternative backflow devices, providing they are as restrictive as the provisions of this chapter. (WSR 01-13-063, Effective November 9, 2001)

WAC 16-202-2011 What are the prevention requirements for backflow into or seepage from application tanks? All irrigation and injection systems used for fertigation must prevent backflow into the application tank. Leakage or siphonage from the application tank through the injection system into the irrigation system must also be prevented.

(1) Injection into a pressurized section of an irrigation system must include:

(a) An automatic, quick-acting injection line check valve must be used to prevent leakage from the application tank into irrigation water and to prevent irrigation water from entering the chemical injection line. The injection line check valve must maintain, at a minimum, 10 psi opening (cracking) pressure or adequate opening pressure to prevent gravity flow due to hydraulic head pressure from the application tank. The check valve must be located at the point of product injection into the irrigation water; and

(b) Where siphon action induced by an irrigation system could compromise the cracking (opening) pressure of an injection line check valve, a vacuum relief valve must be installed in the irrigation line downstream of the injection point. The orifice size must comply with current American Society of Agricultural Engineers (ASAE) standards.

(2) Injection into nonpressurized (e.g., open surface, gated pipe, or spigotted pipe) portion of irrigation system must include a hydraulic discontinuity in source water flow or a sufficient hydraulic gradient such that chemicals or treated water cannot contaminate the water source. Backflow devices for nonpressurized systems may include a weir box, drop structure, air gap, batch tank, or similar device whose intended function is to prevent backflow into the application tank.

(3) Venturi or other passive injection systems.

(a) If backpressure or backsiphonage can occur, the chemical injection line must contain an automatic, quick-closing check valve. The valve must be located immediately adjacent to the chemical inlet side of the venturi.

(b) If product can potentially siphon or seep into the water supply, the chemical injection line must contain a normally closed solenoid operative valve connected to the system interlock, or a normally closed hydraulically operated valve that opens only when the main water line is adequately pressurized. The valve must be installed adjacent to the product outlet on the application tank.

(c) With a bypass system, as an alternative to (a) and (b) of this subsection, the automatic, quick-closing check valve may be installed in the bypass immediately upstream of the venturi water inlet. In addition, either the normally closed solenoid or the hydraulic solenoid may be installed immediately downstream of the venturi water outlet.

(d) Bypass systems with a booster pump must have the normally closed solenoid interlocked with the source pump for the irrigation system. (WSR 01-13-063, Effective November 9, 2001)

WAC 16-202-2012 What alternative methods may be used to prevent backflow into or seepage from application tanks? Alternative technology used for backflow prevention must be accomplished by system design to fulfill the provisions of this chapter.

(1) In lieu of a normally closed solenoid with the injection system.

(a) A normally open valve must be located in the chemical injection line between the application tank and a positive displacement injection pump. The normally open valve must be spring-loaded, and must close upon a vacuum and open at atmospheric pressure. It must be elevated at least twelve inches above the maximum fluid level in the application tank and must be the highest point in the injection line.

(b) The mechanism described in (a) of this subsection cannot be used in conjunction with a venturi injection system.

(2) In lieu of a 10 psi opening (cracking) pressure check valve.

(a) An automatic, quick-acting, spring-loaded check valve must be attached at or positioned immediately adjacent to the injection point to prevent irrigation water from entering the chemical injection line.

(b) A normally closed solenoid must be installed immediately adjacent to the product outlet on the application tank. If electric, it must be interlocked with the injection pump or, if hydraulic, with the irrigation system.

(c) In place of (b) of this subsection, a normally open valve must be located in the chemical injection line between the application tank and a positive displacement injection pump as described in subsection (1) (a) of this section. This alternative cannot be used with venturi injection systems. (WSR 01-13-063, Effective November 9, 2001)

WAC 16-202-2013 What are the requirements for metering devices? Metering devices must be capable of being accurately calibrated. Metering devices must control the rate of product injection into irrigation water and discontinue product delivery when the predetermined application quantity has been dispensed. All metering systems must be functionally interlocked with the source irrigation pump or irrigation water distribution system.

(1) Injecting product with a pressurized metering pump.

(a) The metering pump must be of a positive displacement design.

(b) Water-powered injection pumps can only be used when no other power source is available to operate the injection unit.

(c) The metering pump must be interlocked to the irrigation system in the event of an irrigation system malfunction or failure.

(2) Injection into nonpressurized section of an irrigation system.

