CHAPTER 18 – ENVIRONMENTAL HEALTH

SUBCHAPTER 18E – WASTEWATER TREATMENT AND DISPERSAL SYSTEMS

SECTION .0100 – GENERAL

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 except as allowed when used in conjunction with a RCW system.

Authority G.S. 130A-333; 130A-334(15); 130A-335(a), (b), and (e).

15A NCAC 18E .0102 APPLICABILITY

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

(b) If an existing facility's wastewater strength changes or DDF increases, 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) Notwithstanding Paragraph (a) of this Rule, all wastewater systems shall comply with Section .1300 of this Subchapter. ~~Subchapter, except for the wastewater systems that meet the requirements of Paragraph (a) of this Rule.~~

Authority G.S. 130A-335(e).

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, contact information, and terms for access to referenced documents.

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 – Enclosures for Electrical Equipment	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 – Cation Exchange Capacity of Soils	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	
C564 – Standard Specifications for Rubber Gaskets for Cast Iron Soil Pipe and Fittings	Forty one dollars ($41.00) each plus six dollars and seventy five cents ($6.75) shipping and handling
C890 – Standard Practive for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures	Forty five dollars ($45.00) each plus six dollars and seventy five cents ($6.75) shipping and handling
C923 – Standard Specifications for Resilient Connectors Between Reinforced	Forty one dollars ($41.00) each plus six dollars and seventy five cents ($6.75) shipping and handling

Concrete Manhole Structures, Pipes, and Laterals	
C990 – Standard Specifications for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants	Forty dollars ($40.00) each plus six dollars and seventy five cents ($6.75) shipping and handling
C1644 – Standard Specification for Resilient Connectors Between Reinforced Concrete On-Site Wastewater Tanks and Pipes	Forty five dollars ($45.00) each plus six dollars and seventy five cents ($6.75) shipping and handling
D448 – Standard Classification for Sizes of Aggregate for Road and Bridge Construction	Thirty nine dollars ($39.00) each plus six dollars and seventy five cents ($6.75) shipping and handling
D1784 – Standard Specification for Rigid Poly (Vinyl ~~Chloride)(PVC)~~ Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl ~~Chloride)(CPVC)~~ Chloride) (CPVC) Compounds	Thirty nine ($39.00) dollars each plus six dollars and seventy five cents ($6.75) shipping and handling
D1785 – Standard Specifications for Poly (Vinyl ~~Chloride)(PVC)~~ Chloride)(PVC) Plastic Pipe, Schedules 40, 80, and 120	Fifty dollars ($50.00) plus six dollars and seventy five cents ($6.75) shipping and handling
D2241 – Standard Specification for Poly (Vinyl~~— Chloride)(PVC)~~ Chloride)(PVC) Pressure-Rated Pipe (SDR Series)	Forty four dollars ($44.00) each plus six dollars and seventy five cents ($6.75) shipping and handling
D2466 – Standard Specification for Poly (Vinyl ~~Chloride)(PVC)~~ Chloride) (PVC) Plastic Pipe Fittings, Schedule 40	Forty four ($44.00) dollars each plus six dollars and seventy five cents ($6.75) shipping and handling
D2564 – Standard Specification for Solvent Cements for Poly (Vinyl ~~Chloride)(PVC)~~ Chloride) (PVC) Plastic Piping Systems	Forty four dollars ($44.00) each plus six dollars and seventy five cents ($6.75) shipping and handling
D2729 – Standard Specification for Poly (Vinyl ~~Chloride)(PVC)~~ Chloride) (PVC) Sewer Pipe and Fittings	Forty five dollars ($45.00) each plus six dollars and seventy five cents ($6.75) shipping and handling
D2774 – Standard Practice for Underground Installation of Thermoplastic Pressure Piping	Forty four dollars ($44.00) each plus six dollars and seventy five cents ($6.75) shipping and handling

D3034 – Standard Specification for Type PSM Poly (Vinyl ~~Chloride)(PVC)~~ Chloride) (PVC) Sewer Pipe and Fittings	Fifty dollars ($50.00) each plus six dollars and seventyfive cents ($6.75) shipping and handling
D6913 – Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis	Sixty five dollars ($65.00) each plus ~~six~~ thirteen dollars and ~~seventy~~ thirty five cents ~~($6.75)~~ ($13.35) shipping and handling
D7928 – Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis	Sixty five dollars ($65.00) each plus ~~six~~ thirteen dollars and ~~seventy~~ thirty five cents ~~($6.75)~~ ($13.35) shipping and handling
F667 – Standard Specification for 3 through 24 in. Corrugated Polyethylene Pipe and Fittings	Forty five dollars ($45.00) each plus six dollars and seventy five cents ($6.75) shipping and handling
F810 – Standard Specification for Smoothwall Polyethylene (PE) Pipe for Use in Drainage and Waste Disposal Absorption Fields	Forty one dollars ($41.00) each plus six dollars and seventy five cents ($6.75) shipping and handling
North Carolina Administrative Code	
15A NCAC 01O – Environmental Health	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 – Well Construction Standards	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 – Procedures for Permits: Approvals	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 – Groundwater Classification and Standards	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 02T – Waste Not Discharged to Surface Waters	Available at no charge at: http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2002%20-%20environmental%20management/subchapter%20t/subchapter%20t%20rules.pdf
15A NCAC 02U – Reclaimed Water	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 08G – Authority: Organization: Structure: Definitions	Available at no charge at: http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2008%20-%20water%20pollution%20control%20system%20operators%20certification%20commission/subchapter%20g/subchapter%20g%20rules.pdf
15A NCAC 13B – Solid Waste Management	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 – Residential ~~Onsite~~ Wastewater Systems	One hundred five dollars ($105.00) each plus shipping and handling
Standard 41 – Non-Liquid Saturated Treatment Systems	One hundred five dollars ($105.00) each plus shipping and handling
Standard 46 – Evaluation of Components and Devised Used in Wastewater Treatment Systems	One hundred five dollars ($105.00) each plus shipping and handling
Standard 245 – Wastewater Treatment Systems – Nitrogen Reduction	One hundred five dollars ($105.00) each plus shipping and handling
Standard 350 – Onsite Residential and Commercial Water Reuse Treatment	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 – Prefabricated Septic Tanks	One hundred dollars ($100.00) each
Canadian Standards Association 178 Rexdale Blvd, Toronto, ON Canada M9W 1R3 http://www.csagroup.org/	
B66 – Design, material, and manufacturing requirements for prefabricated septic tanks and sewage holding tanks	One hundred eighty dollars ($180.00) each plus eighteen dollars ($18.00) shipping and handling
2012 North Carolina Plumbing Code	
	Available at no charge at: https://codes.iccsafe.org/public/getpdf/2012_NC_Plumbing.pdf
2015 North Carolina Building Code	
	Available at no charge at: https://codes.iccsafe.org/public/getpdf/2015_NC_ExistingBldg.pdf
North Carolina Food Code Manual	
	Available at no charge at: http://ehs.ncpublichealth.com/faf/docs/foodprot/NC-FoodCodeManual-2009-FINAL.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

Authority G.S. 130A-335(e).

