0302

SUBCHAPTER 18E – WASTEWATER TREATMENT AND DISPERSAL SYSTEMS

SECTION .0100 – GENERAL

15A NCAC 18E .0101 is proposed for adoption as follows:

15A NCAC 18E .0101 SCOPE

The rules contained in this Subchapter shall govern wastewater treatment and dispersal from wastewater systems, as defined in G.S. 130A-334(15), serving single or multiple-family residences, places of business, or places of public assembly. The wastewater system shall be designed to not discharge effluent to the land surface, surface waters, or directly to groundwater.

History Note: Authority G.S. 130A-335(e);

15A NCAC 18E .0102 is proposed for adoption as follows:

15A NCAC 18E .0102 APPLICABILITY

(a) The provisions of this Subchapter shall not apply to functioning wastewater systems in use prior to July 1, 1977, unless the wastewater strength changes or design daily flow increases.

(b) If the existing facility's design daily flow increases or wastewater strength changes, the owner shall submit an application in accordance with Rule .0202 of this Subchapter. The owner shall submit this application to the LHD prior to any change of flow or wastewater strength.

(c) All wastewater systems shall comply with Section .1300 of this Subchapter, except for the wastewater systems that meet the requirements of Paragraph (a) of this Rule.

History Note: Authority G.S. 130A-335(e);

15A NCAC 18E .0103 is proposed for adoption as follows:

15A NCAC 18E .0103 INCORPORATION BY REFERENCE

For this Subchapter, the following rules, standards, and other materials are hereby incorporated by reference, including any subsequent amendments and editions. Table I lists the agency, document title, and contact information for where a copy of the documents may be obtained from.

Table I: Rules, standards, and other materials incorporated by reference

United States Department of Agriculture – Natural Resources Conservation Service (USDA-NRCS)

Soil Survey Laboratory Information Manual, Soil Survey Investigations Report No. 45	Available at no charge at: http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/ref/
Kellogg Soil Survey Laboratory Methods Manual, Soil Survey Investigation Report No. 42	Available at no charge at: http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/ref/
Field Book for Describing and Sampling Soils	Available at no charge at: http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/ref/copy or U. S. Government Publishing Office, P. O. Box 979050, St. Louis, MO, 63197-9000
Guide to Soil Texture by Feel, Journal of Agronomic Education	Available at no charge at: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/edu/?cid=nrcs142p2_054311
National Engineering Handbook, Part 624 (Drainage), Chapter 10 (Water Table Control); Part 630 (Hydrology), Chapter 18; Part 650 (Engineering Field Handbook), Chapter 14 (Water Management, Drainage)	Available at no charge at: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/mi/technical/engineering
National Electrical Manufacturers Association 1300 North 17th Street, Suite 900, Arlington, VA 22209 www.nema.org	
Standard 250	One hundred twenty four dollars ($124.00)
U. S. Environmental Protection Agency (EPA) U. S. EPA/NSCEP P. O. Box 42419, Cincinnati, OH 45242-0419	
Method 9080	Available at no charge at: https://www.epa.gov/hw-sw846/sw-846-test-method-9080-cation-exchange-capacity-soils-ammonium-acetate
ASTM International 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19438-2959 http://www.astm.org	
C890	Forty five dollars ($45.00) each plus six dollars and ten cents ($6.10) shipping and handling
C990	Forty dollars ($40.00) each plus six dollars and ten cents ($6.10) shipping and handling

C1644	Forty five dollars ($45.00) each plus six dollars and ten cents ($6.10) shipping and handling
D448	Thirty nine dollars ($39.00) each plus six dollars and ten cents ($6.10) shipping and handling
D1784	Thirty nine ($39.00) dollars each plus six dollars and ten cents ($6.10) shipping and handling
D1785	Fifty dollars ($50.00) plus six dollars and ten cents ($6.10) shipping and handling
D2241	Forty four dollars ($44.00) each plus six dollars and ten cents ($6.10) shipping and handling
D2466	Forty four ($44.00) dollars each plus six dollars and ten cents ($6.10) shipping and handling
D2564	Forty four dollars ($44.00) each plus six dollars and ten cents ($6.10) shipping and handling
D2729	Forty five dollars ($45.00) each plus six dollars and ten cents ($6.10) shipping and handling
D2774	Forty four dollars ($44.00) each plus six dollars and ten cents ($6.10) shipping and handling
D3034	Fifty dollars ($50.00) each plus six dollars and ten cents ($6.10) shipping and handling
D6913	Sixty five dollars ($65.00) each plus six dollars and ten cents ($6.10) shipping and handling
D7928	Sixty five dollars ($65.00) each plus six dollars and ten cents ($6.10) shipping and handling
F667	Forty five dollars ($45.00) each plus six dollars and ten cents ($6.10) shipping and handling
North Carolina Administrative Code	
15A NCAC 01O	Available at no charge at: http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2001%20-%20departmental%20rules/subchapter%20o/subchapter%20o%20rules.html
15A NCAC 02C	Available at no charge at: http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2002%20-%20environmental%20management/subchapter%20c/subchapter%20c%20rules.pdf

15A NCAC 02H	Available at no charge at: http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2002%20-%20environmental%20management/subchapter%20h/15a%20ncac%2002h%20.0101.pdf
15A NCAC 02L	Available at no charge at: http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2002%20-%20environmental%20management/subchapter%20l/subchapter%20l%20rules.pdf
15A NCAC 02U	Available at no charge at: http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2002%20-%20environmental%20management/subchapter%20u/subchapter%20u%20rules.pdf
15A NCAC 13B	Available at no charge at: http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2013%20-%20solid%20waste%20management/subchapter%20b/subchapter%20b%20rules.pdf
NSF International PO Box 130140, Ann Arbor, MI 48105 http://www.nsf.org/	
Standard 40	One hundred five dollars ($105.00) each plus shipping and handling
International Association of Plumbing and Mechanical Officials (IAPMO) 4755 E Philadelphia St, Ontario, CA 91761 http://www.iapmo.org/Pages/IAPMOgroup.aspx	
IAPMO/ANSI Z1000	One hundred dollars ($100.00) each
Canadian Standards Association 178 Rexdale Blvd, Toronto, ON Canada M9W 1R3 http://www.csagroup.org/	
B66	One hundred eighty dollars ($180.00) each plus eighteen dollars ($18.00) shipping and handling
North Carolina Plumbing Code	
	Available at no charge at:

	http://www.ncdoi.com/OSFM/Engineering_and_Codes/Documents/2012_NCBuildingCode_amendments/PlumbingCode-2012NCAmendments100517.pdf
U.S. Government Publishing Office 732 North Capitol St, NW, Washington, DC 20401-0001 https://bookstore.gpo.gov/	
40 CFR 136	Sixty seven dollars ($67.00) each
American Association of State and Highway Transportation Officials (AASHTO) 444 North Capital Street, NW, Suite 249, Washington, DC 20001 https://www.transportation.org/	
Standard Specifications for Highway Bridges (AASHTO H5 and H10)	Three hundred eighty dollars ($380.00) each plus shipping and handling

History Note: Authority G.S. 130A-335(e);

15A NCAC 18E .0104 is proposed for adoption as follows:

15A NCAC 18E .0104 ABBREVIATIONS

As used in this Subchapter, the following abbreviations mean:

(1) ABS: Acrylonitrile-Butadiene-Styrene;

(2) ACEC: Apparent Cation Exchange Capacity;

(3) ANSI: American National Standards Institute;

(4) ASTM: American Society for Testing and Materials;

(5) ATO: Authorization to Operate;

(6) BOD: Biochemical Oxygen Demand;

(7) CA: Construction Authorization;

(8) CBOD: Carbonaceous Biochemical Oxygen Demand;

(9) CFR: Code of Federal Regulations;

(10) CSA: Canadian Standards Association;

(11) DDF: Design Daily Flow;

(12) DEQ: Department of Environmental Quality;

(13) DIP: Ductile Iron Pipe;

(14) DOT: Department of Transportation;

(15) DSE: Domestic Strength Effluent;

(16) EOP: Engineer Option Permit;

(17) FOG: Fats, Oil, and Grease;

(18) gpd: Gallons per Day:

(19) IP: Improvement Permit;

(20) IPWW: Industrial Process Wastewater;

(21) LC: Limiting Condition;

(22) LDP: Large Diameter Pipe;

(23) LG: Licensed Geologist;

(24) LHD: Local Health Department;

(25) LPP: Low Pressure Pipe;

(26) LSS: Licensed Soil Scientist;

(27) LTAR: Long Term Acceptance Rate;

(28) mg/L: Milligrams/Liter;

(29) NEMA: National Electrical Manufacturers Association;

(30) NH_3: Total Ammonia Nitrogen;

(31) NOI: Notice of Intent to Construct;

(32) NOV: Notice of Violation;

(33) NSF: NSF International;

(34) OP: Operation Permit;

(35) PE: Professional Engineer;

(36) PIA: Provisional, Innovative, and Accepted;

(37) PPBPS: Prefabricated Permeable Block Panel System;

(38) psi: Pounds per square inch;

(39) PVC: Poly Vinyl Chloride;

(40) RV: Recreational Vehicle;

(41) RWTS: Residential Wastewater Treatment Systems;

(42) SDR: Standard Dimension Ratio;

(43) SWC: Soil Wetness Condition;

(44) TKN: Total Kjeldahl Nitrogen;

(45) TL: Trench Length;

(46) TN: Total Nitrogen;

(47) TSS: Total Suspended Solids;

(48) TW: Trench Width;

(49) USDA-NRCS: United States Department of Agriculture – Natural Resources Conservation Service;

(50) VIP: Visual Inspection Protocol; and

(51) WS: Water Supply Class.

History Note: Authority G.S. 130A-335(e);

15A NCAC 18E .0105 is proposed for adoption as follows:

15A NCAC 18E .0105 DEFINITIONS

The following definitions shall apply throughout this Subchapter:

(1) "Aggregate" means naturally occurring inorganic material (crushed rock or gravel) screened to size for various uses.

(2) "Apparent Cation Exchange Capacity" (ACEC) means the sum of exchangeable bases plus total soil acidity at a pH of 7.0. ACEC is expressed in milliequivalents per 100 grams of soil (meq/100g of soil) or centimoles per kilogram of soil (cmols/kg of soil). The apparent soil ACEC is calculated by determining the ACEC using the neutral normal ammonium acetate method, pH of 7.0 neutral normal, and then dividing by the percent clay as determined by particle size distribution (pipette method) and then multiplying by 100, as described in USDA-NRCS Soil Survey Laboratory Information Manual, Soil Survey Investigations Report No. 45 and Kellogg Soil Survey Laboratory Methods Manual, Soil Survey Investigation Report No. 42.

(3) "Approved" means that which the State or LHD has determined is in accordance with this Subchapter and G.S. 130A, Article 11.

(4) "Artificial drainage" means any man-made structure or device designed to overcome a soil wetness condition or intercept lateral flowing ground or surface water. Artificial drainage systems include the following: groundwater lowering system, interceptor drain, foundation drain, and surface water diversion.

(5) "Authorized agent of the LHD" referred to as authorized agent, means a person who has been authorized by the State in accordance with G.S. 130A, Article 4 and 15A NCAC 01O .0100 to permit wastewater systems.

(6) "Authorized designer" means a service provider authorized by the manufacturer who creates plans for the installation, expansion, or repair of a proprietary wastewater system.

(7) "Bed" means an excavation with a width greater than three feet containing dispersal media and one or more laterals.

(8) "Bedroom" means any room defined as a sleeping room in the current North Carolina Building Code.

(9) "Berm" means a raised drainage feature used to divert stormwater runoff.

(10) "Certified Inspector" means a person authorized to inspect a wastewater system at the time of sale of a facility in accordance with G.S. 90A, Article 5, and applicable rules of the North Carolina On-Site Wastewater Contractors and Inspectors Certification Board.

(11) "Collection sewer" means gravity flow pipelines, force mains, effluent supply lines, manholes, lift stations and all applicable appliances, used for conducting wastes from the sanitary building drain or building sewer to and within a wastewater system.

(12) "Complete data set" means analytical results for all required influent and effluent constituents (as specified in the effluent quality standard) for a specific site on a specific date. A data set may include other constituents specified in an RWTS or PIA approval, permit, or other document.

(13) "Composite sample" means commingled individual samples collected from the same point at different times. Samples may be of equal volume or may be proportional to the flow at time of sampling.

(14) "Demand dosing" means a configuration in which a specific volume of effluent is delivered to a component based upon patterns of wastewater generation from the source and dosing activation elevation settings.

(15) "Design daily flow" means the quantity of wastewater a facility is projected to produce in a 24-hour period upon which wastewater system sizing and design are based as determined in Section .0400 of this Subchapter.

(16) "Design unit" means a discrete connection such as an individual dwelling unit, place of business, or place of public assembly on which wastewater design daily flows are based. Multiple design units can comprise a facility.

(17) "Dispersal field" means physical location where final treatment and dispersal of effluent occurs in the soil.

(18) "Dispersal media" means the media used to provide void space through which effluent flows and is stored prior to infiltration (e.g., washed gravel or crushed stone, polystyrene aggregate, chambers, pipe, drip tubing with emitters, etc.).

(19) "Dose volume" means an amount of effluent delivered during a dosing event as determined by the activation levels in a demand dosing system or by a timer in a time dosing system.

(20) "Dwelling unit" means any room or group of rooms located within a structure and forming a single, habitable unit with facilities which are used or intended to be used for living, sleeping, bathing, toilet usage, cooking, and eating.

(21) "Effluent" means the liquid discharge from a pretreatment component.

(22) "Facility" means one or more design units located on a single or multiple lot(s) or tract(s) of land and served by a common wastewater system comprised of one or more ground absorption systems.

(23) "Finished grade" means the final elevation of the land over the wastewater system after installation.

(24) "Flood pool elevation" means the maximum water surface elevation of a reservoir, equal to the elevation of the spillway.

(25) "Flow equalization" means a system configuration that includes sufficient storage capacity to allow for uniform flow to a subsequent component despite variable flow from the source.

(26) "Full kitchen" means all the appliances in a warming kitchen plus a warewashing machine or equipment.

(27) "Grab sample" means a discrete sample collected at a specific time and location.

(28) "Gravity distribution" means gravity delivery of effluent to and within each lateral.

(29) "Groundwater lowering system" means a type of artificial drainage system designed to lower the water table by gravity or in conjunction with a pump to maintain the vertical separation distance beneath a dispersal field.

(30) "Horizon" means a layer of soil, approximately parallel to the surface that has distinct physical, chemical, and biological properties or characteristics such as color, structure, texture, consistence, kinds and number of organisms present, degree of acidity or alkalinity, etc, resulting from soil forming processes.

(31) "Infiltrative surface" means the designated interface where effluent moves from dispersal media or a distribution device into treatment media, naturally occurring soil, or fill.

(32) "Installer" means a person authorized to construct, install, or repair a wastewater system in accordance with G.S. 90A, Article 5 and applicable rules of the North Carolina On-Site Wastewater Contractors and Inspectors Certification Board.

(33) "Interceptor drain" means subsurface artificial drainage designed to intercept and divert lateral moving groundwater or perched water away from the dispersal field or other system component to an effective outlet. Interceptor drains are a type of artificial drainage.

(34) "Invert" means the lowest elevation of the internal cross-section of a pipe, fitting, or component.

(35) "Jurisdictional wetland" means land established as a wetland by DEQ or the US Army Corp of Engineers under Section 404 of the Federal Clean Water Act.

(36) "Ksat" or saturated hydraulic conductivity, means the value of water flow (flux) through a unit cross sectional area of soil under saturated conditions. In-situ Ksat is measured in the field using clean water. Results of in-situ Ksat are used to simulate movement of effluent through the soil and may be used to field verify LTAR.

(37) "Lateral water movement" means the movement of subsurface water down gradient often associated with a less permeable horizon. Lateral water movement can be observed in a bore hole, excavation, or monitoring well on sloping sites.

(38) "Lateral" means any pipe, tubing, or other device used to convey and distribute effluent in a dispersal field.

(39) "Limiting condition" means soil conditions (morphology, wetness, depth, restrictive horizon, or organic matter content) or site features (topography, slope, landscape position, or available space) that restrict design options or prohibit permitting a wastewater system.

(40) "Lithochromic feature" means soil mottle or matrix associated with variations of color due to weathering of parent materials.

(41) "Long Term Acceptance Rate," referred to as LTAR, means the rate of effluent absorption by the soil or saprolite in a wastewater system after long-term use. The LTAR, in units of gallons per day per square foot (gpd/ft^2), is assigned based upon soil textural class, structure, consistence, depth, percent coarse rock, landscape position, topography, and system type, and is used to determine the dispersal field sizing requirements, in accordance with applicable rules of this Subchapter.

(42) "Local health department," referred to as LHD, means any county, district, or other health department authorized to be organized under the General Statutes of North Carolina.

(43) "Management Entity" means the person, entity, company, or firm designated by the owner of the system who has primary responsibility for the operation of a wastewater system in accordance with this Subchapter, G.S. 90A, Article 3, and applicable rules of the Water Pollution Control System Operators Certification Commission. The Management Entity can be the owner, a public Management Entity, a certified operator, a management company, or an entity that employs certified operators. The Management Entity is or employs the operator in responsible charge for the wastewater system.

(44) "Mass loading" means the total mass of one or more organic or inorganic effluent constituents delivered to the wastewater system over a specified period. It is computed by multiplying the total volume of flow during the specified period by the flow-weighted average constituent concentration in the same period. Units of measurement are pounds per day.

(45) "Matrix" means a volume of soil equivalent to 50 percent or greater of the total volume of a horizon.

(46) "Mean high-water mark" or normal high-water mark, means, for coastal waters having six inches or more lunar tidal influence, the average height of the high-water over a 19-year period as may be ascertained from National Ocean Survey, U.S. Army Corps of Engineers tide stations data, or as otherwise determined under the provisions of the Coastal Area Management Act. The most stringent high-water mark shall be applied.

(47) "Media" means a solid material that can be described by shape, dimensions, surface area, void space, and application.

(48) "Mottle" means subordinate color of a differing Munsell color system notation in a soil horizon.

(49) "Naturally occurring soil" means soil formed in place due to natural formation processes and being unaltered by filling, removal, or other artificial modification other than tillage.

(50) "NEMA 4X" means an enclosure for an electrical control panel or junction box that meets standards for protection of equipment due to the ingress of water (including rain and hose-directed water) and an additional level of protection against corrosion, as set forth in NEMA Standard 250.

(51) "NSF-40 systems" means individual residential wastewater treatment systems (RWTS) that are approved and listed in accordance with the standards adopted by NSF International for Class I residential wastewater treatment systems under NSF-ANSI Standard 40 and approved for use in accordance with G.S. 130A-342 and the rules of this Subchapter.

(52) "Non-ground absorption system" means a system for waste treatment designed not to discharge to the soil, land surface, or surface waters, including approved vault privies, incinerating toilets, mechanical toilets, composting toilets, chemical toilets, and recycling systems.

(53) "Off-site system" means a wastewater system where any system component is located on property other than the lot the facility is located on.

(54) "Organic soils" means those organic mucks and peats consisting of more than 20 percent organic matter, by dry weight, and 18 inches or greater in thickness.

(55) "Owner" means owner or owner's representative who is a person holding legal title to the facility, wastewater system, or property or who holds power of attorney to act on the owner's behalf. The owner's representative is an agent designated by letter or contract to act on the owner's behalf.

(56) "Parallel distribution" means the distribution of effluent that proportionally loads multiple sections of a dispersal field at one time.

(57) "Parent material" means the mineral matter that is in its present position through deposition by water, wind, gravity or by decomposition of rock.

(58) "Ped" means a unit of soil structure, such as blocky, granular, prismatic, or platy formed by natural processes, in contrast to a clod, which is formed artificially.

(59) "Perched water table" means a zone of saturation held above the main groundwater body by a slowly-permeable layer, impermeable rock, or sediment, which may or may not exhibit redoximorphic features.

(60) "Person" means any individual, firm, association, organization, partnership, business trust, corporation, company, or unit of local government.

(61) "Pressure dispersal" means an approved system utilizing an effluent pump or siphon to distribute effluent uniformly to the infiltrative surface in the dispersal field through a pressurized pipe network.

(62) "Pressure dosed gravity distribution" means pressure delivery of effluent to a manifold, dissipator box, or other splitter with subsequent gravity distribution within one or more laterals to the infiltrative surface.

(63) "Public management entity" means a city (G.S. 160A, Article 16), county (G.S. 153A, Article 15), interlocal contract (G.S. 153A, Article 16), joint management agency (G.S. 160A, Articles 461 and 462), county service district (G.S. 153A, Article 16), county water and sewer district (G.S. 162A, Article 6), sanitary district (G.S. 130A, Article 2), water and sewer authority (G.S. 162A, Article 1), metropolitan water district (G.S. 162A, Article 4), metropolitan sewerage district (G.S. 162A, Article 5), public utility [G.S. 62-3(23)], county or district health department (G.S. 130A, Article 2), or other public entity legally authorized to operate and maintain wastewater systems.

(64) "Redoximorphic features" means a color pattern of a horizon due to a loss (depletion) or gain (concentration) of pigment compared to the matrix color, formed by oxidation and reduction of iron (Fe) coupled with its removal, translocation, or accrual, or a soil matrix color controlled by the presence of Fe^{+2}.

(65) "Repair area" means an area that has been classified suitable consistent with the rules in this Subchapter. The repair area is reserved for the extension, alteration, wastewater system relocation, or replacement of part or all of the initial wastewater system. The repair area shall be available to be used in the event of a malfunction or if a wastewater system is partially or totally destroyed.

(66) "Residential Wastewater Treatment Systems," referred to as RWTS, means approved individual advanced pretreatment systems which are covered under standards of NSF International, in accordance with G.S. 130A-342 and applicable rules in this Subchapter.

(67) "Restrictive horizon" means a soil horizon that is capable of perching groundwater or effluent. Restrictive horizons may occur as:

(a) physical root restrictions due to high bulk density;

(b) strong pedogenic cementation or induration, physically root restrictive;

(c) plinthite; or

(d) fragipan characteristics.

The horizon suffixes d, m, and x from the USDA-NRCS Field Book for Describing and Sampling Soils can be used to describe restrictive horizons. Restrictive horizons are recognized by their resistance in excavation or in using a soil auger.

(68) "Rock" means the body of consolidated or partially consolidated material composed of minerals at or below the land surface. Rock includes bedrock and partially weathered rock that is hard and cannot be dug with hand tools. The upper boundary of rock is saprolite, soil, or the land surface.

(69) "Saprolite" means the body of porous material formed in place by weathering of rock that has a massive, rock-controlled structure and retains the fabric (arrangement of minerals) of its parent rock in 50 percent of its volume. Saprolite can be dug with hand tools. The lower limit of saprolite is rock and its upper limit is soil or the land surface.

(70) "Septic tank" means a water-tight, covered receptacle designed for primary treatment of wastewater and constructed to:

(a) receive the discharge of wastewater from a building;

(b) separate settleable and floating solids from the liquid;

(c) digest organic matter by anaerobic bacterial action;

(d) store digested solids through a period of detention; and

(e) allow effluent to discharge for additional treatment and final dispersal.

(71) "Sequential distribution" means the distribution method in which effluent is loaded into one trench and fills it to a predetermined level before passing through a relief line or device to the succeeding trench at a lower elevation. All trenches are fed through the proximal end.

(72) "Setback" means the minimum horizontal separation distance between the wastewater system and features listed in Section .0600 of this Subchapter.

(73) "Serial distribution" means the distribution method in which effluent is loaded into one trench and fills it to a predetermined level and passes through a relief line or device to the succeeding trench, in a single uninterrupted flow path.

(74) "Soil" means the naturally occurring body of porous mineral and organic materials on the land surface. Soil is composed of sand-, silt-, and clay-sized particles that are mixed with varying amounts of larger fragments and some organic material. Soil contains less than 50 percent of its

volume as rock, saprolite, or coarse-earth fraction (mineral particles greater than 2.0 millimeters). The upper limit of the soil is the land surface, and its lower limit is rock, saprolite, or other parent materials.

(75) "Soil consistence" means the degree and kind of cohesion and adhesion that a soil exhibits.

(76) "Soil series" means an official series name established by USDA-NRCS.

(77) "Soil structure" means the arrangement of primary soil particles into compound particles, peds, or clusters that are separated by natural planes of weakness from adjoining aggregates.

(78) "Soil textural classes" means soil classification based upon size distribution of mineral particles in the fine-earth fraction less than two millimeters in diameter. The fine-earth fraction includes sand (2.0 - 0.05 mm in size), silt (less than 0.05 mm or greater than 0.002 mm in size), and clay (less than 0.002 mm in size) particles.

(79) "State" means the Department of Health and Human Services, Division of Public Health, Environmental Health Section, On-Site Water Protection Branch. The mailing address for the State is as follows: 1642 Mail Service Center, Raleigh, NC 27699-1642.

(80) "Stream" means a body of concentrated flowing water in a natural low area or natural or manmade channel on the land surface. This includes ephemeral, intermittent, and perennial streams as defined by DEQ, as well as streams which have been modified by channeling, culvert installation, or relocation.

(81) "Suitable" means classification of a specific site evaluation parameter or the site. A site is classified suitable for a wastewater system when all site evaluation parameters are suitable.

(82) "Surface water diversion" means a natural or constructed drainage feature used to divert surface water, collect runoff and direct it to an effective outlet. Surface water diversions include waterways, interceptor drains, foundation drains, swales, and ditches. Surface water diversions are a type of artificial drainage.

(83) "Swales" mean natural or constructed elongated, sloped depressional drainage features used to collect runoff and direct the flow to an effective outlet to prevent surface water convergence downslope. Swales can be used in conjunction with a berm.

(84) "TS-I systems" means advanced pretreatment systems which are approved in accordance with TS-I effluent quality standards in Table XXIV in Rule .1201(a) of this Subchapter.

(85) "TS-II systems" means advanced pretreatment systems which are approved in accordance with TS-II effluent quality standards in Table XXIV in Rule .1201(a) of this Subchapter.

(86) "Third-party" means a person or body engaged in testing or evaluation that may be compensated for their work product that is independent of the parties for whom testing or evaluation is performed and does not otherwise benefit regardless of the outcome. The third-party person or body has knowledge of the subject area based upon relevant training and experience.

(87) "Timed dosing" means a configuration in which a specific volume of effluent is delivered to a component based upon a prescribed interval, regardless of facility water use variation over time.

(88) "Treatment media" means the non- or slowly-degradable media used for physical, chemical, and biological treatment in a wastewater treatment component.

(89) "Trench" means an excavation with a width of three feet or less containing dipsersal media and one or more laterals.

(90) "Unstable slopes" means areas showing indications of mass downslope movement.

(91) "Unsuitable" means classification of a specific site evaluation parameter or the site. A site is classified unsuitable for a wastewater system when any one site evaluation parameter is unsuitable.

(92) "Vertical separation distance" means the vertical measurement from the infiltrative surface to a limiting condition.

(93) "Warming kitchen" means a kitchen which includes only the following appliances: handwashing sink, domestic two compartment sink, heating appliance (microwave, oven, or stove), and a refrigerator.

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

SECTION .0200 – PERMITS

15A NCAC 18E .0201 is proposed for adoption as follows:

15A NCAC 18E .0201 GENERAL

Wastewater system permits issued in accordance with the rules of this Subchapter shall be a three-tier process. Upon receipt from the owner of an application which includes a site plan or plat, the LHD shall perform a soil and site evaluation to determine if the site is suitable or unsuitable in accordance with Section .0500 of this Subchapter. If the site is classified suitable, the LHD shall issue an IP which states that a specific trench type can be installed in a specific location on the site, based on the proposed facility type listed in the application. The LHD shall issue a CA with the design details for the wastewater system. After the wastewater system has been installed, the LHD shall inspect the wastewater system installation and confirm that it meets all the permit requirements. The LHD shall then issue an OP. A PE, LSS, or LG may be needed to perform the soil and site evaluation, geologic or hydrogeologic evaluation, or wastewater system design if required in G.S. 89C, 89E, or 89F.

History Note: Authority G.S. 130A-335;

15A NCAC 18E .0202 is proposed for adoption as follows:

15A NCAC 18E .0202 APPLICATION

(a) Any person owning or controlling a facility containing water-using fixtures connected to a water supply source shall discharge all wastewater directly to an approved wastewater system permitted for that specific use.

(b) An application for an IP, CA, and existing system authorization shall be submitted to the LHD for each site prior to the construction, location, or relocation of a residence, place of business, or place of public assembly.

(c) A complete application for an IP, CA, or existing system authorization shall expire 12 months from the date of application.

(d) When an IP, CA, or existing system authorization expires or is revoked a new application shall be required prior to evaluation for a new IP, CA, or existing system authorization.

(e) The application for an IP shall contain the following information:

(1) owner's name, mailing address, and phone number;

(2) type of permit requested:

(A) new;

(B) change of use;

(C) expansion or increase in design daily flow; or

(D) wastewater system relocation;

(3) site plan or plat indicating the locations of the following:

(A) existing and proposed facilities, structures, appurtenances, and wastewater systems;

(B) site for the proposed wastewater system showing setbacks to property line(s) or other fixed reference point(s);

(C) existing and proposed vehicular traffic areas;

(D) existing and proposed water supplies, wells, springs, and water lines; and

(E) all existing and proposed artificial drainage;

(4) designation of the permit requested: five-year expiration (with site plan) or non-expiring (with plat);

(5) location, Parcel Identification Number or other property identification, 911 address (if known), acreage, and general directions to the property;

(6) description of existing and proposed facilities and wastewater systems;

(7) information needed to determine design daily flow and effluent strength of the facility(s) served including number and function of individual design units, number of bedrooms, or number of occupants;

(8) notification if the property contains any of the following, when applicable:

(A) previously identified jurisdictional wetlands;

(B) existing or proposed easements, rights-of-way, encroachments, or other areas subject to legal restrictions; and

(C) site is subject to approval by other public agencies, such as the Coastal Area Management Act, U.S. Army Corp of Engineers, etc.; and

(9) signature of owner.

(f) The application for a CA shall contain:

(1) the information required in Paragraph (e) of this Rule;

(2) identification of the proposed use of a garbage disposal, grinder pump, or sewage pump; and

(3) the proposed wastewater system type in accordance with Table XXXI of Rule .1301 of this Subchapter specified by the owner.

(g) The application for an existing system authorization shall contain:

(1) the owner's name, mailing address, and phone number;

(2) a site plan or plat indicating the locations of the existing and proposed facilities, existing wastewater systems, existing and proposed water supplies, easements, rights-of-way, encroachments, artificial drainage, and all appurtenances;

(3) location, Parcel Identification Number, other property identification, 911 address (if known), acreage, and directions to the property;

(4) for reconnections, information needed to determine design daily flow of the facility served including number and function of individual design units, number of bedrooms, or number of occupants; and

(5) signature of owner.

(h) The application shall state that submittal of a signed application constitutes right of entry to the property.

History Note: Authority G.S. 130A-335; 130A-336; 130A-337; 130A-338;

15A NCAC 18E .0203 is proposed for adoption as follows:

15A NCAC 18E .0203 IMPROVEMENT PERMIT

(a) Upon receipt of a complete application for an IP, an authorized agent shall evaluate the site to determine whether the site is suitable or unsuitable for the installation of a wastewater system in accordance with Section .0500 of this Subchapter. If the site is classified suitable, a IP shall be issued in accordance with this Subchapter. The authorized agent shall prepare dated, written documentation of the soil and site conditions required to be evaluated in Section .0500 of this Subchapter.

(b) When the site is classified suitable an authorized agent shall issue an IP that includes the items contained in G.S. 130A-336(a)(1) through (6) and the following information:

(1) a site plan or plat as defined in G.S. 130A-334 showing the location of the initial wastewater system and repair area including dimensions from two fixed reference points;

(2) all applicable setbacks and requirements in accordance with Section .0600 of this Subchapter;

(3) location(s) of existing and proposed public or private water supplies, including private drinking water wells and springs and associated water lines;

(4) location and description of the facility, structures, vehicular traffic areas, and other proposed improvements;

(5) design daily flow, number of bedrooms, maximum number of occupants or people served, and wastewater strength in accordance with Section .0400 of this Subchapter;

(6) the proposed initial wastewater system and repair system types in accordance with Table XXXI of Rule .1301 of this Subchapter, including LTARs for each system;

(7) required effluent quality standard - DSE, NSF-40, TS-I, or TS-II in accordance with Table III of Rule .0402 and Table XXIV of Rule .1201 of this Subchapter;

(8) easements, rights-of-way, encroachments agreements, as applicable; and

(9) permit conditions, such as site-specific installation requirements, maintenance of the groundwater lowering system, etc.

(c) When the site is classified unsuitable, the IP application shall be denied and a signed, written report shall be provided to the owner describing the unsuitable site characteristics and citing the applicable rule(s). If modifications or alternatives are available to support site reclassification, this information shall be included in the report.

(d) An IP for which a plat is provided shall be valid without expiration. An IP for which a site plan is provided shall be valid for five years from the date of issue.

(e) The IP shall be transferable subject to the conditions set forth in G.S. 130A-336(a).

(f) An IP shall be revoked or suspended if:

(1) the information submitted in the application is found to be false, incorrect, or altered;

(2) the site is altered and the permitted system cannot be installed or operated as permitted;

(3) conditions of the IP or the rules of this Subchapter cannot be met; or

(4) a new application for an IP is filed for the same design unit on the same property.

(g) An IP shall be applicable to both initial and repair dispersal field areas identified and approved on the IP.

History Note: *Authority G.S. 130A-335; 130A-336*

15A NCAC 18E .0204 is proposed for adoption as follows:

15A NCAC 18E .0204 CONSTRUCTION AUTHORIZATION

(a) The owner shall obtain a CA after an IP has been issued and prior to the construction, location, or relocation of a facility or the construction or repair of a wastewater system.

(b) Conditions of an IP shall be completed prior to the issuance of a CA. A CA shall be issued by an authorized agent for wastewater system installation when it is found that the IP conditions and rules of this Subchapter are met.

(c) The CA shall contain the following:

(1) all information required in Rule .0203(b) of this Section;

(2) the initial wastewater system type and layout, location of all initial wastewater system components, and design details and specifications for the following, as applicable;

(A) tanks;

(B) collection sewers;

(C) pump requirements;

(D) advanced pretreatment;

(E) distribution devices; and

(F) trench widths, lengths, and depth on the downslope side of the trench;

(3) if a Management Entity is required and the minimum operation and maintenance requirements in accordance with Section .1300 of this Subchapter; and

(4) permit conditions, such as site-specific installation requirements, maintenance of the groundwater lowering system, etc.

(d) A CA shall be issued for each wastewater system serving a facility. Separate CAs may be issued for individual components. A building permit shall not be issued until CAs for all wastewater system components serving the facility have been issued.

(e) Prior to the issuance of a CA for a system where all or part of the system will be under common or joint control, a draft multi-party agreement between the developer and an incorporated owners' association shall be submitted to the LHD for approval. The draft multi-party agreement shall include and address the following, as applicable:

(1) ownership;

(2) transfer of ownership;

(3) maintenance;

(4) operation;

(5) wastewater system repairs; and

(6) designation of fiscal responsibility for the continued satisfactory performance of the wastewater system and repair or replacement of collection, treatment, dispersal, and other components.

(f) Systems or components under common or joint control include the following:

(1) wastewater system serving a condominium or other multiple-ownership development; or

(2) off-site system.

(g) The CA shall be valid for a period equal to the period of validity of the IP.

(h) The CA shall be transferable subject to the conditions set forth in G.S. 130A-336(a).

(i) A CA shall be revoked or suspended if:

(1) the information submitted in the application is found to be false, incorrect, or altered;

(2) the site is altered and the permitted system cannot be installed or operated as permitted;

(3) conditions of the CA or the rules of this Subchapter cannot be met; or

(4) a new application for an CA is filed for the same design unit on the same property.

(j) Upon written request of the owner, revised CAs shall be issued for sites where the CA is greater than five years old and current technology can be expected to improve the wastewater system performance.

History Note: Authority G.S. 130A-335; 130A-336; 130A-338

15A NCAC 18E .0205 is proposed for adoption as follows:

15A NCAC 18E .0205 OPERATION PERMIT

(a) The owner shall obtain an OP after the wastewater system has been installed and the authorized agent has inspected the system prior to the system being covered and determined that the system has been installed in accordance with this Subchapter and any conditions of the IP, CA.

(b) If the wastewater system has been permitted in accordance with G.S. 130A-336.1 and Rule .0207 of the Section, an ATO shall be issued by the authorized agent

(c) The OP shall include:

(1) the initial system and designated repair system type in accordance with Table XXXI of Rule .1301 of this Subchapter and the system code assigned under Rule .1713(9) of this Subchapter;

(2) facility description including design daily flow, number of bedrooms, maximum number of occupants or people served, and wastewater strength;

(3) a site plan or plat showing the location of the proposed or existing facility, the entire wastewater system as installed from two fixed reference points, including the location and dimensions of the repair area;

(4) dispersal field design including trench or bed length, width, depth, and location;

(5) the tank(s) location, capacity, and ID numbers;

(6) groundwater monitoring well locations, sampling frequency, and characteristics sampled, as applicable;

(7) conditions for system performance, operation, monitoring, influent and effluent sampling requirements, and reporting, including the requirement for a contract with a Management Entity, as applicable; and

(8) approved engineered plans and specifications if required in Rule .0303(b) of this Subchapter.

(d) Prior to the issuance of an OP for a system requiring a multi-party agreement, the multi-party agreement shall be executed between the developer and an incorporated owners' association and filed with the local register of deeds.

(e) When a wastewater system is designed by an authorized designer or PE, the information in Rule .0303(e) of this Subchapter shall be provided to the authorized agent prior to issuance of the OP.

(f) When an authorized agent determines that the system installation does not meet the rules of this Subchapter and conditions described in the IP and CA, corrections shall be made to bring the system into compliance with this Subchapter. If corrections cannot be made, an authorized agent shall not issue an OP and the system shall not be placed into use. The authorized agent making the determination shall prepare a written report referencing deficiencies in the system installation, citing the applicable rule(s) and IP and CA conditions, and include a letter of Intent to Revoke the IP and CA. A copy of the report shall be provided to the owner and the installer.