(a) Application rate may be accomplished with an adjustable valve, flow control device, or other metering mechanism.

(b) The metering device must also control application quantity by employing a slide metering device or by placing a predetermined quantity into a batch tank.

(3) Venturi system as a metering device.

(a) A venturi system may be used as a metering device, except where variable pressure may contribute to a variable injection rate.

(b) The chemical injection line must contain either a normally closed, solenoid-operated valve connected to the system interlock or a normally closed hydraulically operated valve that opens only when the main water line is adequately pressurized. The valve must be placed on the intake side of the injection pump, immediately adjacent to the application tank.

(c) The chemical injection line between the application tank and the venturi must contain an automatic, quick-closing check valve to prevent the flow of liquid back toward the application tank. The check valve must be placed immediately adjacent to the venturi chemical inlet.

(d) In bypass systems, the check valve may be installed immediately upstream of the venturi water inlet. Either the normally closed solenoid or hydraulically operated valve may be installed immediately downstream of the venturi water outlet.

(e) If a booster or auxiliary pump is used in conjunction with a venturi system, the normally closed solenoid must be electrically interlocked with the source pump for the irrigation system. (WSR 01-23-018, Effective November 9, 2001)

WAC 16-202-2014 What are alternative methods for metering? Alternative technology used for metering product must fulfill the provisions of this chapter.

A person may function as a metering device with a nonpressurized irrigation delivery system. However, the individual must remain on-site to continuously monitor the application and be immediately available to terminate the application in the event of equipment malfunction. The person must be knowledgeable about the operation of the irrigation and injection systems. (WSR 01-13-063, Effective November 9, 2001)

WAC 16-202-2015 What are the requirements for product injection devices? The irrigation water source and application tank must be protected from backflow and from siphonage.

(1) Pressurized injection or injection into pressurized irrigation system.

(a) An injection line check valve must be used whenever injection occurs in a pressurized section of an irrigation system or with a pressurized injection system.

(b) The injection line check valve must inject product directly into the irrigation water and must be installed downstream of the irrigation mainline check valve.

(c) The point of injection into an irrigation system cannot be located within ten feet of a wellhead, public waterway, off-farm irrigation supply ditch or conveyance system, or sensitive area.

(d) The injection line check valve mechanism must prevent leakage due to hydraulic head pressure from the application tank and must prevent backflow from the irrigation water source into the supply tank. The injection line check valve must maintain, at a minimum, 10 psi opening (cracking) pressure or adequate opening pressure to prevent gravity flow from the application tank.

(e) In instances where siphoning action induced by an irrigation system could compromise the opening (cracking) pressure of a injection line check valve, a vacuum relief valve must be installed in the irrigation line downstream of the injection point.

(2) Injection into nonpressurized section of irrigation system.

(a) If injection occurs in a nonpressurized portion of the irrigation system, an air gap or other hydraulic discontinuity must exist between the pressurized or nonpressurized irrigation water source and the point of product injection.

(b) When an air gap is used in conjunction with a public water supply, injection may only occur downstream of the air gap.

(3) Venturi systems.

(a) The chemical injection line must contain either a normally closed solenoid-operated valve connected to the system interlock or a normally closed hydraulically operated valve that opens only when the main water line is adequately pressurized. The valve must be placed on the intake side of the injection pump, immediately adjacent to the application tanks.

(b) The chemical injection line between the application tank and the metering device must contain an automatic, quick-closing check valve. The check valve must be placed immediately adjacent to the venturi chemical inlet. (WSR 01-13-063, Effective November 9, 2001)

WAC 16-202-2016 What alternative methods may be used for product injection?

Alternative technology used for product injection must fulfill the provisions of this chapter. With a surface supplied water source, the injection point must occur downstream from the point of diversion. With a pressurized water source, the injection point must be located such that product backflow cannot occur.

(1) Injection with barometric loops.

(a) Barometric loops can only be used on systems pumping from a surface water source.

(b) The barometric loop must be located in the water line immediately downstream of the irrigation water pump.

(c) A barometric pipe loop must be designed with sufficient elevation differential to compensate for backflow.

(d) The bottom of the barometric loop apex must be at least thirty inches above the highest water-emitting device or of any portion of the irrigation application system.

(e) The barometric loop must contain a vacuum relief device at the loop apex that allows air into the pipeline immediately upon loss of pressure. The orifice size must comply with current American Society of Agricultural Engineers (ASAE) standards.