15A NCAC 18E .0104 ABBREVIATIONS

As used in this Subchapter, the following abbreviations refer to:

(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_5: Five Day 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) DO: Dissolved Oxygen;

(14) DIP: Ductile Iron Pipe;

(15) DOT: Department of Transportation;

(16) DSE: Domestic Strength Effluent;

(17) EOP: ~~Engineer~~ Engineered Option Permit;

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

(19) gpd: Gallons per Day;

(20) HSE: High Strength Effluent;

(21) IAPMO: International Association of Plumbing and Mechanical Officials

~~(21)~~(22) IP: Improvement Permit;

~~(22)~~(23) IPWW: Industrial Process Wastewater;

~~(23)~~(24) LC: Limiting Condition;

~~(24)~~(25) LDP: Large Diameter Pipe;

~~(25)~~(26) LG: Licensed Geologist;

~~(26)~~(27) LHD: Local Health Department;

~~(27)~~(28) LPP: Low Pressure Pipe;

~~(28)~~(29) LSS: Licensed Soil Scientist;

~~(29)~~(30) LTAR: Long Term Acceptance Rate;

~~(30)~~(31) mg/L: Milligrams/Liter;

~~(31)~~(32) NEMA: National Electrical Manufacturers Association;

~~(32)~~(33) NH_3: Total Ammonia Nitrogen;

~~(33)~~(34) NOI: Notice of Intent to Construct;

~~(34)~~(35) NOV: Notice of Violation;

~~(35)~~(36) NSF: NSF International;

~~(36)~~(37) OP: Operation Permit;

~~(37)~~(38) PE: Professional Engineer;

~~(38)~~(39) PIA: Provisional, Innovative, and Accepted;

~~(39)~~(40) PPBPS: Prefabricated Permeable Block Panel System;

~~(40)~~(41) psi: Pounds per square inch;

~~(41)~~(42) PVC: ~~Poly Vinyl~~ Polyvinyl Chloride;

~~(42)~~(43) RCW: Reclaimed Water;

~~(43)~~(44) RV: Recreational Vehicle;

~~(44)~~(45) RWTS: Residential Wastewater Treatment Systems;

~~(45)~~(46) SDR: Standard Dimension Ratio;

~~(46)~~(47) SPI: Standard Precipitation Index;

(48) STEP: Septic Tank Effluent Pump;

~~(47)~~(49) SWC: Soil Wetness Condition;

~~(48)~~(50) TKN: Total Kjeldahl Nitrogen;

~~(49)~~(51) TL: Trench Length;

~~(50)~~(52) TN: Total Nitrogen;

~~(51)~~(53) TSS: Total Suspended Solids;

~~(52)~~(54) TW: Trench Width;

~~(53)~~(55) USDA-NRCS: United States Department of Agriculture – Natural Resources Conservation Service;

~~(54)~~(56) VIP: Visual Inspection Protocol; and

~~(55)~~(57) WS: Water Supply Class.

Authority G.S. 130A-335(e).

15A NCAC 18E .0105 DEFINITIONS

The following definitions shall apply throughout this Subchapter:

(1) "Aggregate" means naturally occurring inorganic material (crushed rock or gravel) or other State approved media of a specific size or grade.

(2) "Apparent Cation Exchange Capacity" 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 SWC or intercept lateral flowing ground or surface water. Artificial drainage systems include the following: groundwater lowering system, interceptor 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 North Carolina Building Code.

(9) "Building drain" means the lowest piping of a drainage system that receives the discharge from waste pipes inside the design unit and extends to 10 ft beyond the walls of the building (or five feet for a building with a foundation) and conveys the drainage to a building sewer.

(10) "Building sewer" means the part of a drainage system that extends from the end of the building drain and conveys the discharge to a wastewater system.

(11) "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.

(12) "Collection sewer" means gravity flow pipelines, force mains, effluent supply lines, manholes, lift stations and all applicable ~~appliances,~~ appurtenances, used for conducting wastes from the sanitary building drain or building sewer to and within a wastewater system. A collection system is a collection sewer. The State has authority for the permitting of collection sewers when two or more design units have a common collection sewer and the wastewater system is permitted under this Subchapter.

(13) "Complete data set" means analytical results for all required influent and effluent constituents (as specified in the effluent 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.

(14) "Component" means a part of a wastewater system, as defined in G.S. 130A-334(15). The component could be any part of the wastewater system, such as a collection sewer, pretreatment, dispersal field, etd.

~~(14)~~(15) "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.

~~(15)~~(16) "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.

~~(16)~~(17) "Design daily flow" means the unadjusted 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.

~~(17)~~(18) "Design unit" means a discrete connection such as an individual dwelling unit, place of business, or place of public assembly on which wastewater DDF are based. Multiple design units can comprise a facility.

~~(18)~~(19) "Dispersal field" means physical location where final treatment and dispersal of effluent occurs in the soil.

~~(19)~~(20) "Dispersal media" means the media used to provide void space through which effluent flows and ~~is~~ may be stored prior to infiltration (e.g., washed gravel or crushed stone, products referenced in Section .0900 of this Subchapter, products approved pursuant to Section .1700 of this Subchapter, etc.).

(21) "Dispersal system" means the dispersal field and associated components that distribute effluent to and within the dispersal field. This includes a pump, pump tank, pressure manifold, distribution box, drip box, lateral, dispersal media, etc.

~~(20)~~(22) "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.

~~(21)~~(23) "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.

~~(22)~~(24) "Effluent" means the liquid discharge from a pretreatment process, component, or system as defined in G.S. 130A-334(7b).

~~(23)~~(25) "Facility" means one or more design units located on a single or multiple lot(s) or tract(s) of land and served by a wastewater system comprised of one or more ground absorption systems.

~~(24)~~(26) "Finished grade" means the final elevation of the land over the wastewater system after installation.

~~(25)~~(27) "Flood pool elevation" means the maximum water surface elevation of a reservoir, equal to the elevation of the spillway.

~~(26)~~(28) "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.

~~(27)~~(29) "Full kitchen" means the appliances meet the requirements of North Carolina Food Code, Chapters 4-1 and 4-2. ~~The wastewater system for a facility with a full kitchen shall include a grease trap, the dispersal field LTAR shall not exceed the mean for the applicable soil group, and no dispersal field reduction in size.~~

~~(28)~~(30) "Grab sample" means a discrete sample collected at a specific time and location.

~~(29)~~(31) "Grease tank" means the tank located outside the facility that is used to reduce the amount of grease being discharged to a wastewater system.

~~(30)~~(32) "Grease trap" means a device used inside the ~~facility, generally under the sink,~~ facility, to reduce the amount of grease being discharged to a wastewater system.

~~(31)~~(33) "Gravity distribution" means gravity delivery of effluent to and within each lateral.

~~(32)~~(34) "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.

~~(33)~~(35) "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.

~~(34)~~(36) "Infiltrative surface" means the designated interface where effluent moves from dispersal media or a distribution device into treatment media, naturally occurring soil, or fill.

~~(35)~~(37) "Influent" means the sewage discharged to pretreatment as defined in G.S. 130A-334(7b).

~~(36)~~(38) "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.

~~(37)~~(39) "Interceptor drain" means a type of 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. ~~An interceptor drain can also be a foundation drain.~~

~~(38)~~(40) "Invert" means the lowest elevation of the internal cross-section of a pipe, fitting, or component.

~~(39)~~(41) "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.

~~(40)~~(42) "Ksat" or saturated hydraulic conductivity, means the ~~value~~ rate 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.

~~(41)~~(43) "Lateral water movement" means the movement of subsurface water ~~down~~ downslope ~~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.

~~(42)~~(44) "Lateral" means any pipe, tubing, or other device used to convey and distribute effluent in a dispersal field.

~~(43)~~(45) "Limiting condition" means soil conditions (morphology, depth, restrictive horizon, soil wetness, or organic matter content) or site features (topography, slope, landscape position, or available space) that ~~restrict~~ determine the depth of the suitable soil conditions and site features and design options. ~~options or prohibit permitting a wastewater system.~~

~~(44)~~(46) "Lithochromic feature" means soil mottle or matrix associated with variations of color due to weathering of parent materials.

~~(45)~~(47) "Long Term Acceptance Rate," referred to as LTAR, means the rate of effluent absorption by the soil, ~~fill,~~ 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.

