SECTION .1100 – SYSTEM DOSING AND CONTROLS

15A NCAC 18E .1101 GENERAL DOSING SYSTEM REQUIREMENTS[20]

(a) Dosing systems with a single pump or siphon shall be required to be used to deliver effluent into laterals when:

(1) gravity distribution cannot be achieved between the septic tank and dispersal field;
(2) the total lateral length exceeds 750 linear feet in a single system; or
(3) a pressure dosed gravity distribution or pressure dispersal system is used.

(b) Dosing systems with multiple alternating or sequencing pumps or siphons shall be used to discharge to separate dispersal fields when:

(1) DDF from a single system exceeds 3,000 gpd; or
(2) the total line length exceeds 2,000 linear feet in a single trench system or 5,000 linear feet in a drip dispersal system.

(c) If alternating pumps or siphons are not required in accordance with Paragraph (b) of this Rule, but used, then the alternating pumps or siphons may discharge to a single dispersal field.

(d) The dose volume to a dispersal field shall be calculated as follows:

(1) 66 to 75 percent of the volume of the installed linear lateral footage for pressure dosed gravity distribution systems;
(2) 66 to 75 percent of the volume of the installed linear lateral footage for LDP systems and trench products with a PIA approval based on lateral capacity equivalent to the capacity of a four-inch corrugated pipe;
(3) LPP systems in accordance with Rule .0907(e)(14)(B) of this Subchapter; and
(4) drip dispersal systems in accordance with Rule .1602(f)(3) of this Subchapter.

(e) The pump operating flow rate from a dosing system shall be designed to achieve scour velocity in the supply line and to distribute effluent in accordance with the dispersal field design.

(f) The pump operating flow rate or average pump run time shall be within 25 percent of the initial measurements collected during the final inspection.

(g) All dosing systems shall be tested using water prior to issuance of an ~~OP.~~ OP or the ATO. The test ~~shall~~ may be conducted by the installer. ~~installer,~~ The installer shall give the LHD, LSS, authorized designer, AOWE, ~~and~~ or PE, as applicable, the option to witness the test. ~~witnessed by the LHD,~~ A PE and AOWE shall be authorized to witness the dosing tests for systems they have designed and for LHD permits upon a signed acceptance of responsibility for the verification of the dosing system. The dosing test shall ~~and~~ include a demonstration and documentation of the following:

(1) pump or siphon operating flow rate and dose volume delivered;
(2) float control levels;
(3) high-water alarm, including sound;
(4) operating pressure head, if applicable; and
(5) delivery of water to the dispersal field.

(h) Documentation of the dosing system test results shall be provided to the LHD, PE, or AOWE for attachment to the permit or NOI, as applicable.

History Note: *Authority G.S. 130A-335(e), (f), and ~~(f1).~~ (f1), S.L. 2023-77, s.18.*

15A NCAC 18E .1102 PUMP DOSING

(a) The effluent pump shall be:

(1) capable of handling a minimum of one-half inch solids or be a screened, high head pump designed for effluent;
(2) designed to meet the pump operating flow rate and total dynamic head specified for the effluent distribution system;
(3) removable without requiring entrance into the tank; and
(4) listed by a third-party electrical testing and listing agency, such as Underwriter's Laboratory. A PE may propose a pump model not listed by a third-party electrical testing and listing agency. The Department shall approve the pump when review of documentation provided by the PE demonstrates that the pump model meets the performance requirements for the dispersal field design.

(b) A vent or anti-siphon hole of a 3/16-inch minimum diameter shall be used to prevent air locking of the pump and siphoning from the pump tank when pumping downhill. When a check valve is provided, the anti-siphon hole or vent shall be located between the pump and the check valve. Additional venting may be required at the high point in the pump force main to prevent siphoning.

(c) Each pump discharge line in a pump tank shall have a disconnect device, such as a pressure-rated threaded union, flange, or camlock.

(d) Check valves or other type valves shall prevent drainback from the dispersal field or supply line into the pump tank. A system may be designed and approved for the supply line to drain back to the pump tank based on site-specific considerations, such as freeze protection.

(e) An isolation valve shall be provided on the field side of the disconnect device when pumping uphill.

(f) The pump discharge piping shall be accessible within the tank or riser from finished grade.