(g) An OP shall be valid and remain in effect for a system provided:

(1) wastewater strength and design daily flow remain unchanged;

(2) the system is operated and maintained in accordance the G.S. 130A, Article 11, and this Subchapter;

(3) no malfunction is found as defined in Rule .1303(a)(1) and (2) of this Subchapter;

(4) the system has not been abandoned in accordance with Rule .1307 of this Subchapter;

(5) the system complies with the condition(s) of the OP; and

(6) OP has not expired or been revoked.

(h) For a Type V or VI system as specified in Table XXXI of Rule .1301 of this Subchapter, the OP shall expire five years after being issued.

(i) At the compliance inspection frequency specified in Table XXXI of Rule .1301 of this Subchapter, an authorized agent shall determine whether a system complies with the conditions of the OP, this Subchapter, and G.S. 130A, Article 11.

(j) An authorized agent may modify, suspend, or revoke the OP or seek other remedies under G.S. 130A, Article 2, if it is determined that the system is not being operated and maintained as specified in G.S. 130A, Article 11, this Subchapter, and all conditions imposed by the OP.

(k) When an OP expires or is revoked a new application shall be required prior to evaluation for a new IP, CA, OP, or existing system authorization.

(l) All documentation related to a wastewater system shall be maintained in the county where the permit is issued.

History Note: Authority G.S. 130A-335; 130A-337;

15A NCAC 18E .0206 is proposed for adoption as follows:

15A NCAC 18E .0206 EXISTING SYSTEM APPROVALS FOR RECONNECTIONS AND PROPERTY ADDITIONS

(a) Approval by an authorized agent shall be issued prior to any of the following:

(1) a facility being reconnected to an existing system;

(2) reuse of an existing system; or

(3) other site modifications as described in Paragraph (c) of this Rule.

(b) Approvals for reconnecting a facility to or resuming use of an existing system which has a valid OP or to which Rule .0102 of this Subchapter applies, shall be issued upon determination of the following:

(1) the site complies with its OP or Rule .0102 of this Subchapter;

(2) there is no evidence or documentation of a current or past uncorrected malfunction of the system as described in Rule .1303(a)(1) and (2) of this Subchapter;

(3) the design daily flow and wastewater strength for the proposed facility do not exceed that of the existing system;

(4) the facility meets required setbacks; and

(5) the existing system is being operated and maintained as specified in G.S. 130A, Article 11, this Subchapter, and permit conditions.

(c) Prior to construction, relocation of a structure, the expansion of an existing facility's footprint, or other site modifications which do not increase design flow or change wastewater strength and require the issuance of a building permit, an authorization shall be issued upon determination of the compliance of the proposed structure with setback requirements in Section .0600 of this Subchapter.

(d) For authorizations issued in accordance with this Rule the authorized agent shall provide written documentation to the owner that describes the site modification, system use and design flow, number of bedrooms, number of occupants and includes a site plan showing the location, dimensions, and setbacks of existing and proposed structures to the existing system and repair area.

History Note: *Authority G.S. 130A-335; 130A-337(c) and (d);*

15A NCAC 18E .0207 is proposed for adoption as follows:

15A NCAC 18E .0207 ENGINEER OPTION PERMIT

(a) An owner choosing to use an EOP for wastewater systems in accordance with G.S. 130A-336.1 shall employ the services of a PE to prepare signed and sealed drawings, specifications, plans, and reports for the design, construction, operation, and maintenance of the wastewater system.

(b) Prior to the submittal of an NOI for an EOP system as required by G.S. 130A-336.1(b), an LSS shall conduct soil and site evaluations and, as applicable, an LG shall evaluate geologic and hydrogeologic conditions. These evaluations shall be in accordance with the rules of this Subchapter.

(c) The NOI for an EOP System shall be submitted by the owner or a PE to the LHD in the county where the facility is located. The NOI shall be submitted on the common form provided by the State. The common form is available by accessing the State's website at http://ehs.ncpublichealth.com/rules.htm#oswprules. It shall include all the information specified in G.S. 130A-336.1(b) and the following:

(1) the LSS's, LG's, and installer's name, license number, address, e-mail address, and telephone number;

(2) information required in Rule .0201 of this Subchapter for IP and CA applications;

(3) identification and location on the site plan of existing or proposed potable water supplies, geothermal heating and cooling wells, and groundwater monitoring wells for the proposed site. The PE shall reference any existing permit issued for a private drinking water supply, public water supply, or a wastewater system on both the subject and adjoining properties to provide documentation of compliance with setback requirements in Section .0600 of this Subchapter; and

(4) proof of insurance for the PE, LSS, LG, and installer, as applicable.

(d) The PE design shall incorporate findings on soil and site conditions, limitations, site modifications, and geologic and hydrogeologic conditions specified by the LSS or LG, as applicable, and in accordance with G.S. 130A-336.1(k)(1). When the PE chooses to employ pretreatment technologies not approved in this State, the engineering report shall specify the proposed technology and the associated siting, installation, operation, maintenance, and monitoring requirements, including written manufacturers endorsement of the proposed use.

(e) No building permit for construction, location, or relocation shall be issued until after a decision of completeness of the NOI is made by the LHD, or the LHD fails to act within 15 business days.

(f) If the owner chooses to increase the design daily flow or change the wastewater strength discharging to the wastewater system prior to construction, a new NOI shall be submitted to the LHD. The owner shall request in writing that the PE invalidate the prior NOI with a signed and sealed letter sent to the owner and LHD.

(g) Construction of the wastewater system shall not commence until the system design plans and specifications have been provided to the installer and the signed and dated statement by the installer is provided to the owner. The owner shall be responsible for preventing modifications or alterations of the site for the wastewater system or the system repair area due to any construction activities for the facility before or after construction of the wastewater system, unless approved by the PE, LSS, or LG, as applicable.

(h) Prior to providing written confirmation for the ATO, the PE shall submit the following to the LHD:

(1) documentation that all reporting requirements identified in G.S. 130A-336.1(l) have been met;

(2) information set forth in Rule .0301(d) of this Subchapter;

(3) system start-up documentation, including applicable baseline operating parameters for all components;

(4) documentation by the owner that all necessary legal agreements, including easements, encroachments, multi-party agreements, and other documents have been prepared, executed, and recorded in accordance with Rule .0301(b) and (c) of this Subchapter; and

(5) record drawings.

The LHD shall use the common form for written confirmation.

(i) The owner of the wastewater system approved in accordance with the EOP shall be responsible for maintaining the wastewater system in accordance with the written operation and management program required in G.S. 130A-336.1(i)(1) and Section .1300 of this Subchapter.

(j) For repair of a malfunctioning EOP system, this Rule shall be followed in conjunction with Rule .1306 of this Subchapter. The Management Entity shall notify the LHD within 48 hours of the system malfunction.

(k) The owner of an EOP system who wishes to change the use of the facility shall contact the PE, LSS, LG, and installer, as applicable, to determine whether the current system would continue to meet the requirements of the rules of this Section for the proposed change of use. The PE, LSS, LG, or installer shall determine what, if any, modifications shall be necessary for the wastewater system to continue to meet the requirements of the rules of this Section following the proposed change of use. A NOI reflecting the change of use and any required modifications to the system shall be submitted to the LHD and follow the EOP permitting process.

(l) The LHD is responsible for the following activities related to the EOP system:

(1) file all EOP documentation consistent with current permit filing procedures at the LHD;

(2) submit a copy to the State of the NOI common form and written confirmation of ATO;

(3) review the performance and operation reports submitted in accordance with Rule .1305(c) and Table XXXI of Rule .1301 of this Subchapter;

(4) perform on-site compliance inspections of the wastewater system in accordance with Rule .1305(d) and Table XXXI of Rule .1301 of this Subchapter;

(5) investigate complaints regarding EOP systems;

(6) issue a NOV for systems determined to be malfunctioning in accordance with Rule .1303(a)(1) and (2) of this Subchapter. The LHD shall direct the owner to contact the PE, LSS, LG, and installer, as applicable, for determination of the reason of the malfunction and development of a NOI for repairs; and

(7) require an owner receiving a NOV to pump and haul sewage in accordance with Rule .1306 of this Subchapter.

(m) The Owner may contract with another licensed professional to complete an EOP project. A revised NOI shall be submitted to the LHD.

(n) Nothing in this Rule shall be construed as allowing any licensed professional to provide services for which he or she has neither the educational background, expertise, or license to perform, or is beyond his or her scope of work as provided for in accordance with G.S. 130A-336.1 and the applicable statues for their respective professions.

History Note: *Authority G.S. 130A-335; 130A-336.1;*

SECTION .0300 – RESPONSIBILITIES

15A NCAC 18E .0301 is proposed for adoption as follows:

15A NCAC 18E .0301 OWNERS

(a) The owner shall:

(1) apply in accordance with Section .0200 of this Subchapter;

(2) comply with the laws, this Subchapter, and permit conditions regarding wastewater system location, including repair area;

(3) identify property lines and fixed reference points in the field prior to the LHD site evaluation;

(4) make the site accessible for the site evaluation described in Rule .0501 of this Subchapter;

(5) field stake the proposed facility location and all associated appurtenances (such as vehicular traffic areas, garage, swimming pool, shed, entryways, decks, etc.);

(6) excavate pits with adequate ingress and egress when necessary for a soil and site evaluation at the site as determined by the LHD or the State in accordance with Rule .0501 of this Subchapter;

(7) provide for system operation, maintenance, monitoring, and reporting, including access for system maintenance;

(8) maintain artificial drainage systems;

(9) prevent encroachment on the initial wastewater system and repair area by utilities, structures, vehicular traffic areas, etc.;

(10) provide necessary records of title to the LHD when seeking an exemption for a lot or tract of land from the minimum setback requirements in Rule .0601(a) of this Subchapter; and

(11) repair a malfunctioning system as necessary in accordance with this Subchapter.

(b) The entire initial wastewater system and repair area shall be on property owned or controlled by the person owning or controlling the system. An easement or encroachment agreement shall be required for the permitting of the following wastewater system installations:

(1) common area with other wastewater systems;

(2) area with multiple or third-party ownership or control;

(3) proposed off-site area; or

(4) system and the facility are located on different lots or tracts of land and cross a property line or right-of-way.

(c) Necessary easements, rights-of-way, or encroachment agreements, as applicable, shall be obtained prior to the issuance of an IP. Terms of the easement, right-of-way, or encroachment agreement shall provide that the easement, right-of-way, or encroachment agreement meets the following criteria:

(1) appurtenant to described property, runs with the land, and is not affected by change of ownership or control;

(2) valid for as long as the wastewater system is required for the facility that it is designed to serve;

(3) describes and specifies the uses being granted and shall include ingress, egress, and regress, system installation, operation, maintenance, monitoring, repairs, and any other activity required to remain in compliance with this Subchapter including that the easement, right-of-way, or encroachment remain free of structures, landscaping, or any other activities that would interfere with the use of the easement or encroachment for its intended purpose;

(4) specified in a deed by metes and bounds description and attached survey map, the area or site required for the wastewater system and repair area, including collection sewers, tankage or raw sewage lift stations, distribution devices, and dispersal fields; and

(5) shall be recorded with the register of deeds in the county (or counties) where the system and facility are located.

(d) Prior to OP issuance for a system required to be designed by an authorized designer or PE, the owner shall submit to the LHD a statement signed by the authorized designer or PE specifying that the system has been installed in accordance with the permitted design. For systems designed by a PE, the statement shall be affixed with the PE seal.

History Note: Authority G.S. 130A-335;

15A NCAC 18E .0302 is proposed for adoption as follows:

15A NCAC 18E .0302 LOCAL HEALTH DEPARTMENT AND STATE

(a) The permitting of a wastewater system shall be the responsibility of agents authorized by the State in accordance with G.S. 130A, Article 4 and 15A NCAC O10 .0100, and registered with the North Carolina State Board of Environmental Health Specialist Examiners, as required in G.S. 90A, Article 4, unless the permit is issued in accordance with G.S. 130A-336.1.

(b) When the wastewater system crosses county lines or the facility is in one county and the wastewater system is in another county, the LHD in the county that assesses property taxes on the facility shall implement the requirements of this Subchapter.

(c) The State shall review and approve the wastewater system design layout, including plans and specifications for all wastewater systems, which serve a facility with a design daily flow greater than 3,000 gpd, as determined in Section .0400 of this Subchapter. The State shall also review and approve plans and specifications for the following:

(1) IPWW systems required by this Section to be designed by a PE unless the wastewater has been determined to not be IPWW in accordance with Rule .0303(b)(13) of this Section;

(2) advanced pretreatment or drip dispersal systems not previously approved by the State; and

(3) any other system so specified by the authorized agent.

(d) State review is not required when the design daily flow for the facility is greater than 3,000 gpd as determined in Section .0400 of this Subchapter and all the following are met:

(1) individual ground absorption system(s) serving individual design units with a design daily flow less than or equal to 1,500 gpd;

(2) initial and repair dispersal fields for each individual ground absorption system(s) are 20 feet from any other individual wastewater system;

(3) total design daily flow for all ground absorption system(s) on a lot or tract of land is less than 1,500 gpd per acre.

(e) State review is not required when a PE calculates the proposed design daily flow to be less than or equal to 3,000 gpd based on engineering design utilizing low-flow fixtures and low-flow technologies in accordance with Rule .0403(e) of this Subchapter. In accordance with S.L. 2013-413 and S.L. 2014-120, neither the State nor any LHD shall be liable for a system approved or permitted in accordance with this Paragraph.

(f) For systems that require State review and approval, an IP shall not be issued by the LHD until the site plan or plat and system layout, including details for any proposed site modifications, are approved by the State. A CA shall not be issued by the LHD until plans and specifications, submitted in accordance with Rule .0304 of this Section, are approved by the State.

(g) The State will provide technical assistance to the LHD as may be needed for interpretation of this Subchapter, in accordance with the recognized principles and practices of soil science, geology, engineering, and public health.

History Note: Authority G.S. 130A-335;

15A NCAC 18E .0303 is proposed for adoption as follows:

15A NCAC 18E .0303 LICENSED OR CERTIFIED PROFESSIONALS

(a) Prior to the issuance of an IP or CA, plans and specifications shall be required by the authorized agent where there is a limiting condition and a groundwater lowering system is required. These plans and specifications shall be prepared by a person or persons who are licensed or registered to consult, investigate, evaluate, plan, or design wastewater

systems, soil and rock characteristics, groundwater hydrology, or artificial drainage systems if required in G.S. 89C, 89E or 89F.

(b) Any wastewater system which meets one or more of the following conditions shall be designed by a PE if required in G.S. 89C and plans and specifications shall comply with Rule .0304 of this Section:

(1) the system has a design daily flow greater than 3,000 gpd, as determined in Section .0400 of this Subchapter, except where the system is limited to an individual wastewater system serving an individual dwelling unit or multiple individual wastewater systems, each serving an individual dwelling unit;

(2) the system requires advanced pretreatment or drip dispersal other than a system approved under Sections .1500, .1600, or .1700 of this Subchapter;

(3) the system requires pumping more than 1,000 feet horizontally;

(4) elevation head is greater than 100 feet;

(5) the system requires pumping downhill to a pressure dosed gravity or pressure dispersal field where the volume of the supply line that could drain to the dispersal field between doses exceeds 25 percent of the required dose volume;

(6) the pump system has one intermediate high point greater than five feet relative elevation;

(7) the system includes a pressure sewer receiving effluent from two or more pump tanks;

(8) an adjusted design daily flow is proposed based on the use of low-flow fixtures or low-flow technologies in accordance with Rule .0403(e) of this Subchapter;

(9) the system requires use of sewage pumps prior to the septic tank or other treatment system, except for systems subject to the North Carolina Plumbing Code or which consist of grinder pumps and associated pump basins that are approved and listed in accordance with standards adopted by NSF International;

(10) an individual system uses more than one pump or siphon in a single pump tank;

(11) the system includes a collection sewer prior to the septic tank or other treatment system serving two or more buildings, except for systems subject to the North Carolina Plumbing Code;

(12) the system includes structures which have not been pre-engineered;

(13) the system is designed for the collection, treatment, and dispersal of IPWW, except under the following circumstances:

(A) the State has determined that the wastewater generated by the proposed facility has a pollutant strength which is lower than or equal to domestic wastewater and does not require specialized treatment or management; or

(B) the State has pre-approved a predesigned treatment system or process and management method proposed by the facility owner which shall enable the IPWW to have a pollutant strength which is lower than or equal to domestic wastewater;

(14) any wastewater system designed by a licensed professional that has been determined to be within the practice of engineering in accordance with G.S. 89C-3(6) by the North Carolina Board of Examiners for Engineers and Surveyors;

(15) any wastewater system approved in accordance with Sections .1500, .1600, and .1700 of this Subchapter that requires in the RWTS or PIA approval that the system be designed by a PE; and

(16) any other system so specified by the LHD.

(c) An installer shall construct, install, or repair wastewater systems as required by G.S. 90A, Article 5. The installer shall be responsible for the following:

(1) certification at the appropriate Level according to the system design specifications as required by G.S. 90A-72;

(2) notification to the LHD upon completion of the system installation or each stage requiring inspection as conditioned on a CA;

(3) participation in a preconstruction conference when specified in the CA or by the RWTS or PIA approval;

(4) participation during the inspection of the wastewater system by the authorized agent;

(5) participation during the post-construction conference when the wastewater system is permitted in accordance with Rule .0207 of this Subchapter; and

(6) final cover of the system after LHD approval. The wastewater system shall be in the same condition when covered as when approved.

(d) Nothing in this Rule shall be construed as allowing any licensed professional to provide services for which he or she has neither the educational background, expertise, or license to perform, or is beyond his or her scope of work and the applicable statues for their respective professions.

(e) The PE or authorized designer shall provide a written statement to the owner specifying that construction is complete and in accordance with approved plans, specifications, and modifications. This statement is based on periodic observations of construction and a final inspection for design compliance.

History Note: Authority G.S. 89C; 89E; 89F; 90A; 130A-335;

15A NCAC 18E .0304 is proposed for adoption as follows:

15A NCAC 18E .0304 SUBMITTAL REQUIREMENTS FOR PLANS, SPECIFICATIONS, AND REPORTS PREPARED BY LICENSED PROFESSIONALS FOR SYSTEMS OVER 3,000 GALLONS/DAY

(a) Plans and specifications required to be prepared by a LSS, PE, or other North Carolina licensed professional shall contain the information necessary for construction of the wastewater system in accordance with G.S. 130A, Article 11, and this Subchapter, and shall include the information in Paragraphs (b) through (d) of this Rule, and any other information, determined to be applicable by the LHD or the State.

(b) Applicant information and design daily flow determination:

(1) the seal, signature, and the date on all plans, specifications, and reports prepared by the PE, LSS, and any other licensed or registered professionals who contributed to the plans, specifications, or reports;

(2) name, address, and phone number for owner and all consultants; and

(3) design daily flow and projected wastewater strength based on the application submitted to the LHD that includes calculations and the basis for the proposed design daily flow and wastewater strength.

(c) Special Site Evaluation including soil and site evaluation, hydraulic and hydrologic assessment reports, and site plans:

(1) soil and site evaluation report, written by the LSS, on the field evaluation of the soil conditions and site features within the proposed initial and repair dispersal field areas including the following:

(A) vertical soil profile descriptions for pits and soil borings in accordance with Section .0500 of this Subchapter;

(B) recommended LTAR, system type, trench width, length, depth on downslope side of trench for proposed initial and repair dispersal field areas with justification;

(C) soil and site based criteria for dispersal field design and site modifications;

(D) for sites originally classified unsuitable, written documentation indicating that the proposed system can be expected to function in accordance with Rule .0509(e) of this Subchapter; and

(E) recommended effluent quality standard for proposed initial and repair dispersal field areas with justification; and

(2) hydraulic assessment reports on site-specific field information which shall include, as applicable:

(A) in-situ Ksat measurements at the proposed infiltrative surface elevation and at every distinct horizon within and beneath the treatment zone;

(B) logs from deep borings identifying restrictive layers, changes in texture and density, and aquifer boundaries;

(C) groundwater mounding analysis (level sites) or lateral flow analysis (sloping sites) in accordance with Rule .0510(d) of this Subchapter; and

(D) contaminant transport assessment showing projected compliance with groundwater standards at property lines or at the required setback from water supply sources within the property; and

(3) site evaluation plan showing:

(A) site topography;

(B) proposed site modifications;

(C) location of existing and proposed site features listed in Rule .0601 of this Subchapter;

(D) proposed facility location;

(E) location and proposed initial and repair dispersal field area and type; and

(F) location of LSS soil pits, hand auger borings, deep borings, and in-situ Ksat tests as

appropriate; and

(4) site plan prepared by the PE based on a boundary survey prepared by a registered land surveyor with the information listed in Subparagraph (3) of this Rule and the following:

(A) existing and proposed public wells or water supply sources on the property or within 500 feet of any proposed initial and repair dispersal field areas;

(B) existing and proposed private wells or water supply sources within 200 feet of existing or proposed system component locations;

(C) other existing and proposed wells, existing and proposed water lines (including fire protection, irrigation, etc.) within the property boundaries and within 10 feet of any projected system component;

(D) surface waters with water quality classification, jurisdictional wetlands, and existing and proposed stormwater management drainage features and groundwater drainage systems;

(E) topographic map with two-foot contour intervals (or spot elevations when there is less than a two-foot elevation difference across the site) identifying areas evaluated for initial and repair dispersal field areas, proposed location of trenches, and pits and soil borings labeled to facilitate field identification;

(F) location of tanks and advanced pretreatment components, including means of access for pumping and maintenance; and

(G) any site modifications and site and slope stabilization plans.

(d) System components design, installation, operation, and maintenance information:

(1) collection systems and sewers:

(A) plan and profile drawings, including location, pipe diameter, invert and ground surface elevations of manholes and cleanouts;

(B) proximity to utilities and pertinent features;

(C) drawings of service connections, manholes, cleanouts, valves and other appurtenances, aerial crossings, road crossings, water lines, stormwater management drainage features, streams, or ditches; and

(D) installation and testing procedures and pass or fail criteria; and

(2) tank information:

(A) plan and profile drawings of all tanks, including tank dimensions and all elevations;

(B) access riser, manhole, chamber interconnection, effluent filter, and inlet and outlet details;

(C) construction details for built-in-place tanks, including dimensions, reinforcement details and calculations, and construction methods;

(D) identification number for State approved tanks;

(E) installation criteria and water tightness testing procedures with pass or fail criteria; and

(F) anti-buoyancy calculations and provisions; and

(3) pump stations, including raw sewage lift stations and effluent pump tanks:

(A) information required in Subparagraph (d)(2) of this Rule;

(B) specifications for pumps, discharge piping, pump removal system, and all related appurtenances;

(C) system total dynamic head calculations, pump specifications, pump curves and expected operating conditions (dosing, flushing, etc.);

(D) control panel, float switches and settings, and high-water alarm components, location, and operational description under normal and high-water conditions;

(E) emergency storage capacity calculations, timer control settings, and provisions for stand-by power; and

(F) lighting, wash-down water supply with back siphon protection and protective fencing; and

(4) advanced pretreatment systems:

(A) information required in Subparagraphs (d)(2) and (3) of this Rule;

(B) drawings and details showing all advanced pretreatment units and appurtenances (pumps, valves, vents, removal systems, floats, etc.), piping (size and type), disinfection unit, blowers if needed, location of control panels, height of control panels, etc; and

(C) documentation from the manufacturer supporting the proposed design and use of the advanced pretreatment system to achieve specified effluent quality standards if not otherwise approved by the State in accordance with Section .1700 of this Subchapter; and

(5) dispersal field plans and specifications with design and construction details:

(A) final field layout, including ground elevations based on field measurements at a maximum of two-foot intervals (or spot elevations when there is less than a two-foot elevation difference across the site);

(B) trench plan and profile drawings, including cross sectional details, length, spacing, connection, clean out, etc., and invert elevations for each lateral;

(C) manifolds, supply lines, pipe sizes, cleanouts and interconnection details and invert elevations;

(D) flow distribution device design;

(E) artificial drainage system locations, elevations, discharge points and design details;

(F) site preparation procedures;

(G) construction and system testing phasing; and

(H) final landscaping and compliance with erosion control requirements; and

(6) materials specification for all materials to be used, methods of construction, means for assuring the quality and integrity of the finished product; and

(7) operation and maintenance procedures for the Management Entity, inspection schedules, and maintenance specifications for mechanical components and dispersal field vegetative cover.

History Note: *Authority G.S. 130A-335;*

15A NCAC 18E .0305 is proposed for adoption as follows:

15A NCAC 18E .0305 SUBMITTAL REQUIREMENTS FOR PLANS, SPECIFICATIONS, AND REPORTS PREPARED BY LICENSED PROFESSIONALS FOR SYSTEMS LESS THAN OR EQUAL TO 3,000 GALLONS/DAY

Wastewater systems with a design daily flow less than or equal to 3,000 gpd that are required to be prepared by a LSS, PE, or other North Carolina licensed professional shall include the following information in the plans and specifications:

(1) Rule .0304(b) of this Section;

(2) Rules .0304(c)(1) through (c)(3) of this Section for Special Site Evaluations and submittals prepared under Rule .0510 of this Subchapter; and

(3) Rule .0304(d) of this Section for advanced pretreatment and IPWW.

History Note: Authority G.S. 89C; 89E; 89F; 130A-335;

SECTION .0400 DESIGN DAILY FLOW AND EFFLUENT CHARACTERISTICS

15A NCAC 18E .0401 is proposed for adoption as follows:

15A NCAC 18E .0401 DESIGN DAILY FLOW

(a) The minimum design daily flow for dwelling units shall be based on:

(1) 120 gpd per bedroom with a minimum of 240 gpd per dwelling unit;

(2) 60 gpd per person when occupancy exceeds two persons per bedroom; or

(3) greater of Subparagraphs (1) or (2) of this Paragraph.

(b) The minimum design daily flow for dwelling units with one bedroom, no more than two occupants, and 400 square feet of living space or less is 175 gpd.

(c) Table II shall be used to determine design daily flows for facilities other than dwelling units.

(d) The minimum design daily flow from any facility other than a dwelling unit shall be 100 gpd. For facilities with multiple design units, the minimum design daily flow shall be 100 gpd per design unit. The design daily flow of the facility is the sum of all design unit flows.

(e) Design of wastewater systems for facilities not identified in this Rule shall be determined using available water use data, capacity of water-using fixtures, occupancy or operation patterns, and other measured data from the facility itself or a comparable one.

(f) Unless otherwise noted in Table II, the design daily flow for laundry facilities is not included. Where laundry is not specified for a facility in Table II, but is proposed to be provided, the design daily flow shall be adjusted to account

for the proposed usage and machine water capacity. Applicant shall provide cut-sheets for laundry machines proposed for use in facilities.

(g) HVAC unit or ice machine condensate, gutter or sump pump discharge, or similar incidental flows shall not discharge to the wastewater system.

(h) Unless otherwise noted in Table II, the design daily flow per unit includes employees.

(i) Food service facilities and other facilities that are projected to generate wastewater with constituent levels greater than domestic strength, as defined in Rule .0402 of this Section, are identified in Table II. Any facility which has a food service component that contributes 50 percent of the design daily flow shall be considered to generate high strength wastewater. Determination of wastewater strength is based on projected or measured levels of one or more of the following: BOD, TSS, FOG, or TN. Table III identifies the constituent limits for DSE. Excess concentrations of other constituents may result in a high strength wastewater classification on a site-specific basis.

TABLE II. Design daily flow for Facilities

Facility type	**Design daily flow**
Commercial	
Airport, railroad stations, bus, and ferry terminals, etc.	5 gal/traveler, food preparation not included
Barber shops	50 gal/chair
Bars, cocktail lounges*	20 gal/seat, food preparation not included
Beauty shops, style shops, hair salons	125 gal/chair, booth, or bowl
Bed and breakfast homes and inns	Dwelling unit design daily flow based on Paragraph (a) of this Rule plus 120 gal/rented room which includes the following: Meals served to overnight guests Laundry for linens 150 gal/room with cooking facilities in individual rooms
Event Center*	2 gal/person with toilets and hand sinks; 3 gal/person with addition of a warming kitchen; 5 gal/person with full kitchen
Markets open less than four days/week	30 gal/stall or vendor, food preparation not included
Marinas with no holding tank discharge included	30 gal/boat slip, with bathhouse 10 gal/boat slip, wet slips (slips on dock) 5 gal/boat slip, dry storage (warehouse)
Motels/hotels	120 gal/room includes the following: No cooking facilities in individual rooms No food service or limited food service establishment Laundry for linens

	150 gal/room with cooking facilities in individual rooms
Offices and factories with no IPWW included	12 gal/employee/ ≤ 8 hr shift Add 2 gal/employee/ hour for more than 8 hr shift Add 10 gal/employee for showers
Stores, shopping centers, and malls	100 gal/1,000 ft^2 of retail sales area, food preparation not included
Warehouse (not retails sales warehouses)	100 gal/loading bay, or 12 gal/employee/≤ 8 hr shift Add 2 gal/employee/hr for more than 8 hr shift
Storage warehouse including self-storage facilities and does not include caretaker residence	12 gal/employee/≤ 8 hr shift Add 2 gal/employee/hr for more than 8 hr shift
Alcoholic beverage tasting areas* with no process wastewater included	200 gal/1,000 ft^2 of tasting area floor space, food preparation not included
Camps/Campgrounds	
Summer camps (overnight stay)**	60 gal/person, applied as follows: 15 gal/person/food preparation 20 gal/person/toilet facilities 10 gal/person/bathing facilities 15 gal/person/laundry facilities
Day camps (not inclusive of swimming area bathhouse)**	20 gal/person; and 5 gal/meal served with multi use service; or 3 gal/meal served with single-service articles
Temporary Labor Camp or Migrant Housing Camp (overnight stay)**	60 gal/person, applied as follows: 15 gal/person/food preparation 20 gal/person/toilet facilities 10 gal/person/bathing facilities 15 gal/person/laundry facilities
Travel trailer/RV in an RV park**	120 gal/space
Recreational Park Trailer (Park Model) in an RV park**	175 gal/space
Bathhouse for campsites and RV park sites with no water and sewer hook ups (maximum of four people per campsite)	70 gal/campsite
Food preparation facilities	
Food Establishments with multiuse articles**	25 gal/seat or 25 gal/15 ft^2 of floor space for the following: Open 6 hrs/day or less Add 2.5 gpd/seat for every additional hour open

Food Establishments with single service articles**	20 gal/seat or 20 gal/15 ft^2 of floor space for the following: Open 6 hrs/day or less Add 2.0 gpd/seat for every additional hour open
Food stand with up to eight seats, mobile food units, and commissary kitchens**	50 gal/100 ft^2 of food stand, food unit, or food prep floor space; and 12 gal/employee/≤ 8 hr shift Add 2 gal/employee/hr for more than 8 hr shift
Other food service facilities**	5 gal/meal served with multiuse articles 3 gal/meal served with single service articles
Meat markets/fish markets with no process wastewater included**	50 gal/100 ft^2 of floor space and 12 gal/employee/≤ 8 hr shift Add 2 gal/employee/hr for more than 8 hr shift
Health care and other care institutions	
Hospitals**	300 gal/bed
Rest homes, assisted living homes, and nursing homes**	150 gal/bed with laundry 75 gal/bed without laundry Add 60 gal/resident employee with laundry
Day care facilities	15 gal/person/≤ 12 hr shift with the following: No food preparation Warming kitchen only Single service articles No laundry Add 1 gal/person/hr for more than 12 hr shift
Group homes, drug rehabilitation, mental health, and other care institutions	75 gal/person with laundry
Orphanages	60 gal/student or resident employee with laundry
Public access restrooms	
Convenience store, service station, truck stop**	250 gal/toilet or urinal meeting the following: Open less than 16 hours/day Food preparation not included Retail space not included
	325 gal/toilet or urinal meeting the following: Open 16 to 24 hours/day Food preparation not included Retail space not included
Highway rest areas and visitor centers**	325 gal/toilet or urinal; or 10 gal/parking space, whichever is greater

Recreational facilities	
Bowling center*	50 gal/lane, food preparation not included
Community center, gym*	5 gal/person plus 12 gal/employee/≤ 8 hr shift Add 2 gal/employee/hr for more than 8 hr shift; or 50 gal/100 ft^2, whichever is larger
Country club/golf course*	10 gal/person 12 gal/employee/≤ 8 hr shift Add 2 gal/employee/hr for more than 8 hr shift 3 gal/person for convenience stations Food preparation not included
Fairground	250 gal/toilet or urinal
Fitness center, spas, karate, dance, exercise*	50 gal/100 ft^2 of floor space used by clientele, food preparation not included
Recreational park, State park, county park, and other similar facilities with no sports facilities	10 gal/parking space
Outdoor sports facilities, mini golf, batting cages, driving ranges, motocross, athletic park, ball fields, stadiums*, and other similar facilities	250 gal/toilet or urinal; or 5 gal/seat; or 10 gal/parking space, whichever is greater food preparation not included
Auditorium*, theater*, amphitheater, drive-in theater	2 gal/seat; or 10 gal/parking space, whichever is greater Food preparation not included
Swimming pools and bathhouses	5 gal/person domestic waste only, bathing load of pool as alternative method of sizing
Sports facilities courts or other similar facilities	250 gal/toilet or urinal; or 50 gal/court, whichever is greater
Institutions	
Church	2 gal/seat with no kitchen, school, day care, or camp 3 gal/seat with warming kitchen; no school, day care, or camp 5 gal/seat with full kitchen
Public or private assembly halls used for worship, recreation, regularly scheduled meetings, events, or amusement – building occupancy* (for churches, flow should be in addition to sanctuary flow)	2 gal/person with toilets and hand sinks; 3 gal/person with addition of a warming kitchen; 5 gal/person with full kitchen
Schools	
Day schools**	6 gal/student with no cafeteria or gymnasium 9 gal/student with cafeteria only

	12 gal/student with cafeteria and gymnasium
After school program	5 gal/student in addition to flow for regular school day
Boarding schools	60 gal/student and resident employee with laundry

*Designer may alternately use the maximum building occupancy assigned by the local fire marshal in determining design daily flow.

**Facility has potential to generate high strength wastewater

History Note: Authority G.S. 130A-335(e);

15A NCAC 18E .0402 is proposed for adoption as follows:

15A NCAC 18E .0402 EFFLUENT CHARACTERISTICS

(a) Effluent quality standards are listed in Table III.

Table III. Effluent quality standards for domestic strength effluent

Constituent	**DSE (maximum) mg/L**
BOD	≤ 350
TSS	≤ 200
TN*	≤ 100
FOG	≤ 30

*TN is the sum of TKN, nitrate nitrogen, and nitrite nitrogen

(b) Wastewater systems with an adjusted design daily flow in accordance with Rule .0403 of this Section or a design daily flow greater than or equal to 1,500 gpd, and with projected or measured effluent characteristics that exceed domestic strength as identified in Table III of this Section or otherwise determined by the State, authorized agent, or licensed consultant in accordance with G.S. 89C, G.S. 89E, or G.S. 89F, shall utilize advanced pretreatment to produce DSE prior to dispersal. Alternately, a licensed consultant may justify not using advanced pretreatment by providing the following:

(1) mass loading calculations based on site-specific projected or measured effluent characteristics and water use data. Calculations shall demonstrate that the soil loading rate does not exceed the mass loading rate identified in Table XVI or Table XVII of Rule .0901 or Table XX or Table XXI of Rule .0907 of this Subchapter; and

(2) site-specific nitrogen migration analysis based on projected or measured effluent nitrogen levels. Analysis shall demonstrate that the nitrate-nitrogen concentration at the property line will not exceed 10 mg/L.

History Note: Authority G.S. 130A-335(e);

15A NCAC 18E .0403 is proposed for adoption as follows:

15A NCAC 18E .0403 ADJUSTMENTS TO DESIGN DAILY FLOW

(a) The authorized agent and the State may approve a proposed adjusted design daily flow relative to the values in Table II. The water use information provided to support the proposed adjusted design daily flow shall meet the requirements of Paragraphs (b) or (c) of this Rule.

(b) Documented data from the facility or a comparable facility justifying an adjusted design daily flow and meeting the following criteria:

(1) the submitted data shall consist of 12 consecutive monthly total water consumption readings, and 30 consecutive daily water consumption readings taken during a projected normal or above normal wastewater flow month;

(2) a hydraulic peaking factor shall be derived by dividing the highest monthly flow from the 12 monthly readings by the sum of 30 consecutive daily water consumption readings;

(3) the adjusted design daily flow shall be determined by taking the numerical average of the greatest 10 percent of the daily readings and multiplying that average by the hydraulic peaking factor; and

(4) an alternative method of determining the adjusted design daily flow is to multiply the highest monthly flow from the 12 monthly readings by 1.5 and then divide by the number of days in the month.

(c) Proposed use of extreme water-conserving fixtures shall be based upon the capacity of fixtures and documentation of the amount of flow reduction to be expected from the proposed facility. Cut sheets of the proposed fixtures shall be provided.

(d) The proposed adjusted design daily flow calculations in accordance with Paragraphs (b) or (c) of this Rule shall account for projected increased constituent concentrations in accordance with Rule .0402(b) of this Section.

(e) In accordance with S.L. 2013-413 and S.L. 2014-120, a PE can propose an adjusted design daily flow in accordance with the following:

(1) design daily flows less than those listed in Rule .0401 of this Section that are achieved through engineering design which utilizes low-flow fixtures and low-flow technologies;

(2) comparison of flow from proposed fixtures and technologies to flow from conventional fixtures and technologies;

(3) the signed and sealed proposal shall account for projected increased constituent concentrations resulting from reduction in water use in accordance with Rule .0402(b) of this Section;

(4) proposed adjusted design daily flows for wastewater systems determined to be less than 3,000 gpd shall not require State review in accordance with Rule .0302(e) of this Subchapter unless requested by the LHD; and

(5) neither the State nor any LHD shall be liable for any damages caused by a system approved or permitted in accordance with this Paragraph.

(f) A PE can propose and the State approve an adjusted design daily flow for a facility made up of individual dwelling units when the following criteria are met:

(1) design daily flow calculated in accordance with this Section is greater than 3,000 gpd;

(2) adjusted design daily is based on information in Paragraphs (b) or (c) of this Rule; and

(3) increase in wastewater strength is accounted for in accordance with Paragraph (d) of this Rule.

(g) Adjusted design daily flows based upon use of water-conserving fixtures shall apply only to design capacity requirements of the dosing system and dispersal fields. The design daily flow from Table II shall be used to determine minimum pretreatment component capacities.