~~(46)~~(48) "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.

~~(47)~~(49) "Management Entity" means the person, entity, company, or firm designated by the owner of the wastewater 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.

~~(48)~~(50) "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.

~~(49)~~(51) "Matrix" means a volume of soil equivalent to 50 percent or greater of the total volume of a horizon.

~~(50)~~(52) "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.

~~(51)~~(53) "Media" means a solid material that can be described by shape, dimensions, surface area, void space, and application.

(54) “Media filter” means a device that uses materials designed to treat effluent by reducing BOD and removing suspended solids in an unsaturated environment. Biological treatment is facilitated via microbial growth on the surface of the media.

~~(52)~~(55) "Mottle" means subordinate color of a differing Munsell color system notation in a soil horizon.

~~(53)~~(56) "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.

~~(54)~~(57) "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.

~~(55)~~(58) "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.

~~(56)~~(59) "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.

~~(57)~~(60) "Off-site system" means a wastewater system where any system component is located on property other than the lot the facility is located on.

~~(58)~~(61) "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.

~~(59)~~(62) "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 shall own or control the wastewater system. The owner's representative is an agent designated by letter or contract to act on the owner's behalf.

~~(60)~~(63) "Parallel distribution" means the distribution of effluent that proportionally loads multiple sections of a dispersal field at one time.

~~(61)~~(64) "Parent material" means the mineral and organic matter that is in its present position through deposition by water, wind, gravity or by decomposition of rock. ~~rock and has not gone through the soil forming process.~~

~~(62)~~(65) "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.

~~(63)~~(66) "Perched water table" means a zone of saturation held above the main groundwater body by a ~~slowly permeable~~ slowly permeable layer, impermeable rock, or sediment, which may or may not exhibit redoximorphic features.

~~(64)~~(67) "Person" means any individual, firm, association, organization, partnership, business trust, corporation, company, or unit of local government.

~~(65)~~(68) "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.

~~(66)~~(69) "Pressure dosed gravity distribution" means pressure delivery of effluent to a manifold, distribution box, or other splitter with subsequent gravity distribution within one or more laterals to the infiltrative surface.

~~(67)~~(70) "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.

~~(68)~~(71) "Raw sewage lift stations" means a dosing system that is designed to move untreated sewage from a lower elevation to a higher elevation. Raw sewage lift stations are ~~generally~~ installed prior to any wastewater treatment.

~~(69)~~(72) "RCW systems" means advanced pretreatment systems which are approved in accordance with RCW effluent standards in Rule .1002 of this Subchapter.

~~(70)~~(73) "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}.

~~(71)~~(74) "Repair area" means an area that has been classified suitable consistent with the rules in this ~~Subchapter.~~ Subchapter and is reserved ~~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.

~~(72)~~(75) "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.

~~(73)~~(76) "Restrictive horizon" means a soil horizon that is capable of perching groundwater or effluent and that is brittle an strongly compacted or strongly cemented with iron, aluminum, silica, organic matter, or other compounds. Restrictive horizons may occur as fragipans, iron pans, or organic pans, and are recognized by their resistance in excavation or in using a soil auger. ~~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.~~

~~(74)~~(77) "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.

~~(75)~~(78) "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 a minimum of 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.

~~(76) "Settling tank" means a septic tank designed to be used in conjunction with a RWTS. A settling tank is not required to meet the design requirements of a septic tank.~~

~~(77)~~(79) "Septic tank" means a structurally sound, 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.

(80) "Septic tank effluent pump" means a collection system that uses a septic tank to separate solids and incorporates a pump vault, pump, and associated devices to convey effluent under pressure to a subsequent component.

~~(78)~~(81) "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 drop box or stepdown to the succeeding trench at a lower elevation. All trenches are fed from the same side.

~~(79)~~(82) "Setback" means the minimum horizontal separation distance between the wastewater system and features listed in Section .0600 of this Subchapter.

(83) "Settling tank" means a septic tank designed to be used in conjunction with a RWTS. A settling tank is not required to meet the design requirements of a septic tank.

~~(80)~~(84) "Serial distribution" means the distribution method in which effluent is loaded into one trench and fills it to a predetermined level before passing through a pipe to the succeeding trench at a lower elevation.

~~(81)~~(85) "Soil" means the naturally occurring body of unconsolidated 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.

~~(82)~~(86) "Soil consistence" means the degree and kind of cohesion and adhesion that a soil exhibits.

~~(83)~~(87) "Soil series" means an official series name established by USDA-NRCS.

~~(84)~~(88) "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.

~~(85)~~(89) "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.

~~(86)~~(90) "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.

~~(87)~~(91) "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.

~~(88)~~(92) "Structurally sound" means a tank that is able to withstand a uniform live loading of 150 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.

~~(89)~~(93) "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 or can be reclassified as suitable based upon site modifications.

~~(90)~~(94) "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, berms, swales, and ditches. Surface water diversions are a type of artificial drainage.

~~(91) "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.~~

~~(92)~~(95) "TS-I systems" means advanced pretreatment systems which are approved in accordance with TS-I effluent standards in Table XXIV of Rule .1201 of this Subchapter.

~~(93)~~(96) "TS-II systems" means advanced pretreatment systems which are approved in accordance with TS-II effluent standards in Table XXIV of Rule .1201 of this Subchapter.

~~(94)~~(97) "Telemetry" means the ability to contact by phone, email, or another electronic medium. The telemetry unit shall continue alarm notifications to ~~must contact~~ the designated party ~~on a continuous basis~~ until the alarm condition is remedied or the telemetry unit is physically turned off.

~~(95)~~(98) "Third-party" means a person or entity 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 entity has knowledge of the subject area based upon relevant training and experience.

~~(96)~~(99) "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.

~~(97)~~(100) "Treatment media" means the non- or ~~slowly degradable~~ slowly degradable media used for physical, chemical, and biological treatment in a wastewater treatment component.

~~(98)~~(101) "Trench" means an excavation with a width less than or equal to three feet containing dispersal media and one or more laterals.

~~(99)~~(102) "Unstable slopes" means areas showing indications of mass downslope ~~movement.~~ movement such as debris flows, landslides, and rock falls.

~~(100)~~(103) "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.

~~(101)~~(104) "Vertical separation distance" means the vertical measurement from the dispersal field infiltrative surface to a ~~LC or SWC.~~ LC.

~~(102)~~(105) "Warming kitchen" means a kitchen which does not meet the requirements of North Carolina Food Code, Chapters 4-1 and 4-2.

Authority G.S. 130A-335(e) and (f).

SECTION .0200 - PERMITS

15A NCAC 18E .0201 GENERAL

(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 for that specific use.

(b) Wastewater system permits issued in accordance with the rules of this Subchapter shall follow a three-tier process. Upon receipt of an application in accordance with Rule .0202 of this Section 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 in accordance with Rule .0203 of this Section which states that a specific trench type can be installed in a specific location on the site, based on the proposed facility listed in the application. The LHD shall issue a CA in accordance with Rule .0204 of this Section that includes the design details for the wastewater system. After the CA has been issued, the building permit can be issued in accordance with G.S. 130A-338. The LHD shall inspect the wastewater system upon installation and confirm that it meets all the permit requirements. The LHD shall then issue an OP in accordance with Rule .0205 of this Section, allowing the wastewater system to be placed in use and the facility occupied in accordance with G.S. 130A-339.

(c) If required in G.S. 89C, 89E, or 89F, a PE, LSS, or LG shall perform the soil and site evaluation, geologic or hydrogeologic evaluation, or prepare a wastewater system design.

(d) Upon receipt of an application in accordance with Rule .0202 of this Section for an existing system approval the LHD shall determine compliance in accordance with Rule .0206 of this Section.