(g) Fittings and valves shall be of compatible non-corrodible material. Isolation valves and disconnects shall be located within 18 inches of the top of the access riser opening.

[20] Changed by S.L. 2023-77, Section 18

(h) All submersible pumps shall be provided with a non-corrodible rope or chain attached to each pump enabling pump removal from the ground surface without requiring dewatering or entrance into the tank.

History Note: *Authority G.S. 130A-335(e), (f), and (f1).*

15A NCAC 18E .1103 CONTROL PANELS

(a) A control panel shall be provided for all systems that use a pump. The control panel enclosure shall be rated NEMA 4X at a minimum. A third-party electrical testing and listing agency shall list the control panel. The control panel shall include for each pump:

(1) an independent overload protection, if not integral with the pump motor;
(2) circuit breaker(s);
(3) a motor contactor that disconnects all current to the pump or a solid-state relay that controls current to the pump;
(4) a hand-off-automatic (H-O-A) switch or alternate method to enable manual or automatic pump operation and for the pump to be deactivated manually;
(5) a pump run light;
(6) an elapsed time meter; and
(7) an event counter.

(b) An automatic pump sequencer shall be included in systems requiring multiple pumps in accordance with Rule .1101(b) of this Section and shall remain operable whenever any pump is inoperable.

(c) When telemetry is required in accordance with Sections .0800, .1500, .1600, and .1700 of this Subchapter, the control panel shall be connected to an active phone line, wireless internet router, dedicated cellular line, or another form of telemetry that allows the Management Entity to be notified and respond to alarm conditions. The telemetry shall remain active for the life of the wastewater system. The authorized designer, AOWE, or PE shall specify the minimum notification frequency based on site-specific conditions.

(d) The control panel bottom shall be mounted a minimum of 24 inches above finished grade, within 50 feet of and in the line of sight of the pump tank. The Management Entity and LHD shall be able to access the control panel and operate the pumps when the owner is not present.

(e) A NEMA 4X junction box shall be installed above grade or adjacent to the pump tank riser when the control panel is located more than 10 feet from the pump tank access riser and one or more electrical splices are used. Electrical splices shall not be used within the conduit piping.

(f) Wiring shall be conveyed to the control panel or outside junction box through waterproof, gasproof, and corrosion-resistant conduits, with no splices or junction boxes inside the tank. Wire and wire conduit openings inside the pump tank and disconnect enclosure shall be sealed.

(g) Dual and multiple fields shall be dosed by separate pumps that shall automatically alternate or sequence. The supply lines shall be "H" connected to permit manual alternation between fields dosed by each pump. "H" connection valving shall be accessible from the ground surface, either from the pump tank access manhole or in a separate valve chamber outside the pump tank. The Department shall approve other methods of dosing dual or multiple fields when the authorized designer or PE provides documentation of equivalent performance to this Paragraph.

(h) Liquid level detection devices, such as floats, shall be provided in the pump tank to control pump cycles and trigger notification of alarm conditions. The liquid level detection device configuration shall meet the following requirements:

(1) a minimum of 12 inches of effluent shall be maintained in the bottom of the pump tank;
(2) pump-off level shall be set to keep the pump submerged or in accordance with the manufacturer's written specifications;
(3) a separate control float shall be provided to activate the high-water alarm;
(4) the high-water alarm float shall be set to activate within six inches of the pump-on level or higher, if applicable, if providing design equalization capacity in a timed dosing system;
(5) the lag pump float switch, where provided, shall be located at or above the high-water alarm activation level; and
(6) floats shall be supported utilizing durable, corrosion resistant material, and designed to be adjustable, removable, and replaceable from the ground surface without requiring dewatering, entrance into the tank, or pump removal.

(i) The pump tank shall have a high-water alarm that shall:

(1) be audible and visible to the system users and the Management Entity;
(2) have a silencer button or silencer device that is located on the outside of the panel enclosure;
(3) provide for manual testing;
(4) automatically reset after testing and when an alarm condition has cleared;
(5) remain operable whenever the pump is inoperable;
(6) have an enclosure that is watertight, corrosion resistant, and shall be rated NEMA 4X at a minimum; and
(7) be mounted outside the facility and accessible.