History Note: Authority G.S. 130A-335(e);

SECTION .0500 – SOIL AND SITE EVALUATION

15A NCAC 18E .0501 is proposed for adoption as follows:

15A NCAC 18E .0501 SITE EVALUATION

(a) Upon receipt of an application, an authorized agent shall investigate each proposed site to determine if a wastewater system can be installed. The field investigation shall include the evaluation of the following soil and site features with written field descriptions including:

(1) topography, slope, and landscape position;

(2) soil morphology:

(A) horizons;

(B) texture;

(C) structure;

(D) consistence;

(E) color; and

(F) organic soils, as applicable;

(3) soil wetness;

(4) soil depth;

(5) restrictive horizons;

(6) the suitability and LTAR for each profile description; and

(7) available space.

(b) Soil profiles shall be evaluated at the site by borings, pits, or other means of excavation.

(c) Soil profiles shall be evaluated and described to the following depths:

(1) 48 inches from the ground surface; or

(2) to an unsuitable soil condition determined in accordance with this Section.

(d) Owners may be required to dig pits when necessary for evaluation of the site as determined by the authorized agent.

(e) Soil profiles shall be excavated and described to reflect variations in soil and site characteristics across both initial and repair areas.

(f) Site evaluations shall be completed in accordance with this Section. Based on the evaluation of the soil and site features listed in Paragraph (a) of this Rule, each soil profile shall be classified suitable (S) or unsuitable (U).

(g) A limiting condition initially classified unsuitable may be reclassified suitable if the requirements of Rule .0509(c), (d), or (e) of this Section are met.

(h) The authorized agent shall specify the overall site classification and suitability in accordance with Rule .0509 of this Section.

(i) The authorized agent shall specify the LTAR for sites classified suitable in accordance with Rule .0509 of this Section.

History Note: Authority G.S. 130A-335(e);

15A NCAC 18E .0502 is proposed for adoption as follows:

15A NCAC 18E .0502 TOPOGRAPHY AND LANDSCAPE POSITION

(a) Uniform stable slopes less than or equal to 65 percent shall be considered suitable with respect to topography.

(b) Unstable slopes shall be considered unsuitable with respect to topography.

(c) Slopes greater than 65 percent shall be considered unsuitable with respect to topography.

(d) Areas subject to surface water convergence shall be considered unsuitable with respect to topography, unless the surface water can be diverted from the site.

(e) Slope patterns (topography) that prohibit the design, installation, maintenance, monitoring, or repair of the wastewater system shall be considered unsuitable with respect to topography.

(f) Depressions shall be considered unsuitable with respect to landscape position except when, with site modifications, the site complies with the requirements of this Section and is approved by an authorized agent.

(g) A jurisdictional wetland as determined by the U.S. Army Corps of Engineers or DEQ shall be considered unsuitable with respect to landscape position, unless the proposed use is approved in writing by the U.S. Army Corps of Engineers or DEQ.

(h) For all sites, except where a drip dispersal system is proposed, additional required soil depth (slope correction) shall be calculated using the following formula to determine site suitability for soil depth in accordance with Rule .0505 of this Section:

SD = MSD + (TW x S)

Where SD = soil depth required with slope correction (inches)

MSD = minimum soil depth (inches)

TW = actual trench width (inches)

S = percent slope (in decimal form)

History Note: Authority G.S. 130A-335(e);

15A NCAC 18E .0503 is proposed for adoption as follows:

15A NCAC 18E .0503 SOIL MORPHOLOGY

The soil morphology shall be evaluated by an authorized agent in accordance with the following:

(1) Texture – The texture of each soil horizon in a profile shall be classified into four general groups and 12 soil textural classes based upon the relative proportions of sand, silt, and clay sized mineral particles. The soil textural class shall be determined in the field by hand texturing samples of each soil horizon in the soil profile in accordance with the criteria in Guide to Soil Texture by Feel, Journal of Agronomic Education, USDA, NRCS. Table IV identifies the Soil Groups that are suitable with respect to texture.

Table IV. Soil Groups that are suitable with respect to texture

Soil Group	**USDA Soil Textural Class**	
I	Sands	Sand
		Loamy Sand
II	Coarse Loams	Sandy Loam
		Loam
III	Fine Loams	Silt
		Silt Loam
		Sandy Clay Loam
		Clay Loam
		Silty Clay Loam
IV	Clays	Sandy Clay
		Silty Clay
		Clay

In place of field testing, the LHD or the State may substitute laboratory determination of the soil textural class when conducted in accordance with ASTM D6913 and D7928.

(2) Structure – Soil structure shall be determined in the field for each soil horizon in the soil profile and shall be classified granular, blocky, platy, prismatic, and absence of structure and suitability determined based on Table V. If an authorized agent determines that the soil structure cannot be determined from auger borings, pits shall be required.

Table V. Soil structure and associated suitability classification

Structure	Size (diameter)	Classification
Granular	N/A	suitable
Blocky	≤ 1 inches (2.5 cm)	suitable
	> 1 inches (2.5 cm)	unsuitable
Platy	N/A	unsuitable
Prismatic	≤ 2 inches (5 cm)	suitable
	> 2 inches (5 cm)	unsuitable
Absence of structure: Single Grain	N/A	suitable
Absence of Structure: Massive (no structural peds)	N/A	unsuitable

(3) Clay Mineralogy – Clay mineralogy shall be determined in the field by evaluation of moist and wet soil consistence in accordance with the USDA-NRCS Field Book for Describing and Sampling Soils. The clay mineralogy suitability shall be determined based on Table VI.

Table VI. Clay mineralogy (consistence) field method results, associated mineralogy, and suitability classification

Consistence	Mineralogy	Classification
Moist		
Loose, very friable	Slightly expansive	suitable
Friable, firm	Slightly expansive	suitable
Very firm or extremely firm	Expansive	unsuitable*
Wet		
Nonsticky, slightly sticky Nonplastic, slightly plastic	Slightly expansive	suitable
Moderately sticky Moderately plastic	Slightly expansive	suitable
Very sticky or very plastic	Expansive	unsuitable*

*If either the moist consistence or wet consistence is unsuitable then clay mineralogy is classified unsuitable.

(A) Laboratory testing of ACEC may be substituted for field testing to determine clay mineralogy. The laboratory testing shall be conducted in accordance with Kellogg Soil Survey Laboratory Methods Manual, Soil Survey Investigation Report No. 42, page 229, or EPA Method 9080. Table VII shall be used to determine the clay mineralogy suitability

when laboratory testing is used. When using laboratory testing to determine clay mineralogy, the clay content of the soil must be greater than 35 percent and the organic matter component must be less than 0.5 percent.

Table VII. Clay mineralogy laboratory method results, mineralogy, and associated suitability classification

ACEC (cmol/kg)	Mineralogy	Classification
≤ 16.3	Slightly expansive	suitable
> 16.3	Expansive	unsuitable

(B) When laboratory testing of clay mineralogy is proposed, the LHD shall be notified 48 hours before samples are to be taken by the licensed consultant in accordance with G.S. 89C, G.S. 89E, or G.S. 89F. The authorized agent and the consultant shall be present when the samples are collected. Samples shall be representative of the soil horizon being evaluated for clay mineralogy. Split samples shall be made available to the LHD when requested. The consultant shall document chain of custody and seal, sign, and date the first page of the report.

(4) Organic Soils - Organic soils shall be considered unsuitable.

History Note: Authority G.S. 130A-335(e);

15A NCAC 18E .0504 is proposed for adoption as follows:

15A NCAC 18E .0504 SOIL WETNESS CONDITIONS

(a) Soil wetness conditions caused by a seasonal high-water table, a perched water table, tidal water, seasonally saturated soil, or by lateral water movement shall be determined by field evaluation for soil wetness indicators and field observations, and may be further characterized by well monitoring, computer modeling, or a combination of monitoring and modeling as required by this Rule. All sites shall be evaluated by an authorized agent using Basic Field Evaluation Procedures in accordance with Paragraph (b) of this Rule.

(b) Basic Field Evaluation Procedures:

(1) A soil wetness condition shall be determined by the indication of colors of chroma 2 or less (Munsell Color System) at greater than or equal to two percent of soil volume in mottles or matrix of a horizon. Colors of chroma 2 or less that are lithochromic shall not be considered indicative of a soil wetness condition; or

(2) A soil wetness condition shall be determined by the periodic observation or indication of saturated soils or a perched water table, or lateral water movement flowing into a bore hole, monitoring well, or open excavation above a less permeable horizon, that may occur without the presence of colors

of chroma 2 or less. A soil wetness condition resulting from saturated soils or a perched water table shall be confirmed to persist for three consecutive days.

(3) The shallowest depth to soil wetness condition determined by Subparagraph (b)(1) or (b)(2) of this Rule shall take precedence.

(c) Site Suitability as to Soil Wetness: Initial suitability of the site as to soil wetness shall be determined based upon the findings of the Basic Field Evaluation Procedures made in accordance with Paragraph (b) of this Rule. Sites where the soil wetness condition is less than 12 inches below the naturally occurring soil surface shall be considered unsuitable with respect to soil wetness.

(d) Alternative Procedures for Soil Wetness Determination: The owner shall have the opportunity to submit documentation that the soil wetness condition and resultant site classification be alternately determined and reclassified by monitoring, computer modeling, or a combination of monitoring and modeling, in accordance with Direct Monitoring Procedure, Monitoring and Modeling Procedure, or Modeling Procedure made in accordance with Paragraphs (e), (f), or (g) of this Rule. This determination shall take precedence over the determination made in accordance with the Basic Field Evaluation Procedures in accordance with Paragraph (b) of this Rule, when the conditions of Paragraphs (e), (f), or (g) of this Rule are met. Determination by one of these Monitoring or Modeling procedures shall also be required when:

(1) the Owner proposes to use a wastewater system requiring a deeper depth to a soil wetness condition than the depth determined by the Basic Field Evaluation Procedures in accordance with Paragraph (b) of this Rule; or

(2) the Owner proposes to use sites with Group III or IV soil within 36 inches of the naturally occurring soil surface and where artificial drainage systems are existing or are proposed or on such sites when fill is proposed to be used in conjunction with artificial drainage systems. Final determination of soil wetness condition for these sites shall be made in accordance with the Modeling Procedure in Paragraph (g) of this Rule.

(e) Direct Monitoring Procedure: Soil wetness conditions may be determined by observation of the water surface in wells during periods of high-water elevations utilizing the following monitoring procedures and interpretation method.

(1) The owner shall notify the LHD of the intent to monitor water surface elevations by submitting a proposal that includes a site plan, well and soil profile at each monitoring location, and a monitoring plan no later than 30 days prior to the start of the monitoring period. Soil wetness and rainfall monitoring shall be conducted by a third-party consultant or by the owner. A third-party consultant is qualified when licensed or registered in accordance with G.S. 89C, G.S. 89E, or G.S. 89F, if required. The Owner shall submit the name(s) of the consultant(s) performing any monitoring on their behalf to the LHD.

(2) The owner shall submit a site plan showing proposed sites for wastewater systems, shall provide the longitude and latitude of the site, location of monitoring wells, and all drainage features that may influence the soil wetness conditions, and specify any proposed fill and drainage modifications.

(3) The owner shall submit a monitoring plan indicating the proposed number, installation depth, screening depth, soil and well profile, materials, and installation procedures for each monitoring well, and proposed method of analysis. A minimum of three water level monitoring wells shall be installed for water surface observation at each site. Sites handling systems with a design daily flow greater than 600 gpd shall have one additional well per 600 gpd increment.

(4) The authorized agent shall be given the opportunity to conduct a site visit and verify the appropriateness of the proposed plan. Well locations shall include portions of the initial and repair dispersal field areas containing the most limiting soil/site conditions. Prior to installation of the wells the authorized agent shall approve the plan. If the plan is disapproved, the authorized agent shall include specific changes necessary for approval of the monitoring plan.

(5) Wells shall extend five feet below the naturally occurring soil surface, or existing soil surface for fill installed prior to July 1, 1977 meeting the requirements for consideration of a site with existing fill in accordance with G.S. 130A-341 and the rules of this Subchapter. However, a well or wells which extend(s) down only 40 inches may be used if they provide a continuous record of the water table for half of the monitoring period, and one or more shallower wells may be required on sites where shallow lateral water movement or perched soil wetness conditions are anticipated.

(6) Water elevation in the monitoring wells shall be recorded daily from January 1 to April 30, taken at the same time during the day (plus or minus three hours). A rain (precipitation) gauge is required within one-half mile of the site. Daily rainfall shall be recorded beginning no later than December 1 through April 30 (the end of the well monitoring period).

(7) Interpretation Method for Direct Monitoring Procedure: The following method of determining depth to soil wetness condition from water surface observations in wells shall be used when the 60-day weighted rainfall index for the January through April monitoring period equals or exceeds the site's long-term (historic) 60-day weighted rainfall index for January to April rainfall with a 30 percent recurrence frequency (wetter than the 9th driest year of 30, on average). The 60-day weighted rainfall index for the monitoring period and historic rainfall record shall be computed as:

$$WRI_{60} = 0.5P_D + P_J + P_F + P_M + 0.5P_A$$

Where WRI_{60} = 60-day weighted rainfall index for January to April

P_D = Total December rainfall (inches)

P_J = Total January rainfall (inches)

P_F = Total February rainfall (inches)

P_M = Total March rainfall (inches)

P_A = Total April rainfall (inches)

The State shall prepare contour maps for each county where this interpretation procedure is proposed. Contours shall be prepared following standard interpolation procedures using normalized

data collected from all National Weather Service Stations, or equivalent, from which appropriate data are available, prior to February 1 of the monitoring season. Data from each station shall be normalized by fitting a 2-parameter gamma distribution to the 60-day weighted rainfall index computed for the most recent three decades of historic data, in accordance with procedures outlined in Chapter 18 of the National Engineering Handbook, USDA-NRCS. From this fitted distribution, the 60-day weighted rainfall index for January through April rainfall with a 30 percent, 50 percent, 70 percent and 80 percent recurrence frequency shall be computed for each Station, to provide the raw data points from which the contour maps shall be prepared. From these maps, the site's 60-day weighted rainfall index for the January through April monitoring period shall be compared to the long-term (historic) January to April 60-day weighted rainfall index at different expected recurrence frequencies. The soil wetness condition shall be determined as the highest level that is continuously saturated for the number of consecutive days during the January through April monitoring period shown in Table VIII.

TABLE VIII. Weighted rainfall index related to number of consecutive days of continuous saturation

Recurrence Frequency Range January to April 60-Day Weighted Rainfall Index	**Number of Consecutive Days of Continuous Saturation for Soil Wetness Condition**
30% to 49.9%	3 days or 72 hours
50% to 69.9%	6 days or 144 hours
70% to 79.9%	9 days or 216 hours
80% to 100%	14 days or 336 hours

(8) If monitoring well data is collected during monitoring periods that span multiple years, the year which yields the highest (shallowest) soil wetness condition shall be applicable.

(f) Monitoring and Modeling Procedure: A combination of monitoring and modeling may be used to determine a soil wetness condition utilizing the following monitoring procedures and interpretation method.

(1) The procedures described for the Direct Monitoring Procedure in Subparagraphs (e)(1) through (e)(6) of this Rule shall be used to monitor water surface elevation and precipitation for determining soil wetness conditions by a combination of direct observation and modeling, except that the rainfall gauge and each monitoring well shall use a recording device and a data file (DRAINMOD compatible) shall be submitted with the report to the LHD (devices shall record rainfall hourly and well water level daily).

(2) The groundwater simulation model DRAINMOD shall be used to predict daily water levels over a 30-year historic time period after the model is calibrated using the water surface and rainfall observations made on-site during the monitoring period. The soil wetness condition shall be determined as the highest level predicted by the model to be saturated for a 14-day continuous period

between January 1 and April 30 with a recurrence frequency of 30 percent (an average of nine years in 30).

(A) Weather input files, required to run the DRAINMOD, shall be developed from hourly rainfall gauge data taken within a half-mile of the site and from daily temperature and hourly or daily rainfall data collected over a minimum 30-year period from the closest available National Weather Service, State Climate Office of North Carolina, or equivalent, measuring station to the site. DRAINMOD weather data files on file with the State shall be made available upon request to the owner or owner's consultants. Daily maximum and minimum temperature data for the January 1 through April 30 monitoring period, plus for 30 days prior to this period, shall be obtained from the closest available weather station.

(B) Soil and Site inputs for DRAINMOD, including a soils data file closest to the soil series identified, depths of soil horizons, in-situ Ksat of each horizon, depth and spacing of drainage features and depression storage, shall be selected in accordance with procedures outlined in the DRAINMOD Users Guide, and guidance is also available in Reports 333 and 342 of the University of North Carolina Water Resources Research Institute. DRAINMOD soil data files on file with the State shall be made available upon request to the owner or owner's consultants.

(C) Inputs shall be based upon site-specific soil profile descriptions. Soil and site input factors shall be adjusted during the model calibration process to achieve the best possible fit as indicated by least squares analysis of the daily observations over the whole monitoring period (mean absolute deviation between measured and predicted values no greater than eight inches), and to achieve the best possible match between the highest water table depth during the monitoring period (measured vs predicted) that is saturated for 14 consecutive days.

(D) For sites intended to receive over 1,500 gpd, the soil wetness determination using DRAINMOD shall take into consideration the impact of wastewater application on the projected water table surface.

(E) The groundwater simulation analysis shall be prepared and submitted to the LHD by individuals qualified to use DRAINMOD by training and experience and who are licensed in North Carolina if required in G.S. 89C, G.S. 89E, and G.S. 89F. The LHD or Owner may request a technical review by the State prior to approval of the soil wetness condition determination.

(g) Modeling Procedure: A soil wetness condition may be determined by application of DRAINMOD to predict daily water levels over a 30-year historic time period after all site-specific input parameters have been obtained, as outlined in the DRAINMOD Users Guide. This modeling procedure shall be used when a groundwater lowering system is proposed for a site with Group III or IV soils within 36 inches of the naturally occurring soil surface. This procedure shall also be used to evaluate sites with Group III or IV soils within 36 inches of the naturally occurring soil surface,

where the soil wetness condition was initially determined using a procedure described in Paragraphs (e) or (f) of this Rule and where artificial drainage systems are proposed or when fill is proposed to be used in conjunction with artificial drainage systems. The soil wetness condition shall be determined as the highest level predicted by the model to be saturated for a 14-day continuous period between January 1 and April 30 with a recurrence frequency of 30 percent (an average of nine years in 30).

(1) Weather input files, required to run DRAINMOD, shall consist of hourly rainfall and daily temperature data collected over the entire period of record but for a 30-year period from the closest available National Weather Service, State Climate Office of North Carolina, or equivalent, measuring station to the site. DRAINMOD weather data files on file with the State shall be made available upon request to the owner or owner's consultants.

(2) Soil and Site inputs for DRAINMOD, including a soils data file closest to the soil series identified, depths of soil horizons, in-situ Ksat of each horizon, depth and spacing of proposed drainage features and surface storage and drainage parameters, shall be selected in accordance with procedures outlined in the DRAINMOD User's Guide. DRAINMOD soils data files on file with the State shall be made available upon request to the owner or owner's consultants. Inputs shall include:

(A) Soil input file with the soil moisture characteristic curve and data for the soil profile that is closest to the described soil profile that is present on the site;

(B) Soil horizon depths determined on site;

(C) Site measured or proposed drain depth and spacing, and drain outlet elevation;

(D) In-situ Ksat measurements for a minimum of three representative locations on the site and at each location for the three most representative soil horizons within five feet of the surface. In-situ Ksat measurements shall be for one representative soil horizon at or above redoximorphic depletion features and two representative soil horizons at and below redoximorphic concentration features at each location on the site;

(E) All other model parameters based upon the DRAINMOD User's Guide, or other accepted values consistent with the simulation model; and

(F) A sensitivity analysis shall be conducted for the following model parameters: soil input files for two other most closely related soil profiles; in-situ Ksat of each horizon; drain depth and spacing; and surface storage and depth of surface flow inputs. The sensitivity analysis shall be used to evaluate the range of soil and site characteristics for choosing input parameters related to the soil profiles, Ksat input values based upon the range of in-situ Ksat values measured on the site, and inputs for surface and subsurface drainage features based upon the range of possible elevations and distances that occur or may occur after installation of improvements. The sensitivity analysis shall establish which parameters are most critical for determination of the depth to soil wetness condition. Conservative values for the most critical parameters shall be used in applying the model to the site.

(3) For sites designed to receive over 600 gpd, the soil wetness determination using DRAINMOD shall take into consideration the impact of wastewater application on the projected water table surface.

(4) The groundwater simulation analysis shall be prepared and submitted to the LHD by individuals qualified to use DRAINMOD by training and experience and who are licensed in North Carolina if required in G.S. 89C, G.S. 89E, and G.S. 89F. The LHD shall submit the groundwater simulation analysis to the State for technical review prior to approval of the soil wetness condition determination.

(h) A report of the investigations made for the Direct Monitoring Procedure, Monitoring and Modeling Procedure or Modeling Procedure in accordance with Paragraphs (e), (f), or (g) of this Rule shall be prepared prior to approval of the soil wetness condition determination. Reports prepared by a licensed professional shall bear the professional seal of the person(s) whom conducted the investigation. A request for technical review of the report by the State shall include digital copies of monitoring data and digital copies of model inputs, output data, and graphic results, as applicable.

History Note: Authority G.S. 130A-335(e);

15A NCAC 18E .0505 is proposed for adoption as follows:

15A NCAC 18E .0505 SOIL DEPTH TO ROCK, SAPROLITE, OR PARENT MATERIAL

(a) Soil depths to saprolite, rock, or parent material 18 inches or greater shall be considered suitable as to soil depth for DSE using gravity or pressure dosed gravity distribution.

(b) Soil depths to saprolite, rock, or parent material less than 18 inches shall be considered unsuitable as to soil depth for DSE using gravity or pressure dosed gravity distribution.

(c) The soil depth shall be measured from the naturally occurring soil surface to rock, saprolite, or parent material.

History Note: Authority G.S. 130A-335(e);

15A NCAC 18E .0506 is proposed for adoption as follows:

15A NCAC 18E .0506 SAPROLITE

(a) Sites classified unsuitable as to depth to saprolite may be reclassified suitable in accordance with this Rule.

(b) A 24-inch minimum vertical separation distance shall be maintained in saprolite to an unsuitable soil condition. If any of the vertical separation is suitable soil, then one-inch of suitable soil equals two inches of saprolite.

(c) An investigation of the site using pits, at locations approved by the authorized agent, shall be conducted. The following physical properties and characteristics shall be present in the 24 inches (or less if combined with soil) of saprolite below the proposed infiltrative surface:

(1) the saprolite texture as determined in the field by hand texturing samples of each horizon, shall be sand, loamy sand, sandy loam, loam, or silt loam;

(2) clay mineralogy shall be suitable in accordance with Rule .0503(3) of this Section;

(3) greater than 2/3 of the saprolite by volume shall have a moist consistence of loose, very friable, friable, or firm;

(4) the saprolite wet consistence shall be nonsticky or slightly sticky and nonplastic or slightly plastic;

(5) the saprolite shall be in an undisturbed, naturally occurring state;

(6) the saprolite shall have no open and continuous joints, quartz veins, or fractures relic of parent rock; and

(7) lab determinations may be used to supplement field determinations. Split samples shall be made available to the LHD when requested.

History Note: Authority G.S. 130A-335(e);

15A NCAC 18E .0507 is proposed for adoption as follows:

15A NCAC 18E .0507 RESTRICTIVE HORIZONS

(a) Soils in which restrictive horizons are three inches or more in thickness located at depths less than 18 inches below the naturally occurring soil surface shall be considered unsuitable as to depth to restrictive horizons.

(b) Soils in which restrictive horizons are three inches or more in thickness and at depths greater than 18 inches below the naturally occurring soil surface shall be considered suitable as to depth to restrictive horizons.

History Note: Authority G.S. 130A-335(e);

15A NCAC 18E .0508 is proposed for adoption as follows:

15A NCAC 18E .0508 AVAILABLE SPACE

(a) Sites shall have sufficient available space to allow for the installation of the initial wastewater system and repair area for a system identified or approved in Sections .0900, .1500, or .1700 of this Subchapter. The available space provided shell meet all required setbacks in Section .0600 of the Subchapter and provide access for operation and maintenance activities.

(b) The dispersal field repair area shall not be altered so that the specified system cannot be installed or function as permitted.

(c) Prior to the issuance of the IP, the proposed dispersal field shall be field located and staked on-contour, as applicable, to determine that initial and repair dispersal field systems can be installed in the area delineated. The dispersal field may be installed level but off contour if an authorized agent has determined that there is sufficient

vertical separation distance to a limiting condition along the entire trench length in accordance with Rule .0901(d)(3) of this Subchapter.

(d) The repair area requirement of Paragraph (a) of this Rule shall not apply to a lot or tract of land which meets the following:

(1) described in a recorded deed or a recorded plat on January 1, 1983;

(2) insufficient size to satisfy the repair area requirement of Paragraph (a) of this Rule, as determined by the authorized agent;

(3) design daily flow is no more than 480 gallons for a single-family dwelling unit or a single facility; and

(4) designed for DSE.

(e) Repair area shall be required for any proposed additional flow from an existing facility meeting the requirements of Paragraph (d) of this Rule.

(f) Repair area shall be required when any new initial wastewater system is proposed on a lot or tract of land on which the exemption in Paragraph (d) of this Rule was previously utilized.

(g) Although a lot or tract of land is exempted under Paragraph (d) of this Rule from the repair area requirement of Paragraph (a) of this Rule, the maximum feasible area, as determined by the authorized agent, shall be allocated for a repair area and documented on the IP, CA, and OP.

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

15A NCAC 18E .0509 is proposed for adoption as follows:

15A NCAC 18E .0509 SITE SUITABILITY AND CLASSIFICATION

(a) The most limiting condition determined in Rules .0502 through .0508 of this Section shall be used to determine the overall site classification as suitable or unsuitable. The overall site shall be classified suitable if there is sufficient soil and area for a wastewater system that complies with the minimum vertical separation distance to a limiting condition consistent with this Subchapter.

(b) The minimum vertical separation distance to any limiting conditions shall be 18 inches.

(c) Sites classified unsuitable due to soil wetness conditions may be reclassified suitable when modifications are made to meet the requirements in Sections .0900 or .1200 of this Subchapter for the minimum vertical separation distance to the water table.

(d) Sites classified unsuitable due to soil wetness conditions because of the presence of lateral water movement may be reclassified suitable as to soil wetness conditions when such water is intercepted and diverted to prevent saturation of the wastewater system.

(e) A site classified unsuitable may be approved for a system identified or approved in Sections .0900, .1500, or .1700 of this Subchapter. A Special Site Evaluation in accordance with Rule .0510 of this Section shall be provided to the authorized agent that demonstrates that the proposed system can be expected to overcome the unsuitable soil or site

conditions and function in accordance with this Subchapter. The written documentation shall be prepared and submitted to the LHD by individuals qualified by training and experience and licensure in North Carolina in accordance with G.S. 89C, G.S. 89E, and G.S. 89F, to consult, investigate and evaluate soil and rock characteristics, groundwater hydrology, design artificial drainage systems, or design wastewater systems. The proposed wastewater system or artificial drainage system shall be designed, installed, operated, and maintained in accordance with this Subchapter. The State shall review the substantiating data if requested by the LHD.

(f) An IP shall not be issued for a site which is classified unsuitable.

History Note: Authority G.S. 130A-335(e);

15A NCAC 18E .0510 is proposed for adoption as follows:

15A NCAC 18E .0510 SPECIAL SITE EVALUATIONS

(a) A Special Site Evaluation shall demonstrate that the proposed use of the site with a specific wastewater system design and configuration will not result in effluent discharge to the ground surface or adversely impact ground and surface water quality. Any site for a wastewater system that is proposed with one or more of the following shall require a Special Site Evaluation by a person or persons who are licensed or registered to consult, investigate, or evaluate soil characteristics and hydrologic and hydraulic testing and analysis in accordance with G.S. 89F or G.S. 89E:

(1) proposal submitted in accordance with Rule .0504(h) of this Section;

(2) proposal submitted in accordance with Rule .0509(e) of this Section;

(3) advanced pretreatment is required for any of the following:

(A) vertical separation distance to a limiting condition is proposed to be reduced. The vertical separation distance to rock or tidal water shall not be reduced to less than 12 inches;

(B) less than 18 inches of naturally occurring soil to an unsuitable soil condition, excluding soil wetness;

(C) increased LTAR is proposed for a site with Group III or IV soils within three feet of the infiltrative surface;

(D) increased LTAR is proposed for a site which requires artificial drainage of Group II or III soils;

(E) proposed use of a groundwater lowering system to meet vertical separation distance requirements to a soil wetness condition;

(F) bed systems located directly beneath the advanced pretreatment unit on a site with uniform slope exceeding two percent;

(G) bed systems with a design daily flow greater than 1,500 gpd; or

(H) increased LTAR is proposed on a site with a design daily flow greater than 1,500 gpd;

(4) sand lined trench systems when the texture of the receiving permeable horizon is sandy loam or loam and the design daily flow is greater than 600 gpd; or when the texture of the receiving permeable horizon is silt loam;

(5) DSE drip dispersal systems meeting the following soil and site conditions:

(A) depth from the naturally occurring soil surface to any unsuitable soil condition is greater than or equal to 18 inches and the LTAR is proposed to exceed 0.5 gpd/ft^2 for Group I, 0.35 gpd/ft^2 for Group II, or 0.2 gpd/ft^2 for Group III soils;

(B) depth from the naturally occurring soil surface to any soil wetness condition is less than 18 inches and the LTAR is proposed to exceed 0.5 gpd/ft^2 for Group I, 0.3 gpd/ft^2 for Group II, or 0.15 gpd/ft^2 for Group III soils;

(C) Group IV soils are encountered within 18 inches of the naturally occurring soil surface or within 12 inches of the infiltrative surface, whichever is deeper, and the LTAR is proposed to exceed 0.05 gpd/ft^2;

(D) Group IV soils are encountered within 18 inches of the naturally occurring soil surface and depth from the naturally occurring soil surface to any unsuitable soil condition is less than 24 inches;

(E) Group IV soils are encountered within 18 inches of the naturally occurring soil surface and driplines are installed in new fill material;

(F) groundwater lowering system is used to meet soil depth and vertical separation distance requirements to a soil wetness condition;

(G) proposed LTAR exceeds that assigned by the LHD;

(H) design daily flow exceeds 1,500 gpd; or

(6) NSF-40 and drip dispersal systems when the LTAR is proposed to exceed 0.8 gpd/ft^2 for Group I soils, 0.5 gpd/ft^2 for Group II soils, 0.25 gpd/ft^2 for Group III soils, or 0.1 gpd/ft^2 for Group IV soils within 18 inches of the naturally occurring soil surface or within 12 inches of the infiltrative surface, whichever is deeper;

(7) TS-I and drip dispersal systems which meet the following criteria:

(A) site has less than 18 inches of naturally occurring soil to any unsuitable limiting condition;

(B) Group III soils are present and a groundwater lowering system is used to meet the vertical separation distance requirements to a soil wetness condition;

(C) Group IV soils are encountered within 18 inches of the naturally occurring soil surface, the LTAR is proposed to exceed 0.05 gpd/ft^2, and the system is proposed to be installed in new fill; or

(D) LTAR is proposed to exceed 1.0 gpd/ft^2 for Group I soils, 0.6 gpd/ft^2 for Group II soils, 0.3 gpd/ft^2 for Group III soils, or 0.12 gpd/ft^2 for Group IV soils within 18 inches of the naturally occurring soil surface or within 12 inches of the infiltrative surface, whichever is deeper;

(8) TS-II and drip dispersal systems which meet the following criteria:

(A) Subparagraphs (7)(A), (B), or (C) of this Rule; or

(B) LTAR is proposed to exceed 1.2 gpd/ft^2 for Group I soils, 0.7 gpd/ft^2 for Group II soils, 0.4 gpd/ft^2 for Group III soils, or 0.15 gpd/ft^2 for Group IV soils within 18 inches of the naturally occurring soil surface or within 12 inches of the infiltrative surface, whichever is deeper; or

(9) site-specific nitrogen migration analysis is required to verify that the nitrate concentration at the property line will not exceed groundwater standards;

(10) LHD or State determines that the combination of soil conditions, site topography and landscape position, design daily flow, system layout and/or proposed stormwater appurtenances will potentially result in hydraulic overload; or

(11) design daily flow greater than 3,000 gpd, unless the requirements of Rule .0302(d) of this Subchapter are met.

(b) If the adjusted design daily flow is less than or equal to 3,000 gpd, a Special Site Evaluation is not required.

(c) The Special Site Evaluation shall include hydrologic and hydraulic testing and analysis, in accordance with Rule .0304(c)(2) of this Subchapter.

(d) For sites serving systems with a design daily flow greater than 3,000 gpd, the Special Site Evaluation shall include sufficient site-specific data to predict the height of the water table mound that will develop beneath the field (level sites) and the rate of lateral and vertical flow away from the trenches (sloping sites). The data submitted may include deep soil borings to an impermeable layer or to a depth to support the hydrologic testing and modeling, permeability, and in-situ Ksat measurements, water level readings, and other information determined to be necessary by the LHD or the State. The site shall be considered unsuitable if the data indicate any of the following:

(1) the groundwater mound which will develop beneath the site cannot be maintained two feet or more below the bottom of the trenches;

(2) effluent is likely to become exposed on the ground surface; or

(3) contaminant transport assessment indicates that groundwater standards established in accordance with 15A NCAC 02L are determined or projected to be violated at the property line.

History Note: Authority G.S. 89E; 89F; 130A-335(a1), (e) and (f);

SECTION .0600 – LOCATION OF WASTEWATER SYSTEMS

15A NCAC 18E .0601 is proposed for adoption as follows:

15A NCAC 18E .0601 LOCATION OF WASTEWATER SYSTEMS

(a) Every wastewater system shall be located the minimum setbacks from the site features specified in Table IX. The setback shall be measured from the nearest wastewater system component sidewall or as otherwise specified in a system specific rule or PIA approval.

TABLE IX. Minimum setbacks from all wastewater systems to site features

Site Features	Setback (feet)
Any public or private water supply source, including a private drinking water well or spring*	100
Surface waters classified Water Supply Class I (WS-I), from mean high-water mark	100
Waters classified SA, from mean high-water mark	100
Any Class I or Class II reservoir, from normal pool elevation	100
Lake, pond, or stormwater detention pond, from flood pool elevation	50
Any other coastal water, canal, marsh, stream, non-water supply spring, perennial waterbodies, streams, or other surface waters, from the mean high-water mark	50
Any water line, including fire protection and irrigation water lines	10
Geothermal wells – open or closed loop vertical bore	50
Geothermal wells – horizontal closed loop system	10
Building foundation with artificial drainage	15
Building or other foundation without artificial drainage, including patio, deck, porch, stoop, lighting fixtures, or signage supporting columns, or posts	5
Any basement, cellar, or in-ground swimming pool	15
Buried storage tank or basin, except stormwater	15
Above ground swimming pool	5
Top of slope of embankment or cuts of two feet or more vertical height	15
Subsurface groundwater lowering system, ditch, or device, as measured on the ground surface from the edge of the feature	25
Surface water diversion, as measured on the ground surface from the edge of the diversion	15
Any stormwater conveyance (pipe or open channel) or ephemeral stream	15

Permanent stormwater retention basin or sediment detention basin	50
Bio-retention area, injection well, or infiltration gallery	25
Any other dispersal field, except designated dispersal field repair area for project site	20
Any property line	10
Burial plot or graveyard boundary	15
Above ground storage tank (from dripline or foundation pad, whichever is more limiting)	5
Utility transmission and distribution line poles and towers, including guy wires	15
Utility transformer, ground-surface mounted	10

(b) Wastewater systems not listed in Paragraphs (d) and (e) of this Rule may be located closer than 100 feet from a private water supply source for repairs, space limitations, and other site-planning considerations under the following conditions:

(1) the private water supply is a well on a lot serving a single-family dwelling and intended for domestic use; or

(2) the private water supply is a well for which a variance for a reduced separation has been issued.

(c) The wastewater system sited in accordance with Paragraph (b) of this Rule shall be located the maximum feasible distance and never less than 50 from the private water supply.

(d) Wastewater systems shall not be located closer than 100 feet to springs and uncased wells located downslope from the dispersal field and used as a source of drinking water.

(e) Dispersal fields utilizing saprolite for treatment shall not be located closer than 100 feet to a private water supply source.

(f) Initial and repair dispersal field systems shall not be located under impervious surfaces or areas subject to vehicular traffic unless approved in accordance with G.S. 130A-343 and Section .1700 of this Subchapter.

(g) If effluent is conveyed under areas subject to vehicular traffic or areas subject to soil disturbance or compaction, one of the following shall be used:

(1) DIP;

(2) Schedule 40 pipe (PVC, Polyethylene, or ABS) sleeved in DIP;

(3) Schedule 40 pipe (PVC, Polyethylene, or ABS) sleeved in DOT traffic rated culvert pipe;

(4) Schedule 40 pipe (PVC, Polyethylene, or ABS) with 30 inches of compacted cover provided over the crown of the pipe; or

(5) other pipe materials may be proposed when designed, inspected, and certified by a PE and approved by the LHD.

(h) In addition to the requirements of Paragraph (a) of this Rule, wastewater systems with a proposed design daily flow greater than 3,000 gpd, as determined in Rule .0401 of this Subchapter, shall be located the minimum setbacks from the site features in Table X.

TABLE X. Minimum setbacks from wastewater systems greater than 3,000 gpd to site features*

Feature	Setback (feet)
Any Class I or II reservoir or any public water supply source utilizing a shallow (under 50 feet) groundwater aquifer	500
Any other public water supply source, unless a confined aquifer	200
Any private water supply source, unless a confined aquifer	100
Surface water classified WS- I, from mean high-water mark	200
Surface waters classified WS-II, WS-III, B, or SB, from mean high-water mark	100
Waters classified SA, from mean high-water mark	200
Any property line	25

*Increased setbacks for separate dispersal fields that are part of wastewater systems with a design daily flow greater than 3,000 gpd shall not apply to one or more field(s) that are designed for less than 1,500 gpd when a Special Site Evaluation in accordance with Rule .0510 of this Subchapter demonstrates that the wastewater system will comply with the performance requirements in Rule .0510(d) of this Subchapter.

(i) In addition to the requirements of Paragraph (a) of this Rule, collection sewers shall be located the minimum setbacks to site features shown in Table XI.