~~(d)~~(e) An owner may ~~also~~ choose to ~~have a wastewater system permitted by~~ utilize a PE and have a wastewater system approved under the EOP provisions of G.S. 130A-336.1 and in accordance with Rule .0207 of this Section.

Authority G.S. 130A-335.

15A NCAC 18E .0202 APPLICATION

(a) 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. An application for a CA shall be submitted to the LHD for the repair of a wastewater system.

(b) A ~~complete~~ pending application for an IP, CA, or existing system authorization for which the LHD is waiting for action by the owner shall expire 12 months from the date of application.

(c) When an IP, CA, or existing system authorization expires or is revoked a new application shall be required.

(d) The application for an IP shall contain the following information at a minimum:

(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 DDF; 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) 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) surface water, drainage features, and all existing and proposed artificial drainage, as applicable;

(4) location, parcel identification number or other property identification, 911 address (if known), acreage, and general directions to the property;

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

(6) information needed to determine DDF and effluent strength of the facility(s) served including number and function of individual design units, number of bedrooms and occupants per ~~bedroom,~~ bedroom if more than two occupants per bedroom, or number of occupants;

(7) wastewater other than domestic sewage will be generated:

(8) notification if the property includes, or is subject to, any of the following, as applicable:

(A) previously identified jurisdictional wetlands;

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

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

(9) signature of owner.

(e) The application for a CA shall contain:

(1) the information required in Paragraph (d) of this Rule. A site plan or plat shall not be required with the application to repair a permitted wastewater system when the repairs will be accomplished on property owned and controlled by the owner and for which property lines are identifiable in the field;

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

(3) the location and type of the proposed wastewater system specified by the owner.

(f) 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 and repair areas, 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; ~~and~~

(4) for reconnections, information needed to determine DDF of the facility served including number and function of individual design units, number of bedrooms and occupants per bedroom, or number of ~~occupants.~~ occupants; and

(5) signature of owner.

(g) The application shall state that submittal of a signed application constitutes right of entry to the property by an authorized agent.

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

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) DDF, number of bedrooms, maximum number of occupants or people served, and wastewater strength in accordance with Section .0400 of this Subchapter;

(2) required effluent quality standard - DSE, HSE, NSF-40, TS-I, TS-II, or RCW in accordance with Table III of Rule .0402, Rule .1002, or Table XXIV of Rule .1201 of this Subchapter;

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

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

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

(6) a site plan or plat as defined in G.S. 130A-334 showing the existing and proposed property lines with dimensions, the location of the facility and appurtenances, the site for the proposed wastewater system and repair area, and the location of water supplies and surface water;

(7) the proposed initial wastewater system and repair system types, including LTARs for each system;

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

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

(c) When the site is classified unsuitable, 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) The period of validity for the permit in accordance with G.S. 130A-335(f) shall be stated on the IP.

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

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

(1) the information submitted in the application is found to be incomplete, 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;

(4) a new IP is issued for the same design unit on the same property; or

(5) an NOI is issued 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 and only a CA shall be issued if wastewater system repairs are necessary.

Authority G.S. 130A-335; 130A-336.

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~~ facility, or the construction or repair of a wastewater system. A CA can also be issued at the same time as the IP.

(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 specify 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) the nature of the Management Entity 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 ground absorption system serving a facility. Separate CAs may be issued for individual components. A building permit shall not be issued for a design unit until CAs for all components of the ground absorption system serving that design unit 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 systems serving two or more facilities where any components are under common or joint control.

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

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

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

(1) the information submitted in the application is found to be incomplete, 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;

(4) a new CA is issued for the same design unit on the same property; or

(5) a NOI is issued for the same design unit on the same property.

Authority G.S. 130A-335; 130A-336; 130A-338.

15A NCAC 18E .0205 OPERATION PERMIT

(a) The owner shall obtain an OP after the wastewater system has been installed or repaired 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,~~ IP and CA. ~~The OP shall be issued prior to the wastewater system being placed into operation.~~

~~(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)~~(b) 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 unique code assigned under Rule.1713(10) of this Subchapter;

(2) facility description including number of bedrooms and ~~occupants per bedroom,~~ maximum occupancy, maximum number of occupants or people served, DDF, and wastewater strength;

(3) a site plan or plat as defined in G.S. 130A-334 showing the existing and proposed property lines with dimensions, the location of the facility and appurtenances, the site for the proposed wastewater system and repair area including location and dimensions, and the location of water supplies and surface water;

(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, specifications, and record drawings if required in Rule ~~.0303(b)~~ .0303(f) of this Subchapter.

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

~~(f)~~(e) 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 Suspend or Revoke the IP and CA or the CA. A copy of the report shall be provided to the owner and the installer.

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

(1) wastewater strength and DDF remain unchanged;

(2) the system is operated and maintained in accordance with 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)~~(g) 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)~~(h) 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 accordance with this Subchapter and all conditions imposed by the OP.

~~(j)~~(i) When an OP expires in accordance with Paragraph (h) of this Rule a new application shall be required prior to issuance of a new OP to confirm that the previously approved facility has not changed and that the system remains in compliance with permit conditions.

~~(k)~~(j) When an OP is revoked due to facility non-compliance, such as additional wastewater flow or increased wastewater strength, a new application shall be required prior to evaluation for a new IP, CA, and OP.

~~(l)~~ (k) An OP shall be revoked prior to an ATO being issued for the same design unit on the same property.

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

Authority G.S. 130A-335; 130A-337; 130A-338.

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; or

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

(b) Approvals for reconnecting a facility shall be issued upon determination of the following:

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

(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 DDF 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, design flow, wastewater strength, 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.

Authority G.S. 130A-335; 130A-337(c) and (d).

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, authorized as the legal representative of the owner, 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 .0202 of this Section 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 well, public water ~~system,~~ system as defined in G.S. 130A-313(10), 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 and recommendations 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. The PE shall allow for the use of Accepted Systems in accordance with G.S. 130A-336.1(e)(5).

(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 DDF 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 and the system repair area before, ~~during~~ during, and after 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) revocation of an OP for a wastewater system prior to an ATO being issued for the same design unit on the same property, if applicable;

~~(2)~~(3) submit a copy to the State of the NOI common form and written confirmation of ATO;

~~(3)~~(4) participate in a post-construction conference in accordance with G.S. 130A-336.1(j);

~~(4)~~(5) review the performance and operation reports submitted and perform on-site compliance inspections of the wastewater system in accordance with Rule .1305(c) and Table XXXI of Rule .1301 of this Subchapter;

~~(5)~~(6) investigate complaints regarding EOP systems;

~~(6)~~(7) 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)~~(8) 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~~ different licensed ~~professional~~ professionals than those originally identified on the initial NOI 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.

Authority G.S. 130A-335; 130A-336.1.

SECTION .0300 - RESPONSIBILITIES

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 or otherwise mark 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, as applicable;

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

(8) maintain artificial drainage systems, as applicable;

(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, as applicable;

(11) establish and maintain appropriate vegetation over the dispersal field and repair area; and

(12) 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 wastewater system owner. 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 a CA. 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, the area or site required for the wastewater system and repair area, including collection sewers, tanks 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.

Authority G.S. 130A-335.

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 01O .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 and Rule .0207 of this Subchapter.

(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, as defined in G.S. 130A-334(15), including design, layout, plans, and specifications for all wastewater systems, which serve a facility with a ~~cumulative~~ cumulative DDF 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)(18) 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 ~~cumulative~~ cumulative DDF 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 serving an individual dwelling unit or several individual ground absorption systems, each serving an individual dwelling unit;

~~(1)~~(2) individual ground absorption system(s) serving individual design units with a DDF less than or equal to 1,500 gpd;

~~(2)~~(3) initial and repair dispersal fields for each individual ground absorption system(s) are at a minimum 20 feet from any other individual wastewater system;

~~(3)~~(4) total DDF for all ~~ground absorption system(s)~~ dispersal fields ~~on a lot or tract of land~~ is less than or equal to 1,500 gpd per ~~acre.~~ acre based on the portion of the land containing the dispersal fields; and

(5) the wastewater is not HSE as identified in Section .0400 of this Subchapter.