(j) For systems designed, inspected, and certified by a PE, alternative panel construction and location criteria may be used if the alternative panel construction and location criteria meet the panel performance criteria, comply with local electrical codes, and are approved by the local electrical inspector.

History Note: *Authority G.S. 130A-335(e), (f), and (f1).*

15A NCAC 18E .1104 SIPHON DOSING

Siphons and siphon tanks may be used when a minimum of two feet of elevation drop is maintained between the siphon outlet invert and the inlet invert in the dispersal field distribution system. Siphons and siphon tanks shall meet the following criteria:

(1) Slope and size of the siphon discharge line shall be sufficient to handle the peak siphon discharge by gravity flow without the discharge line flowing full. Vents for the discharge lines shall be located outside of the siphon tank and shall not serve as an overflow for the tank.

(2) All siphon parts shall be installed in accordance with the manufacturer's specifications. All materials shall be corrosion-resistant, of cast iron, high-density plastic, fiberglass, stainless steel, or equal as approved by the Department when documentation is provided which shows the materials meet the requirements of this Rule.

(3) Siphon tanks shall have a functioning trip counter and high-water alarm. The high-water alarm shall be audible and visible by system users and weatherproof if installed outdoors in an enclosure rated as NEMA 4X at a minimum. The high-water alarm shall be set to activate within two inches of the siphon trip level.

History Note: *Authority G.S. 130A-335(e), (f), and (f1).*

15A NCAC 18E .1105 TIMED DOSING

(a) Timed dosing systems shall be used with the following:

(1) when a dosing system is required in accordance with Rule .1101 of this Section in conjunction with an adjusted DDF granted in accordance with Rule .0403 of this Subchapter;

(2) flow equalization systems;

(3) advanced pretreatment or dispersal systems, if required by the manufacturer; or

(4) when specified by the authorized designer.

(b) The timed dosing system shall be integrated with the pump tank control sensors to ensure that the minimum dose volume calculated in accordance with Rule .1101(d) of this Section is present prior to the start of any scheduled dose event and to provide that a full dose is delivered.

(c) The float configuration of a flow equalization system using timed dosing shall be adjusted by the LHD, authorized designer, or PE, to provide for equalization capacity in the system.

History Note: *Authority G.S. 130A-335(e), (f), and (f1).*

15A NCAC 18E .1106 PRESSURE DOSED GRAVITY DISTRIBUTION DEVICES

(a) Pressure manifolds for pressure dosed gravity distribution shall meet the following minimum design and performance requirements:

(1) uniform distribution of flow proportional to lateral length with a minimum of two feet of residual pressure head;

(2) a pressure regulating valve incorporated in the supply line just prior to the pressure manifold to control pressure to the manifold;

(3) a mechanism or device for measuring residual pressure head in the manifold;

(4) a mechanism to stop flow to individual laterals;

(5) a method to visually verify the flow to each individual lateral;

(6) the feeder lines from the pressure manifold shall be of sufficient size and slope for effluent to flow by gravity to each lateral; and

(7) the pressure manifold and appurtenances shall be designed and installed to be accessible for inspection, operation, maintenance, and monitoring.

(b) A distribution box or a drop box may be used to dissipate or distribute flow in a pressure dosed gravity dispersal system for parallel, serial, or sequential distribution. Such devices shall be watertight, corrosion resistant, constructed to withstand active and passive loads, and the volume of the device shall be such that when the dose volume is delivered, the box shall not overflow. The authorized agent shall approve the distribution device when it has been determined to be in accordance with Rule .0901(g)(9) through (11) of this Subchapter.

History Note: *Authority G.S. 130A-335(e), (f), and (f1).*

SECTION .1200 – ADVANCED PRETREATMENT SYSTEMS STANDARDS, SITING, AND SIZING CRITERIA

15A NCAC 18E .1201 ADVANCED PRETREATMENT SYSTEM STANDARDS

(a) Advanced pretreatment systems with a DDF less than or equal to 3,000 gpd shall meet the following conditions:

(1) have an RWTS or PIA Approval;

(2) be designed to comply with the effluent standard specified in the OP and defined in Table XXV prior to effluent dispersal to the soil;

(3) comply with the siting and sizing requirements of this Section; and

(4) comply with Rules .1302(f) and .1710 of this Subchapter.

TABLE XXV. Effluent standards for advanced pretreatment systems