TABLE XI. Minimum setbacks from collection sewers to site features

Feature	Setback (feet)
Any public water supply source, including wells, springs, and Class I or Class II reservoirs	100, unless the collection sewer is constructed of or sleeved in DIP with mechanical joints equivalent to water main standards, in which case the minimum setback may be reduced to 50 ft*
Any private water supply source, including wells and springs	50, unless the collection sewer is construction of or sleeved in DIP with mechanical joints equivalent to water main standards, in which case the minimum setback may be reduced to 25 ft*
Surface waters classified WS-I, WS-II, WS-III, B, SA, or SB, from flood pool elevation	50, unless the collection sewer is construction of or sleeved in DIP with mechanical joints equivalent to water main standards, in which case the minimum setback may be reduced to 10 ft*

Any other stream, canal, march, coastal water, lakes, and other impoundments, or other surface waters	10
Geothermal wells – open or closed loop vertical bore	25
Geothermal wells – horizontal closed loop system	5
Any basement, cellar, or in-ground swimming pool	10
Top of slope of embankment or cuts of two feet or more vertical height	5
Surface water diversion, as measured on the ground surface from the edge of the diversion	5
Any stormwater conveyance (pipe or open channel) or ephemeral stream	10
Permanent stormwater retention basin or sediment detention basin	10
Bio-retention area, injection well, or infiltration gallery	5
Any other dispersal field except designated dispersal field repair area for project site	5
Any property line	5
Burial plot or graveyard boundary	5
Utility transmission and distribution line poles and towers, including guy wires	5
Utility transformer, ground-surface mounted	5

*Pipe materials other than DIP shall be acceptable when the materials conform to materials, testing methods, and acceptability standards meeting water main standards and when the line has been designed, installed, inspected, and certified by a PE and approved by the LHD.

(j) The minimum setback from water lines to collection sewers shall be 10 feet. If a 10-foot setback is not maintained, the following criteria shall be met:

(1) water line is laid in a separate trench with the elevation of the bottom of the water line 18 inches above the top of the collection sewer; or

(2) water line is laid in the same trench as the collection sewer with the water line located on one side of the trench, on a bench of undisturbed earth and with the elevation of the bottom of the water line

18 inches above the top of the collection sewer. The collection sewer shall be located the maximum setback from the water line.

(k) Crossings of collection sewers and a water line may occur with the following:

(1) 18 inches clear vertical separation distance is maintained, with the sewer line passing under the water line; or

(2) the water line crosses under the sewer line or 18 inches clear vertical separation distance is not maintained and the following criteria are met:

(A) collection sewer shall be constructed of DIP with joints equivalent to water main standards and extend 10 feet on each side of the point of crossing, with full sections of pipe centered at the point of crossing; and

(B) water line shall be constructed of ferrous materials and with joints equivalent to water main standards and extend 10 feet on each side of the point of crossing, with full sections of pipe centered at the point of crossing.

(l) Collection sewers may cross a storm drain if:

(1) 12 inches clear vertical separation distance is maintained;

(2) collection sewer is constructed of DIP with mechanical joints or restrained push-on joints; or

(3) collection sewer is encased in concrete or DIP for five feet on either side of the crossing.

(m) Collection sewers may cross a stream if:

(1) 36 inches of stable cover is maintained;

(2) sewer line is constructed of DIP with mechanical joints or restrained push-on joints; or

(3) sewer line is encased in concrete or DIP for 10 feet on either side of the crossing and protected against the normal range of high and low water conditions, including the 100-year flood or wave action.

(n) Collection sewer aerial crossings shall be constructed of DIP with mechanical joints or restrained push-on joints. Pipe shall be anchored for 10 feet on either side of the crossing.

(o) Septic tanks, pump tanks, grease tanks, raw sewage lift stations, wastewater treatment plants, sand filters, and other advanced pretreatment systems shall not be located in areas subject to frequent flooding (areas inundated at a 10-year or less frequency), unless designed and installed to be watertight and to remain operable during a 10-year storm. Mechanical or electrical components of treatment systems shall be above the 100-year flood level or otherwise protected against a 100-year flood.

History Note: Authority G.S. 130A-334; 130A-335(e) and (f);

15A NCAC 18E .0602 is proposed for adoption as follows:

15A NCAC 18E .0602 APPLICABILITY OF SETBACKS

(a) The minimum setback requirements in Table IX of Rule .0601(a) of this Section for SA waters, basements, property lines, or cuts of two feet or more vertical height, shall not apply to the installation of a single wastewater system serving a single-family residence with a maximum design daily flow of 480 gpd on a lot or tract of land that meets the following requirements:

(1) on July 1, 1977, is described in a deed, contract, or other instrument conveying fee title or that is described in a recorded plat;

(2) insufficient size to satisfy the minimum setback requirements in Table IX of Rule .0601(a) of this Section for SA waters, basement, property lines, or cuts of two feet or more vertical height of this Section on July 1, 1977; and

(3) cannot be served by a community or public sewerage system on the date system construction is proposed to begin.

(b) For those lots or tracts of land described in Paragraph (a) of this Rule, the maximum feasible setback as determined by an authorized agent shall be required. The minimum setbacks in Table XII shall be required in all cases.

TABLE XII. Minimum setbacks from wastewater systems to specific site features on lots described in this Rule

Feature	**Minimum setback (feet)**
SA waters from mean high-water mark	50
Basement	8
Property line	5
Cuts of two feet or more vertical height	5

(c) For those lots or tracts of land that meet the requirements of Paragraph (a) of this Rule, and the wastewater system will be installed in Group I soils, the wastewater system shall be located as far as possible, but not less than 10 feet from any other wastewater system.

(d) For those lots or tract of land which, on July 1, 1982, are specifically described in a deed or recorded plat and the minimum horizontal setbacks in Table IX of Rule .0601(a) of this Section for groundwater lowering systems cannot be met, the maximum feasible horizontal distance as determined by the authorized agent shall be required. The minimum setback shall not be less than 10 feet

(e) Any rules and regulations of the Commission for Public Health or any local board of health in effect on June 30, 1977, which establish greater minimum distance requirements than those provided for in this Section, shall remain in effect and shall apply to a lot or tract of land to which Table IX of Rule .0601(a) of this Section does not apply.

History Note: Authority G.S. 130A-335(e);

SECTION .0700 – COLLECTION SEWERS, RAW SEWAGE LIFT STATIONS, AND PIPE MATERIALS

15A NCAC 18E .0701 is proposed for adoption as follows:

15A NCAC 18E .0701 COLLECTION SEWERS

Collection sewers shall be designed and constructed in accordance with the following criteria:

(1) Building drains and building sewers shall be in accordance with the North Carolina Plumbing Code and approved by the local building inspector.

(2) Pipe material shall be specified to comply with the applicable ASTM standards based on pipe material.

(3) Gravity sewers shall be designed to maintain scour velocities of two feet per second with the pipe half full and one-foot per second at the peak projected instantaneous flow rate. Force mains shall be sized to obtain a two-foot per second scour velocity at the projected pump operating flow rate.

(4) Infiltration and exfiltration shall not exceed 100 gpd per inch diameter per mile of gravity sewer pipe or 20 gpd per inch diameter per mile of pressure pipe in force mains and supply lines.

(5) Three-foot minimum cover shall be provided for all collection sewers, except as provided for in Rule .0601(g) of this Subchapter.

(6) Ferrous material pipe or other pipe designed and bedded for traffic-bearing loads shall be provided where collection sewers are subject to traffic-bearing loads.

(7) Manholes shall be used for collection sewers at any bends, junctions, and every 425 feet along the sewer lines. Drop manholes are required where the inlet to outlet elevation difference exceeds 2.5 feet. Manhole lids shall be watertight if located below the 100-year flood elevation, within 100 feet of any public water supply source, or within 50 feet of any private water supply source or any surface waters classified WS-I, WS-II, WS-III, SA, SB, or B.

(8) Cleanouts may be used instead of manholes for four-inch and six-inch sewers serving one or two buildings, or as otherwise allowed by the North Carolina Plumbing Code. Cleanouts are required every 100 feet for four or six-inch sewers and at all junctions and bends which exceed 45 degrees, unless otherwise allowed by the North Carolina Plumbing Code.

(9) Collection sewers may require additional ventilation provisions. Air relief valves shall be provided as needed for force mains.

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

15A NCAC 18E .0702 is proposed for adoption as follows:

15A NCAC 18E .0702 RAW SEWAGE LIFT STATIONS

(a) Raw sewage lift stations permitted by the LHD shall meet all setbacks for wastewater systems in accordance with Rule .0601(a) of this Subchapter. If the raw sewage lift station is a sealed, watertight chamber the setbacks requirements for collection sewers in Rule .0601(i) of this Subchapter shall apply.

(b) Raw sewage lift stations shall meet the following design and construction standards:

(1) sealed, watertight chamber shall be a prefabricated unit with a sealed top cover, and preformed inlet and outlet pipe openings connected with solvent welds, O-ring seals, rubber boots, stainless steel straps, or equivalent;

(2) dual pumps shall be provided for stations serving two or more buildings or for a facility with more than six water closets;

(3) pumps shall be listed by Underwriter's Laboratories or an equivalent third-party electrical testing and listing agency;

(4) pumps shall be grinder pumps or solids-handling pumps capable of handling three-inch spheres. If the raw sewage lift station serves no more than a single water closet, lavatory, and shower, two-inch solids handling pumps shall be acceptable;

(5) minimum pump operating flow rate shall be 2.5 times the average design daily flow;

(6) systems shall be designed so that the pump-off time does not exceed 30 minutes;

(7) raw sewage lift stations serving single buildings shall be designed for pump run-times between three to 10 minutes at average flow;

(8) pump station emergency storage capacity and total liquid capacity shall be determined in accordance with Rule .0802 of this Subchapter except for a sealed, watertight chamber serving an individual building, in which case a minimum storage capacity of eight hours shall be required; and

(9) all other applicable requirements for pump tanks and dosing systems in accordance with Rule .0802 and Section .1100 of this Subchapter shall also apply to raw sewage lift stations.

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

15A NCAC 18E .0703 is proposed for adoption as follows:

15A NCAC 18E .0703 PIPE MATERIALS

(a) The gravity pipe between a septic tank, gravity distribution device, and the dispersal field shall be three-inch nominal size Schedule 40 PVC, Schedule 40 polyethylene, Schedule 40 ABS, or non-perforated polyethylene with a minimum fall of 1/8-inch per foot if the installation requirements of Paragraph (b) of this Rule are met.

(b) Three-inch or greater non-perforated polyethylene corrugated tubing, or alternative pipe materials described in Paragraph (c) of this Rule, may be substituted for Schedule 40 PVC between the distribution device and the dispersal field when the following installation criteria are met:

(1) the pipe is placed on a compacted, smooth surface at a uniform grade, and with a minimum excavation width of one-foot;

(2) the pipe is placed in the middle of the excavation with three inches of clearance between the pipe and the walls;

(3) a washed gravel or crushed stone envelope is placed in the excavation on both sides of the pipe and to a point two inches above the top of the pipe;

(4) six inches of soil cover is placed and compacted over the stone or gravel envelope; and

(5) earthen dams consisting of two feet of undisturbed or compacted soil are placed at both ends of the excavation separating the trench from the distribution device.

(c) Alternative pipe materials allowed from the distribution device to the dispersal field, when installed in accordance with Paragraph (b) of this Rule, are as follows:

(1) PVC SDR 21 and SDR 26 pressure rated at 160 psi or greater and labeled as compliant with ASTM D2241; or

(2) PVC SDR 35 gravity sewer pipe rated as compliant with ASTM D3034.

(d) All pipe joints from the septic tank to the dispersal field shall be watertight. Solvent cement-joints shall be made in a two-step process with primer manufactured for thermoplastic piping systems and solvent cement conforming to ASTM D2564.

(e) Alternative gravity pipe materials may be proposed when designed and certified by a PE, including any installation and testing procedures. The pipe materials shall be shown to meet the requirements of Paragraphs (a), (b), and (c) of this Rule.

(f) Pipe used for gravity distribution laterals shall be corrugated plastic tubing certified as complying with ASTM F667 or smooth-wall plastic pipe certified as complying with ASTM D2729. The corrugated tubing or smooth-wall pipe shall have three rows of holes, each hole between ½-inch and ¾-inch in diameter, and spaced longitudinally approximately four inches on centers. The rows of holes may be equally spaced 120 degrees on centers around the pipe periphery, or three rows may be located in the lower portion of the tubing, the outside rows being approximately on 120-degree centers. The holes may be located in the same corrugation or staggered in adjacent corrugations. Other types of pipe may be used for laterals provided the pipe satisfies the requirements of this Section and is approved by the State.

(g) Pump discharge piping shall be of Schedule 40 PVC or stronger material and pressure rated for water service at two times the operating pressure. The pipe shall meet ASTM D1784, ASTM D1785, and ASTM D2466.

(h) Alternative pressure rated pipe materials are allowed in place of Schedule 40 PVC from the pump tank to the distribution device or dispersal field are when designed and certified by a PE. The proposed pipe shall be constructed of PVC, polyethylene, or other pressure rated pipe and comply with applicable ASTM standards for pipe material. The proposed pipe shall be installed per ASTM D2774. Installation testing shall include a hydrostatic pressure test similar to pressure testing required for water mains and shall comply with the requirements of Rule .0701(4) of this Section.

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

SECTION .0800 – TANK CAPACITY, LEAK TESTING, AND INSTALLATION REQUIREMENTS

15A NCAC 18E .0801 is proposed for adoption as follows:

15A NCAC 18E .0801 SEPTIC TANK CAPACITY REQUIREMENTS

(a) Minimum liquid capacities for septic tanks shall be in accordance with the following:

(1) The minimum capacity of any septic tank shall be 1,000 gallons.

(2) Individual dwelling units with five bedrooms or less shall be sized based on Table XIII.

TABLE XIII. Minimum septic tank liquid capacity for dwelling units

Number of bedrooms	Minimum liquid capacity (gallons) without a garbage disposal	Minimum liquid capacity (gallons) with a garbage disposal
4 or less	1,000	1,250
5	1,250	1,500

(3) Septic tanks for dwelling units greater than five bedrooms, multiple dwelling units, places of business, or places of public assembly shall be sized in accordance with Table XIV.

TABLE XIV. Septic tank capacity for facilities not listed in Table XIII

Design daily flow (gpd) (Q)*	Minimum septic tank liquid capacity (V) calculation (gallons)
$Q \leq 600$	$V = 2Q$
$600 < Q < 1,500$	$V = 1.17Q + 500$
$1,500 \leq Q \leq 4,500$	$V = 0.75Q + 1,125$
$Q > 4,500$	$V = Q$

*For individual wastewater systems serving dwelling units with more than five bedrooms or more than one design unit, the minimum septic tank capacity is 1,500 gallons

(b) The minimum liquid capacity requirements of Paragraph (a) of this Rule shall be met by use of a single two compartment tank or by two tanks installed in series. Each tank shall have a minimum liquid capacity of 1,000 gallons. The tanks in series may be constructed with or without a baffle wall. For two tanks installed in series, one of the tanks or tank compartments shall contain two-thirds of the total required liquid capacity.

(c) When a grinder pump or sewage lift pump is installed prior to the septic tank, the required septic tank liquid capacity shall be doubled, and meet the following:

(1) minimum liquid capacity may be met by installing two or more septic tanks in series, each tank containing two compartments; and

(2) each tank shall have a minimum liquid capacity of 1,000 gallons.

(d) The State may consider other septic tank designs to receive wastewater from grinder pumps or sewage lift pumps if designed by a PE. The design shall demonstrate that the effluent discharged to the septic tank meets DSE in accordance with Table III of Rule .0402(a) of this Subchapter.

(e) A State approved effluent filter shall be in the second compartment of the septic tank. When two or more tanks are used in series in accordance with Paragraphs (b) or (c) of this Rule, the following conditions shall be met:

(1) approved effluent filter shall be in the compartment immediately prior to discharge; and

(2) outlet sanitary tee extending down 25 to 50 percent of the liquid depth shall be used at the outlet end of the initial tank.

History Note: Authority G.S. 130A-334; 130A-335(e), (f), (f1);

15A NCAC 18E .0802 is proposed for adoption as follows:

15A NCAC 18E .0802 PUMP TANK CAPACITY REQUIREMENTS

(a) The minimum pump tank liquid capacity shall be based on one of the following, but shall never be less than 1,000 gallons:

(1) equal to the required septic tank capacity in Group IV soils;

(2) equal to two-thirds of the required septic tank capacity in Group I, II, or III soils; or

(3) based on the following:

(A) pump submergence or as recommended by the pump manufacturer;

(B) required dose volume in accordance with Rule .1101(d) of this Subchapter;

(C) flow equalization storage, if applicable; and

(D) 24-hour emergency storage above the high-water alarm activation level.

(b) An alternate method to determine the minimum pump tank liquid capacity shall be calculated by a PE and provide for the following:

(1) pump submergence or as recommended by the pump manufacturer;

(2) required dose volume in accordance with Rule .1101(d) of this Subchapter;

(3) flow equalization storage, if applicable; and

(4) minimum emergency storage capacity requirement determined in accordance with Table XV of this Rule.

(c) The emergency storage capacity may be calculated as the sum of freeboard space in the pump tank above the high-water alarm activation level, the available freeboard space in previous tankage, and the available freeboard space in the collection system below the lowest ground elevation between the pump tank and the lowest connected building drain invert.

(d) The emergency storage capacity requirement shall be determined based on the following and in accordance with Table XV:

(1) type of facility served;

(2) classification of surface waters which would be impacted by a pump tank failure; and

(3) availability of standby power devices and emergency maintenance personnel.

TABLE XV. Pump tank emergency storage capacity requirements

Facility Type	Surface Water Classification of Watershed	Standby Power and Emergency Maintenance Personnel Provisions	Emergency Storage Capacity Period Requirement
Residential systems and other systems in full time use	WS-I, WS-II, WS-III, SA, SB, and B waters	No standby power	24 hours
		Manually activated standby power and telemetry contacting a 24-hour maintenance service	12 hours
		Automatically activated standby power and telemetry contacting a 24-hour maintenance service	4 hours
	All other surface waters	No standby power	12 hours
		Manually activated standby power and telemetry contacting a 24-hour maintenance service	8 hours
		Automatically activated standby power and telemetry contacting a 24-hour maintenance service	4 hours
Non-residential systems not in full-time use and all other systems	All surface waters	No standby power	12 hours
		Manually activated standby power and telemetry contacting a 24-hour maintenance service	8 hours
		Automatically activated standby power and telemetry contacting a 24-hour maintenance service	4 hours

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

15A NCAC 18E .0803 is proposed for adoption as follows:

15A NCAC 18E .0803 GREASE TANK CAPACITY REQUIREMENTS

(a) Grease tanks or grease tanks in conjunction with grease interceptors shall be required at food preparation facilities, food processing facilities, meat markets, churches with commercial kitchen equipment, institutions, places of public assembly with a kitchen, and other facilities where the accumulation of FOG may cause premature failure of a wastewater system. The grease tank shall be plumbed to receive all wastes associated with food handling, preparation, and cleanup. No toilet wastes shall be discharged to a grease tank.

(b) The minimum liquid capacity of any grease tank shall be 1,000 gallons with two compartments.

(c) When the required minimum grease tank capacity for a facility is less than or equal to 1,500 gallons, the grease tank may be a single tank with two compartments and a 2:1 length to width ratio.

(d) When the required minimum grease tank capacity for a facility is greater than 1,500 gallons, the grease tank shall have a 4:1 length to width ratio and four compartments. This requirement can be met by two or more tanks in series. Each tank shall have a minimum liquid capacity of 1,000 gallons.

(e) The grease tank liquid capacity shall be calculated by one of the following:

(1) five gallons per meal served per day;

(2) equal to the required septic tank liquid capacity; or

(3) equal to the capacity as determined in accordance with the following, whichever is greater:

LC = D x GL x ST x HR/2 x LF

Where LC = grease tank liquid capacity (gallons)

D = number of seats in dining area

GL = gallons of wastewater per meal (1.5 single-use; 2.5 multi-use)

ST = storage capacity factor (2.5)

HR = number of hours open

LF = loading factor

(1.25 if along an interstate highway;

1.0 if along US and recreational areas;

0.8 if along other roads)

(f) An approved grease rated effluent filter shall be in the second compartment of the grease tank. When two or more grease tanks are used in series in accordance with Paragraph (d) of this Rule, the following conditions shall be met:

(1) approved grease rated effluent filter shall be in the compartment immediately prior to discharge; and

(2) outlet sanitary tee extending down 40 to 60 percent of the liquid depth shall be used at the outlet end of the initial tank.

(g) The grease tank liquid capacity may be reduced by up to 50 percent when grease interceptors are used inside the facility. The system shall be designed by a PE, if required by G.S. 89(c), and approved by the State. The PE shall provide documentation showing that the grease interceptor is projected to reduce the FOG concentration by 50 percent.

(h) Grease interceptors shall be maintained by a permitted septage management firm and the contents disposed of in accordance with 15A NCAC 13B .0800.

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

15A NCAC 18E .0804 is proposed for adoption as follows:

15A NCAC 18E .0804 SIPHON TANK CAPACITY REQUIREMENTS

Siphon tanks shall be sized to provide the minimum dose requirements of Rule .1101(d) of this Subchapter, plus three inches of freeboard above the siphon trip level.

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

15A NCAC 18E .0805 is proposed for adoption as follows:

15A NCAC 18E .0805 TANK STRUCTURAL INTEGRITY AND LEAK TESTING REQUIREMENTS

(a) Ten percent of all tanks installed in each county shall be tested for structural integrity on the job site or at the tank yard using a method approved by the State for the specific material used for construction.

(1) Reinforced precast concrete tanks shall be tested by an authorized agent using a Schmidt Rebound Hammer or approved equal that is calibrated according to the manufacturer's recommendations.

(2) Thermoplastic and glass-fiber reinforced tanks shall be enrolled in a third-party quality assurance and quality control program, which includes material testing and unannounced annual audits. The results of the annual audit and material testing shall be submitted to the State on an annual basis.

(3) A concrete tank manufacturer enrolled in a third-party quality assurance and quality control program as described in Subparagraph (a)(2) of this Rule is not subject to 10 percent testing of all tanks installed.

(b) Tanks installed under the following conditions shall be leak tested at the site using leak testing methods described in this Rule:

(1) soil wetness condition is present within five feet of the elevation of the top of a mid-seam pump tank;

(2) advanced pretreatment; or

(3) PE design.

(c) Tanks subject to leak testing in accordance with Paragraph (b) of this Rule shall be leak tested with one of the following standards:

(1) Hydrostatic test procedure

(A) Fill tank with clean water to the outlet invert or pipe, as applicable.

(B) Allow the tank to sit for 24 hours if the tank is made of material that absorbs water (such as concrete) and refill to the tank outlet.

(C) Let the tank stand for one hour.

(D) If a leak is detected, the tank may be repaired in accordance with the tank manufacturer's written instructions and retested.

(E) Tank shall be approved if there is no visible flowing leakage and the water level in the tank has not fallen after sitting for one hour.

(2) Vacuum test procedure

(A) Temporarily seal inlet and outlet pipes and access openings.

(B) Using calibrated equipment, draw a vacuum on the empty tank to a negative pressure of 2.5 inches of mercury.

(C) Hold the vacuum for five minutes and re-measure and record the ending negative pressure inside the tank.

(D) Tank shall be approved if there is no difference between the starting negative pressure and the ending negative pressure and no permanent deformation that impairs the shape and working effectiveness of the tank openings.

(E) All tank openings shall be un-sealed after the vacuum test is completed.

(3) Other test procedures as specified by PE.

(d) Tanks unable to pass a leak test or be repaired to pass a leak test shall be removed from the site and the imprint described in Rule .1402(d)(17) and (e)(8) of this Subchapter marked over.

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

15A NCAC 18E .0806 is proposed for adoption as follows:

15A NCAC 18E .0806 TANK INSTALLATION REQUIREMENTS

(a) An effluent filter and support case shall be installed level in the outlet end of the septic tank and shall meet the following criteria:

(1) solvent welded to three-inch PVC Schedule 40 outlet pipe at a minimum;

(2) installed in accordance with filter manufacturer's specifications and effluent filter approval; and

(3) accessible and removable without entering the septic tank.

(b) The tank outlet pipe shall be inserted through the outlet pipe penetration, creating a watertight joint, and extending two feet beyond the tank outlet.

(c) The tank outlet pipe shall be placed on undisturbed soil or bedded in accordance with Rule .0703 of this Subchapter to prevent differential settling of the pipe and shall be level for two feet after exiting the tank.

(d) Septic tanks shall be installed with the access openings within six inches of finished grade. If the septic tank is installed deeper than six inches, the risers shall be brought to within six inches of finished grade.

(e) Risers shall be installed in accordance with the rules of this Subchapter, the manufacturer's specifications, and a product specific approval.

(f) The bottom of the tank shall be installed level in undisturbed or compacted soil, or bedded using sand, gravel, stone, or other equivalent approval material, and installed in accordance with the tank manufacturer's instructions and industry standards. When rock or other protruding obstacles are encountered, the bottom of the tank excavation shall be backfilled with sand, gravel, stone, or other approved equivalent material to three inches above rock or obstacle.

(g) Leak testing of tanks shall be done in accordance with Rule .0805(c) of this Section.

History note: Authority G.S. 130A-335(e), (f), (f1);

SECTION .0900 – SUBSURFACE DISPERSAL

15A NCAC 18E .0901 is proposed for adoption as follows:

15A NCAC 18E .0901 GENERAL DESIGN AND INSTALLATION CRITERIA FOR SUBSURFACE DISPERSAL SYSTEMS

(a) Wastewater systems shall be used on sites classified suitable in accordance with Rule .0509 of this Subchapter. The site shall meet the following criteria:

(1) 12 inches of naturally occurring soil is on the downslope side of the trench between the infiltrative surface and any limiting condition; and

(2) 18 inches of separation between the infiltrative surface and any soil wetness condition in Group I soils.

(b) The LTAR shall be determined in accordance with the following:

(1) Tables XVI and XVII shall be used;

(2) LTARs determined from Table XVI shall be based on the soil textural class of the most limiting, naturally occurring soil horizon within 30 inches of the ground surface (36 inches for Group I soils) or to a depth of 12 inches below the infiltrative surface, whichever is deeper;

(3) LTARs determined from Table XVII shall be based on the most limiting, naturally occurring saprolite to a depth of 24 inches (or less if combined with soil) below the infiltrative surface;

(4) for shallow systems, the LTAR shall be based on the most limiting, naturally occurring soil horizon or to a depth of 12 inches below the infiltrative surface, whichever is deeper;

(5) the LTAR shall be assigned based upon soil textural class, structure, consistence, depth, percent coarse rock, landscape position, topography, and system type; and

(6) the LTAR shall not exceed the mean rate for the applicable Soil Group for effluent exceeding DSE as specified in Table III of Rule .0402(a) of this Subchapter.

(c) The minimum required infiltrative surface area and trench length shall be calculated in accordance with the following:

(1) The minimum required infiltrative surface area shall be determined by dividing the design daily flow by the LTAR.

(2) The minimum trench length shall be determined by dividing the required infiltrative surface area by the trench width. The authorized agent may approve trench widths between two and three feet. The following equation shall be used to calculate the minimum line length required:

TL = (DDF ÷ LTAR) ÷ ETW

Where TL = length of trench (feet)

DDF = design daily flow (gpd)

LTAR = in gpd/ft^2

ETW = equivalent trench width (feet)

(3) The area occupied by step-downs and drop boxes shall not be included as part of the minimum required infiltrative surface area.

(4) The total trench length required for trench products approved under Section .1700 of this Subchapter shall be determined in accordance with the PIA approval.

(5) When high strength effluent is proposed to be discharged to a dispersal field with no advanced pretreatment, a licensed consultant shall calculate the mass loading to the soil in accordance with Rule .0402(b) of this Subchapter. The consultant shall demonstrate that the mass loading rate on the soil does not exceed the mass loading rates identified in Tables XVI and XVII.

TABLE XVI. LTAR and mass loading rate for wastewater systems based on Soil Group and texture class

Soil Group	**USDA Soil Textural Class**		**LTAR (gpd/ft^2)**	**Mass Loading Rate (lbs/day/ft^2)***
I	Sands	Sand	0.8 – 1.2	0.00151 – 0.00227
		Loamy Sand		
II	Coarse Loams	Sandy Loam	0.6 – 0.8	0.00113 – 0.00151
		Loam		
III	Fine Loams	Sandy Clay Loam	0.3 – 0.6	0.00057 – 0.00113
		Silt Loam		
		Clay Loam		
		Silty Clay Loam		
		Silt		
IV	Clays	Sandy Clay	0.1 – 0.4	0.00019 – 0.00076
		Silty Clay		
		Clay		

*Mass loading rate is based on the combined load of BOD and TSS.

TABLE XVII. LTAR for wastewater systems in saprolite based on Saprolite Group and texture class

Saprolite Group	**Saprolite Textural Class**	**LTAR (gpd/ft^2)**	**Mass Loading Rate (lbs/day/ft^2)***

I	Sands	Sand	0.6 – 0.8	0.0012 – 0.0015
		Loamy Sand	0.5 – 0.7	0.00095 – 0.0013
II	Loams	Sandy Loam	0.4 – 0.6	0.00076 – 0.0012
		Loam	0.2 – 0.4	0.00038 – 0.00076
		Silt Loam	0.1 – 0.2	0.00019 – 0.00038
III	Sandy Clay Loam**		0.05 – 0.15	0.000095 – 0.00029

*Mass loading rate is based on the combined load of BOD and TSS.

** Sandy clay loam saprolite can only be used with advanced pretreatment in accordance with Section .1200 of this Subchapter.

(d) Wastewater system installation shall be in accordance with the following criteria:

(1) an engineer's level, laser level, or equivalent shall be used for the following:

(A) staking (flagging) or marking on the soil surface the location of trenches on site before installation begins;

(B) installation of the trenches; and

(C) verification of elevations, excavations, and installation of other system components;

(2) the trenches shall follow the ground contour. Trenches may be installed level but off contour if an authorized agent has determined that there is sufficient vertical separation distance to a limiting condition along the entire trench length in accordance with Subparagraph (d)(3) of this Rule;

(3) trenches shall be installed with 12 inches of naturally occurring suitable soil between the downslope side of the infiltrative surface and any unsuitable soil condition. If a site has six inches of Group I soils, trenches shall be installed with 18 inches of naturally occurring suitable soil between the downslope side of the infiltrative surface and a soil wetness condition;

(4) the pipe shall be centered laterally in the trench;

(5) final soil cover over the dispersal field shall be to a depth of six inches after settling. The finished grade over the wastewater system shall be sloped to shed surface water. Surface water runoff, including stormwater, shall be diverted away from the wastewater system;

(6) Schedule 40 PVC or other State-approved equivalent pipe may be used as needed to connect sections of trench and overcome site limitations. The bottom area of trench where solid piping is installed shall not be included as part of the minimum area required for infiltrative surfaces;

(7) gravity effluent distribution components including distribution boxes, drop boxes, and flow diversion devices shall be of sound construction, watertight, corrosion resistant, and meeting the following criteria:

(A) separated by two feet of undisturbed soil from the septic tank and trench(es);

(B) placed level on a solid foundation of undisturbed soil, pea gravel, or concrete to prevent differential settling of the component; and

(C) backfilled by hand to minimize disturbance;

(8) when parallel distribution is used to distribute effluent to the trenches, the installer shall demonstrate that the distribution devices perform as designed;

(9) serial and sequential distribution may be used when approved by the authorized agent. The effluent in an individual trench shall be constructed to allow full utilization of the upstream trench prior to overflowing to the next downslope trench through either a stepdown or drop box in accordance with Subparagraphs (d)(10) and (d)(11) of this Rule;

(10) step-downs shall be constructed of two feet of undisturbed soil, bedding material, or concrete and the effluent shall be conveyed over the step-down through Schedule 40 PVC or other equivalent State-approved pipe. The installer shall demonstrate that the drop boxes perform as designed;

(11) drop boxes shall be separated from the trench by two feet of undisturbed soil and constructed so that the invert of the inlet supply pipe is one-inch above the invert of the outlet supply pipe which is connected to the next lower drop box. The installer shall demonstrate that the drop boxes perform as designed;

(12) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval; and

(13) appropriate site-specific vegetation shall be established over the wastewater system and repair area.

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

15A NCAC 18E .0902 is proposed for adoption as follows:

15A NCAC 18E .0902 CONVENTIONAL WASTEWATER SYSTEMS

(a) A conventional wastewater system consists, at a minimum, of an approved septic tank and a gravity distribution dispersal field. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) Conventional wastewater systems shall be used on sites that have been classified suitable in accordance with Rules .0509 of this Subchapter. Sites classified suitable as to soil depth may utilize shallow placement of dispersal system

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section. An equivalent trench width of three feet shall be used to determine trench length in accordance with Rule .0901(c) of this Section.

(d) Conventional wastewater system installation shall be in accordance with Rule .0901(d) of this Section and the following:

(1) trenches shall be constructed level in all directions with a plus or minus one-half inch tolerance from side-to-side and the maximum fall in a in a single trench bottom not to exceed one-fourth inch in 10 feet as determined by an engineer's level, laser level, or equivalent;

(2) trenches shall be located not less than three times the trench width on centers. The minimum spacing for trenches is six feet on center;

(3) trench widths shall not exceed three feet and trench depth shall not exceed 36 inches on the

downslope side of the trench, except as approved by an authorized agent;

(4) aggregate used in trenches shall be clean, washed gravel or crushed stone and graded or sized in accordance with size numbers 4, 5, or 6 of ASTM D448. The aggregate shall be distributed uniformly across the infiltrative surface and over the pipe and placed 12 inches deep with six inches below the pipe and two inches over the pipe; and

(5) aggregate shall be accompanied by a bill of lading labeled as drainfield aggregate which certifies that the aggregate meets the requirements of this Rule. The installer shall provide a copy of the bill of lading as documentation of the type and quantity of aggregate installed.

(e) Shallow systems shall not be installed on slopes greater than 30 percent and shall be installed in accordance with Paragraph (d) of this Rule and the following:

(1) soil cover above the original grade shall be placed over the entire dispersal field and shall extend laterally five feet beyond the trenches, with the dispersal field crowned at one-half percent as measured from the centerline of the dispersal field; and

(2) the type and placement of soil cover shall be approved by the authorized agent. The cover material shall have not more than 10 percent by volume of fibrous organics, building rubble, rocks, or other debris and shall be Soil Groups II or III.

(f) Alternating dual dispersal fields shall only be used with DSE in Soil Groups III and IV. Alternating dual dispersal fields shall be approved when designed and installed in accordance with Paragraph (d) of this Rule and the following:

(1) both initial and repair dispersal fields shall be installed at the same time;

(2) initial and repair dispersal fields of the same system type are sized at 75 percent of the total area required;

(3) the initial and repair dispersal fields shall be separated by an effluent flow diversion valve(s);

(4) diversion valve(s) shall be resistant to 500 pounds crushing strength and resistant to corrosion;

(5) effluent flow diversion valves placed below finished grade shall be installed in a valve box and be operable from the ground surface;

(6) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval; and

(7) the maximum reduction in dispersal field area is 25 percent, unless a greater percentage is specifically identified in a PIA approval or this Subchapter.

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

15A NCAC 18E .0903 is proposed for adoption as follows:

15A NCAC 18E .0903 BED SYSTEMS

(a) This Rule provides for the permitting of bed systems receiving DSE. Bed systems shall be limited to 600 gpd design daily flow. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter. Beds may be permitted on sites that meet the following criteria:

(1) soil texture is Group I, II, or III; and

(2) topography or available space limits the design options for the site.

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section. The number of square feet of infiltrative surface area required shall be increased by 50 percent over that required for a conventional trench system as calculated in accordance with Rule .0901(c) of this Section.

(d) Bed system installation shall be in accordance with Rule .0901(d) of this Section and the following:

(1) the bottom of the bed shall be excavated level, plus or minus one-half inch, in all directions;

(2) laterals shall be one and one-half feet from the side of the bed;

(3) laterals shall be placed on a maximum of three-foot centers;

(4) the lateral design criteria shall meet the requirements of Rule .0902(d)(3) and (4) of this Section for gravity and pressure dosed gravity distribution systems;

(5) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval;

(6) the gravel surface shall be covered by an approved geo-textile fabric capable of preventing the downward movement of soil particles while allowing the movement of liquids and gases; and

(7) if pressure dispersal is used, the pressure dispersal system shall be designed in accordance with Rules .0907(d) and (e) or .0908(c) and (e) of this Section or in accordance with a PIA approval.

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

15A NCAC 18E .0904 is proposed for adoption as follows:

15A NCAC 18E .0904 LARGE DIAMETER PIPE SYSTEMS

(a) Large diameter pipe (LDP) systems consist of laterals composed of eight-inch or 10-inch (inside diameter) corrugated, polyethylene tubing encased in a nylon and polyester blend filter wrap that are installed in trenches in the dispersal field. LDP systems shall only be used with domestic strength wastewater. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter.

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section except that the LTAR shall not exceed 0.8 gpd/ft^2. To calculate trench length in accordance with Rule .0901(c) of this Section, an equivalent trench width of two feet shall be used for eight-inch pipe and an equivalent trench width of two and one-half feet shall be used for 10-inch pipe.

(d) LDP tubing, filter wrap, and fittings shall meet the following criteria:

(1) tubing and fittings shall comply with the requirements of ASTM F667;

(2) the corrugated tubing shall have two rows of holes, each hole between three-eighths inch and one-half inch in diameter, located 120 degrees apart along the bottom half of the pipe (each 60 degrees from the bottom center line) and staggered so that one hole is present in the valley of each corrugation;

(3) the tubing shall be marked with a visible top location indicator, 120 degrees away from each row of holes;

(4) corrugated tubing shall be covered with filter wrap at the factory;

(5) filter wrap shall be spun, bonded, or spunlaced nylon, polyester, or nylon/polyester blend nylon filter wrap meeting the minimum requirements in Table XVIII; and

(6) the large diameter pipe with filter wrap shall be encased in a black polyethylene sleeve until immediately prior to installation in the trench to prevent physical damage and ultraviolet radiation deterioration of the filter wrap.