(e) State review is not required when a PE calculates the proposed DDF 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, s.34 and S.L. 2014-120, s.53 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 shall 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.

Authority G.S. 130A-335.

15A NCAC 18E .0303 LICENSED OR CERTIFIED PROFESSIONALS

(a) Plans and specifications for the use of a groundwater lowering system to meet the vertical separation to a SWC shall be prepared by a licensed professional if required in G.S. 89C, 89E, or 89F. Prior to the issuance of an IP or CA, the plans and specifications shall be reviewed and approved by the authorized agent.

(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 DDF 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) pressure dispersal systems that require pumping more than 500 feet horizontally or more than 50 feet of net elevation head;

(4) pressure dosed gravity distribution systems that require pumping more than 1,000 feet horizontally or more than 100 feet of net elevation head;

(5) dosing systems or force mains that have one or more intermediate high points greater than five feet;

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

(7) pressure dispersal systems with a DDF greater than 600 gpd serving a single design unit;

(8) pressure dispersal and pressure dosed gravity distribution systems where there is more than 15 percent variation in line length. The 15 percent variation shall be measured by comparing the longest line length to the shortest line length in any dispersal field;

(9) two or more septic tanks or advanced pretreatment units, each serving a separate design unit, and served by a common dosing tank;

(10) a STEP system with ~~the system includes~~ a pressure sewer or other pressure sewer system receiving effluent from two or more pump tanks;

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

(12) the system requires use of sewage pumps prior to the septic tank or other pretreatment system, except for systems governed by 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;

(13) an individual system required by the rules of this Subchapter to use more than one pump or siphon in a single pump tank;

(14) the system includes a collection sewer prior to the septic tank or other pretreatment system serving two or more design units, except for systems governed by the North Carolina Plumbing Code;

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

~~(16) any tank with a capacity greater than 4,000 gallons, rated for traffic load, installed deeper than 36 inches below finished grade, or built in place;~~

~~(17)~~(16) the proposed pump model is not listed by Underwriter Laboratories or an equivalent third party electrical testing and listing agency;

~~(18)~~(17) 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 generate effluent with a pollutant strength which is lower than or equal to domestic wastewater;

~~(19)~~(18) the wastewater system is designed for RCW;

~~(20)~~(19) 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;

~~(21)~~(20) 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;

~~(22)~~(21) any system or system component where the rules of this Subchapter provide for an engineer to propose alternative materials, capacity determination, or performance requirements; and

~~(23)~~(22) any other system so specified by the LHD.

(c) Any tank with a capacity greater than 4,000 gallons, rated for traffic load, installed deeper than 36 inches below finished grade, or built-in-place shall be designed by a PE.

~~(c)~~(d) 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 required 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)~~(e) The Management Entity, or its employees, shall hold a valid and current certificate or certifications as required for the system from the Water Pollution Control Systems Operators Certification Commission, and nothing in this Subchapter shall preclude any requirements for system Management Entities in accordance with G.S. 90A, Article 3.

~~(e)~~(f) 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.

~~(f)~~(g) 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. Record drawings shall be provided when any change has been made to the wastewater system installation from the approved plans.

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

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 an LSS or PE, if required in G.S. 89C or 89E, or other North Carolina licensed professional shall contain the information necessary for construction of the wastewater system in accordance with this Subchapter, and shall include the information in Paragraphs (b) through (e) of this Rule, and any other information, determined to be applicable by the LHD or the State, such as the impact of projected wastewater constituents on the trench and receiving soil.

(b) Applicant information and DDF 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 licensed professionals; and

(3) DDF and projected wastewater strength based on the application submitted to the LHD that includes calculations and the basis for the proposed DDF 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(f) of this Subchapter; and

(E) recommended effluent 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:~~ include:

(A) in-situ Ksat measurements at the proposed infiltrative surface elevation where possible and at ~~every~~ each distinct horizon within and beneath the treatment zone to a depth of 48 inches below the ground surface or to a depth references in an associated hydraulic assessment, such as groundwater mounding analysis or lateral flow analysis;

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

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

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

(E) in-situ Ksat measurements and groundwater mounding or lateral flow analysis are not required for dispersal fields (including sub-fields or zones) with a DDF less than or equal to 1,500 gpd that are in separate lateral flow windows or are shown to not be hydraulically connected;

(d) site plan prepared by the PE based on a boundary survey prepared by a registered land surveyor with the following information:

(1) site topography, proposed site modifications, location of existing and proposed site features listed in Rule .0601 of this Subchapter, proposed facility location, location of proposed initial and repair dispersal field areas and types, and location of LSS soil pits, hand auger borings, deep borings, and in-situ Kats tests, as applicable;

(2) 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;

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

(4) 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;

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

(6) 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;

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

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

(e) 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 site features listed in Rule .0601 of this Subchapter;

(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 pump tanks:

(A) information required in Subparagraph (e)(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, ventilation, if applicable, wash-down water supply with back siphon protection and protective fencing; and

(4) advanced pretreatment systems:

(A) information required in Subparagraphs (e)(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 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.

Authority G.S. 130A-335.

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 DDF less than or equal to 3,000 gpd that are required to be prepared by an LSS or PE, if required in G.S. 89C or 89E, 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)(2) of this Section for Special Site Evaluations and submittals prepared under Rule .0510 of this Subchapter; and

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

Authority G.S. 130A-335.

SECTION .0400 – DESIGN DAILY FLOW AND EFFLUENT CHARACTERISTICS

15A NCAC 18E .0401 DESIGN DAILY FLOW

(a) The minimum DDF for dwelling units shall be based on:

(1) 175 gpd for a one bedroom dwelling unit with no more than two occupants, and 400 square feet of living space or less; or

(2) 120 gpd per bedroom with a minimum of 240 gpd per dwelling unit or 60 gpd per person when occupancy exceeds two persons per bedroom, whichever is greater.

(b) Table II shall be used to determine DDF for facilities other than dwelling units.

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

(d) 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 facility.

(e) Unless otherwise noted in Table II, the DDF for laundry facilities is not included. Where laundry is not specified for a facility in Table II, but is proposed to be provided, the DDF 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.

(f) HVAC unit or ice machine condensate, gutter or sump pump discharge, water treatment system back flush lines, or similar incidental flows shall not discharge to the wastewater system, unless a PE designs the wastewater system for these flows.

(g) Unless otherwise noted in Table II, the DDF per unit includes employees.

(h) 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 with a single asterisk (*). Any facility which has a food service component that contributes 50 percent of the DDF shall be considered to generate HSE. 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 HSE classification on a site-specific basis.

(i) A request for an adjusted DDF shall be made in accordance with Rule .0403 of this Section.