(f) The injection point on a barometric loop must be located downstream of and at least thirty inches below the bottom of the barometric pipe loop apex.

(2) Solenoid and check valve.

(a) The chemical injection line must contain either a normally closed solenoid-operated valve connected to the system interlock or a normally closed hydraulically operated valve that opens only when the main water line is adequately pressurized. A normally closed, solenoid-operated valve must be placed on the intake side of the injection pump, immediately adjacent to the application tank.

(b) The chemical injection line between the application tank and the metering device and the injection point must contain an automatic, quick-closing check valve to prevent the flow of liquid back toward the application tank. The check valve must be placed immediately adjacent to the venturi chemical inlet. (WSR 01-23-018, Effective November 9, 2001)

WAC 16-202-2017 What are the requirements for a system interlock?

A system interlock must automatically shut off the injection system if the irrigation pump stops operating or if variation in water flow adversely affects product injection rate or product distribution uniformity. The operator must be able to demonstrate that backflow cannot occur.

(1) Pressurized injection systems or injection into a pressurized portion of the irrigation system requires either an electrical, hydraulic, or mechanical system interlock device.

(2) When the injection point is at a nonpressurized section of an irrigation water distribution system, a slide metering scale or batch tank may function as the system interlock.

(3) With venturi systems.

(a) Booster or auxiliary water pumps must be connected with the system interlock such that when pressure in the mainline changes to the point where product distribution is adversely affected automatic shutoff of product supply will occur.

(b) The supply line must contain either a normally closed solenoid-operated valve connected to the system interlock or a normally closed hydraulically operated valve that opens only when the main water line is adequately pressurized. If a booster or auxiliary pump is used in conjunction with a venturi system, the normally closed solenoid must be electrically interlocked with the source pump for the irrigation system. (WSR 01-23-018, Effective November 9, 2001)

WAC 16-202-2018 What alternative methods can be used as a system interlock?

Alternative technology used as a system interlock must fulfill the provisions of this chapter.

(1) Human interlock. In lieu of an automatic interlock, a person may serve as a system interlock. The individual must continuously monitor the application, be alert throughout the application process, be immediately available to terminate the application in the event of equipment malfunction, and be knowledgeable about the operation of the irrigation and injection systems.

(2) Solenoid and check valve.

(a) The chemical injection line must contain either a normally closed solenoid-operated valve connected to the system interlock or a normally closed hydraulically operated valve that opens only when the main water line is adequately pressurized. A normally closed, solenoid-operated valve must be placed on the intake side of the injection pump, immediately adjacent to the application tank.

(b) The chemical injection line between the application tank and the metering device must contain an automatic, quick-closing check valve to prevent the flow of liquid back toward the application tank. The check valve must be placed immediately adjacent to the venturi chemical inlet. (WSR 01-23-018, Effective November 9, 2001)

WAC 16-202-2019 What is an appropriate monitoring schedule? A fertigation application must be visually inspected at least daily to ensure that system components are functioning properly. Specific applications due to location or product characteristics may require more frequent monitoring. (WSR 01-13-063, Effective November 9, 2001)

WAC 16-202-2020 Public water system cross-connections or connection to a potable water supply intended for human use. (1) If the irrigation system is cross-connected to a public water system, Washington state department of health (DOH) rules (WAC 246-290-490) apply to backflow prevention.

(2) Cross-connections of a fertigation system to any potable water system intended for human use must have either a department of health-approved reduced pressure backflow assembly or reduced pressure detector assembly installed for backflow prevention. Otherwise, a physical separation in the form of an air gap may be used to protect the water source. (WSR 01-23-018, Effective November 9, 2001)

**PART 4
PENALTIES AND PENALTY ASSIGNMENT SCHEDULE**

WAC 16-202-2021 Penalties. (1) Any person who fails to comply with any provision of this chapter shall be subject to imposition of a civil penalty as provided in RCW 15.54.474.

(2) The director may bring an action to enjoin the violation or threatened violation of any provision of this chapter or any rule made pursuant to this chapter in a court of competent

jurisdiction of the county in which such violation occurs or is about to occur. (WSR 01-13-063, Effective November 9, 2001)

Repealer

The following section of the Washington Administrative Code is repealed:

WAC 16-202-2000 Fertigation
(WSR 01-23-018, Effective November 9, 2001)