Table XVIII. Minimum filter wrap requirements for large diameter pipe

Property	**Value**
Unit Weight	1.0 ounce per square yard
Sheet Grab Tensile Strength	Machine Direction: 23 pounds
Trapezoid Tear Strength	Machine Direction: 6.2 pounds Cross Direction: 5.1 pounds
Mullen Burst Strength	40 psi or 276 kilopascals
Frazier Air Permeability	500 cubic feet per minute per square foot at pressure differential of 0.5 inches of water

(e) LDP system installations shall be in accordance with Rule .0901(d) of this Section and the following:

(1) trenches shall be 12 inches wide;

(2) the infiltrative surface and pipe shall be level (with a maximum fall of one inch in 100 feet);

(3) backfill material shall have no more than 10 percent by volume of fibrous organics, building rubble, rocks, large clods, or other debris and shall be Soil Groups II or III;

(4) the LDP shall be connected to the septic tank or distribution box outlet pipe using an offset adapter, with the small end of the adapter facing upwards, to create a mechanical joint; and

(5) minimum on center spacing for eight and 10-inch LDP shall be six feet.

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

15A NCAC 18E .0905 is proposed for adoption as follows:

15A NCAC 18E .0905 PREFABRICATED PERMEABLE BLOCK PANEL SYSTEMS

(a) PPBPS utilize both horizontal and vertical air chambers in a 16-inch PPBPS and are constructed to promote downline and horizontal distribution of effluent. PPBPS systems shall only be used with domestic strength wastewater. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter.

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section except that the LTAR shall not exceed 0.8 gpd/ft^2 for DSE. An equivalent trench width of six feet shall be used to determine trench length in accordance with Rule .0901(c) of this Section.

(d) PPBPS installation shall be in accordance with Rule .0901(d) of this Section, the following, and the manufacturer's specifications:

(1) PPBPS trenches shall be located a minimum of eight feet on center;

(2) trench sidewalls shall be raked in Group IV soils;

(3) pressure dosed gravity distribution or pressure dispersal shall be used when the individual trench lengths are greater than 50 feet and less than or equal to 70 feet;

(4) pressure dispersal shall be used when the individual trench lengths are greater than 70 feet; and

(5) trenches shall be constructed level in all direction with a plus or minus one-half inch tolerance from side-to-side and maximum fall in a single trench bottom shall not exceed one-fourth inch in 10 feet as determined by an engineer's level, laser level, or equivalent.

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

15A NCAC 18E .0906 is proposed for adoption as follows:

15A NCAC 18E .0906 SAND LINED TRENCH SYSTEMS

(a) Sand lined trench systems may be used on sites originally classified unsuitable due to soil wetness, soil morphology, restrictive horizon, or soil depth, and which may be reclassified suitable in accordance with this Rule. Sand lined trenches are limited to 1,500 gpd design daily flow. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The soil and site shall meet the following criteria:

(1) texture of the receiving permeable horizon is sand, loamy sand, sandy loam, loam, or silt loam;

(2) structure of the receiving permeable horizon is classified suitable;

(3) moist consistence of the receiving permeable horizon is loose, very friable, friable, or firm;

(4) if the receiving permeable horizon has zones of heavier textured materials, these zones are discontinuous with an average thickness not exceeding 1/3 of the required thickness of the receiving permeable horizon;

(5) the naturally occurring receiving permeable horizon shall be less than 60 inches below the natural soil surface;

(6) artificial drainage shall be provided, as needed, to maintain the following minimum separation distances to a soil wetness condition:

(A) 18 inches with gravity distribution; or

(B) 12 inches with pressure dispersal; and

(7) the minimum required thickness of the receiving permeable horizon shall be determined by the texture of that horizon as follows:

(A) sand or loamy sand texture requires a minimum thickness of one-foot;

(B) sandy loam or loam texture requires a minimum thickness of two feet; or

(C) silt loam texture requires a minimum thickness of three feet.

(c) If a groundwater lowering system is required to meet the minimum vertical separation distance in Paragraph (b)(6) of this Rule to a soil wetness condition that is not related to lateral water movement, the following conditions apply to the groundwater lowering system:

(1) shall extend into the receiving permeable horizon;

(2) shall be prepared by a person or persons who are licensed to consult, investigate, evaluate, plan, or design wastewater systems, soil and rock characteristics, groundwater hydrology, or artificial drainage systems if required in G.S. 89C, G.S. 89E, or G.S. 89F;

(3) shall have a suitable outlet accessed by the artificial drainage system. The outlet location and elevation must be shown on the artificial drainage system plan with relative water level elevations and dispersal field site elevations labeled; and

(4) all artificial drainage system components are integral to the wastewater system and subject to ownership and easement requirements of Rule .0301(b) and (c) of this Subchapter.

(d) The LTAR shall be determined in accordance with Table XIX for all DSE sand-lined trench systems. The LTAR shall be one of the following:

(1) LTAR set forth in Table XIX based on the texture of the receiving permeable horizon; or

(2) 10 percent of the in-situ Ksat of the receiving permeable horizon, whichever is less.

(e) There shall be no reduction in trench length comparted to a conventional gravel trench when Accepted or Innovative gravelless trench media is used.

TABLE XIX. LTAR for sand lined trench systems based on receiving permeable horizon texture

Texture of receiving permeable horizon	**Distribution type**	**LTAR ($gpd/ft^{2)}$**
Sand or Loamy Sand	Gravity Distribution	0.3 – 0.6
	Pressure Dispersal	0.4 – 0.7
Sandy Loam or Loam	Gravity Distribution	0.2 – 0.4
	Pressure Dispersal	0.3 – 0.6

Silt Loam	Gravity Distribution	≤ 0.3*
	Pressure Dispersal	≤ 0.4*

* For Silt Loam soils, LTAR shall be field verified and no greater than 10 percent of in-situ Ksats.

(f) A Special Site Evaluation in accordance with Rule .0510 of this Subchapter is required for the following conditions:

(1) texture of the receiving permeable horizon is sandy loam or loam and the system design daily flow is greater than 600 gpd; or

(2) texture of the receiving permeable horizon is silt loam.

(g) Sand lined trench dispersal field installation shall be in accordance with Rule .0901(d) of this Section and the following:

(1) gravity trenches shall have a maximum width of three feet and a minimum width of one and a half feet;

(2) trenches shall have a center-to-center spacing three times the trench width, but no less than five feet on centers;

(3) drip dispersal systems in sand lined trenches shall require multiple runs per trench of drip tubing with emitters: two runs within a trench between one and one half and two feet wide; and three runs within a trench between two and three feet wide. The drip tubing shall be uniformly spaced across the trench with the tubing six inches from the trench sidewalls. Drip tubing shall be covered by six inches of sand lined trench media;

(4) the sand lined trenches shall be constructed to extend into the naturally occurring receiving permeable horizon;

(5) the infiltrative surface shall be no deeper than 24 inches below finished grade. The top of the media for a media filled trench shall be at or below the naturally occurring soil surface. Drip tubing shall be installed six inches below the natural grade;

(6) sand used to line the trench shall be sand in texture. If required by the LHD in the CA, the installer shall provide written laboratory verification of the media textural classification and quality prior to the sand lined trench being installed. When laboratory analysis is required, the material shall be determined to be clean, uncoated fine, medium, or coarse sand with 90 percent in sizes ranging from 0.1 to 2.0 millimeters, with no more than one percent smaller than 0.002 millimeters;

(7) pressure dosed gravity distribution shall be used when the total dispersal field line length exceeds 600 linear feet in a single system;

(8) pressure dispersal shall be used when the total dispersal field line length exceeds 1,200 linear feet in a single system;

(9) if pressure dispersal is used, the pressure dispersal network shall be designed in accordance with Rules .0907(e) or .0908(e) of this Section, except that the trenches shall have a maximum width of three feet;

(10) no depressions are allowed over the dispersal field area, including no linear depressions over the trenches;

(11) finished grade shall provide for positive surface drainage away from all system components, with the dispersal field crowned at 1/2 percent as measured from the centerline of the dispersal field. The finished grade requirements shall be made a condition of the CA; and

(12) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with PIA approval.

(h) Other sand lined trench systems may be approved by the authorized agent on a site-specific basis in accordance with Rule .0509(e) of this Subchapter.

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

15A NCAC 18E .0907 is proposed for adoption as follows:

15A NCAC 18E .0907 LOW PRESSURE PIPE SYSTEMS

(a) LPP systems utilize a network of small diameter pipes with a three to six-foot pressure head to distribute effluent across the entire dispersal field. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter.

(c) The LTAR shall be determined in accordance with Rule .0901(b) of this Section, except for the following:

(1) LTAR shall be based on the soil textural class of the most limiting, naturally occurring soil horizon within 24 inches of the naturally occurring soil surface or to a depth of 12 inches below infiltrative surface, whichever is deeper; and

(2) Tables XX and XXI shall be used to determine the LTAR for LPP systems.

TABLE XX. LTAR for LPP systems based on Soil Group and texture

Soil Group	**USDA Soil Textural Class**		**LTAR (gpd/ft^2)**	**Mass Loading Rate (lbs/day/ft^2)***
I	Sands	Sand	0.4 – 0.6	0.00076 – 0.0012
		Loamy Sand		
II	Coarse Loams	Sandy Loam	0.3 – 0.4	0.00057 – 0.00076
		Loam		
III	Fine Loams	Sandy Clay Loam	0.15 – 0.3	0.00029 – 0.00057
		Silt Loam		
		Clay Loam		
		Silty Clay Loam		
		Silt		

IV	Clays	Sandy Clay	0.05 – 0.2	0.000095 – 0.00038
		Silty Clay		
		Clay		

*Mass loading rate is based on the combined load of BOD and TSS.

TABLE XXI. LTAR for LPP systems in saprolite based on Saprolite Group and texture class

Saprolite Group	Saprolite Textural Class		LTAR (gpd/ft^2)	Mass Loading Rate ($lbs/day/ft^2$)*
I	Sands	Sand	0.3 – 0.4	0.0006 – 0.00075
		Loamy Sand	0.25 – 0.35	0.0000475 – 0.00065
II	Loams	Sandy Loam	0.2 – 0.3	0.00038 – 0.0006
		Loam	0.1 – 0.2	0.00019 – 0.0003
		Silt Loam	0.005 – 0.1	0.000095 – 0.00019

*Mass loading rate is based on the combined load of BOD and TSS.

(d) The minimum required dispersal field area and trench length shall be calculated in accordance with the following:

(1) the minimum required dispersal field area shall be determined by dividing the design daily flow by the LTAR; and

(2) the minimum trench length shall be determined by dividing the required dispersal field area by a lateral spacing of five feet. The following equation shall be used to calculate the minimum line length required.

TL = (DDF ÷ LTAR) ÷ LS

Where TL = length of trench (feet)

DDF = design daily flow (gpd)

LTAR = in gpd/ft^2

LS = five feet

(3) When high strength effluent is proposed to be discharged to a dispersal field with no advanced pretreatment, a licensed consultant shall calculate the mass loading to the soil in accordance with Rule .0402(b) of this Subchapter. The consultant shall demonstrate that the mass loading rate on the soil does not exceed the mass loading rates identified in Tables XX and XXI.

(e) LPP system design and installation shall be in accordance with Rule .0901(d) of this Section and the following:

(1) the LPP distribution network shall be constructed of small diameter pressure rated Schedule 40 PVC laterals placed in gravel or other approved media filled trenches;

(2) the trench width shall be one to two feet;

(3) trenches shall be located no less than three times the trench width on centers, with a minimum spacing of five feet on centers;

(4) trenches shall include eight inches of approved gravel or other approved media, with no less than six inches vertical separation distance from the discharge piping to the infiltrative surface;

(5) laterals, manifolds and LPP fields shall comply with the following design criteria:

(A) the maximum lateral length shall yield no more than a 10 percent difference in discharge rate between the first and last orifice along the lateral;

(B) minimum orifice size shall be 5/32-inch for 2/3 of the field lateral lines, with no orifices sized smaller than 1/8-inch in any lateral line; and

(C) maximum orifice spacing shall be as follows: Soil Group I - five feet; Soil Group II - six feet; Soil Group III - eight feet; and Soil Group IV - 10 feet;

(6) the orifices shall be protected by the following:

(A) lateral sleeved within four-inch perforated corrugated or smooth wall tubing meeting the requirements of Rule .0703 of this Subchapter;

(B) specially designed and approved orifice shields; or

(C) State-approved equivalent tubing or pipe;

(7) the following additional design provisions are required for sloping sites:

(A) separately valved manifolds are required for all subfield segments where the elevation difference between the highest and lowest laterals exceeds three feet;

(B) the orifice spacing, orifice size or both shall be adjusted to compensate for relative elevation differences between laterals branching off a common supply manifold and to compensate for the bottom lines receiving more effluent at the beginning and end of a dosing cycle;

(C) the lateral network shall be designed to achieve a 10 to 30 percent higher steady state (pipe full) flow rate into the upper lines, relative to the lower lines, depending on the amount of elevation difference; and

(D) maximum elevation difference between the highest and lowest laterals in a field shall not exceed 10 feet unless the flow is uniformly divided using multiple pumps or split between subfield segments, such as with State-approved automatically alternating valves, without requiring simultaneous adjustment of multiple throttling valves, or as otherwise approved by the State;

(8) turn-ups shall be provided at the ends of each lateral, constructed of Schedule 40 PVC pipe or stronger pressure-rated pipe, and protected with valve boxes, or approved equivalent protective access devices. Turn-ups shall terminate at or above the ground surface and be installed in a valve box or equivalent for protection and accessibility;

(9) the supply manifold shall be constructed of solvent-welded pressure rated Schedule 40 PVC;

(10) the supply manifold shall be sized large enough based on the size and number of laterals served to prevent more than a 15 percent variation in discharge rate between the first and last laterals when feeding the manifold from the downhill side;

(11) the supply manifold shall comply with the following design criteria:

(A) the ratio of the supply manifold inside cross-sectional area to the sum of the inside cross-sectional areas of the laterals served shall exceed 0.7:1;

(B) the reduction between the manifold and connecting laterals shall be made directly off the manifold using reducing tees or threaded fittings (Schedule 80 PVC only); and

(C) cleanouts shall be installed at the ends of the supply manifold and shall be enclosed in valve boxes for protection and accessibility from the ground surface;

(12) gate valves or other State approved valves shall be provided for pressure adjustment at the fields whenever the supply line exceeds 100 feet in length or the dispersal field is not visible from the pump tank;

(13) valves shall be installed in a valve box or other approved access device and be readily accessible from the ground surface;

(14) the LPP dosing system shall comply with the following design criteria:

(A) the flow rate shall be based upon delivering three feet to six feet of static pressure head at the distal end of all lateral lines;

(B) the dose volume shall be between five and 10 times the liquid capacity of the lateral pipe dosed, plus the liquid capacity of the portions of manifold and supply lines which drain between doses; and

(C) when pumping downhill and the supply line volume exceeds 20 percent of the calculated dose volume, special design considerations shall be followed to prevent more than 20 percent of the dose volume from draining by gravity to the dispersal field between doses;

(15) the dispersal field shall be covered to a depth four inches after settling; and

(16) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval.

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

15A NCAC 18E .0908 is proposed for adoption as follows:

15A NCAC 18E .0908 DRIP DISPERSAL SYSTEMS

(a) This Rule provides for the permitting of drip dispersal systems receiving DES. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) Drip dispersal systems shall meet the following soil and site criteria:

(1) Eighteen inches of naturally occurring suitable soil above a limiting condition, 13 inches of naturally occurring suitable soil above a soil wetness condition, and the minimum vertical separation distance to any unsuitable limiting condition shall be 12 inches.

(2) For new fill, the soil and site shall meet the following criteria:

(A) Rule .0909(b) and (c) of this Section, except as otherwise specified in this Subparagraph;

(B) no soil wetness exists within the first 12 inches below the naturally occurring soil surface. A groundwater lowering system may be used to meet the vertical separation distance to a soil wetness condition only when Group I or II soils with suitable structure are present within 36 inches of the naturally occurring soil surface; and

(C) minimum vertical separation distance to any unsuitable soil horizon or rock shall be 18 inches and 12 inches for any soil wetness condition.

(3) For existing fill, the soil and site shall meet the following criteria:

(A) Rule .0909(d) and (e) of this Section, except as otherwise specified in this Subparagraph; and

(B) minimum vertical separation distance to any limiting condition shall be 24 inches.

(c) Tables XXII and XXIII shall be used to determine the LTAR for all DSE drip dispersal systems:

(1) Table XXII shall be used for systems utilizing soil. The LTAR shall be based on the most limiting, naturally occurring soil horizon within 18 inches of the naturally occurring soil surface or to a depth of 12 inches below the infiltrative surface, whichever is deeper;

(2) Table XXIII shall be used for systems utilizing saprolite. The LTAR shall be based on the most limiting, naturally occurring saprolite to a depth of 24 inches below the infiltrative surface;

(3) the LTAR for new fill systems shall not exceed 0.5 gpd/ft^2 for Group I, 0.3 for gpd/ft^2 Group II, 0.15 gpd/ft^2 for Group III or 0.05 gpd/ft^2 for Group IV soils, respectively;

(4) sections of tubing without emitters (blank tubing) shall not count towards the minimum dripline length required; and

(5) the design daily flow shall be divided by the LTAR, determined from Table XXII or XXIII, to determine the minimum dispersal field area required. The minimum dripline length shall be determined by dividing the required area by the maximum line spacing of two feet. The designer may recommend additional linear footage as soil and site conditions allow. The following equations shall be used to calculate the minimum dispersal field area and dripline length required:

MA = DDF ÷ LTAR

DL = MA ÷ LS

Where MA = minimum dispersal field area (ft^2)

DDF = design daily flow (gpd)

LTAR = in gpd/ft^2

DL = dripline length (feet)

LS = two-foot line spacing

TABLE XXII. LTAR for DSE drip dispersal systems based on Soil Group

Soil Group	**USDA Soil Textural Class**		**LTAR (gpd/ft^2)**
I	Sands	Sand	0.4 – 0.6

		Loamy Sand	
II	Coarse Loams	Sandy Loam	0.3 – 0.4
		Loam	
III	Fine Loams	Sandy Clay Loam	0.15 – 0.3
		Silt Loam	
		Clay Loam	
		Silty Clay Loam	
		Silt	
IV	Clays	Sandy Clay	0.05 – 0.2
		Silty Clay	
		Clay	

TABLE XXIII. LTAR for DSE drip dispersal systems based on Saprolite Group

Saprolite Group	Saprolite Textural Class	LTAR (gpd/ft^2)
I	Sand	0.3 – 0.4
	Loamy sand	0.25 – 0.35
II	Sandy loam	0.2 – 0.3
	Loam	0.1 – 0.2
	Silt Loam	0.05 – 0.1

(d) A Special Site Evaluation in accordance with Rule .0510 of this Subchapter is required for the following conditions:

(1) depth from the naturally occurring soil surface to any unsuitable soil condition is greater than or equal to 18 inches and the LTAR is proposed to exceed 0.5 gpd/ft^2 for Group I, 0.35 gpd/ft^2 for Group II, or 0.2 gpd/ft^2 for Group III soils;

(2) depth from the naturally occurring soil surface to any soil wetness condition is less than 18 inches and the LTAR is proposed to exceed 0.5 gpd/ft^2 for Group I, 0.3 gpd/ft^2 for Group II, or 0.15 gpd/ft^2 for Group III soils;

(3) Group IV soils are encountered within 18 inches of the naturally occurring soil surface or within 12 inches of the infiltrative surface, whichever is deeper, and the LTAR is proposed to exceed 0.05 gpd/ft^2;

(4) depth from the naturally occurring soil surface to any unsuitable soil condition is less than 24 inches and Group IV soils are encountered within 18 inches of the naturally occurring soil surface;

(5) driplines are installed in new fill material and Group IV materials are encountered within 18 inches of the naturally occurring soil surface;

(6) groundwater lowering system is used to meet soil depth and vertical separation distance requirements to a soil wetness condition and the LHD or State requires such an evaluation to

determine its projected effectiveness;

(7) verify a proposed LTAR that exceeds the LTAR assigned by the LHD;

(8) the design daily flow exceeds 1,500 gpd; and

(9) the LHD or State determines that the combination of soils conditions, site topography and landscape position, design daily flow, system layout and/or proposed stormwater appurtenances creates the potential for hydraulic overloading of the proposed site.

(e) Drip dispersal installation shall be in accordance with the following criteria:

(1) dripline shall be installed in accordance with the approved design. The design shall specify installation depth, installation equipment, blanking, drainback prevention, and any other site-specific design requirements identified by the designer;

(2) dripline shall be installed one-inch into naturally occurring soil, except when installed in a fill system;

(3) driplines shall be installed level. A maximum variance of plus or minus two inches may be allowed within any contiguous section of dripline containing drip emitters;

(4) six inches of cover over the dripline shall be maintained;

(5) the requirement for six inches of cover may be met by the addition of up to six inches, after settling, of suitable Group II or III soil over the drip field;

(6) minimum required soil cover shall be uniform over the entire drip dispersal field;

(7) drip dispersal fields shall be graded to shed surface water;

(8) if cover material is required and the slope is greater than 30 percent, a slope stabilization plan must be provided by an appropriately licensed individual; and

(9) the drip dispersal field shall be field tested after installation in accordance with Rule .1603 of this Subchapter.

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

15A NCAC 18E .0909 is proposed for adoption as follows:

15A NCAC 18E .0909 FILL SYSTEMS

(a) A fill system (including new and existing fill) is a system in which all or part of the dispersal field media is installed in fill material. The system includes both the basal area of dispersal field and the toe slopes in all directions. The fill pad shall be constructed when the wastewater system is installed.

(b) New fill systems may be installed on sites that meet the following requirements:

(1) the first 18 inches below the naturally occurring soil surface consist of suitable soil;

(2) no soil wetness condition exists within the first 12 inches below the naturally occurring soil surface and a groundwater lowering system is not used to meet this requirement;

(3) systems shall be installed only on sites with uniform slopes less than four percent. Stormwater diversions, subsurface interceptor drains, or swales shall be required as needed upslope of the system to divert surface runoff or lateral flow from passing over or into the system; and

(4) the area of suitable soil shall be large enough to include the basal area of dispersal field and the toe slopes in all directions.

(c) New fill system design and installation shall be in accordance with the following criteria:

(1) trenches shall be installed with 24 inches separating the infiltrative surface and any limiting condition. If pressure dispersal is used, the minimum separation distance shall be 18 inches;

(2) trenches shall be installed with 18 inches separating the infiltrative surface and any soil wetness condition. This separation requirement may be met with the use of a groundwater lowering system only in Soil Groups I and II with suitable structure. If pressure dispersal is used, the minimum separation distance shall be 12 inches;

(3) fill systems with a design daily flow greater than 480 gpd shall use pressure dispersal systems;

(4) fill material soil texture shall be classified sand or loamy sand (Soil Group I) up to the top of the trenches. The final six inches of fill used to cover the system shall have a finer texture (such as Group II or III) for the establishment of a vegetative cover;

(5) minimum cover shall be six inches of settled soil;

(6) additional fill may be added to facilitate drainage and accommodate landscaping requirements at the site provided the infiltrative surface is less than 30 inches below the finished grade;

(7) where fill material is added, the fill material and the existing soil shall be mixed to a depth of six inches below the interface. Vegetative cover or organic litter (O horizon) shall be removed before the additional fill material is incorporated;

(8) the fill system shall be constructed as an elongated berm with the long axis parallel to the ground elevation contours of the slope;

(9) the side slope of the fill system shall not exceed a rise to run ratio of 1:4. If the first 18 inches below the naturally occurring soil surface is Group I soil, the side slope of the fill shall not exceed a rise to run ratio of 1:3;

(10) the outside edge of the trench shall be located five feet horizontally from the top of the side slope;

(11) the fill system shall be shaped to shed surface water and shall be stabilized with a vegetative cover;

(12) the setback requirements shall be measured from the projected toe of the slope. If this setback cannot be met, the setback requirements shall be measured five feet from the nearest edge of the trench if the following conditions are met:

(A) slope of the site shall not exceed two percent;

(B) the first 18 inches of soil beneath the naturally occurring soil surface shall consist of Group I soils; and

(C) the lot or tract of land was recorded on or before December 31, 1989; and

(13) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with PIA approval.

(d) An existing pre-July 1, 1977 fill site that does not meet the requirements of Paragraph (b) of this Rule may be utilized for a wastewater system if the following requirements are met:

(1) substantiating data are provided by the lot owner (if not readily available to the LHD) indicating that the fill material was placed on the site prior to July 1, 1977;

(2) the fill material shall have sand or loamy sand (Group I) soil texture for a depth of 24 inches below the existing ground surface;

(3) the fill material shall have no more than 10 percent by volume of fibrous organics, building rubble, or other debris. The fill shall not have discreet layers containing greater than 35 percent of shell fragments;

(4) if 24 inches of Group I fill material is present, additional fill with soil texture classified Group I may be added to meet the separation requirements of Subparagraph (e)(5) of this Rule;

(5) soil wetness condition, as determined by Rule .0504 of this Subchapter, is 18 inches or greater below the ground surface of the fill. This requirement shall be met without the use of a groundwater lowering system; and

(6) the area of suitable soil factors shall be large enough to include the basal area of dispersal field and the toe slopes in all directions.

(e) Existing fill system design and installation shall be in accordance with Paragraph (c) of this Rule and the following criteria:

(1) the design daily flow shall not exceed 480 gpd;

(2) pressure dispersal shall be used. LPP systems shall meet the requirements of Rule .0907(c), (d), and (e) of this Section. Drip dispersal systems shall meet the requirements of Rule .0908 (c) and (e) of this Section;

(3) the LTAR shall not exceed 0.5 gpd/ft^2;

(4) existing fill sites with 48 inches of Group I soils may use conventional trenches with a maximum LTAR of 1.0 gpd/ft^2 in lieu of a pressure dispersal system;

(5) the minimum vertical separation distance to any limiting condition shall be 24 inches for pressure dispersal systems and 48 inches for conventional systems. This vertical separation requirement may be met by adding additional Group I soil, but shall not be met with the use of a groundwater lowering system;

(6) where additional Group I fill is to be added, the side slope of the fill shall not exceed a side slope ratio of 1:3; and

(7) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with their PIA approval.

(f) The LTAR shall be determined in accordance with Rule .0901(c) of this Section and the following:

(1) the LTAR shall be based on the hydraulic conductivity of the most limiting, naturally occurring soil horizon within 18 inches of the ground surface or to a depth 12 inches below the infiltrative surface, whichever is deeper;

(2) the lowest LTAR for the applicable Soil Group shall be used for systems installed in accordance with this Rule; and

(3) for sites with 18 inches of Group I soils below the naturally occurring soil surface or to a depth of 12 inches below the infiltrative surface, whichever is deeper, the LTAR shall not exceed 1.0 gpd/ft^2 for gravity distribution or 0.5 gpd/ft^2 for pressure dispersal systems.

(g) Other fill systems may be approved by the authorized agent on a site-specific basis in accordance with Rule .0509(e) of this Subchapter.

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

15A NCAC 18E .0910 is proposed for adoption as follows:

15A NCAC 18E .0910 ARTIFICIAL DRAINAGE SYSTEMS

(a) Artificial drainage systems are a site modification and may be proposed to reclassify sites as suitable which were originally classified unsuitable due to a soil wetness condition. Artificial drainage systems include groundwater lowering systems, interceptor drains, and surface water diversions.

(b) Artificial drainage systems may be used on the following sites:

(1) Group I or II soils with suitable structure and clay mineralogy; and

(2) the artificial drainage system shall be designed to maintain the required minimum vertical separation distance to a soil wetness condition as specified in Rule .0901(d)(3) of this Section.

(c) Artificial drainage systems shall be designed in accordance with the following, as applicable.

(1) Groundwater lowering systems shall be designed in accordance with the following:

(A) substantiating information, calculations and data shall be provided justifying the effectiveness of the proposed artificial drainage system design;

(B) artificial drainage system design and devices shall comply with accepted standards of practice as set forth in the USDA-NRCS National Engineering Handbook, Part 624 - Drainage, Chapter 10 - Water Table Control, and Part 650 - Engineering Field Handbook, Chapter 14 - Water Management, Drainage;

(C) the effectiveness of artificial drainage shall be determined by use of the Ellipse, Hooghoudt, or equivalent drainage equations for sites with Group I or II soils. Justification for use of a specific drainage equation shall be provided;

(D) artificial drainage equation input parameters shall be based upon field determinations of soil profiles and in-situ Ksat measurements. The drainage coefficient used in these equations shall be calculated from the highest monthly rainfall value with a 30-percent

exceedance probability from the closest available National Weather Service or North Carolina State Climate Office station. A source of these data is the WETS tables published on the Natural Resource Conservation Service Website: www.wcc.nrcs.usda.gov/climate/wedlands.html. This monthly value shall be divided by 14 to give the drainage coefficient (inches per day). For systems designed for over 1,500 gpd, the projected contribution of wastewater application shall be added to the drainage coefficient used in the equations;

(E) DRAINMOD shall be used to determine the artificial drainage system effectiveness at sites with the following conditions: three of more effective soil layers; Group III or IV soils within 36 inches of the naturally occurring soil surface; or sites requiring a pump drainage system; and

(F) the modeling procedure set forth in Rule .0504(g) of this Subchapter shall be followed.

(2) Artificial drainage systems using pumps shall be designed in accordance with the following:

(A) plan and profile detail drawings of pump tank, showing all dimensions, pumps, discharge piping, floats, and float and alarm activation levels;

(B) calculations and supporting information shall be provided as the basis for sizing the pumps, dose volume, emergency storage capacity, and overall tank capacity;

(C) the high-water alarm in the control panel shall automatically contact a 24-hour maintenance service;

(D) information on discharge pipe line, line location, materials, and provisions for erosion control at the discharge point;

(E) except as required in this Rule, the requirements in Section .1100 of this Subchapter are applicable to artificial drainage systems using pumps; and

(F) dual alternating pumps shall be required when serving two or more design units. Each pump shall be sized at a capacity of 2.5 times the projected peak inflow rate to the station.

(3) Plans and specifications for artificial drainage systems shall include the following information in addition to the information in Subparagraphs (c)(2) and (c)(3) of this Rule:

(A) location of existing and proposed artificial drainage systems in relation to all facilities and wastewater system components. Plans shall indicate flow direction, slope and drain outlet location;

(B) profile drawings showing drainage trench dimensions, depth, pipe size, aggregate envelop and filter fabric detail, cover, and cleanout detail;

(C) all relevant elevations with reference to an established benchmark;

(D) specifications for all artificial drainage system materials and installation procedures;

(E) the entire artificial drainage system shall be on property owned or controlled by the person owning or controlling the system. Necessary legal agreements shall be provided in accordance with Rule .0301(c) of this Subchapter; and

(F) easements for egress, ingress, and regress for maintenance of artificial drainage systems serving two or more lots shall have adequate width, in no case less than 20 feet plus the width of the artificial drainage system.

(d) Interceptor drains shall be used on sites where soil wetness conditions are based on lateral water movement that can be intercepted and diverted to prevent saturation of the dispersal field.

(e) Other artificial drainage systems, including surface water diversions, shall comply with USDA-NRCS guidance documents.

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

15A NCAC 18E .0911 is proposed for adoption as follows:

15A NCAC 18E .0911 PRIVIES

(a) An approved privy shall consist of a pit, floor slab, and seat assembly housed in a building which affords privacy and reasonable protection from the weather and shall meet the following criteria:

(1) the pit shall consist of an excavation with a bottom surface area of 3.5 feet square;

(2) the maximum depth of the pit shall not exceed 36 inches;

(3) the pit bottom shall not be located closer than 12 inches to saprolite, rock, parent material, expansive clay mineralogy, unsuitable soil structure, restrictive horizons, or soil wetness condition;

(4) the pit bottom shall not be in a depression;

(5) the pit shall be curbed to prevent caving. In sandy or loose soil, the curb should extend the full depth of the pit. In clay soils, partial curbing may be acceptable if sufficient stability can be provided;

(6) the privy floor slab shall be constructed of reinforced concrete;

(7) where it is impractical to secure or construct reinforced concrete floor assemblies, wood construction shall be acceptable. The floor slab shall be constructed of the following:

(A) rot resistant joists covered with tight tongue-and-groove rot resistant flooring;

(B) other approved flooring materials to provide strength, durability and prevent entrance of flies and mosquitoes to the privy pit; and

(C) where wood construction is used, floors shall be anchored to the sills. The minimum sill size is four-inch by four-inch;

(8) the pit shall be vented through approved screened PVC Schedule 40 pipe or approved equal, six inches in diameter, and extending above the roofline. The vent pipe shall be:

(A) located on a south side wall of the building;

(B) covered to prevent rainfall from entering, but still allow gases to escape;

(C) not have any bends in the pipe; and

(D) shall be black colored pipe; and

(9) privies shall not be used for the disposal of water-carried sewage.

(b) Any person owning or controlling the property upon which a privy is located shall be responsible for the following requirements:

(1) the privy building shall afford a reasonable degree of protection from bad weather conditions;

(2) when the pit becomes filled to within 18 inches of the top of the ground, the privy building shall be moved to a new pit and the old pit completely covered with soil; and

(3) if the pit caves in, a new pit shall be provided.

(c) The person owning or controlling the system shall be responsible for the following requirements:

(1) the privy and grounds immediately adjacent shall be kept clean;

(2) a hinged seat cover shall be provided and kept closed when the privy is not in use;

(3) privy shall have a hinged door that can be locked when not in use;

(4) flies shall always be excluded from the pit;

(5) garbage and trash shall be kept out of the pit; and

(6) privy building shall not be used as a storage building.

(d) When a new pit is required, an IP, CA, and OP shall be obtained.

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

SECTION .1000 – NON-GROUND ABSORPTION SYSTEMS

15A NCAC 18E .1001 is proposed for adoption as follows:

15A NCAC 18E .1001 ALTERNATIVE TOILETS

(a) Incinerating, composting, and mechanical toilets, and vault privies shall comply with the North Carolina Plumbing Code.

(b) When an alternative toilet is used, the rest of the wastewater generated by any other plumbing fixture in the facility shall be discharged to a wastewater system that is approved under this Subchapter.

History Note: Authority G.S. 130A-335(e);

15A NCAC 18E .1002 is proposed for adoption as follows:

15A NCAC 18E .1002 WASTEWATER RECYCLE/REUSE

(a) Wastewater recycling systems that produce treated wastewater may be used for toilet flushing as long as the wastewater recycling system meets:

(1) the North Carolina Plumbing Code requirements; and

(2) 15A NCAC 02U as adopted by the Environmental Management Commission.

(b) Recycled wastewater shall be not used for body contact or human consumption.

History Note: Authority G.S. 130A-335(e);

SECTION .1100 – DOSING SYSTEMS AND CONTROLS

15A NCAC 18E .1101 is proposed for adoption as follows:

15A NCAC 18E .1101 GENERAL DOSING SYSTEM REQUIREMENTS

(a) A pump or siphon shall be used for discharging effluent into laterals when:

(1) total lateral length exceeds 750 linear feet in a single system; or

(2) discharging to a pressure dosed gravity distribution or pressure dispersal system.

(b) Alternating siphons or pumps shall be used and discharge to separate dispersal fields for the following:

(1) design daily flow from a single system exceeds 3,000 gpd, or

(2) total length of trench exceeds 2,000 linear feet in a single system.

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

(d) The dose volume from pressure dosed gravity distribution systems shall be designed to fill the installed linear footage of the laterals between 66 and 75 percent at each dosing event. The lateral capacity for trench products with a PIA approval is equivalent to the capacity of a four-inch corrugated pipe. Dose volumes for LPP systems shall be calculated in accordance with Rule .0907(e)(14)(B) of this Subchapter. Dose volumes for drip dispersal systems shall be calculated in accordance with Rule .1602(f)(3) of this Subchapter.

(e) The pump operating flow rate from dosing systems shall be designed to optimize the distribution of the effluent throughout the dispersal field.

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

15A NCAC 18E .1102 is proposed for adoption as follows:

15A NCAC 18E .1102 PUMP DOSING

(a) The effluent pump shall be:

(1) capable of handling ½-inch solids or be a screened, high head pump designed for effluent;

(2) designed to meet the discharge rate and total dynamic head of the effluent distribution system;

(3) removable without requiring entrance into the tank; and

(4) listed by Underwriter's Laboratory or an equivalent third-party electrical testing and listing agency, unless a PE specifies the proposed pump model.

(b) Air locking of the pump and siphoning from the pump tank when pumping downhill shall be prevented using a vent or anti-siphon holes (3/16-inch minimum).

(c) A pressure-rated threaded union, flange, camlock, or similar disconnect device shall be provided in each pump discharge line.

(d) Check valves or other type valves shall prevent drainback from the dispersal field or supply line back into the pump tank. These back-flow prevention devices shall be located on the pump side of the disconnect device.

(e) A shut-off 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. Shut-off valves and disconnects shall be located within 18 inches of the top of the access riser opening.

(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), (f1);

15A NCAC 18E .1103 is proposed for adoption as follows:

15A NCAC 18E .1103 CONTROL PANELS

(a) A control panel shall be provided for all systems requiring use of a pump. The panel enclosure shall be NEMA 4X or equivalent. Underwriter's Laboratory or an equivalent third-party electrical testing and listing agency shall list the panel. The panel shall include for each pump:

(1) an independent overload protection (if not integral with the pump motor);

(2) a circuit breaker(s);

(3) a motor contactor or solid-state relay which breaks all current to the pump;

(4) a latching hand-off automatic (H-O-A) switch or alternate method to enable manual or automatic pump operation and for the pump to be manually deactivated;

(5) a pump run light;

(6) an elapsed time meter; and

(7) an event counter.

(b) An automatic pump sequencer shall be provided in systems requiring multiple pumps and shall remain operable whenever any pump or pump circuit 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 any other form of telemetry that allows the Management Entity to properly monitor system performance and respond to alarm conditions. The telemetry shall remain active for the life of the wastewater system.

(d) The control panel shall be mounted 36 inches above finished grade, within 50 feet of and in direct view of the pump tank. The control panel shall always be accessible.

(e) A NEMA 4X outside junction box shall be installed above grade on or adjacent to the pump tank access riser when the control panel is more than 10 feet from the access riser.

(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 grips, duct seal, or other suitable material or methods shall be used to seal around wire and wire conduit openings inside the pump tank and disconnect enclosure.

(g) Dual and multiple fields shall be independently dosed by separate pumps which 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 State may approve other equivalent methods of dosing dual or multiple fields.

(h) Floats or similar State approved devices designed for detecting liquid levels in DSE shall be provided to control pump cycles:

(1) 18 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 sealed 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, as needed, to provide 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 device shall be visible and located on the outside of the panel enclosure;

(3) provide for manual testing, and shall enable the audible alarm to be silenced by the system user. The alarm shall automatically reset after testing and when an alarm condition has cleared;

(4) remain operable whenever the pump or pump circuit is inoperable;

(5) have an enclosure that is watertight, corrosion resistant, and rated NEMA 4X or equivalent; and

(6) be mounted outside the facility and always accessible.