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
Bed and breakfast homes and inns	Dwelling unit DDF 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∞	5 gal/person with toilets and hand sinks up to 4 hours; 10 gal/person with toilets and hand sinks up to 8 hours; 15 gal/person with toilets and hand sinks greater than 8 hours; Add 5 gal/person with full kitchen
Markets open less than four days/week, such as a flea market or farmers market	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 other than a microwave or other similar devices 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*	100 gal/space
Recreational Park Trailer (Park Model 400 ft^2 or less) in an RV park*	150 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 open 6 hrs/day or less 40 gal/seat or 40 gal/15 ft^2 of floor space open 6 to 16 hrs/day Add 4 gpd/seat for every additional hour open beyond 16 hours
Food Establishments with single service articles*	20 gal/seat or 20 gal/15 ft^2 of floor space open 6 hrs/day or less 30 gal/seat or 30 gal/15 ft^2 of floor space open 6 to 16 hrs/day Add 3 gpd/seat for every additional hour open beyond 16 hours
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 open ≤ 12 hr shift without laundry Add 1 gal/person/hr open for more than 12 hrs per day Add 5 gal/person with full kitchen
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, stadium, 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 or other religious institution*	2 gal/seat sanctuary only 3 gal/seat with warming kitchen in same structure as sanctuary 5 gal/seat with full kitchen in same structure as sanctuary
Public or private assembly halls used for recreation, regularly scheduled meetings, events, or amusement∞* (for churches, flow should be in addition to sanctuary structure 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

* Facility has potential to general HSE.

∞Designer shall use the maximum building occupancy assigned by the local fire marshal in determining DDF unless another method for determining DDF is proposed, including the justification for not using the maximum building occupancy.

Authority G.S. 130A-335(e).

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15A NCAC 18E .0402 SEPTIC TANK EFFLUENT CHARACTERISTICS

(a) Septic tank effluent standards for DSE are listed in Table III. Effluent that exceeds these standards for any constituent is considered HSE. When measured, effluent characteristics shall be based on at least two effluent samples collected during normal or above-normal operating periods. The samples should be taken from the existing or a comparable facility on non-consecutive days of operation. The samples should be analyzed for a minimum of BOD_5, TSS, TN, and FOG.

Table III. Septic tank effluent standards for DSE

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

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

(b) Facilities that generate HSE or propose an adjusted ~~design daily flow~~ DDF in accordance with Rule .0403 shall have to address the issue of wastewater strength in accordance with either Subparagraph (b)(1) or (b)(2) of this Rule.

(1) Wastewater systems that meet one of the following criteria shall utilize advanced ~~pretreatment~~ pretreatment, designed in accordance with Rule .1201(b) of this Subchapter, to produce DSE or better prior to dispersal:

(A) DDF greater than or equal to 1,500 gpd and HSE;

(B) any proposed flow reduction in accordance with Rule .0403 of this Section where the DDF is greater than or equal to 1,500 gpd; or

(C) any proposed flow reduction in accordance with Rule .0403 of this Section with projected or measured effluent characteristics that exceed domestic strength as identified in Table III of this Rule.

(2) A licensed professional, if required in G.S. 89C, 89E, or 89F, may justify not using advanced pretreatment by providing the following, as applicable:

(A) the system design is determined based upon a mass loading adjusted LTAR calculated using site-specific projected or measured BOD_5 and TSS values. The adjusted LTAR calculations shall be done as follows:

MLAF = 300/(BOD_5 + TSS) or one, whichever is greater

ALTAR = MLAF x LTAR

~~If MLAF is greater than or equal to one, ALTAR = LTAR~~

~~MLAF = 300/(BOD_5 + TSS)~~

Where MLAF = mass loading LTAR adjustment factor

~~ALTAR = adjusted LTAR~~

BOD_5 = measured or projected

TSS = measured or projected

LTAR = LTAR assigned by the authorized agent for DSE in accordance with this Section

ALTAR = adjusted LTAR

(B) site-specific nitrogen migration analysis when projected or measured effluent total nitrogen levels are greater than 100 mg/L. Analysis shall demonstrate that the nitrate-nitrogen concentration at the property line will not exceed 10 mg/L; and

(C) additional pretreatment to reduce FOG to less than or equal to 30 mg/L, including justification for the proposed pretreatment method.

(c) If the effluent characteristics for a specific facility identified in Rule .0401 of this Section as having HSE and effluent has been measured in accordance with Paragraph (a) and shown to be DSE, the requirements in Paragraph (b) do not apply.

Authority G.S. 130A-335(e).

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

(a) The authorized agent and the State may approve a proposed adjusted DDF relative to the values in Table II for new or existing facilities. The water use information provided to support the proposed adjusted DDF shall meet the requirements of Paragraphs (b) or (c) of this Rule and may be provided by the owner, ~~applicant,~~ designer, or PE. All adjustments to DDF shall meet the requirements of Paragraph (d) of this Rule.

(b) Adjustments to DDF based on documented data from the facility or a comparable facility shall meet the following criteria:

(1) the submitted data shall consist of a minimum 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 of the 12 monthly readings by the sum of the 30 consecutive daily water consumption readings. The hydraulic peaking factor shall not be less than one;

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

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

(c) Adjustments to DDF based on 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 their use in the proposed facility. Cut sheets of the proposed fixtures shall be provided.

(d) The proposed adjusted DDF ~~calculations~~ due to their reduction in water use. Calculations shall be provided to verify that the conditions set forth in ~~Rule .0402(b)~~ Rules .0402 and .1201 of this ~~Section~~ Subchapter are met.

(e) In accordance with S.L. 2013-413, s.34 and S.L. 2014-120, s.53, a PE can propose an adjusted DDF for new or existing dwelling units or facilities identified in Table II in accordance with the following:

(1) DDF 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 the site-specific impact on the wastewater system based on projected increased constituent concentrations resulting from reduction in water use in accordance with Rule .0402(b) of this Section;

(4) inspection of the existing wastewater system and verification that the system meets the current rules and can accept the increase in constituent loading;

(5) proposed adjusted DDF 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

(6) 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 DDF for a facility made up of individual dwelling units when the following criteria are met:

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

(2) adjusted DDF 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 DDF based upon use of water-conserving fixtures shall apply only to design capacity requirements of the dosing system and dispersal fields. The DDF from Table II shall be used to determine minimum tank and advanced pretreatment component capacities.

Authority G.S. 130A-335(e).

SECTION .0500 – SOIL AND SITE EVALUATION

15A NCAC 18E .0501 SITE EVALUATION

(a) Upon receipt of an application, an authorized agent shall investigate each proposed site in accordance with this Section to determine whether the site is suitable or unsuitable for the installation of a wastewater system. 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) depth of horizons;

(B) texture;

(C) structure;

(D) consistence;

(E) color; and

(F) organic soils, as applicable;

(3) SWC;

(4) soil depth;

(5) restrictive horizons;

(6) the suitability for each profile description;

(7) LTAR; and

(8) available space.

(b) Soil profiles shall be evaluated at the site by borings, pits, or other means of excavation, and described to reflect variations in soil and site characteristics across both initial and repair areas.

(c) Soil profiles shall be evaluated and described to the following minimum 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 provide pits when necessary for evaluation of the site as determined by the authorized agent.

(e) 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).

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

(g) The authorized agent shall specify the LTAR in accordance with Section .0900 of this Subchapter for sites classified suitable in accordance with Rule .0509 of this Section.

(h) A LC ~~or SWC~~ initially classified unsuitable may be reclassified suitable if the requirements of Rule .0509(b), (c), (d) or (e) of this Section are met.

Authority G.S. 130A-335(e).

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 may be considered unsuitable with respect to topography, unless the surface water can be diverted from the site.

(e) ~~Slope~~ Complex slope patterns and slopes dissected by gullies 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~~ proposed trench width (inches)
		S	=	percent slope (in decimal form)

Authority G.S. 130A-335(e).

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

The owner, LHD, or the State may substitute laboratory testing of the soil textural class for field testing when the laboratory testing is conducted in accordance with ASTM D6913 and D7928. When laboratory testing of soil texture is proposed, the LHD shall be notified a minimum of 48 hours before samples are to be taken by the licensed professional if required by G.S. 89C, 89E, or 89F. The authorized agent and the licensed professional shall be present when the samples are collected. Samples shall be representative of the soil horizon being evaluated for texture. Split samples shall be made available to the LHD when requested. The licensed professional shall document chain of custody and seal, sign, and date the first page of the report.