(j) All pump systems shall have their performance demonstrated using clean water prior to issuance of an OP. The test shall include a demonstration and documentation of the following:

(1) pump delivery rate;

(2) float control levels;

(3) operating pressure head, when applicable; and

(4) structural integrity of the piping network.

(k) For systems designed by a PE, the PE may propose other panel construction and location criteria that meet these 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), (f1);*

15A NCAC 18E .1104 is proposed for adoption as follows:

15A NCAC 18E .1104 SIPHON DOSING

Siphons and siphon tanks may be used when 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 or otherwise designed to 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; and

(3) siphon tanks shall have a functioning high-water alarm that is audible and visible by system users and weatherproof if installed outdoors in a NEMA 4X enclosure or equivalent. 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), (f1);*

15A NCAC 18E .1105 is proposed for adoption as follows:

15A NCAC 18E .1105 TIMED DOSING

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

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

(2) when a dosing system is required in accordance with Rule .1101 of this Section and in conjunction with an adjusted design daily flow granted in accordance with Rule .0403 of this Subchapter.

(b) Flow equalization systems designed under a PIA approval issued in accordance with Section .1700 of this Subchapter and G.S. 130A-343(i) shall incorporate timed dosing to control the maximum amount of effluent that shall be delivered to the advanced pretreatment or dispersal field in a specific period.

(c) The timed dosing system shall be integrated with the pump tank control sensors to assure that the minimum dose volume calculated in accordance with Rule .1101(d) of this Section shall be present prior to the start of any scheduled dose event.

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

15A NCAC 18E .1106 is proposed for adoption as follows:

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 among individual laterals with two feet of residual pressure head;

(2) a pressure regulating valve incorporated 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) observation ports located inside or outside of the pressure manifold box to verify flow to individual laterals; and

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

(b) A dissipator box may be used to dissipate flow in a pressure dosed system designed for pressure dosed gravity dispersal of effluent in a serial or sequential manner. Such devices shall be of sound construction, watertight, not subject to excessive corrosion, of adequate capacity, and approved by the authorized agent.

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

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

15A NCAC 18E .1201 is proposed for adoption as follows:

15A NCAC 18E .1201 ADVANCED PRETREATMENT SYSTEM STANDARDS

(a) Advanced pretreatment systems with a design daily flow up to 3,000 gpd shall meet the following conditions:

(1) RWTS or PIA approval in accordance with Sections .1500 or .1700 of this Subchapter;

(2) design that meets one of the effluent quality standards specified on the OP and defined in Table XXIV prior to dispersal of the effluent to the soil;

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

(4) compliance with Rules .1302(d) and .1709 of this Subchapter.

TABLE XXIV. Effluent quality standards for advanced pretreatment systems

Constituent	Effluent Quality Standards

	NSF-40	TS-I	TS-II
CBOD	≤ 25 mg/L	≤ 15 mg/L	≤ 10 mg/L
TSS	≤ 30 mg/L	≤ 15 mg/L	≤10 mg/L
NH_3		≤ 10 mg/L or 80% removal of NH_3 if influent TKN exceeds 50 mg/L	≤ 10 mg/L
TN			≤ 20 mg/L
Fecal Coliform		≤ 10,000 colonies/100 mL	≤ 1,000 colonies/100 mL

(b) The effluent applied to advanced pretreatment systems shall not exceed DSE as specified in Table III of Rule .0402(a) of this Subchapter, unless the system is designed to treat high strength effluent and approved by the State on a product or project-specific basis.

History Note: Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;

15A NCAC 18E .1202 is proposed for adoption as follows:

15A NCAC 18E .1202 SITING AND SIZING CRITERIA FOR SYSTEMS WITH A DESIGN DAILY FLOW LESS THAN OR EQUAL TO 1,500 GALLONS/DAY

(a) The initial site evaluation shall be conducted and depth to limiting conditions determined in accordance with Section .0500 of this Subchapter. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Subchapter shall apply.

(b) Only one of the following modifications to system siting and sizing criteria may be approved, unless otherwise identified in this Rule:

(1) reduction in depth to limiting condition and vertical separation distance;

(2) setback reduction; or

(3) LTAR increase.

(c) The minimum required vertical separation distance to a limiting condition may be reduced with the use of advanced pretreatment in accordance with Table XXV. Table XXVI provides the minimum depths and vertical separation distances for new and existing fill. A Special Site Evaluation shall be submitted and approved in accordance with Rule .0510 of this Subchapter when a reduction in vertical separation distance to a limiting condition is proposed in accordance with this Rule.

Table XXV. Minimum vertical separation distance to soil wetness condition (SWC) or limiting condition (LC) based on effluent quality

Minimum vertical separation distance (inches) from infiltrative surface to SWC or LC

Soil Group	Distribution Method	Effluent Quality Standard**			
		DSE*	NSF-40	TS-I	TS-II
I	Gravity	18	12	12	12
	LPP	12	12	9	6
	Drip	12	12	9	6
II-IV	Gravity	12	12	9	9
	LPP	12	12	9	6
	Drip	12	12	9	6

*For comparison

**12-inch vertical separation shall always be maintained to rock or tidal water

Table XXVI. Minimum depth to LC and vertical separation to SWC in new or existing fill based on effluent quality

Minimum depth (inches)*** from naturally occurring soil surface to LC					
Type of Fill	Distribution Method		Effluent Quality Standard		
		DSE*	NSF-40	TS-I	TS-II
New Fill (≤1,500 gpd) (slope ≤ 4%)	Gravity	18 to LC 12 to SWC	18 to LC 12 to SWC	14 to LC 12 to SWC	14 to LC 12 to SWC
	LPP	18 to LC 12 to SWC	18 to LC 12 to SWC	12	12
	Drip	18 to LC 12 to SWC	18 to LC 12 to SWC	12	12
Existing Fill (≤480 gpd)	Gravity	36 of Group I Fill/Soils			
	LPP	24 of Group I Fill/Soils			
	Drip	24 of Group I Fill/Soils			
Minimum vertical separation distance (inches) from infiltrative surface to SWC or LC					
Type of Fill	Distribution Method	Effluent Quality Standard			
		DSE*	NSF-40	TS-I	TS-II
New Fill (≤1,500 gpd) (slope ≤ 4%)	Gravity	24 to LC 18 to SWC	18	18 to LC 14 to SWC	18 to LC 14 to SWC
	LPP	18 to LC 12 to SWC	18 to LC 12 to SWC	12 to LC 9 to SWC	12 to LC 9 to SWC
	Drip	18 to LC 12 to SWC	18 to LC 12 to SWC	12 to LC 9 to SWC	12 to LC 9 to SWC
Existing Fill	Gravity	36	36	36	36

(≤480 gpd)	LPP	18	18	12	12
	Drip	18	18	12	12

*For comparison

***Minimum depth after adjustment for slope correction

(d) The LTAR may be modified when the following criteria are met:

(1) for advanced pretreatment systems meeting NSF-40 effluent quality standards the LTAR may be increased by up to a factor of 1.33 when compared to the rate assigned by the authorized agent for a new system using DSE in soils which are Group I or II with suitable structure;

(2) for advanced pretreatment systems meeting TS-I or TS-II effluent quality standards the LTAR may be increased by up to a factor of 2.0 when compared to the rate assigned by the authorized agent for a new system using DSE when pressure dispersal is utilized;

(3) for advanced pretreatment systems meeting TS-II effluent quality standards the LTAR may be increased by up to a factor of 2.5 when compared to the rate assigned by the authorized agent for a new system using DSE and all the following conditions are met:

(A) 36 inches of Group I soils from the naturally occurring soil surface;

(B) depth to a soil wetness condition below the naturally occurring soil surface is 24 inches;

(C) space shall be available for an equivalently sized dispersal field repair area; and

(D) pressure dispersal shall be utilized;

(4) a Special Site Evaluation shall be submitted and approved in accordance with Rule .0510 of this Subchapter when an increased LTAR for TS-I or TS-II systems is proposed in accordance with Subparagraphs (d)(2) or (d)(3) of this Rule on sites that also meet one of the following conditions:

(A) Group III or IV soils occur within three feet of the infiltrative surface; or

(B) site requires artificial drainage of Group II or III soils;

(5) the LTAR for an aerobic drip system shall be assigned in accordance with Rule .1204 of this Section;

(6) for trench dispersal products subject to a specific dispersal field area reduction when receiving DSE in accordance with the rules or a PIA approval, the dispersal field area or trench length, as applicable, shall not be reduced by more than 50 percent when any LTAR adjustments are taken in accordance with this Rule; and

(7) design daily flow shall not be increased by the addition of advanced pretreatment to an existing wastewater system.

(e) Advanced pretreatment systems shall meet the following setback requirements:

(1) minimum setback requirements of Section .0600 of this Subchapter, as applicable, shall be met, except as shown in Table XXVII of this Rule; and

(2) when any other siting or sizing modifications are applied (reduced depth to limiting condition, vertical separation distance or increased LTAR) for a TS-I or TS-II system in accordance with

Paragraphs (c) and (d) of this Rule, no setback reductions shall be taken except those to artificial drainage systems described in Table XXVII.

Table XXVII: Setbacks for wastewater systems meeting NSF-40, TS-1 or TS-II effluent quality standards

Feature (structure, water source, etc.)	**Setback (feet) according to Effluent Quality Standard**			
	DSE*	**NSF-40**	**TS-I**	**TS-II**
Surface waters classified WS-I, from mean high-water mark	100	70	70	50
Waters classified SA, from mean high-water mark	100	70	70	50
Any Class I or Class II reservoir, from normal pool elevation	100	70	70	50
Any other coastal water, canal, marsh, stream, perennial waterbodies, streams, or other surface waters, from mean high-water mark	50	35	35	25
Lake or pond, from flood pool elevation	50	35	35	25
Subsurface groundwater lowering system, ditch, or device, as measured on the ground surface from the edge of the feature	25	25	20	15
Surface water diversion, as measured on the ground surface from the edge of the diversion	15	15	10	10
Any stormwater conveyance (pipe or open channel) or ephemeral stream	15	15	10	10
Permanent stormwater retention basin or detention basin	50	50	35	25
Any other dispersal field except designated dispersal field repair area for project site	20	20	10	10

*For comparison

History Note: Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;

15A NCAC 18E .1203 is proposed for adoption as follows:

15A NCAC 18E .1203 SITING AND SIZING CRITERIA FOR SYSTEMS WITH A DESIGN DAILY FLOW GREATER THAN 1,500 GALLONS/DAY AND LESS THAN OR EQUAL TO 3,000 GALLONS/DAY

(a) No reductions in depth to limiting condition, vertical separation distance or setback requirements shall be taken. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Subchapter shall apply.

(b) The LTAR may be modified when the following criteria are met:

(1) For advanced pretreatment systems meeting TS-I or TS-II effluent quality standards, the LTAR may be increased by up to a factor of 2.0 compared to that assigned by the authorized agent for a system using DSE.

(2) For advanced pretreatment systems meeting TS-II effluent quality standards, LTAR may be increased by up to a factor of 2.5 compared to that assigned by the authorized agent for a system using DSE when the following conditions are met:

(A) 48 inches of Group I soils from the naturally occurring soil surface; and

(B) 30 inches to a soil wetness condition below the naturally occurring soil surface.

(3) When the LTAR for a system is proposed to be increased in accordance with this Rule, the following conditions shall also be met:

(A) Special Site Evaluation required in accordance with Rule .0510 of this Subchapter shall be submitted and approved;

(B) pressure dispersal shall be utilized;

(C) space shall be available for an equivalently sized dispersal field repair area; and

(D) 25-foot setback shall be maintained to all property lines unless one of the following criteria are met: site-specific nitrogen migration analysis for a TS-I system indicates that the nitrate-nitrogen concentration at the property line will not exceed 10 mg/L; or a TS-II system is used.

(4) The LTAR for an aerobic drip system shall be assigned in accordance with Rule .1204 of this Section.

(c) For trench dispersal products that are subject to a specific percent dispersal field area reduction when receiving DSE in accordance with this Subchapter or a PIA approval, when any LTAR adjustments are taken in accordance with this Rule, the dispersal field area or trench length, as applicable, shall not be reduced by more than 50 percent when compared to a conventional wastewater system.

(d) Design daily flow shall not be increased by the addition of advanced pretreatment to an existing wastewater system.

History Note: Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;

15A NCAC 18E .1204 is proposed for adoption as follows:

15A NCAC 18E .1204 ADVANCED PRETREATMENT DRIP DISPERSAL SYSTEMS

(a) Drip dispersal systems may utilize the following siting and sizing criteria when used with advanced pretreatment and a design daily flow less than or equal to 1,500 gpd. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) The soil and site characteristics shall meet the following criteria based on effluent quality standards:

(1) NSF-40 Systems

(A) 18 inches of naturally occurring suitable soil above a limiting condition and 13 inches of naturally occurring suitable soil above a soil wetness condition, and the minimum vertical separation distance to any limiting condition shall be 12 inches;

(B) for new fill, the requirements of Rules .0909(b) and (c) of this Subchapter shall be met, except as follows: 18 inches of naturally occurring suitable soil above a limiting condition and 12 inches of naturally occurring suitable soil above a soil wetness condition; and the minimum vertical separation distance shall be 12 inches to a soil wetness condition and 18 inches for any other limiting condition; or

(C) for existing fill, the requirements of Rules .0909(d) and (e) of this Subchapter shall be met, except that the minimum vertical separation distance to any limiting condition shall be 18 inches;

(2) TS-I Systems

(A) 15 inches of naturally occurring suitable soil above a limiting condition and 13 inches of naturally occurring suitable soil above a soil wetness condition, and the minimum vertical separation distance to any limiting condition shall be nine inches;

(B) for new fill, the requirements of Rules .0909(b) and (c) of this Subchapter shall be met, except as follows: 12 inches of naturally occurring suitable soil above a limiting condition; nine inches vertical separation distance to a soil wetness condition, and 12 inches vertical separation distance to any other limiting conditions; or

(C) for existing fill, the requirements of Rules .0909(d) and (e) of this Subchapter shall be met, except that the minimum vertical separation distance to any limiting condition shall be 12 inches; and

(3) TS-II Systems

(A) 13 inches of naturally occurring suitable soil above a limiting condition and the minimum vertical separation distance to any limiting condition shall be six inches;

(B) for new fill, the requirements of Subparagraph (2)(B) of this Paragraph shall be met; or

(C) for existing fill, the requirements of Subparagraph (2)(C) of this Paragraph shall be met.

(c) Site modifications shall meet the following criteria based on effluent quality standards:

(1) NSF-40 Systems may utilize a groundwater lowering system to meet the vertical separation distance requirements to a soil wetness condition only when Group I or II soils with suitable structure are present within 36 inches of the naturally occurring soil surface. The minimum vertical separation distance to the projected (drained) soil wetness condition shall be 12 inches. The addition of fill material shall not be used to meet this requirement; and

(2) TS-I and TS-II Systems may utilize a groundwater lowering system to meet the vertical separation distance requirements to a soil wetness condition. The minimum vertical separation distance to the projected (drained) soil wetness condition shall be 12 inches. The groundwater lowering system may be used with the following:

(A) Group III soils are present at any depth above the invert elevation of the highest point of the artificial drainage system or within 36 inches of the naturally occurring soil surface, whichever is deeper; or

(B) on new fill sites.

(d) Table XXVIII shall be used to determine the LTAR for advanced pretreatment drip dispersal systems based on Soil Group. Limitations in adjustment allowances for NSF-40, TS-I, and TS-II systems are listed in Subparagraphs (d)(5), (d)(6), and (d)(7) of this Rule.

TABLE XXVIII. LTAR for advanced pretreatment drip dispersal systems based on Soil Group

Soil Group	**USDA Soil Textural Class**		**LTAR (gpd/ft^2)**		
			NSF-40	**TS-I**	**TS-II**
I	Sands	Sand	0.6 1.0	0.8 – 1.2	0.8 – 1.5
		Loamy Sand			
II	Coarse Loams	Sandy Loam	0.4 – 0.6	0.5 – 0.8	0.6 – 0.8
		Loam			
III	Fine Loams	Sandy Clay Loam	0.15 – 0.4	0.2 – 0.6	0.2 – 0.6
		Silt Loam			
		Clay Loam			
		Silty Clay Loam			
		Silt			
IV	Clays	Sandy Clay	0.05 – 0.15	0.05 – 0.2	0.05 – 0.2
		Silty Clay			
		Clay			

(1) The LTAR shall be based on the hydraulic conductivity of the most limiting, naturally occurring soil horizon within 18 inches of the naturally occurring soil surface or to a depth of 12 inches below the infiltrative surface, whichever is greater.

(2) The design daily flow shall be divided by the LTAR, determined from Table XXVIII or XXIX, to determine the minimum dispersal field area required. The minimum dripline length shall be determined by dividing the required area by the maximum line spacing of two feet. The following equations shall be used to calculate the minimum dispersal field area and dripline length required:

MA = DDF ÷ LTAR

DL = MA ÷ LS

Where MA = minimum dispersal field area (ft^2)

DDF = design daily flow (gpd)

LTAR = in gpd/ft^2

DL = dripline length (feet)

LS = two-foot line spacing

(3) The minimum dripline length calculated in Subparagraph (d)(2) of this Rule shall not be less than 0.5 x DDF for Group I soils, 0.83 x DDF for Group II soils, 1.25 x DDF for Group III soils, or 3.33 x DDF for Group IV soils. This shall not change the minimum area required for the system calculated in Subparagraph (d)(2) of this Rule. The dripline spacing may be adjusted in accordance with Rule .1602(e)(3) of this Subchapter and the PIA approval.

(4) Sections of tubing without emitters (blank tubing) required to meet site-specific conditions shall not count towards the minimum length of dripline needed when laying out the system or when calculating the linear footage of dripline needed.

(5) LTAR adjustment limitations for NSF-40 Systems

(A) the LTAR for new fill shall not exceed 0.6 gpd/ft^2 for Group I soils, 0.4 gpd/ft^2 for Group II soils, 0.15 gpd/ft^2 for Group III soils, or 0.05 gpd/ft^2 for Group IV soils; and

(B) the LTAR for existing fill shall not exceed 0.8 gpd/ft^2.

(6) LTAR adjustment limitations for TS-I Systems

(A) the LTAR for new fill shall not exceed 1.0 gpd/ft^2 for Group I soils, 0.5 gpd/ft^2 for Group II soils, 0.2 gpd/ft^2 for Group III soils, or 0.07 gpd/ft^2 for Group IV soils;

(B) the LTAR for existing fill shall not exceed 1.0 gpd/ft^2; and

(C) the LTAR for sites with less than 18 inches of naturally occurring soil to any unsuitable limiting condition shall not exceed the lowest LTAR for Soil Groups I, II, and III, and 0.1 gpd/ft^2 for Group IV soils.

(7) LTAR adjustment limitations for TS-II Systems

(A) the LTAR for new fill shall not exceed 1.0 gpd/ft^2 for Group I soils, 0.6 gpd/ft^2 for Group II soils, 0.2 gpd/ft^2 for Group III soils, or 0.07 gpd/ft^2 for Group IV soils;

(B) the LTAR for existing fill shall not exceed 1.0 gpd/ft^2; and

(C) the LTAR for sites with less than 18 inches of naturally occurring soil to any unsuitable limiting condition shall not exceed the lowest LTAR for Soil Groups I, II, and III, and 0.1 gpd/ft^2 for Group IV soils.

(8) Table XXIX shall be used in determining the LTAR for advanced pretreatment drip dispersal systems installed in saprolite. The LTAR shall be based on the hydraulic conductivity of the most limiting, naturally occurring saprolite to a depth of 24 inches below the infiltrative surface.

TABLE XXIX. LTAR for advanced pretreatment drip dispersal systems based on Saprolite Group

Saprolite Group	**Saprolite Textural Class**	**LTAR (area basis) (gpd/ft^2)**	
		NSF-40	**TS-I and TS-II**
I	Sand	0.4 – 0.5	0.4 – 0.6
	Loamy sand	0.3 – 0.4	0.3 – 0.5
II	Sandy loam	0.25 – 0.35	0.25 – 0.4

Saprolite Group	Saprolite Textural Class	LTAR (area basis) (gpd/ft^2)	
		NSF-40	TS-I and TS-II
	Loam	0.2 – 0.25	0.2 – 0.3
	Silt loam	0.05 – 0.1	0.05 – 0.15
III	Sandy clay loam	0.05 – 0.1	0.05 – 0.15

(e) A Special Site Evaluation in accordance with Rule .0510 of this Subchapter shall be required to permit advanced pretreatment drip dispersal systems for the following:

(1) NSF-40 Systems

(A) Group IV soils are encountered within 18 inches of the naturally occurring soil surface or within 12 inches of the infiltrative surface, whichever is deeper, and the LTAR is proposed to exceed 0.1 gpd/ft^2; or

(B) LTAR is proposed to exceed 0.8 gpd/ft^2 for Group I soils, 0.5 gpd/ft^2 for Group II soils, 0.25 gpd/ft^2 for Group III soils, or 0.2 gpd/ft^2 for Group IV soils.

(2) TS-I Systems

(A) site has less than 18 inches of naturally occurring soil to any unsuitable limiting condition;

(B) Group III soils are present and a groundwater lowering system is used to meet the vertical separation distance requirements to a soil wetness condition;

(C) Group IV soils are encountered within 18 inches of the naturally occurring soil surface or within 12 inches of the infiltrative surface, whichever is deeper, and the LTAR is proposed to exceed 0.12 gpd/ft^2;

(D) LTAR is proposed to exceed 1.0 gpd/ft^2 for Group I soils, 0.6 gpd/ft^2 for Group II soils, 0.3 gpd/ft^2 for Group III soils, or 0.12 gpd/ft^2 for Group IV soils; or

(E) system is proposed to be installed in new fill, Group IV soils are encountered within 18 inches of the naturally occurring soil surface, and the LTAR is proposed to exceed 0.05 gpd/ft^2.

(3) TS-II Systems

(A) site meets the requirements of Subparagraphs (2)(A), (B), or (E) of this Paragraph;

(B) Group IV soils are encountered within 18 inches of the naturally occurring soil surface or within 12 inches of the infiltrative surface, whichever is deeper, and the LTAR is proposed to exceed 0.15 gpd/ft^2; or

(C) LTAR is proposed to exceed 1.2 gpd/ft^2 for Group I soils, 0.7 gpd/ft^2 for Group II soils, 0.4 gpd/ft^2 for Group III soils, or 0.15 gpd/ft^2 for Group IV soils.

(f) Setback reductions allowed in Table XXVII of Rule .1202(e) of this Section may be used with advanced pretreatment drip dispersal systems when no reduction in the required minimum depth to a limiting condition or vertical separation distance reduction is proposed compared to the requirements for DSE in Rule .1202(c) of this Section. Eighteen inches of naturally occurring soil to an unsuitable limiting condition shall be required to take setback

reductions. The following LTAR limitations shall be applicable:

(1) for NSF-40 and TS-I systems, with the exception of the setback reductions to artificial drainage systems, when reductions are taken in setbacks, the LTAR shall not exceed the lowest LTAR for Soil Groups I, II, and III, and 0.1 gpd/ft^2 for Group IV soil;

(2) for TS-II Systems, with the exception of setback reductions to artificial drainage systems, when reductions are taken in setbacks, the LTAR shall not exceed the mid-range LTAR for Soil Groups I, II, and III, and 0.1 gpd/ft^2 for Group IV soils; and

(3) for NSF-40, TS-I, and TS-II Systems, Table XXVIII may be used to determine the LTAR when only setback reductions to artificial drainage systems are taken.

(g) Drip dispersal installation shall be in accordance with Rule .0908(e) of this Subchapter.

(h) Drip dispersal systems with a design daily flow greater than 1,500 gpd and less than or equal to 3,000 gpd used with advanced pretreatment may propose an adjusted LTAR if the following criteria are met:

(1) no reduction in the depth to a limiting condition, vertical separation distance, or setback reductions is proposed;

(2) proposed LTAR is supported by a Special Site Evaluation in accordance with Rule .0510 of this Subchapter; and

(3) 25-foot setback shall be maintained to all property lines, unless one of the following criteria is met:

(A) site-specific nitrogen migration analysis for a TS-I system indicates that the nitrogen concentration at the property line will not exceed 10 mg/L; or

(B) TS-II system is used.

History Note: Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;

15A NCAC 18E .1205 is proposed for adoption as follows:

15A NCAC 18E .1205 ADVANCED PRETREATMENT SAND LINED TRENCH SYSTEMS

(a) Sand lined trench systems receiving TS-I or TS-II effluent quality may be proposed in accordance with the requirements of this Rule. Except as otherwise required in this Rule, the requirements of Rule .0906 of this Section shall apply.

(b) The site meets the criteria in Rule .0906(b) of this Subchapter and the receiving permeable horizon may be deeper than 60 inches below the natural grade.

(c) If artificial drainage is proposed to meet the required minimum vertical separation distance to a soil wetness condition that is not related to lateral water movement, the following conditions shall apply:

(1) site shall comply with the requirements of Rule .0906(c) of this Subchapter; and

(2) vertical separation distance requirement to a soil wetness condition may be reduced to nine inches with pressure dosed gravity distribution or six inches with pressure dispersal.

(d) Table XXX shall be used to determine the LTAR for a sand-lined trench system and shall be based on the

hydraulic conductivity of the most limiting, naturally occurring soils overlying the permeable receiving layer. The LTAR shall be one of the following:

(1) the rate set forth in Table XXX; or

(2) 20 percent of the in-situ Ksat of the receiving permeable horizon or the rate set forth in Table XXX, whichever is less.

TABLE XXX. LTAR for advanced pretreatment sand lined systems based on receiving permeable horizon texture

Texture of receiving permeable horizon	**LTAR (gpd/ft^2) ***
Sand or Loamy Sand	0.6 – 1.0
Sandy Loam or Loam	0.4 – 0.8
Silt Loam	No greater than 20% of in-situ Ksats or ≤ 0.5, whichever is less

*There shall be no reduction in trench length compared to a conventional gravel trench when Accepted or Innovative gravelless trench media is used.

(e) A Special Site Evaluation in accordance with Rule .0510 of this Subchapter is required for the following conditions:

(1) texture of the receiving permeable horizon is sandy loam or loam, and the system design daily flow is greater than 600 gpd; or

(2) texture of the receiving permeable horizon is silt loam.

(f) Setback reductions in accordance with Table XXVII of Rule .1202(e) of this Section may be applied with sand lined trench systems.

(g) Sand lined trench system installation shall be in accordance with Rule .0906(g) of this Subchapter and pressure dosed gravity distribution or pressure dispersal shall be required.

History Note: Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;

15A NCAC 18E .1206 is proposed for adoption as follows:

15A NCAC 18E .1206 ADVANCED PRETREATMENT BED SYSTEMS

(a) Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply.

(b) Bed systems receiving NSF-40 effluent quality, or better, on sites with a design daily flow not to exceed 600 gpd may be approved when the following requirements have been met:

(1) the soil and site shall meet the following criteria:

(A) the vertical separation distance requirements of Rule .0901(d)(3) of this Subchapter are met;

(B) soil texture is Group I, II or III; and

(C) sites limited by topography, available space, or other site constraints;

(2) Table XVI in Rule .0901(c) of this Subchapter is used to determine the LTAR for a bed system. On sites where the soil texture is Group I or II, the LTAR may be increased by a factor of 1.125 with no further reduction in bed size allowed;

(3) setback reductions allowed in Table XXVII of Rule .1202(e) of this Section may be used; and

(4) bed system installation shall be in accordance with Rule .0903(d) of this Subchapter.

(c) Bed systems receiving TS-I or TS-II effluent quality on sites with a design daily flow less than or equal to 1,500 gpd may be approved when the following requirements have been met:

(1) The soil and site meet the following criteria:

(A) 30 inches of Group I or II soils below the naturally occurring soil surface and no soil wetness condition within the first 36 inches below the naturally occurring soil surface or 36 inches of Group I soils below the naturally occurring soil surface and no soil wetness condition exists within the first 12 inches below the naturally occurring soil surface;

(B) the requirement for 30 inches of Group I or II soils or 36 inches of Soil Group I in Part (c)(1)(A) of this Rule may be reduced to 18 inches when a Special Site Evaluation in accordance with Rule .0510 of this Subchapter is provided;

(C) sites shall have a uniform slope not exceeding two percent, unless a Special Site Evaluation submitted and approved in accordance with Rule .0510 of this Subchapter is provided; and

(D) the bed system shall be considered to be a fill system if the infiltrative surface is installed less than six inches below the naturally occurring soil surface. For bed systems in fill, the requirements of Paragraph (e) of this Rule shall also be met.

(2) Table XVI in Rule .0901(b) of this Subchapter shall be used to determine the initial LTAR for a bed system and shall be based on the hydraulic conductivity of the most limiting, naturally occurring soil horizon within 36 inches of the ground surface or to a depth of 12 inches below the bed bottom, whichever is deeper. The minimum bed size shall be determined in accordance with the following:

(A) the minimum amount of bottom area square feet shall be determined by dividing the design daily flow by the LTAR;

(B) when the bed is a fill system, the lowest LTAR for the applicable Soil Group shall be used. The LTAR shall not exceed 1.0 gpd/ft^2;

(C) fill shall not be added to the naturally occurring soil surface in order to increase the LTAR of a bed system;

(D) the minimum bed size may be reduced by up to 25 percent when the system is designed to meet TS-I or TS-II effluent quality and is not installed in existing fill; and

(E) the minimum bed size may be reduced by up to 40 percent when the following criteria are met: the system is designed to meet TS-II effluent quality; Group I Soil is present in the first 36 inches of naturally occurring soil; no soil wetness condition exists within the first

30 inches below the naturally occurring soil surface or within 24 inches of the bed bottom; the bed or beds shall not be located directly beneath the advanced pretreatment components, and pressure dispersal is used; effluent shall be distributed to the beds by a pump and timer control system designed to distribute flow evenly over a 24-hour period; and there shall be 100 percent dispersal field repair area.

(3) A Special Site Evaluation shall be submitted and approved in accordance with Rule .0510 of this Subchapter shall be required when the vertical separation distance to a limiting condition is reduced and on sites with slopes greater than two percent.

(4) Setback reductions allowed in Table XXVII of Rule .1202(e) of this Section may be proposed in accordance with the following:

(A) the setbacks shall be measured from the nearest edge of the gravel bed;

(B) for bed systems using fill, the setbacks shall be measured from a point five feet from the nearest edge of the gravel bed sidewall, or from the projected toe of the slope that is required to meet the soil and site limitations, whichever is greater;

(C) the minimum separation between initial and repair dispersal field areas serving a single system and facility shall be two feet of naturally occurring soil. Ten feet of naturally occurring soils shall separate the initial and repair dispersal field areas serving separate facilities when these bed systems are on a common site or tract of land; and

(D) whenever the bed size is reduced in accordance with this Rule, only reduced setbacks to artificial drainage systems in accordance with Table XXVII of Rule .1202(e) of this Section are allowed. No other setback reductions are allowed.

(5) Bed system installation shall be in accordance with Rule .0903(d) of this Subchapter and the following:

(A) pressure dispersal shall be used whenever effluent is distributed to a bed not located directly beneath the advanced pretreatment component; and

(B) when new fill is required for the installation of a bed system, suitable Group I fill material shall be used to meet the vertical separation distance requirements from the bed bottom to an unsuitable limiting condition, when all of the following conditions are met: a groundwater lowering system shall not be used to meet the vertical separation distance requirements; new fill material shall be sand or loamy sand, containing not more than 10 percent by volume fibrous organics, building rubble, or other debris and shall not have discreet layers containing greater than 35 percent of shell fragments by volume; and the requirements of Rule.0909(c)(9) of this Subchapter, for the projected side slope of the fill shall be met, as determined beginning at a point six inches above the top edge of the gravel bed.

(d) Bed systems receiving TS-I or TS-II effluent quality on sites with a design daily flow greater than 1,500 gpd and less than or equal to 3,000 gpd may be permitted on the following sites:

(1) The soil and site shall meet the following criteria:

(A) Group I soils are present for 54 inches below the naturally occurring soil surface;

(B) no soil wetness condition exists within the first 48 inches below the naturally occurring soil surface; and

(C) vertical separation distance of 24 inches to any soil wetness condition shall be maintained below the bed bottom, unless a site-specific groundwater mounding analysis is performed and demonstrates a 12-inch separation or 18-inch minimum for a fill system in accordance with Rule .0909(c) of this Subchapter shall be maintained.

(2) Table XVI in Rule .0901(b) of this Subchapter shall be used to determine the initial LTAR for a bed system and shall be based on the hydraulic conductivity of the most limiting, naturally occurring soil horizon within 36 inches of the ground surface or to a depth of 12 inches below the bed bottom, whichever is deeper. The minimum bed size shall be determined in accordance with the following:

(A) the minimum number of square feet of bed bottom area shall be determined by dividing the design daily flow by the LTAR;

(B) the minimum bed size may be reduced by up to 25 percent when the system is designed and approved to meet TS-I or TS-II effluent quality standards and will be installed in naturally occurring soil; and

(C) the minimum bed size may be reduced by up to 40 percent when all of the following criteria are met: the system is designed and approved to meet TS-II effluent quality standards; the hydraulic assessment demonstrates that a 24-inch minimum vertical separation distance to a soil wetness condition shall be maintained after accounting for projected groundwater mounding; and there shall be 100 percent dispersal field repair area.

(3) A Special Site Evaluation shall be submitted and approved in accordance with Rule .0510 of this Subchapter.

(4) No setback reductions shall be allowed in accordance with Table XXVII of Rule .1202(e) of this Section. The following horizontal setbacks shall be met:

(A) the minimum setback between initial and repair dispersal field areas serving a single system and facility shall be two feet of naturally occurring soil. Ten feet of naturally occurring soil shall separate the initial and repair dispersal field areas serving separate facilities when these bed systems are on a common site or tract of land;

(B) when two beds are used, the minimum separation between two beds shall be 20 feet. When three or more beds are used, the minimum separation between beds shall be 10 feet; and

(C) a 25-foot setback shall be maintained from edge of the bed to the property line unless a site-specific nitrogen migration analysis indicates that the nitrate concentration at the property line will not exceed 10 milligrams per liter (mg/l), or TS-II or better effluent is produced by the approved system.

(5) Bed system installation shall be in accordance with Rule .0903(d) of this Subchapter and the following criteria:

(A) two or more equally sized beds shall be used and the beds shall not be located directly beneath the advanced pretreatment components; and

(B) effluent shall be distributed to the beds by a pressure dispersal system. A timer control system shall be used to distribute flow evenly to the beds over a 24-hour period.

(e) Bed systems receiving TS-I or TS-II quality effluent may be proposed for a site with existing fill that meets the requirements of Rule .0909(d) of this Subchapter under the following conditions:

(1) no soil wetness condition exists within 18 inches of the existing fill surface;

(2) 18 inches of vertical separation distance exists to the soil wetness condition;

(3) the design daily flow shall not exceed 480 gpd; and

(4) pressure dispersal is used. The requirement for pressure dispersal shall not be required if the advanced pretreatment system PIA approval issued in accordance with Section .1700 of this Subchapter allows for advanced pretreatment unit(s) to discharge directly to the underlying bed and for multiple units, where applicable, to be uniformly laid out over the bed area.

History Note: Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;

15A NCAC 18E .1207 is proposed for adoption as follows:

15A NCAC 18E .1207 SITE AND SYSTEM COMPLIANCE CRITERIA FOR ADVANCED PRETREATMENT SYSTEMS

Compliance with the effluent quality standards of Rule .1201 of this Section shall be determined as follows:

(1) an individual advanced pretreatment system at a single site shall be in compliance when all the criteria of Rule .1302(d) of this Subchapter have been met; and

(2) an approved system shall be considered in compliance when all the criteria of Rule .1710 of this Subchapter have been met.

History Note: Authority G.S. 130A-334; 130A-335; 130A-336; 130A-337; 130A-340; 130A-342; 130A-343;

SECTION .1300 – OPERATION AND MAINTENANCE

15A NCAC 18E .1301 is proposed for adoption as follows:

15A NCAC 18E .1301 OPERATION AND MAINTENANCE OF WASTEWATER SYSTEMS

(a) Wastewater systems and non-ground absorption systems shall be operated and maintained in accordance with the conditions of the OP, PIA approval, and this Section, including maintaining setbacks as required in Section .0600 of

this Subchapter and the manufacturer's operation and maintenance instructions, as applicable. Dispersal field repair areas shall be maintained in accordance with the rules of this Subchapter.

(b) System management in accordance with Table XXXI shall be required for all systems installed or repaired after July 1, 1992. System management in accordance with Table XXXI shall also be required for all Type V and VI systems existing or installed on or before July 1, 1992.

(c) Wastewater systems with multiple components shall be classified by their highest or most complex system classification type in accordance with Table XXXI to determine LHD and Management Entity responsibilities.

(d) The State shall classify wastewater systems not identified in Table XXXI after consultation with the appropriate commission governing operators of pollution control facilities.

(e) The site for the wastewater system shall be accessible for monitoring, maintenance, inspection, and repair.

(f) The system shall be maintained to meet the effluent quality standards as specified in Table XXIV of Rule .1201(a) of this Subchapter and the OP, as applicable. Influent and effluent sampling may be required for food preparation or processing facilities, IPWW, and other systems as specified in the PIA approval or OP.

(g) The applicant may submit a written request to the LHD and State to reduce the wastewater system effluent sampling frequency, effluent sampling constituents, or Management Entity inspection frequency.

(h) The replacement of a specific component by an identical replacement component, including pipes, blowers, pumps, disinfection components, effluent filters, and control panels and appurtenances, shall be considered maintenance. When the replacement is performed as maintenance, this activity shall be reported to the owner and LHD within 30 days.

(i) All residuals shall be removed as specified in the OP, the RWTS or PIA approval, or as otherwise determined to be needed by the Management Entity. Residuals from the wastewater system shall be transported and disposed of in accordance with G.S. 130A, Article 9, and 15A NCAC 13B et seq.

TABLE XXXI. Management responsibilities based on wastewater system classification type and description

System Classification Type and Description	LHD Compliance Inspection Frequency	Management Entity	Management Entity Minimum Maintenance Inspection Frequency
Ia – Privy or vault privy*	N/A	Owner	N/A
Ib – Chemical toilet*	N/A	Owner	N/A
Ic – Incinerating toilet*	N/A	Owner	N/A
Id – Composing toilet system*	N/A	Owner	N/A
Ie – Other toilet system*	N/A	Owner	N/A
IIa – Conventional system (single family or 480 gpd or less)	N/A	Owner	N/A
IIb – Conventional system with less than 750 linear feet of trench	N/A	Owner	N/A
IIc – Conventional system with shallow placement	N/A	Owner	N/A

IId – Accepted wastewater gravity system	N/A	Owner	N/A
IIIa – Conventional wastewater system greater than 480 gpd (excluding single family residences)	N/A	Owner	N/A
IIIb – Wastewater system with a single pump or siphon	5 years	Owner	5 years
IIIc – Gravity fill system	N/A	Owner	N/A
IIId – Alternating dual fields with gravity distribution	N/A	Owner	N/A
IIIe – PPBPS gravity system	N/A	Owner	N/A
IIIf – LDP gravity system	N/A	Owner	N/A
IIIg – Other non-conventional systems	N/A	Owner	N/A
IIIh – Sand lined trench gravity distribution no artificial drainage	NA	Owner	NA
IIIi – Gravity groundwater lowering system	5 years	Owner	5 years
IVa – LPP distribution	3 years	Certified Operator	2/year
IVb – System with more than one pump or siphon	3 years	Certified Operator	2/year
IVc –Off-site system	5 years	Certified Operator	1/year
IVg –Alternating dual fields with pressure dosed gravity distribution including off-site systems	3 years	Certified operator	1/year
Va – Fixed media advanced pretreatment	1 year	Certified Operator	< 1,500 gpd - 2/year ≥ 1,500 gpd and < 3,000 gpd - 4/year ≥ 3,000 gpd and < 10,000 gpd – 12/year > 10,000 gpd – 1/week
Vb – DSE wastewater systems > 3,000 gpd with dispersal field > 1,500 gpd	1 year	Certified Operator	3,000 – 10,000 gpd - monthly > 10,000 gpd flow - weekly
Vc – RWTS	1 year	Certified Operator	4/year
Vd – Other mechanical, biological, or chemical treatment plants < 3,000 gpd	1 year	Certified Operator	monthly

Ve – Drip dispersal systems	1 year	Certified Operator	< 1,500 gpd - 2/year ≥ 1,500 gpd and < 3,000 gpd - 4/year ≥ 3,000 gpd and < 10,000 gpd – 12/year > 10,000 gpd – 1/week
Vf – IPWW designed by a PE and reviewed by the State and determined to be IPWW	1 year	Certified Operator	< 1,500 gpd - 2/year ≥ 1,500 gpd and < 3,000 gpd - 4/year ≥ 3,000 gpd and < 10,000 gpd – 12/year > 10,000 gpd – 1/week
Vh - Flow equalization	≤ 1,500 gpd – once every three years > 1,500 gpd – 1/year	Certified Operator	Based on equalized flow < 1,500 gpd - 2/year > 1,500 and ≤ 3,000 gpd - 4/year > 3,000 gpd and ≤ 10,000 gpd – 12/year > 10,000 gpd – 1/week
Vi – Wastewater system with pump groundwater lowering systems	Yearly	Certified operator	2/year with one visit during the wet season
VIa – Any system > 3,000 gpd with mechanical, biological, or chemical treatment plant	6 months	Certified Operator	> 3,000 – 9,999 gpd - 1/week 10,000 – 24,999 gpd - 2/week 25,000 – 50,000 gpd - 3/week > 50,000 gpd - 5/week
VIb – Wastewater reuse or recycle	6 months	Certified Operator	≤ 3,000 gpd – 12/year > 3,000 – 9,999 gpd - 1/week 10,000 – 24,999 gpd - 2/week 25,000 – 50,000 gpd - 3/week > 50,000 gpd - 5/week

*Toilet systems serving public facilities or more than 10 users per day shall be required to have a Management Entity other than the Owner as well as annual LHD compliance inspections.

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

15A NCAC 18E .1302 is proposed for adoption as follows:

15A NCAC 18E .1302 OPERATION AND MAINTENANCE OF ADVANCED PRETREATMENT SYSTEMS

(a) This Rule applies to all advanced pretreatment systems approved in accordance with Sections .1500 and .1700 of this Subchapter.

(b) System management in accordance with Table XXXI of Rule .1301 of this Section shall be required for advanced pretreatment systems. The following provisions apply to the operation and maintenance contracts for advanced pretreatment systems:

(1) for systems installed after July 1, 2006, the manufacturer of a proprietary advanced pretreatment system shall provide for the ongoing operation and maintenance of its systems. The manufacturer shall make available to the owner an operation and maintenance contract that meets the requirements for the system in accordance with this Section. The contract shall be renewable and the contract term shall be for one year;

(2) for systems installed prior to July 1, 2006, the manufacturer shall provide an optional renewable yearly operation and maintenance contract with the owner that fulfills the requirements for the system in accordance with this Section;

(3) prior to the issuance or re-issuance of an OP for a proprietary advanced pretreatment system, the owner shall provide to the LHD documentation that a contract for operation and maintenance of the system is in place. The contract shall be with either the manufacturer, manufacturer's representative, or a Management Entity authorized in writing by the manufacturer or manufacturer's representative to operate the system; and

(4) the manufacturer shall notify the LHD and the State when the owner chooses to not renew an operation and maintenance contract executed in accordance with this Paragraph.

(c) Operation and maintenance for advanced pretreatment shall be in accordance with the following:

(1) the Management Entity shall evaluate the performance of each system;

(2) minimum inspection, sampling, and reporting frequency shall be in accordance with this Section, Rule .1709 of this Subchapter, the RWTS or PIA approval, and conditions of the OP;

(3) the Management Entity shall inspect each system twice a year while the system is in operation using a VIP specified by the manufacturer and included in the RWTS or PIA approval. The VIP shall include the following:

(A) a visual inspection and evaluation of effluent in the field for solids, clarity, color, and odor. The VIP shall also include field tests of pH, turbidity, and dissolved oxygen content and, for TS-II systems, alkalinity, and any other tests proposed by the manufacturer and specified in the RWTS or PIA approval;

(B) criteria to determine system compliance status and proposed responses to conditions observed; and

(C) for systems serving vacation rentals subject to the North Carolina Vacation Rental Act, G.S. 42A, this visit shall be scheduled during the seasonal high use period and shall coincide with a water quality sampling event if required in accordance with Rule .1709 of this Subchapter;

(4) the seven-day and 30-day influent wastewater flow from the facility to the system shall be measured by the Management Entity prior to the visual inspection of the system in accordance with

Subparagraph (c)(3) of this Rule and prior to any effluent sampling event required in accordance with Rule .1709 of this Subchapter; and

(5) sampling and resampling for an approved RWTS, Provisional, and Innovative System shall be undertaken as required in accordance with Rule .1709 of the Subchapter and the following:

(A) all samples shall be collected, preserved, transported, and analyzed in compliance with 40 CFR 136;

(B) samples shall be taken to a State certified laboratory for analyzing;

(C) complete chain of custody from sample collection to analysis for each sample collected shall be maintained; and

(D) repeat sampling at any site shall be performed as required in the RWTS or PIA approval, Rule .1709 of this Subchapter, or as otherwise directed by the LHD or State as part of an enforcement action. The owner, manufacturer, or manufacturer's representative may also re-sample a system to verify or refute sample results and substitute out of compliance samples with compliant samples. All samples results collected shall be reported.

(d) An individual advanced pretreatment system at a single site shall be considered compliant with the effluent quality standards of Table XXIV of Rule .1201(a) of this Subchapter when the following conditions are met:

(1) annual VIP specified in the RWTS or PIA approval indicates compliant conditions;

(2) seven-day average daily inflow shall not exceed 1.3 times the design daily flow and the 30-day average daily inflow shall not exceed the design daily flow; and

(3) arithmetic mean (geometric mean for Fecal Coliform) of each constituent across three or more consecutive sampling dates does not exceed the designated effluent quality standard in Table XXIV in Rule .1201(a) of this Subchapter. Non-compliant data may be substituted with a new data set found to meet the designated effluent quality standard upon re-sampling within 30 days of receipt of the non-compliant data results for purposes of meeting the effluent quality standard.

(4) The mass loading of the system, based on site-specific water use records and effluent sampling results may be used to document system compliance with the performance criteria in Subparagraph (d)(3) of this Rule.

(e) The Management Entity may sample influent sample to the advanced pretreatment system as needed to determine compliance with this Rule.

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

15A NCAC 18E .1303 is proposed for adoption as follows:

15A NCAC 18E .1303 OWNER RESPONSIBILITIES FOR WASTEWATER SYSTEM OPERATION AND MAINTENANCE

(a) Any person owning or controlling the property upon which a wastewater system is installed shall be responsible for the following items regarding the operation and maintenance of the system:

(1) the wastewater system shall be operated and maintained to protect North Carolina ground and surface water quality standards and to prevent the following conditions:

(A) discharge of sewage or effluent to the surface of the ground, surface waters, or directly into groundwater at any time;

(B) back-up of sewage or effluent into the facility, building drains, collection system, freeboard volume of the tanks, or distribution system; or

(C) effluent within three inches of finished grade over one or more trenches based on two or more observations made not less than 24 hours apart, and greater than 24 hours after a rainfall event;

(2) the system shall be considered to be malfunctioning when it fails to meet one or more of the conditions of Subparagraph (a)(1) of this Rule, either continuously or intermittently, or if it is necessary to remove the contents of the tank(s) at a frequency greater than once per month in order to satisfy these conditions. The owner shall contact the LHD when the wastewater system is malfunctioning. Legal remedies may be pursued after an authorized agent has observed and documented one or more of the malfunctioning conditions and has issued an NOV;

(3) wastewater systems shall be inspected, and the entire contents of all septic tank compartments shall be removed to ensure proper operation of the system. The contents shall be pumped whenever the solids level (scum and sludge) is found to be more than 1/3 of the liquid depth in any compartment. The effluent filter shall be cleaned or replaced as needed;

(4) residuals from the wastewater system shall be transported and disposed of in accordance with G.S. 130A, Article 9, and 15A NCAC 13B et seq;

(5) grease traps and tanks shall be pumped as needed, but no less than yearly. The owner shall maintain a contract with a certified pumper. All pumping records shall be maintained onsite;

(6) appropriate site-specific vegetation shall be established and maintained over the wastewater system and repair area to stabilize slope and control erosion; and

(7) activities that result in soil disturbance or soil compaction shall not occur over the initial and repair dispersal field areas.

(b) A contract shall be executed between the system owner and a Management Entity prior to the issuance of an OP for a system required to be maintained by a Management Entity, as specified in Table XXXI of Rule .1301 of the Section, unless the system owner and Management Entity are the same. The contract shall include:

(1) specific requirements for operation, maintenance, and associated reporting;

(2) responsibilities of the owner;

(3) responsibilities of the system Management Entity;

(4) provisions that the contract shall be in effect for as long as the system is in use; and

(5) other requirements for the continued performance of the system.

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

15A NCAC 18E .1304 is proposed for adoption as follows:

15A NCAC 18E .1304 MANAGEMENT ENTITY RESPONSIBILITIES FOR WASTEWATER SYSTEM OPERATION AND MAINTENANCE

(a) The Management Entity, or its employees, shall hold a valid and current certificate or certifications as required for the system operated from the appropriate commission, and nothing in this Subchapter shall preclude any requirements for system Management Entities in accordance with G.S. 90A, Article 3.

(b) The Management Entity shall inspect the wastewater system at the frequency specified in Table XXXI in Rule .1301 of this Section.

(c) The Management Entity shall provide a copy of the inspection report to the owner and LHD within 30 days of the system inspection.

(d) When inspections indicate the need for system repairs, the Management Entity shall notify the LHD within 48 hours for the owner to obtain a CA for the repairs.

(e) The Management Entity shall be responsible for assuring routine maintenance procedures and monitoring requirements in accordance with the conditions of the OP and the contract.

(f) The Management Entity shall notify the LHD when the owner or the Management Entity chooses not to renew an operation and maintenance contract executed in accordance with this Rule.

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

15A NCAC 18E .1305 is proposed for adoption as follows:

15A NCAC 18E .1305 LOCAL HEALTH DEPARTMENT RESPONSIBILITIES FOR WASTEWATER SYSTEM OPERATION AND MAINTENANCE

(a) No IP, CA, or OP shall be issued for Type IV, V, or VI systems, unless a Management Entity of the type specified in Table XXXI in Rule .1301 of this Section is authorized and operational to carry out operation and maintenance requirements for the wastewater system.

(b) A LHD may be the Management Entity only for systems classified Type IV, Va, and Vb and only when authorized by resolution of the local board of health.

(c) An authorized agent shall review the performance and operation reports submitted in accordance with Rule .1304(c) of this Section.

(d) An authorized agent shall perform an on-site compliance inspection of the systems as required in Table XXXI in Rule .1301 of this Section. More frequent inspections may be performed by an authorized agent if requested by the system owner or the Management Entity, or identified in the PIA approval or OP.

(e) The authorized agent may provide the owner with the option for a private Management Entity (not the owner) to perform the on-site compliance inspection for Type IIIb and IIIh systems in accordance with Table XXXI in Rule .1301 of this Section instead of the LHD. The Management Entity (not the owner) shall provide to the owner and LHD a written compliance inspection report.

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

15A NCAC 18E .1306 is proposed for adoption as follows:

15A NCAC 18E .1306 SYSTEM MALFUNCTION AND REPAIR

(a) The LHD or State shall issue a written NOV to the wastewater system owner for the following:

(1) malfunctioning wastewater system determined in accordance with Rule .1303(a)(1) and (2) of this Section;

(2) wastewater system that creates or has created a public health hazard or nuisance by effluent surfacing, or effluent discharging directly into groundwater or surface waters; or

(3) wastewater system that is partially or totally destroyed.

(b) The wastewater system shall be repaired within 30 days of notification by the State or LHD unless the NOV specifies a different time frame for the repair.

(c) After investigating the malfunction, the State or LHD shall use its best professional judgement in requiring repairs that will enable the system to function.

(d) When necessary to protect the public health, the State or LHD shall require the owner of a malfunctioning system to pump and haul sewage to an approved wastewater system during the time needed to repair the wastewater system. This requirement shall be included in the NOV issued to the owner.

(e) If no repair options are available for the wastewater system, the LHD may issue a CA for a permanent pump and haul system. Prior to issuing the CA, the LHD shall receive the following information from the owner:

(1) confirmation that a septage management firm permitted in accordance with G.S. 130A-291.1 will be pumping and hauling the sewage from the pump and haul tanks;

(2) identification of the approved wastewater system that will be accepting the sewage. The wastewater system shall be approved under this Subchapter or approved by the Environmental Management Commission in accordance with 15A NCAC 02H; and

(3) approval shall be obtained from the facility receiving the sewage in addition to confirmation that the additional sewage will not result in an exceedance of the treatment capacity of the receiving wastewater system.

(f) A non-transferrable OP, valid for a period not to exceed five years, shall be issued to the pump and haul system owner.

(g) A malfunctioning wastewater system that has been disconnected from the facility for any reason shall be repaired prior to reuse.

(h) If a malfunctioning wastewater system is found to be nonrepairable, or is no longer required, the system shall not be used. The system owner shall be required to abandon the system to protect the public health and safety as specified in Rule .1307 of this Section.

History Note: Authority G.S. 130A-335(e) and (f); 130A-291.1; 130A-291.2;

15A NCAC 18E .1307 is proposed for adoption as follows:

15A NCAC 18E .1307 WASTEWATER SYSTEM ABANDONMENT

If a wastewater system is found to be non-repairable or is no longer required, the system shall have the contents removed, and the components collapsed, backfilled, or otherwise secured as directed by the authorized agent to protect public health and safety.

History Note: Authority G.S. 130A-335;

SECTION .1400 – APPROVAL OF TANKS AND APPURTENANCES

15A NCAC 18E .1401 is proposed for adoption as follows:

15A NCAC 18E .1401 PLANS FOR PREFABRICATED TANKS

(a) All tanks or appurtenances (riser, effluent filter, or pipe penetration) proposed for use in a wastewater system shall be approved by the State. All tanks and appurtenances shall be constructed in accordance with the approved plans and shall comply with all rules of this Section.

(b) Three separate sets of plans and specifications for the initial design of each tank or appurtenance (tank approval, riser approval, effluent filter approval, or pipe penetration approval) including subsequent changes or modifications shall be submitted to the State.

(c) Tanks shall be approved with a two step process. First the tank design shall be approved based on the plans and specifications submitted in accordance with Paragraph (d) of this Rule. After the tank design has been approved and a temporary identification number issued, the tank manufacturer shall conduct the structural loading requirements of Paragraph (f) of this Rule. Once third-party documentation in accordance with Paragraph (f) of this Rule has been submitted to the State, a tank approval letter will be issued to the tank manufacturer with a permanent identification number. Tanks may not be sold without a permanent identification number. The temporary identification number is for tracking purposes only.

(d) Plans and specifications for tanks with a total liquid capacity of 3,500 gallons or less shall show the design in detail, including the following:

(1) all pertinent dimensions in inches, including:

(A) wall and slab thickness and variations;

(B) minimum and maximum dimensions on tanks with tapered or ribbed walls;

(C) baffle wall minimum and maximum thickness and variations;

(D) location and dimension of all openings in baffle wall for gas and liquid movement; and

(E) dimensions of all compartments;

(2) material type and strength, including reinforcement material and location, as applicable, specified by the manufacturer;

(3) liquid depth and operating capacity in gallons;

(4) pipe penetration locations and State approved pipe penetration boot;

(5) methods and material for sealing sections and forming water tight joints in tanks with multiple sections;

(6) detailed drawings showing access openings, tank lids, access manhole risers, and other proposed appurtenances to the tank; and

(7) tank manufacturer and PE requirements for installation, including bedding and recommend methods for additional sealing, as applicable.

(e) Plans and specifications for tanks with a total liquid capacity greater than 3,500 gallons and all tanks designed for traffic loads shall be designed by a PE in accordance with ASTM C890. Plans shall show the design in detail, including all the information listed in Paragraph (d) of this Rule and engineering calculations showing the minimum soil cover, water table, and traffic load the tank is designed to support.

(f) Prior to tank approval, all tank manufacturers shall provide third-party documentation that the proposed tank meet the loading requirements of Rule .1403(a) of this Section based on the following:

(1) structural testing of the tank to a vacuum of four inches of mercury for five minutes with no loss of pressure. The vacuum test shall not result in permanent deformation after testing that impairs the shape and working effectiveness of the tank or tank openings;

(2) after completion of the vacuum test requirement in Subparagraph (f)(1) of this Rule, the tank shall be subject to a water test. The water test shall be conducted in accordance with Rule .0805(c)(1); and

(3) written documentation of the testing shall be provided to the State. The written documentation shall include:

(A) drawing of the tank model tested, showing dimensions and type of reinforcement used;

(B) results of the vacuum and water tests, including if there was any vacuum or water drop, surface cracking, deformation, or cracking of the tank during the test; and

(C) third-party person(s) present who witnessed the testing and their written statement of agreement with the results submitted to the State.

(g) Plans for prefabricated tanks other than those pre-approved under this Section shall be considered for tank approval on an individual basis based on the information provided by the tank manufacturer or designer to the State. The information shall indicate the tank shall perform in the same manner and to the same standard as those designed in accordance with the rules of this Section.

(h) The State or LHD may inspect approved tanks at the place of manufacture, the inventoried sites of the distributors, or at the installation of the tank in a wastewater system, for compliance with the approved plans and specifications.

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

15A NCAC 18E .1402 is proposed for adoption as follows:

15A NCAC 18E .1402 TANK DESIGN AND CONSTRUCTION

(a) Tanks shall be watertight and not subject to excessive corrosion or decay.

(b) Septic tanks and grease tanks shall have State approved effluent filters and access devices.

(c) Septic tanks installed where the access openings on the top of the tank will be deeper than six inches below finished grade shall have an access riser over each compartment with cover, extending to within six inches of the finished grade. The opening shall be adequate to accommodate the removal of the septic tank lid. When the top of the septic tank or access riser is below the finished grade, the location of the tank shall be visibly marked at finished grade.

(d) Septic tanks shall meet the following minimum design standards:

(1) minimum liquid depth of 36 inches;

(2) minimum of nine inches freeboard, measured as the air space between the top of the liquid and the bottom of the tank top. Venting of the tank shall be provided to prevent the buildup of gases;

(3) approved septic tank capacity shall be determined as the liquid volume below the outlet invert to the bottom of the tank;

(4) length of the tank shall be twice as long as the width, as measured by the longest axis and widest axis based on the internal tank dimensions;

(5) three inlet openings in the tank, one on the tank end and one on each sidewall of the inlet end of the tank;

(6) inlet and outlet openings shall have cast or manufactured penetration points;

(7) inlet and outlet pipe penetrations shall be through a resilient, watertight, sealed, non-corrodible, and flexible connective sleeve. The connective sleeve shall meet ASTM C1644;

(8) inlet penetrations shall be greater than or equal to four inches in diameter and outlet penetrations shall be greater than or equal to three inches in diameter;

(9) no pipe penetration points or openings shall be permitted below the septic tank operating liquid level;

(10) the outlet shall be through an approved effluent filter secured in place in an effluent filter support case. The effluent filter case inlet shall extend down to between 25 and 50 percent of the liquid depth;

(11) invert of the outlet shall be two inches lower in elevation than the invert of the inlet;

(12) other methods of supporting the effluent filter case and for making pipe penetrations shall meet all the requirements of this Rule and shall be reviewed on a case by case basis by the State;

(13) all septic tanks shall be designed with a partition so that the tank contains two compartments. The following conditions shall be met:

(A) the partition shall be located at a point not less than two-thirds or more than three-fourths the length of the tank from the inlet end;

(B) the partition shall be designed to remain in position when subjected to a liquid capacity in one compartment;

(C) the partition shall be designed to create a gas passage, not less than the area of the inlet pipe, and the passage shall not extend lower than seven inches from the bottom side of the tank top;

(D) the top and bottom sections of the partition shall be designed to leave a water passage slot four inches high for the full interior width of the tank;

(E) two four-inch openings, or one four-inch opening per 30 linear inches of baffle wall, whichever is greater, may be designed into the partition instead of the four-inch slot;

(F) the entire liquid passage shall be located between 25 and 50 percent of the liquid depth of the tank, as measured from the top of the liquid level;

(G) there shall be no other openings in the partition wall below the water passage slot or openings; and

(H) other methods for designing partition showing performance identical to those designed in accordance with this Paragraph shall be considered for approval by the State on an individual basis;

(14) access openings shall be provided in the top of the tank, located over each compartment, and having a nominal opening of 15 inches by 15 inches or 17 inches in diameter. The opening shall allow for maintenance and removal of internal devices of the septic tank;

(15) access risers and covers shall be designed and installed to prevent water infiltration;

(16) tank lids and riser covers shall be locked, secured, or weigh 40 pounds, but no more than 80 pounds; and

(17) all septic tanks shall bear an imprint identifying the manufacturer, the septic tank serial number assigned to the manufacturer's plans and specifications approved by the State, and the liquid or working capacity of the tanks.

(e) Pump tanks shall meet the design requirements of Paragraph (d) of this Rule with the following modifications:

(1) a watertight access riser with removable cover shall be located over the pump. The access riser shall extend to six inches above finished grade;

(2) the access opening over the pump shall have a nominal clear opening of 24 inches in diameter or other equidimensional opening;

(3) larger or multiple access risers shall be provided when two or more pumps are required;

(4) tanks may be designed with a single compartment. If a partition is provided, the partition shall be designed to contain two four-inch diameter circular openings, or equivalent, located no more than 12 inches above the tank bottom;

(5) there shall be no requirement as to tank length, width, or shape, provided the tank satisfies all other requirements of this Section;

(6) the invert of the inlet openings shall be located within 12 inches of the tank top. No freeboard shall be required in the pump tank;

(7) tanks shall be vented if more than 50 feet from the facility, and accessible for routine maintenance;

(8) all pump tanks shall bear an imprint identifying the manufacturer, the pump tank serial number assigned to the manufacturer by the State, and the liquid or working capacity of the tank; and

(9) the pump tank working capacity shall be the entire internal tank volume.

(f) Grease tanks shall be approved septic tanks with the following modifications:

(1) the liquid passage between chambers shall be located between 40 and 60 percent of the operating liquid depth. The liquid passage between chambers may be made using a sanitary tee extending down between 40 and 60 percent of the liquid depth;

(2) when two tanks, or more, in series are used, a sanitary tee shall be provided in the outlet end of each interconnected tank extending down between 40 and 60 percent of the liquid depth;

(3) the final chamber shall contain an effluent filter and case extending down between 40 and 60 percent of the liquid depth. The effluent filter shall be approved by the State for use in grease tanks. The grease rated effluent filter shall be sized for the design daily flow and have opening of 1/32-inch or less;

(4) access risers shall extend to finished grade and be capped with cast iron manhole rings and covers. Lockable aluminum hatches may be substituted for cast iron manhole rings and covers in non-traffic areas. Locks shall be the responsibility of the person owning or controlling the system; and

(5) when a sanitary tee is used as the liquid passage through an interior compartment partition, an access opening and riser to grade over the tee(s) shall be provided for servicing and routine maintenance.

(g) Siphon tanks shall meet the design requirements of Paragraph (e) of this Rule with the following modifications:

(1) designed in accordance with the minimum dose and construction requirements of this Rule;

(2) provide three inches of freeboard;

(3) inlet pipe shall be three inches above the siphon trip level; and

(4) tanks shall have a watertight access opening over each siphon with a minimum diameter of 24 inches, extending to finished grade, and designed to prevent surface water inflow.

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

15A NCAC 18E .1403 is proposed for adoption as follows:

15A NCAC 18E .1403 TANK MATERIAL REQUIREMENTS

(a) Tanks designed to hold sewage shall be constructed with materials capable of resisting corrosion from sewage and sewage gases, and the active and passive loads on tank walls. Tanks and tank lids shall be able to withstand a uniform live loading of 300 pounds per square foot, in addition to all loads to which an underground tank is normally subjected, such as dead weight of the material and soil cover, active soil pressure on tank walls, and the uplifting force of groundwater.

(b) Reinforced precast concrete tanks shall meet the following minimum material and construction requirements:

(1) the ends and sides of the tank shall have a minimum thickness of two and one-half inches. The top and bottom of the tanks shall be three inches thick;

(2) the top, bottom, end and sides of the concrete tank and tank lid shall be reinforced by using a minimum reinforcing of six-inch by six-inch No. 10 gage welded steel reinforcing wire;

(A) the reinforcing wire shall be lapped six inches;

(B) concrete cover shall be required for all reinforcement; and

(C) reinforcement shall be placed to maximize the structural integrity of the tank;

(3) when the concrete tank, tank lid, riser, or riser cover are subjected to vehicular traffic, the tank shall be designed by a PE to handle the traffic load in accordance with ASTM C890;

(4) any tank installed deeper than three feet shall be designed by a PE for the proposed tank burial depth. The tank design shall be submitted to the State for review and tank approval;

(5) the concrete shall achieve a minimum compressive strength of 4,000 psi prior to removal of the tank from the place of manufacture. It shall be the responsibility of the manufacturer to certify that this condition has been met prior to shipment. A tank may be subject to testing to ascertain the strength of the concrete prior to its being approved for installation. Testing shall be performed using a properly calibrated Schmidt Rebound Hammer or approved equal;

(6) tanks manufactured in multiple sections shall be joined and sealed at the joint by using butyl rubber or other pliable sealant meeting ASTM C990 or State approved equivalent that is waterproof, corrosion-resistant, and approved for use with concrete tanks; and

(7) tank lids and riser covers shall have a handle of steel equivalent in strength to a No. 3 reinforcing rod (rebar).

(c) Unless otherwise required, thermoplastic tanks shall either be IAPMO/ANSI Z1000 or CSA B66 certified.

(d) Glass-fiber-reinforced tanks shall meet the following material and construction requirements:

(1) top, bottom, ends, and sides of the tank shall have a minimum thickness of 0.2 inches. The baffle wall shall be 3/16-inch thick; and

(2) material and laminate requirements specified in IAMPO/ANSI Z1000 for glass-fiber-reinforced tanks.

(e) Cast in place tanks shall be designed by a PE, if required by G.S. 89C, and approved by the State.

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

15A NCAC 18E .1404 is proposed for adoption as follows:

15A NCAC 18E .1404 PLANS FOR RISERS, EFFLUENT FILTERS, AND PIPE PENETRATIONS

(a) Risers and riser lids shall be able to withstand a uniform live loading of 300 pounds per square foot in addition to all loads to which a riser is normally subjected, such as dead weight of the material and soil cover and active soil pressure on riser walls.

(b) Riser plans and specifications submitted for review and riser approval shall show the design of the riser in detail, including:

(1) manufacturer's name, address, phone, and fax numbers;

(2) physical dimensions of the riser and riser cover, such as wall thickness, internal diameter, proposed casting or installation details and methods, pipe penetrations, and all other dimensions as appropriate;

(3) material type and strength including reinforcement material and location as required;

(4) documentation by a third-party of structural testing to four inches of mercury for five minutes without deformation or failure. Testing shall be done on each diameter of riser and shall be done on the greatest height of a single section that the owner is seeking approval for;

(5) for septic tank risers, a secondary lid, concrete plug, or other State approved safety device to be provided inside the riser for additional security and to prevent accidental entry;

(6) for pump tank risers, State approved primary and secondary safety mechanism shall be provided; and

(7) installation instructions, for both new and retrofit applications, for single and multiple riser sections.

(c) Effluent filter plans and specifications submitted for review and effluent filter approval shall show the design of the effluent filter in detail, including:

(1) documentation and a written certification that the effluent filter is designed, constructed, and performs in compliance with G.S. 130A-335.1(a);

(2) sizing as to capacity and wastewater strength for all models of proposed filters to be approved; and

(3) specifications for application, installation, operation, and maintenance.

(d) Pipe penetration plans and specifications submitted for review and pipe penetration approval shall show the design of the pipe penetration in detail, including:

(1) manufacturer's name, address, phone and fax numbers;

(2) design specifications and materials used in the manufacture of pipe penetration components;

(3) applicable testing results from third-party verification showing pull and flexibility testing;

(4) testing for watertight seal around piping including any component or device included to assure the seal, such as non-corrodible adjustable bands;

(5) documentation that the pipe penetration meets the requirements of ASTM C1644; and

(6) specifications for application, installation, operation, and maintenance.

(e) Plans for risers, effluent filters, and pipe penetrations shall be reviewed and approved by the State and assigned an Identification Number when the design is found to comply with this Section.

(f) Plans for prefabricated risers, effluent filters, and pipe penetrations other than those pre-approved under this Rule shall be considered for approval on an individual basis based on the information provided by the manufacturer or designer to the State. The information shall indicate the riser, effluent filter, or pipe penetration shall perform to the same standard as those designed in accordance with the provisions of this Section.

History Note: Authority G.S. 130A-335(e), (f), (f1); 130A-335.1;

15A NCAC 18E .1405 is proposed for adoption as follows:

15A NCAC 18E .1405 RISERS, EFFLUENT FILTERS, AND PIPE PENETRATION APPROVAL RENEWAL

(a) All riser, effluent filter, and pipe penetration approvals will expire five years after the date the approval is signed. Approvals shall be re-issued when the provisions of this Rule have been met.

(b) Six months prior to the approval expiration, the manufacturer shall submit a written re-approval request to the State that includes verification of their continued compliance with the criteria listed in Rule .1404 of this Section.

(c) The State may re-issue a riser, effluent filter, or pipe penetration approval for a new five-year period when the manufacturer's re-approval request provided in accordance with Paragraph (b) of this Rule shows continued product compliance.

History Note: Authority G.S. 130A-335(e) and (f); 130A-343;

15A NCAC 18E .1406 is proposed for adoption as follows:

15A NCAC 18E .1406 MODIFICATION, SUSPENSION, AND REVOCATION OF APPROVALS

The State shall modify, suspend, or revoke the approval for tanks, risers, effluent filters, pipe penetrations, distribution devices or other components, upon a finding that:

(1) approval is determined to be based on false, incomplete, or misleading information or the tank or tank components have been subsequently altered;

(2) experience with the product or component results in altered conclusions about system performance, reliability, or design;

(3) product or component fails to perform in compliance with performance standards established for the product or component; or

(4) product, component, or the applicant fails to comply with G.S. 130A, Article 11, this Subchapter, or conditions of the approval.

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

SECTION .1500 – APPROVAL AND USE OF RESIDENTIAL WASTEWATER TREATMENT SYSTEMS

15A NCAC 18E .1501 is proposed for adoption as follows:

15A NCAC 18E .1501 GENERAL

(a) RWTS that comply with NSF International Standard 40 for Class I residential wastewater treatment systems shall be designed, constructed, and installed in accordance with this Section to serve facilities with a design daily flow less than or equal to 1,500 gpd.

(b) RWTS shall only be used with domestic strength wastewater.

(c) RWTS shall bear one of the following to certify that the product is in accordance with NSF Standard 40:

(1) the NSF mark and the NSF listed model number; or

(2) the certification mark and listed model number of a third-party certification program accredited by ANSI.

(d) For approval of an RWTS as a Provisional or Innovative system, a manufacturer shall apply in accordance with Section .1700 of this Subchapter.

History Note: *Authority G.S. 130A-342;*

15A NCAC 18E .1502 is proposed for adoption as follows:

15A NCAC 18E .1502 APPLICATION

An application shall be submitted for RWTS approval in writing to the State and shall include the following:

(1) manufacturer's name, address, phone number, plant location(s), and contact information for distributors;

(2) verification of NSF Standard 40 Class I system approval and listing by NSF International or other ANSI-accredited third-party certification program;

(3) manufacturer's identifying name or logo, listed model number(s) and treatment capacity in gpd to be imprinted on unit;

(4) three legible copies of plans and specifications, including information required to evaluate any tanks as required in accordance with Rules .1401 and .1503(3) of this Subchapter; and

(5) fee payment as required by G.S. 130A-343(k)(6), by corporate check, money order or cashier's check made payable to: North Carolina On-Site Water Protection Account or North Carolina OSWW System Account, and mailed to the State.

History Note: *Authority G.S. 130A-342;*

15A NCAC 18E .1503 is proposed for adoption as follows:

15A NCAC 18E .1503 DESIGN AND CONSTRUCTION STANDARDS

RWTS shall meet the following design and construction standards:

(1) No blockouts or openings shall be permitted below the liquid level of the RWTS.

(2) RWTS shall be watertight, corrosion resistant structures, with all components needing to be maintained accessible to the Management Entity. Access openings shall be provided in the RWTS top. Access shall be provided for:

(a) cleaning or rodding out the inlet pipe;

(b) cleaning or clearing the air or gas passage space above any partition;

(c) pumping of each compartment required to be pumped;

(d) sampling the effluent; and

(e) repairing any system components or maintaining system components requiring repair or maintenance.

(3) Tanks used in RWTS designed to hold sewage or effluent shall comply with all tank requirements in accordance with Section .1400 of this Subchapter.

(4) RWTS shall bear an imprint identifying the manufacturer, the RWTS serial number assigned to the manufacturer's model approved by the State, and the liquid or working capacity of the unit. The imprint shall be located on the outlet end of the tank within 24 inches of the top of the tank.

(5) The design, construction, and operation of RWTS shall prevent bypass of wastewater.

(6) The manufacturer shall demonstrate that the system can be sampled in compliance with 40 CFR 136 and shall specify the recommended method for effluent sampling.

(7) Control panels provided by the manufacturer shall comply with the requirements for control panels in accordance with Rule .1103 of this Subchapter.

(8) The RWTS shall have an alarm device or devices to warn the user or Management Entity of a unit malfunction or a high-water condition in accordance with Rule .1103 of this Subchapter.

(9) The control panel shall include a method to automatically measure and record daily wastewater flow dispersed to the dispersal field, including tracking the last seven days and 30 days, in accordance with Rule .1702(a)(2)(I) of this Subchapter.

(10) The blower location shall be shown on the plans and detail proposed corrosion-resistant blower enclosures, if applicable.

(11) A settling tank shall be required prior to or as an integral part of the design of the RWTS. The liquid capacity of the settling tank shall be half of the design daily flow of the RWTS, or as otherwise specified by the manufacturer, whichever is larger. The settling tank may either be an integral chamber of the RWTS tank, an approved prefabricated septic tank, or another tank specially

designed for a specific individual system and approved by the State as a part of the plans for the RWTS.

History Note: Authority G.S. 130A-342;

15A NCAC 18E .1504 is proposed for adoption as follows:

15A NCAC 18E .1504 SAMPLING REQUIREMENTS FOR RESIDENTIAL WASTEWATER TREATMENT SYSTEMS

Effluent from an approved RWTS shall be grab or composite sampled annually for all effluent quality standards listed in Table XXIV of Rule .1201(a) of this Subchapter for NSF-40 systems, unless adjusted sampling requirements have been requested and granted in accordance with Rules .1302 and .1709 of this Subchapter.

History Note: Authority G.S. 130A-342;

15A NCAC 18E .1505 is proposed for adoption as follows:

15A NCAC 18E .1505 RESIDENTIAL WASTEWATER TREATMENT SYSTEM APPROVAL RENEWAL

(a) All RWTS approvals will expire five years after the date the approval is issued. Approvals shall be re-issued when the requirements of this Rule have been met.

(b) Six months prior to the approval expiration, the manufacturer shall submit a written re-approval request to the State that includes verification of their continued certification and listing by a nationally recognized certification body, such as NSF International, as compliant with NSF Standard 40 and authorized by NSF to distribute and service products in North Carolina.

(c) The State shall re-issue a RWTS approval for a new five-year period when the manufacturer's re-approval request provided in accordance with Paragraph (b) of this Rule shows continued product certification.

(d) The State may suspend or revoke a system approval upon a finding that the system fails to perform in compliance with established effluent quality standards.

History Note: Authority G.S. 130A-342;

SECTION .1600 – APPROVAL AND USE OF PRE-ENGINEERED PACKAGE DRIP DISPERSAL SYSTEMS

15A NCAC 18E .1601 is proposed for adoption as follows:

15A NCAC 18E .1601 GENERAL

(a) Drip dispersal systems for design daily flows less than or equal to 3,000 gpd shall be configured as a package and approved as a Provisional, Innovative, or Accepted System in accordance with Section .1700 of this Subchapter.