(2) Structure – Soil structure shall be determined in the field for each soil horizon in the soil profile and shall be classified and suitability determined in accordance with 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 shall be classified and suitability determined in accordance with 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 professional. The authorized agent and the licensed professional 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 licensed professional 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.

Authority G.S. 130A-335(e).

15A NCAC 18E .0504 SOIL WETNESS CONDITIONS

(a) SWC 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 observations of soil wetness indicators, 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 for soil wetness indicators.

(b) Soil Wetness Indicators:

(1) A SWC shall be determined by the presence of colors with a value 4 or more and a of chroma 2 or less (Munsell Color System) at greater than or equal to two percent of soil volume as redox depletions or as the ~~in mottles or~~ matrix of a horizon. Colors of chroma 2 or less that are lithochromic features shall not be considered indicative of a SWC; or

(2) A SWC shall be determined by the observation or indication of saturated soils, 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 with a value 4 or more or chroma 2 or less at greater than or equal to two percent of soil volume as redox depletions or as the matrix of a horizon. ~~of free-flowing water from saturated soils into open bore holes where the soils lack redoximorphic features indicative of soil wetness. Free-flowing water may reflect either lateral flow of perched water or other oxyaquic conditions.~~ Artificial drainage may be proposed in accordance with Rule .0509(d) of this Section to overcome a SWC resulting from lateral water movement due to saturated soils, a perched water table, or other oxyaquic conditions. Artificial drainage shall be designed and installed in accordance with Rule .0910 of this Subchapter.

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

(c) Site Suitability as to SWC: Initial suitability of the site as to SWC shall be determined based upon the observations of Soil Wetness Indicators in accordance with Paragraph (b) of this Rule. Sites where the SWC is less than ~~18~~ 12 inches below the naturally occurring soil ~~surface~~ surface, or less than 18 inches if more than six inches of Group I soils are present, shall be considered unsuitable with respect to SWC. A SWC determined by Subparagraph (b)(1) or (b)(2) of this Rule may also be determined by alternative procedures for SWC determination in accordance with Paragraph (d) of this Rule or reclassified in accordance with Rule .0509 of this Subchapter.

(d) Alternative Procedures for SWC Determination: The owner may submit documentation that the SWC and resultant site classification be 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 Paragraphs (e), (f), (g), or (h) of this Rule. This determination shall take precedence over the observations made in

accordance with Soil Wetness Indicators in Paragraph (b) of this Rule. 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 greater depth to a SWC than the depth observed by Soil Wetness Indicators 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 SWC for these sites shall be made in accordance with the Modeling Procedures in Paragraphs (g) and (h) of this Rule.

(e) Direct Monitoring Procedure: SWC 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 prepared by a licensed professional, if required in G.S. 89C, 89E, or 89F, 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. SWC and rainfall monitoring <u>(including all forms of precipitation)</u> shall be conducted by the licensed professional or owner. The owner shall submit the name(s) of the licensed professional(s) performing any monitoring on their behalf to the LHD.

(2) The site plan shall show proposed sites for wastewater systems, the longitude and latitude of the site, location of monitoring wells, and all drainage features that may influence the SWC, and specify any proposed fill and drainage modifications.

(3) The monitoring plan shall indicate 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 DDF 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 denied a signed, written report shall be provided to the owner describing the reasons for denial and the specific changes necessary for approval of the monitoring plan.

(5) Wells shall extend a minimum of five feet below the naturally occurring soil surface, or existing ground 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 from the ground surface may be used if a continuous record of the water table is provided for a minimum of half of the monitoring period.

One or more shallower wells may be required on sites where shallow lateral water movement or perched SWC is 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 two miles 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 SWC from water surface observations in wells shall be used when the 120-day cumulative rainfall for the monitoring period ending on April 15 equals or exceeds the site's long-term (historic) rainfall for this same period with a 30 percent recurrence frequency (wetter than the ninth driest year of 30, on average). The State Climate Office of North Carolina online interface may be used to determine the recurrence frequency of the 120-day April 15 cumulative rainfall for the monitored site. The State Climate Office compares their estimate of its value to recurrence frequency projections they make using a hybrid approach, which includes the most recent three decades of normalized historic rainfall data from established weather stations, adjusted using standardized procedures so that these estimates are on an approximate five kilometer grid that covers the area. This comparison is available by the Climate Office as the 120-day April 15 SPI. At the end of the monitoring period, the owner's licensed professional can ascertain this SPI from the State Climate Office's website: http://climate.ncsu.edu/drought/map by clicking on the map pixel that most closely corresponds with the monitored site's location. The licensed professional will need to adjust the URL coordinates to ascertain results that are specific to the site's latitude and longitude. The State will provide assistance in obtaining this information. The State may also identify alternative resources to derive the monitoring period rainfall recurrence frequency for monitored sites if newer resources become available that provide results with equal or better accuracy as relayed by the State Climate Office in the future. The SWC shall be determined as the highest level that is continuously saturated for the number of consecutive days during the January through April well monitoring period shown in Table VIII.

TABLE VIII. Rainfall SPI and exceedance probability during monitoring season related to number of consecutive days of continuous saturation

SPI and Recurrence Frequency Range 120-Day Cumulative on April 15 Rainfall	**Number of Consecutive Days of Continuous Saturation for Soil Wetness Condition**
SPI -0.543 to 0 (30% to 49.9% duration)	3 days or 72 hours
SPI 0 to 0.545 (50% to 69.9% duration)	6 days or 144 hours
SPI 0.546 to 0.864 (70% to 79.9% duration)	9 days or 216 hours
SPI ≥ 0.865 (80% to 100% duration)	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) SWC shall be applicable.

(f) Monitoring and Modeling Procedure: A combination of monitoring and modeling may be used to determine a SWC utilizing the following monitoring procedures and interpretation method. This procedure may also be followed to re-evaluate a SWC that has previously been determined by the Direct Monitoring Procedure in accordance with Paragraph (e) of this Rule. When this procedure is used, the results shall take precedence over the results from the Direct Monitoring Procedure.

(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 SWC 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 at a minimum 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 SWC 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 or daily rainfall gauge data taken within two miles 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 licensed professionals. Daily maximum and minimum temperature data for the January 1 through April 30 monitoring period, plus for a minimum of 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 licensed professionals.

(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 six 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 SWC 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, 89E, or 89F. The LHD or owner may request a technical review by the State prior to approval of the SWC determination.

(g) Modeling Procedure: A SWC may be determined by application of DRAINMOD to predict daily water levels over a minimum 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 SWC 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 SWC 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 a minimum 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 minimum of 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 licensed professsionals.

(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 a minimum of 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 SWC. 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 SWC 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, 89E, or 89F. The LHD shall submit the groundwater simulation analysis to the State for technical review prior to approval of the SWC determination.

(h) Other modeling procedures may be used to determine the SWC and to predict daily water levels over a minimum of a 30-year historic time period. Documentation shall be provided showing that the proposed model and prediction are at least as accurate as the prediction from DRAINMOD, The DRAINMOD prediction shall be calculated in accordance with Paragraph (g) of this Rule. Documentation to support the basis for applying another modeling procedure shall be provided in accordance with Rule .0509(f) of this Section and shall be reviewed and approved for use on a site-specific basis by the State.

(i) 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 SWC 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.

Authority G.S. 130A-335(e).

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.

(b) Soil depths to unsuitable saprolite, rock, or parent material less than 18 inches shall be considered unsuitable.

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

Authority G.S. 130A-335(e).