(b) The integrated system package shall be provided from a single source manufacturer or system integrator, comprised of catalogued standardized design components that have been coordinated and tested by the manufacturer or integrator. Components shall include:

(1) dispersal field pump(s) and floats;

(2) headworks assemblies;

(3) dispersal field piping network, drip tubing, and appurtenances; and

(4) system controls that provide for automatic filter cleaning, timed field dosing, field flushing, alarm notification, and operating data logging.

(c) All components shall be integrated and designed to work together for the operation of the drip dispersal system. The system manufacturer or integrator shall provide system design information including:

(1) head loss charts, tables, or formulas for various drip tubing lateral lengths during a dosing and flushing cycle;

(2) minimum and maximum zone size and design;

(3) installation specifications;

(4) operation and maintenance manuals; and

(5) design plans and specifications for all components.

(d) The system manufacturer shall provide ongoing support to train and authorize designers, installers, Management Entities, regulators, and users.

(e) Drip dispersal system performance, siting, sizing, installation, operation, monitoring, maintenance and reporting requirements shall comply with Rules .0908, .1204, and Section .1300 of this Subchapter, and this Section.

(f) Drip dispersal systems that are not pre-engineered packages approved in accordance with Section .1600 of this Subchapter shall be designed on a project specific basis by a PE. The drip dispersal system design shall comply with Rules .0908, .1204, Section .1300, and this Section.

(g) Drip dispersal systems for design daily flows greater than 3,000 gpd shall comply with the design and performance requirements of this Section and shall be designed on a project specific basis by a PE. The system design shall be reviewed and approved by the State in accordance with Rule .0302 of this Subchapter, unless the system is permitted in accordance with Rule .0207 of this Subchapter.

History Note: Authority G.S. 130A-343;

15A NCAC 18E .1602 is proposed for adoption as follows:

15A NCAC 18E .1602 DESIGN AND CONSTRUCTION STANDARDS

(a) Drip dispersal systems shall be preceded by pretreatment designed to meet one of the following effluent standards: DSE, NSF-40, TS-I, or TS-II as specified in Table III of Rule .0402(a) and Table XXIV of Rule .1201(a) of this Subchapter.

(b) The drip dispersal system pump tank shall meet the following conditions:

(1) a separate pump tank sized in accordance with Rule .0802 of this Subchapter; or

(2) a pump tank or compartment that is part of an advanced pretreatment system approved in accordance with Section .1700 of this Subchapter. Pump tank operating levels shall not result in effluent backing up into a part of any pretreatment component designed for free gravity flow drainage. All pump submergence, dose volume, flow equalization, and emergency storage capacity requirements for the dosing system shall be met without interfering in the performance of the pretreatment components.

(c) Pumps shall meet the following conditions:

(1) sufficient capacity to accommodate projected flow and total dynamic head conditions;

(2) delivery of 10 to 60 psi of pressure during dosing events;

(3) minimum pressure as required to backwash or forward flush headworks filter;

(4) manufacturer requirements shall be followed to protect the pump intake from solids materials that may accumulate in the pump tank and for pump cooling during operation;

(5) maintenance of velocities of two feet per second at the distal end of each drip lateral line during automatic field flushing for DSE; and

(6) maintenance of velocities of one-foot per second at the distal end of each drip lateral line during automatic field flushing for advanced pretreatment effluent. Valving shall be provided to achieve flushing velocities of two feet per second at the distal end of each dripline with manual flushing.

(d) Headworks assemblies shall contain filtration, totalizing flow meter, mechanism for filter cleaning, and field flushing valves. Zone and isolation valves may be located in the headworks assembly or in the drip dispersal field. The headworks assemblies shall meet the following conditions:

(1) filters shall remove particles greater than 115 microns at the peak design daily flow, typically during network forward flushing. Filter number and size shall operate during both dosing and flushing conditions at a flow rate within the filter manufacturer's specified acceptable operating range;

(2) filters for drip dispersal systems receiving DSE shall be configured with two independently backwashed disk filters;

(3) for drip dispersal systems receiving advanced pretreatment effluent, single or multiple screens or disc filters may be used, designed to be cleaned by either backwashing or forward washing;

(4) filter cleaning and field flushing residuals shall be returned to the head of the pretreatment unit or to a separate settling tank to allow for primary settling prior to the pump tank;

(5) a totalizing flow meter shall be used to record total flow through the system. The meter shall also monitor flow rates during dosing and flushing events; and

(6) the headworks and associated components shall be in a separate enclosure that is freeze protected, UV and corrosion resistant, and accessible for routine operation, maintenance, monitoring and servicing. Design shall facilitate access to all internal components.

(e) The drip dispersal field shall consist of one or more separately dosed zones comprised of a supply and return manifold, manifold to lateral connections, laterals containing drip tubing with emitters, blank sections of tubing, and associated field appurtenances. Drip emitter and associated field appurtenances design shall meet the following:

(1) drip emitters shall be designed and demonstrated to uniformly distribute wastewater effluent at a pre-determined rate when operated in accordance with manufacturer's specified pressure range for emitter operation. Emitter design coefficient of variation (Cv) shall be 0.05 percent or less. Emitters shall be designed to be self-cleaning and to resist root intrusion. Hydraulic design of a drip dispersal zone shall be based upon achieving no more than a 10 percent variation in flow from any emitter over the entire zone, regardless of emitter elevation or position along the lateral including any effluent redistribution due to drainback;

(2) drip emitters shall be pressure compensating unless the manufacturer and designer provide documentation and calculations that a maximum 10 percent flow variance allowance can otherwise be achieved with non-pressure compensating emitters on a project-specific basis. Drip tubing shall be marked to identify the emitter type and flow rate;

(3) drip emitters shall be uniformly spaced along the tubing on 24-inch centers or less, and drip tubing with emitters shall be spaced an average of 24 inches on centers or less, in accordance with the proposed system design. Spacing shall be chosen as needed to assure a sufficient number and density of emitters are present to achieve uniform distribution and instantaneous emitter loading rates that do not exceed the hydraulic capacity of the receiving infiltrative surfaces;

(4) connections between supply and return manifolds, and between runs or drip lateral sections installed at varying elevations or locations shall be made with solvent welded solid Schedule 40 PVC or flexible PVC;

(5) blanking sections of tubing without drip emitters may be used where unfavorable site conditions are encountered along a drip run. Blanking tubing shall be differently colored or marked tubing of the same material, specifications and diameter as the connecting dripline, or flexible PVC;

(6) manufacturer shall specify methods for dealing with drainback; and

(7) field appurtenances shall include the following:

(A) air or vacuum relief valve at the highest elevation of each zone;

(B) cleanout at both ends of the supply and return manifolds;

(C) pressure monitoring fittings at the zone inlet and outlet points;

(D) pressure regulating valve where needed;

(E) for two or more zones: solenoid valves for each zone in the headworks or at the field, with an isolation valve on the supply line side; and a check valve with an isolation valve for each zone between the return manifold and the common return line; and

(F) valves, vents, cleanouts, and pressure monitoring fittings shall be provided with protective vaults or boxes that are decay resistant, ultraviolet rated, and accessible to the Management Entity from the ground surface.

(f) An integrated controller shall be provided to manage the multifunction processes of drip dispersal systems and meet the following conditions:

(1) enable each drip dispersal field or zone to be time-dosed at regular intervals throughout the day, at a projected average flow or design daily flow (peak enable float) dose regime. The controller shall allow for adjustable and variable dose volumes between or among zones;

(2) adjust pump dosing and resting cycles to meet system design and varying operating conditions;

(3) minimum dose volume per zone shall be set as needed so that 80 percent of each dose is delivered when the minimum pressure in the field network is 10 psi;

(4) provide for automatic cleaning of headworks filter(s) at designer and manufacturer-specified frequency and duration;

(5) provide for routine automatic forward flushing of the drip laterals (field flushing) with filtered effluent, at designer and manufacturer-specified frequency and duration;

(6) monitor pump cycles and run times;

(7) systems with a design daily flow greater than 1,500 gpd or as required in conjunction with an advanced pretreatment system shall include telemetry in accordance with Rule .1103(c) of this Subchapter;

(8) for systems with a design daily flow greater than 3,000 gpd the controller shall monitor flow volume to each zone and provide a flow variance indication when flow is plus or minus 20 percent of design. The telemetry system and alarm shall include an automatically rechargeable battery back-up power supply or be otherwise designed to be functional during power outages;

(9) in multi-zone systems, the system controller shall provide for a zone to be rested or taken out of service manually. The controller shall have the capability to bypass the zones that have been taken out of service and dose the next available zone with the normal dosing sequence continuing; and

(10) controls and floats in the pump tank shall be synchronized to assure the minimum dose is available prior to initiating a dosing cycle to the dispersal field or zone.

History Note: Authority G.S. 130A-343;

15A NCAC 18E .1603 is proposed for adoption as follows:

15A NCAC 18E .1603 DRIP DISPERSAL SYSTEM TESTING

(a) The drip dispersal system field testing shall include the following items and any other requirements included by the system designer:

(1) all leaks in the pipe network or from emitters exhibiting excessive emission rates, as evidenced by wet spots during dosing cycles comparable to normal operating conditions, shall be repaired; and

(2) dosing and flushing flow rates shall be measured and confirmed to be in accordance with the drip system design parameters as follows:

(A) dosing pressure shall be measured at the lowest point in the supply manifold;

(B) maximum emitter pressure shall be verified to be within emitter design parameters; and

(C) flushing pressures at the ends of each zone supply and return manifold shall be measured and recorded to document system start-up conditions.

(b) All mechanical components, pumps, pump cycling, filters, valves, vents, flushing, high-water alarm, and telemetry systems shall be demonstrated to be operable and in accordance with their design.

History Note: Authority G.S. 130A-343;

SECTION .1700 – APPROVAL AND PERMITTING OF WASTEWATER SYSTEMS, TECHNOLOGIES, COMPONENTS, OR DEVICES

15A NCAC 18E .1701 is proposed for adoption as follows:

15A NCAC 18E .1701 GENERAL

PIA Systems are any wastewater systems, system components, or devices as defined by G.S 130-343(a) that are not described in other Sections of this Subchapter. This includes systems for which any of the following are proposed:

(1) minimum setbacks reductions;

(2) depth to limiting condition reductions;

(3) vertical separation distance requirements reductions; or

(4) LTAR increases.

This Section shall provide for the approval and permitting of PIA Systems.

History Note: Authority G.S. 130A-335(e) and (f); 130A-343;

15A NCAC 18E .1702 is proposed for adoption as follows:

15A NCAC 18E .1702 APPLICATION

(a) An application shall be submitted in writing to the Department for a PIA System. All applications shall include the information required by G.S. 130A-343(d), (f), (g), (g1), and (h), and the following, as applicable:

(1) identification of the type of PIA approval requested:

(A) Provisional;

(B) Innovative;

(C) Functionally Equivalent;

(D) Accepted; or

(E) a combination of any of the above;

(2) plans and specifications for the system, including the following:

(A) description of the system;

(B) materials used in construction;

(C) proposed use of system;

(D) system design criteria;

(E) detailed system design/drawings;

(F) installation manual;

(G) operation and maintenance manual, including a checklist for documentation of inspection and maintenance activities and the VIP;

(H) influent and effluent sampling locations for advanced pretreatment systems while the system remains in operation;

(I) method for automatically measuring and recording daily wastewater flow dispersed to the dispersal field, including tracking the last seven days and 30 days of wastewater flow for advanced pretreatment systems; and

(J) start-up requirements and information;

(3) summary of the following information:

(A) pertinent literature;

(B) published research; and

(C) previous experience and performance with the system;

(4) results of any available testing, research or monitoring of pilot systems or full-scale operational systems including:

(A) identification of the third-party research or testing organization that conducted the testing, research, or monitoring provided;

(B) documentation that the protocol or evaluation used in the testing, research, or monitoring is: established by a nationally recognized certification body; a listed protocol that has been approved by the Department in accordance with G.S. 130A-343(d); a comparable evaluation protocol used for system approval in other states; or in accordance with an alternative performance evaluation protocol proposed for approval by the manufacturer;

(C) documentation that the system is tested, certified, and listed by a nationally recognized certification body and complies with an ongoing verification program administered by that certification body, as applicable; and

(D) documentation that the system can be sampled in compliance with 40 CFR 136 and that the method for system sampling accurately monitors system compliance with effluent quality standards;

(5) verification that the product submitted for PIA approval is the same as the certified, listed, or tested product, and if not, identification of any modifications made to the submitted product;

(6) notification of any proprietary or trade secret information, system, component, or device. All documents received are considered Public Records in accordance with G.S. 132, unless they meet the criteria for classification as a trade secret as defined in G.S. 66-152(3);

(7) draft written PIA approval that includes criteria for site selection, installation requirements, operation and maintenance procedures including a VIP, system classification, frequency of system inspection and monitoring in accordance with Table XXXI of Rule .1301 of this Subchapter, minimum certification/licensing requirements for designers, installers, and Management Entities; and

(8) fee payment as required by G.S. 130A-343(k), by corporate check, money order or cashier's check made payable to: North Carolina On-Site Water Protection System Account or North Carolina OSWW System Account, and mailed to the State. Fees received are non-refundable.

(b) Provisional System applications shall include the information listed in Paragraph (a) of this Rule and the following evaluation proposal containing all information set forth in G.S. 130-343(f), including:

(1) identity and qualifications of the proposed third-party evaluator, including documentation of their third-party status;

(2) description of the evaluation proposal including any proposed laboratory and field testing;

(3) number of systems to be installed;

(4) site selection criteria;

(5) system monitoring and reporting procedures, and proposed duration of evaluation; and

(6) any other information needed for the system to be able to achieve Innovative status upon successful completion of the Provisional System evaluation proposal.

(c) Functionally Equivalent Trench System Innovative applications shall include the information listed in Paragraph (a) of this Rule and documentation that the manufacturer has petitioned the Commission for Public Health in accordance with G.S. 130A-343(g1).

(d) Accepted Wastewater Dispersal System applications shall include the information listed in Paragraph (a) of this Rule and documentation that the manufacturer has petitioned the Commission for Public Health in accordance with G.S. 130A-343(h).

(e) The Department may initiate review of a nonproprietary PIA system in accordance with G.S. 130A-343(i) without having received an application from a manufacturer. The system may be approved as Provisional or Innovative or the Department may recommend approval to the Commission as an Accepted system. The system shall have been shown to meet all applicable approval criteria of this Section.

History Note: Authority G.S. 130A-335(e) and (f); 130A-343;

15A NCAC 18E .1703 is proposed for adoption as follows:

15A NCAC 18E .1703 DEPARTMENT AND COMMISSION APPLICATION REVIEW

(a) The Department shall review all applications submitted to determine if the information listed in Rule .1702 of this Section is included and determine whether additional information is needed to continue the review.

(b) Within 30 days of receipt of the initial application, the Department shall notify the manufacturer of any items necessary to complete the application or notify the manufacturer that the application is complete. This determination shall not constitute a qualitative review of the information provided, nor the approval or denial of the proposed system designation. Specified additional information shall be received within 180 days or the application file shall be closed.

(c) Upon receipt of a complete application, the Department shall conduct a qualitative review in accordance with PIA approval criteria identified in Rules .1704, .1705, and .1706 of this Section.

(d) For systems that are certified and listed by a nationally recognized certification body, the Department shall complete its review and determine whether to approve or deny Provisional System applications within 90 days of receipt of a complete application.

(e) The Department shall complete its review and determine whether to approve or deny Innovative System applications within 90 days of publication in the North Carolina Register of the notice of receipt of a complete application.

(f) The Department shall prepare and submit its findings and recommendations for a Functionally Equivalent Trench System or an Accepted Wastewater Dispersal System to the Commission within 120 days of receipt of a complete application.

(g) Upon request by the petitioner, the Commission may modify the 180-day time frame for receipt of additional information specified by the Department for a Functionally Equivalent or Accepted System petition based on a determination that a petition is incomplete and additional information is needed. The petitioner may also request Commission review of the Department's determination that a petition is incomplete or additional information request.

(h) The Department may hold technical advisory meetings to discuss PIA applications with stakeholders.

(i) The Department shall notify the applicant and LHDs of the approval or denial of a PIA System. The PIA approval shall include conditions for permitting, siting, installation, use, monitoring, operation and maintenance, and number of systems that can be installed. When an application is denied, the Department shall inform the applicant in writing of the reason for denial and specify appeal rights. The Department shall assign a unique code to the approved products for tracking purposes.

(j) An applicant may reapply in accordance with this Section. When reapplying, a new application shall be required and the applicant shall make a new fee payment as required by G.S. 130A-343(k).

History Note: Authority G.S. 130A-335(e) and (f); 130A-343;

15A NCAC 18E .1704 is proposed for adoption as follows:

15A NCAC 18E .1704 APPROVAL CRITERIA FOR PROVISIONAL SYSTEMS

A system shall be approved for use as a Provisional System when all of the following criteria have been met:

(1) For trench and dispersal systems documentation of one of the following:

(A) 50 installations operational and in use for 12 months, with available information indicating comparable hydraulic performance and rate of malfunction to a conventional trench system;

(B) the system's design and functional similarity to another approved system described elsewhere in this Subchapter, or to a Provisional, Innovative or Accepted System approved in accordance with this Section. The system's design and functional similarity shall be equal or superior to the comparable system for the following:

(i) material physical properties and chemical durability;

(ii) field installed permeable sidewall area and bottom infiltrative area;

(iii) method and manner of function for conveyance and application of effluent;

(iv) structural integrity; and

(v) field installed storage volume;

(C) the system has been certified and listed by a nationally recognized certification body, as defined by G.S. 130A-343(a)(6), for a period that exceeds one year; or

(D) the system has complied with a comparable evaluation protocol used for system approval in other states.

(2) Documentation shall be provided that all trench and dispersal systems have been subject to and complied with AASHTO Standard H-5 and H-10 load testing that demonstrates the structural integrity to be comparable to a conventional trench system.

(3) For advanced pretreatment systems requesting Provisional approval for designs complying with TS-I or TS-II effluent quality standards, documentation of one of the following:

(A) 50 complete third-party field verification data sets from 15 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent quality standard. Two to five data sets may be from the same site if collected three months apart, with no data excluded from the field sampling sites. The data sets shall demonstrate compliance with TS-I or TS-II effluent quality standards in accordance with Rule .1709 of this Section;

(B) the system's design and functional similarity to another approved system described elsewhere in this Subchapter, or to a Provisional or Innovative System approved in accordance with this Section. The system's design and functional similarity shall be equal or superior to the comparable system for all of the following:

(i) material physical properties and chemical durability;

(ii) structural integrity;

(iii) biological, chemical, or physical treatment processes;

(iv) method and manner of function for conveyance and transformation of wastewater and effluent through the system; and

(v) number and size of system compartments;

(C) the system has been certified and listed by a nationally recognized certification body, as defined by G.S. 130A-343(a)(6), for a period that exceeds one year; or

(D) the system has complied with a comparable evaluation protocol used for system approval in other states.

(4) Submittal of a proposed evaluation protocol to be overseen by a third-party evaluator. The evaluation protocol shall ensure that all information necessary to satisfy the criteria to achieve Innovative approval under G.S. 130A-343(f) and Rule .1705 of this Section is collected.

(A) For trench and dispersal systems:

(i) a total of 100 installations operational and in use for 12 months; and

(ii) sufficient information collected to evaluate the systems hydraulic performance, structural integrity and rate of malfunction compared with a conventional trench system;

(B) For advanced pretreatment systems, one of the following:

(i) for a system that has been certified and listed by a nationally recognized certification body, as defined by G.S. 130A-343(a)(6) for a period that exceeds two consecutive years, 50 complete third-party field verification data sets from 15 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent quality standard. Two to five data sets may be from the same site if collected three months apart, with no data excluded from the field sampling sites. The data sets shall show compliance with TS-I or TS-II effluent quality standards in accordance with Rule .1709 of this Section, as applicable; or

(ii) 150 complete third-party field verification data sets from 50 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent quality standard. Two to five data sets may be from the same site if collected three months apart, with no data excluded from the field sampling sites. The data sets shall demonstrate compliance with TS-I or TS-II effluent quality standards in accordance with Rule .1709 of this Section, as applicable.

(5) Manufacturers requesting Provisional approval as both an advanced pretreatment and dispersal system must meet the requirements for advanced pretreatment and dispersal as described in this Rule.

History Note: *Authority G.S. 130A-335(e) and (f); 130A-343;*

15A NCAC 18E .1705 is proposed for adoption as follows:

15A NCAC 18E .1705 APPROVAL CRITERIA FOR INNOVATIVE SYSTEMS

A system shall be approved for use as an Innovative System when all of the following criteria have been met:

(1) The performance requirements for an Innovative System identified in G.S. 130A-343(a)(5) and (g) have been met.

(2) Materials used in construction shall be equal or superior in physical properties, chemical durability, and structural integrity compared to materials used for similar proposed systems described in other Sections of this Subchapter.

(3) The system has been demonstrated to perform equal or superior to a system which is described in other Sections of this Subchapter or to an Innovative or Accepted System previously approved in accordance with this Section, based upon controlled pilot-scale research studies or statistically-valid monitoring of full-scale operational systems.

(4) The system has met one of the following criteria:

(A) the system has completed an evaluation protocol as a Provisional System in accordance with Rule .1704 of this Section;

(B) the manufacturer has provided comparable third-party research and testing conducted in other states, with the data and findings of all evaluations of the system performance, the results of which support the proposed use of the system; or

(C) the system has been evaluated in accordance with G.S. 130A-343(g)(3).

(5) The following documentation is provided for trench and dispersal systems:

(A) the results of AASHTO Standard H-5 and H-10 load testing that demonstrate structural integrity comparable to a conventional trench system;

(B) 100 installations operational and in use for one year. The 100 installations sites may include any combination of systems installed in conjunction with an approved Provisional System evaluation completed in North Carolina and systems in other states; and

(C) system hydraulic performance and rate of malfunction is equal or superior to the demonstrated performance of a conventional trench system.

(6) For advanced pretreatment systems requesting Innovative approval for designs complying with TS-I or TS-II effluent quality standards, documentation is provided of one of the following:

(A) for a system that has been certified and listed by a nationally recognized certification body, as defined by G.S. 130A-343(a)(6) for a period that exceeds two consecutive years, 50 complete third-party field verification data sets from 15 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent quality standard. Two to five data sets may be from the same site if collected three months apart, with no data excluded from the field sampling sites. The data sets shall demonstrate compliance with TS-I or TS-II effluent quality standards, as applicable; or

(B) 150 complete third-party field verification data sets from 50 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent quality standard. Two to five data sets may be from the same site if collected three months apart, with no data excluded from the field sampling sites. The 50 sites may include a combination of sites monitored in conjunction with an approved Provisional system evaluation completed in North Carolina and sites in other states. The data sets shall demonstrate compliance with TS-I or TS-II effluent quality standards, as applicable.

(7) Manufacturers requesting Innovative approval as both an advanced pretreatment and dispersal system shall also meet the requirements for advanced pretreatment and dispersal as described in this Rule.

History Note: Authority G.S. 130A-335(e) and (f); 130A-343;

15A NCAC 18E .1706 is proposed for adoption as follows:

15A NCAC 18E .1706 APPROVAL CRITERIA FOR ACCEPTED SYSTEMS

(a) The Commission shall designate a wastewater dispersal system as an Accepted System when it finds based on clear, convincing, and cogent evidence that the standards set forth by G.S. 130A-343(a)(1) and G.S. l30A-343(h) have been met.

(b) The following information shall be provided by the petitioner and reviewed by the Commission prior to granting Accepted system status:

(1) documentation of 300 systems installed statewide and in use as an approved Innovative System for more than five years;

(2) data and findings of all prior evaluations of the system performance as provided by the manufacturer;

(3) results of prior performance surveys of Innovative Systems in use in North Carolina for the five-year period immediately preceding the petition, including any information available to the manufacturer pertinent to the accuracy and validity of performance surveys not completed under their control;

(4) review(s) of records on system use and performance reported by LHDs, authorized designers, installers, and Management Entities documenting the experiences with performance of the system in North Carolina, including information collected and reported in accordance with Rules .1711 and .1712 of this Section. Upon request of the manufacturer, the Department and manufacturer shall meet to discuss the accuracy and validity of performance data and surveys to be considered for inclusion in the review. LHDs shall be invited to participate in the discussion;

(5) a statistically valid survey of system performance shall be performed, as follows:

(A) the manufacturer shall provide a proposed survey plan for Department concurrence prior to carrying out the survey. This plan shall specify the number of systems to be evaluated, period of evaluation, method to randomly select systems to be evaluated, methods of field and data evaluation, and proposed survey team members, including proposed cooperative arrangements to be made with Department and LHD staff. The Department shall facilitate LHD participation with any performance review or survey. The Department shall utilize the Division of Public Health's State Center for Health Statistics for assistance in evaluating the statistical validity of proposed evaluation protocols; and

(B) the survey shall include the field evaluation of 250 randomly selected Innovative Systems compared with 250 comparably aged randomly selected conventional systems, with 100 of each type of surveyed system currently in use and in operation for five years. Systems surveyed shall be distributed throughout the three physiographic regions of the state (Mountain, Piedmont and Coastal Plain) in approximate proportion to the relative usage in the three regions. The survey shall determine comparative system failure rates, with field evaluations completed during a typical wet-weather season (February through early April), with matched Innovative and conventional Systems sampled during similar time periods in each region. The petitioner shall provide a statistical analysis of the survey results showing a one-sided test where, if the failure rate in the sample of 250 Innovative Systems is five percentage points higher than the failure rate in the sample of 250 conventional systems, there is only a five percent chance that a difference this large would occur by chance (95 percent confidence level). If a statistically significant higher failure rate in the Innovative System is not detected, the Commission shall find that the Innovative System performs the same as or better than the conventional system;

(6) Other criteria for determining whether the proposed system has been in general use, and other surveys, including evaluations of different numbers of Innovative and conventional systems, designed to verify equal or superior performance of the Innovative System compared to the conventional system under actual field conditions in North Carolina shall be approved by the Department when they are demonstrated to have comparable statistical validity as described in Subparagraph (b)(5) of this Rule. The Department's review and approval of proposed alternate criteria for determining whether the system has been in general use, or of other proposed surveys are subject to review and concurrence by the Commission.

(c) The Commission shall impose any use, design, installation, operation, maintenance, monitoring, and management conditions in accordance with G.S. 130A-343.

(d) Accepted system applications for products that are approved to both treat and disperse wastewater must meet the requirements for treatment and dispersal as described in this Section.

History Note: Authority G.S. 130A-335(e) and (f); 130A-343;

15A NCAC 18E .1707 is proposed for adoption as follows:

15A NCAC 18E .1707 DESIGN AND INSTALLATION CRITERIA FOR PROVISIONAL, INNOVATIVE, AND ACCEPTED APPROVALS

All products approved under this Section shall be designed and installed in accordance with the requirements of the PIA approval.

History Note: Authority G.S. 130A-335(e) and (f); 130A-343;

15A NCAC 18E .1708 is proposed for adoption as follows:

15A NCAC 18E .1708 MODIFICATION, SUSPENSION, AND REVOCATION OF APPROVALS

The Department may modify, suspend, or revoke the PIA approval of a system as provided for in G.S. 130A-343(c) and as follows:

(1) The PIA approval shall be modified as necessary to comply with subsequent changes in laws or rules which affect their approval.

(2) The manufacturer of an approved Provisional or Innovative System that seeks to modify their system or its conditions of approval, including siting or sizing criteria, shall submit to the Department a written application. If the manufacturer demonstrates that the modified system will perform in a manner equal or superior to the approved system in terms of structural integrity, chemical durability, hydraulic performance, and wastewater treatment, the Department shall approve the modified system with the same status as the previously approved system.

(3) The manufacturer of an approved Provisional or Innovative System shall notify the Department within 30 days if they lose their approval from any nationally recognized certification body or choose to drop their listing, as applicable.

(4) The manufacturer of an approved Accepted System that seeks to modify their system or its conditions of approval, including siting or sizing criteria, shall submit to the Department a written application. The manufacturer shall demonstrate that the modified system will perform in a manner equal or superior to the approved system in terms of structural integrity, chemical durability, hydraulic performance, and wastewater treatment. The Commission shall approve proposed modifications to Accepted Systems when the manufacturer's demonstration provides clear, convincing, and cogent supporting evidence.

(5) The Department may modify, suspend, or revoke a PIA approval upon a finding that:

(a) subsequent experience with the system results in altered conclusions about system performance, reliability, or design;

(b) the system fails to perform in compliance with established effluent quality standards;

(c) the modified system fails to perform in a manner equal or superior to the previously approved PIA System;

(d) the system or the system petitioner fails to comply with wastewater system laws, rules, or conditions of the PIA approval; or

(e) the manufacturer lost their approval or chooses to drop their listing by any nationally recognized certification body, if applicable.

(6) The Commission may modify, suspend, or revoke its approval of a modified Accepted System if the modified system or component fails to perform in a manner equal or superior to the previously approved system. The Department shall notify the Commission of any action required for Commission approval of any modifications to the status of an Accepted System. The Commission may require the manufacturer or the Department to complete a follow-up survey of a proprietary trench system such as described in this Rule if the Commission determines further information is necessary prior to rendering a final decision on modification of the status of an Accepted System.

(7) Modification, suspension, or revocation of a PIA approval shall not affect systems previously installed in accordance with the approval.

History Note: Authority G.S. 130A-335(e) and (f); 130A-343;

15A NCAC 18E .1709 is proposed for adoption as follows:

15A NCAC 18E .1709 EFFLUENT SAMPLING REQUIREMENTS FOR ADVANCED PRETREATMENT SYSTEMS

(a) Wastewater sampling requirements shall vary in accordance with system classification, designated effluent quality standard, system design daily flow, and system performance history.

(b) Effluent from Provisional Systems shall be grab or composite sampled quarterly for all applicable influent and effluent quality constituents until the system receives Innovative Approval.

(c) Effluent from an approved Innovative System shall be grab or composite sampled annually for all applicable influent and effluent quality constituents when the design daily flow is less than or equal to 1,500 gpd, unless adjusted sampling requirements have been requested and approved in accordance with this Rule.

(d) Effluent from an approved Innovative System shall be grab or composite sampled twice a year for all applicable influent and effluent quality constituents when the design daily flow is greater than 1,500 gpd and less than or equal to 3,000 gpd, unless adjusted sampling requirements have been requested and approved in accordance with this Rule.

(e) Innovative Systems serving vacation rentals subject to the North Carolina Vacation Rental Act, G.S. 42A, shall be sampled during the seasonal high use period.

(f) The manufacturer of an approved Innovative System may request an adjustment in sampling requirements (constituents or frequency) based on a written application submitted to the Department that includes the following information:

(1) data from 50 separate North Carolina sites in operation for six months;

(2) written reports summarizing results of the VIPs for all North Carolina sites submitted as part of this Rule;

(3) 80 complete data sets, including all data sets that do not meet the limits. Data sets may be from the same site if collected three months apart;

(4) analysis indicating compliant system performance in accordance with Rule .1710 of this Section; and

(5) identification of the constituents for which the manufacturer requests a reduced sampling frequency.

(g) Manufacturers of proprietary advanced pretreatment systems with Innovative approval that are also certified and listed by a nationally recognized certification body, as defined by G.S. 130A-343(a)(6), and are in compliance with the ongoing verification program of such body, may submit a written application with a sampling protocol that reduces the data set requirements by up to 50 percent.

(h) Manufacturers of proprietary advanced pretreatment systems that comply with Paragraphs (f) and (g) of this Rule may apply to the Department to replace the requirement for routine effluent sampling of all individual sites with routine field constituent testing that is included as part of the VIP.

(i) While routine sampling of individual sites may no longer be required in accordance with Paragraphs (b), (c), or (d) of this Rule, effluent sampling may still be determined to be necessary during the visual inspection of the system in accordance with Rule .1302(b) of this Subchapter or if required as part of an enforcement action by the LHD or the Department.

(j) Effluent may be re-sampled within 30 days from receiving laboratory results indicating non-compliance with Table XXIV of Rule .1201 of this Subchapter. Complete data sets from resampling may be substituted to meet the minimum number of compliant data sets required for PIA approval. Data sets from resampling may be used by a manufacturer as part of a reduced effluent sampling request in accordance with Paragraph (f) of this Rule.

(k) Alternative sampling requirements may be proposed by the manufacturer for a Provisional or Innovative System and approved by the Department when determined to provide an equal or more reliable indication of system compliance with effluent quality standards.

History Note: Authority G.S. 130A-335(e) and (f); 130A-343;

15A NCAC 18E .1710 is proposed for adoption as follows:

15A NCAC 18E .1710 SYSTEM COMPLIANCE CRITERIA FOR ADVANCED PRETREATMENT SYSTEMS

An approved system shall be considered in compliance with the effluent quality standards of Table XXIV of Rule .1201 of this Subchapter when all the following conditions are met:

(1) the arithmetic mean (geometric mean for Fecal Coliform) of all data collected from all sites does not exceed the designated effluent quality standard;

(2) no more than 20 percent of all data from all sites shall exceed the designated effluent quality standard for any applicable constituent. Non-compliant data may be substituted with a new data set meeting the designated effluent quality standard upon re-sampling within 30 days of receipt of the non-compliant data results;

(3) fifty percent of all complete data sets from all sites shall comply with the designated effluent quality standard for all applicable constituents;

(4) when determining compliance with system effluent quality standards in Items (1), (2), and (3), no data sets shall be excluded from individual advanced pretreatment systems except at single sites found to be out of compliance in accordance with Rule .1302(d) of this Subchapter and sites that have been otherwise documented to have been subjected to significant abuse; and

(5) results of influent samples from all sites shall be provided to demonstrate compliance with percent reduction effluent criteria in accordance with Table XXIV in Rule .1201(a) of this Subchapter.

History Note: Authority G.S. 130A-335(e) and (f); 130A-343;

15A NCAC 18E .1711 is proposed for adoption as follows:

15A NCAC 18E .1711 PROVISIONAL AND INNOVATIVE APPROVAL RENEWAL

(a) All Provisional and Innovative approvals shall expire five years after the date the approval is issued. Approvals shall be re-issued when the applicable provisions of this Rule have been met.

(b) Six months prior to the approval expiration, the manufacturer shall submit a written report and re-approval request to the Department that includes the following:

(1) summary of the current status of systems permitted and installed under their approval;

(2) number of malfunctioning systems, including location, reason for malfunction, and how the system was repaired;

(3) documentation of system compliance with effluent quality standards in accordance with Rule .1710 of this Section, including analysis of all effluent data collected subsequent to the most recent system approval;

(4) documentation of compliance with all requirements in current Provisional or Innovative approval;

(5) documentation that 80 percent of the individual advanced pretreatment systems at a single site are in compliance with Rule .1302(d) of this Subchapter;

(6) current status of certification and listing by a nationally recognized certification body; and

(7) any other information the manufacturer deems necessary to support re-issuance of their PIA Approval.

(c) The Department shall re-issue a Provisional Approval for a specified additional period, not to exceed five years, when the manufacturer has demonstrated progress in completing the approved evaluation protocol; compliance with

applicable effluent quality standards; and that there is the likelihood that re-issuance of the approval will enable the evaluation protocol to be completed. A Provisional Approval may be re-issued only one time.

(d) The Department shall re-issue an Innovative Approval for a five-year period when the manufacturer's report provided in accordance with Paragraph (b) of this Rule shows system compliance with effluent quality standards and this Subchapter.

(e) The Department shall suspend or revoke a PIA approval upon a finding that the system fails to perform in compliance with established effluent quality standards.

History Note: Authority G.S. 130A-335(e) and (f); 130A-343;

15A NCAC 18E .1712 is proposed for adoption as follows:

15A NCAC 18E .1712 AUTHORIZED DESIGNERS, INSTALLERS, AND MANAGEMENT ENTITIES

(a) All designers, installers, and Management Entities shall be authorized in writing by the manufacturer and as defined in the PIA approval.

(b) Manufacturers of proprietary systems approved under this Section shall provide a list of manufacturer's authorized designers, installers, and Management Entities, as identified in the PIA approval, to the Department and LHDs, and update this list annually.

History Note: Authority G.S. 130A-335(e) and (f); 130A-343;

15A NCAC 18E .1713 is proposed for adoption as follows:

15A NCAC 18E .1713 LOCAL HEALTH DEPARTMENT RESPONSIBILITIES

To implement this Section the LHD shall:

(1) When a Provisional System is proposed, confirm that the designated repair system complies with the provisions of Rule .0508 of this Subchapter and with individual PIA approval requirements, except:

(a) when an existing wastewater system is available for immediate use, including connection to a public or community wastewater system; or

(b) when the Provisional System is used as a repair to an existing malfunctioning system when there are no other approved or Accepted repair options; or

(c) as provided in G.S. 130A-343(f) for Provisional Systems.

(2) Notify the Department of all IPs, CAs, and OPs issued for Provisional Systems.

(3) Permit systems designated as approved Accepted Systems in an equivalent manner to a conventional system at the owner's request, provided the location of each trench, trench depth, or effluent

distribution method remains unchanged. The type of Accepted System installed shall be indicated on the OP.

(4) Grant permit reductions in total trench length less than or equal to 25 percent for Innovative or Accepted Systems only to dispersal fields receiving DSE or better quality.

(5) Grant facilities generating high strength effluent the 25 percent reduction allowed for Innovative or Accepted Systems if the system includes an approved advanced pretreatment system designed to assure effluent strength equal to or better than DSE.

(6) Prohibit issuance of an OP for a proprietary system installed by a person not authorized by the manufacturer, unless the manufacturer of the proprietary system approves the installation in writing.

(7) Inform the Department as well as the manufacturer or their authorized representative of any system determined to be malfunctioning.

(8) Issue a NOV to the owner when the system is determined to be malfunctioning in accordance with Rule .1303(a)(1) and (2) of this Subchapter or when an individual advanced pretreatment system at a single site is out of compliance in accordance with Rule .1302(d) of this Subchapter. The notice shall identify the violations and steps necessary to remedy the problems, including modification of the system, established time frame to achieve compliance, other follow-up requirements, and set forth further enforcement possibilities if compliance is not achieved.

(9) Include in its monthly activity report submitted to the Department the following information identified by unique codes:

(a) number of new system OPs issued for PIA Systems;

(b) number of new system OPs issued for Accepted Systems;

(c) number of CAs issued for Provisional Systems, including system type;

(d) number of CAs issued for repairs of PIA Systems, including system type being repaired;

(e) number of CAs issued for repairs of Accepted Systems, including system type being repaired; and

(f) repair system type.

History Note: *Authority G.S. 130A-335(e) and (f); 130A-343;*