15A NCAC 18E .0506 SAPROLITE

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

(b) Sites with saprolite shall be classified as suitable if an investigation of the site using pits at locations approved by the authorized agent confirms that the following conditions are met:

(1) a 24-inch minimum vertical separation distance shall be maintained in saprolite to an unsuitable LC. If any of the vertical separation consists of suitable soil, then the 24-inch separation may be reduced. The minimum vertical separation shall be calculated based on one-inch of suitable soil is equivalent to two inches of saprolite; and

(2) 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:

(A) 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;

(B) the clay mineralogy of both soil and saprolite shall be suitable in accordance with Rule .0503(3) of this Section;

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

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

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

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

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

(c) Saprolite that does not meet all of the criteria in Paragraph (b) of this Rule shall be considered unsuitable.

Authority G.S. 130A-335(e).

15A NCAC 18E .0507 RESTRICTIVE HORIZONS

(a) 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.

~~(a)~~(b) 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.

~~(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.~~

Authority G.S. 130A-335(e).

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 shall meet all required setbacks in Section .0600 of the Subchapter and provide access to the wastewater system for operation and maintenance activities. A site with sufficient available space shall be considered suitable.

(b) If the site does not have sufficient available space for both an initial wastewater system and repair area it shall be considered unsuitable.

(c) A site may be exempt from the repair area requirements of Paragraph (a) of this Rule.

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

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

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

(C) DDF is no more than 480 gallons for a single-family dwelling unit or a single facility; and

(D) the proposed facility will generate DSE.

(2) Although a lot or tract of land may be exempt from the repair area requirement under Subparagraph (c)(1) of this Rule, the authorized agent shall determine if there is any available space for repair ~~area~~ area. The authorized agent shall determine the maximum feasible repair area available, and that repair area shall be identified on the IP, CA, and OP.

(3) If a site meets any of the following criteria, repair area shall be required, even if the site is exempt from the repair area requirement of Subparagraph (c)(1) of this Rule:

(A) proposed increase in flow or wastewater strength to an existing facility permitted under the exemption of Subparagraph (c)(1) of this Rule; or

(B) any new initial wastewater system is proposed on a lot or tract of land on which the exemption in Subparagraph (c)(1) of this Rule was previously utilized.

(d) Prior to the issuance of the IP, the proposed dispersal field shall be field located and staked on-contour, as applicable, to verify that initial and repair wastewater 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 LC ~~or SWC~~ along the entire trench length in accordance with Rule ~~.0901(f)(3)~~ .0901(g)(3) of this Subchapter.

(e) The initial and repair area shall not be altered so that the wastewater system specified on the IP, CA, and OP cannot be installed ~~or~~ and function as permitted.

Authority G.S. 130A-335(e) and (f).

15A NCAC 18E .0509 SITE SUITABILITY AND CLASSIFICATION

(a) The most ~~limiting condition~~ LC 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 LC ~~or SWC~~ consistent with this Subchapter.

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

(c) Sites classified unsuitable due to SWC because of the presence of lateral water movement may be reclassified suitable if installation of an interceptor drain will intercept and ~~direct~~ divert lateral water to prevent saturation of the wastewater system.

(d) Sites classified unsuitable may be reclassified suitable with the use of advanced pretreatment based on the modified siting and sizing criteria in Section .1200 of this Subchapter.

(e) Sites classified unsuitable may be reclassified suitable with the use of wastewater system identified or approved in Sections ~~.0900, .1500,~~ .0900 or .1700 of this Subchapter.

(f) For site that are classified as unsuitable in accordance with Paragraphs (b) through (e) of this Rule, a Special Site Evaluation in accordance with Rule .0510 of this Section may be provided. ~~A~~ The Special Site Evaluation ~~in accordance with Rule .0510 of this Section~~ shall be ~~provided~~ submitted to the authorized agent ~~that demonstrates~~ and demonstrate that the proposed wastewater system can be expected to overcome the unsuitable site conditions and function in accordance with this Subchapter. The written documentation shall be prepared and submitted to the LHD by a licensed professional if required in G.S. 89C, 89E, or 89F. The proposed wastewater system and artificial drainage system, if applicable, shall be designed, installed, operated, and maintained in accordance with this Subchapter. The State shall review a Special Site Evaluation if requested by the LHD.

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

Authority G.S. 130A-335(e).

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 affect 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 licensed professional if required in G.S. 89C, 89F, ~~89F~~ or 89E:

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

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

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

~~(A) vertical separation distance to a LC or SWC 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 SWC;~~

~~(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 with Group II or III soils which requires a groundwater lowering system;~~

~~(E) proposed use of a groundwater lowering system to meet vertical separation distance requirements to a SWC;~~

~~(F) bed systems located directly beneath the advanced pretreatment unit on a site with uniform slope exceeding two percent except in Group I soils with a SWC greater than 36 inches;~~

~~(G) bed systems with a DDF greater than 1,500 gpd; or~~

~~(H) increased LTAR is proposed on a site with a DDF greater than 1,500 gpd;~~

~~(4)~~(3) sand lined trench systems when the texture of the receiving permeable horizon is sandy loam or loam and the DDF is greater than 600 gpd; or when the texture of the receiving permeable horizon is silt loam;

~~(5)~~(4) 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 SWC 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 SWC;

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

(H) DDF exceeds 1,500 gpd;

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

(A) vertical separation distance to a LC or SWC 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 SWC;

(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 with Group II or III soils which requires a groundwater lowering system;

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

(F) bed systems located directly beneath the advanced pretreatment unit on a site with uniform slope exceeding two percent except in Group I soils with a SWC greater than 36 inches;

(G) bed systems with a DDF greater than 1,500 gpd; or

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

(6) drip dispersal systems are used, and Group IV soils are 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 for NSF-40, 0.12 gpd/ft^2 for TS-I, or 0.15 gpd/ft^2 for TS-II;

(7) 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;

(8) 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 ~~LC or SWC;~~ LC;

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

(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;

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

(A) Subparagraphs (8)(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;

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

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

(12) DDF greater than 3,000 gpd, unless the requirements of Rule .0302(d) of this Subchapter are met.

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

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

~~(d)~~(c) For ~~sites serving~~ wastewater systems with a DDF 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 analysis indicates that groundwater standards established in accordance with 15A NCAC 02L are determined or projected to be violated at the property line.

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

SECTION .0600 – LOCATION OF WASTEWATER SYSTEMS

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 water system or private water supply source, including a private drinking water well or spring	100
A private drinking water well or upslope spring serving a single-family dwelling and intended for domestic use	50
Any other well or source not listed in this table, excluding monitoring wells	50

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 retention pond, from flood pool elevation	50
Stormwater detention (temporary) pond	25
Any other coastal water, canal, marsh, stream, non-water supply spring, perennial waterbodies, intermittent or perennial streams, or other surface waters, from the mean high-water mark	50
Any water line, including fire protection and irrigation water lines	10
Geothermal aqueous closed loop wells	50
Geothermal direct expansion closed loop wells	50
Horizontal closed-loop geothermal system	15
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, <u>except for an upslope swale or berm,</u> as measured on the ground surface from the edge of the diversion	15
<u>Interceptor drain – upslope</u>	<u>10</u>
<u>Interceptor drain – sideslope</u>	<u>15</u>
<u>Interceptor drain – downslope</u>	<u>25</u>
~~Swale,~~ <u>Upslope swale or berm,</u> as measured on the ground surface from the edge of the swale	5
<u>Ephemeral stream</u>	<u>15</u>
Any stormwater conveyance (pipe or open ~~channel)~~ <u>channel), excluding gutter drains which connect to a stormwater conveyance</u> ~~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 may be located closer than 100 feet from a private drinking water well or upslope spring for repairs, space limitations, and other site-planning considerations. The wastewater system shall be located the maximum feasible distance and never less than 50 feet from the private drinking water ~~well.~~ well or upslope spring. The wastewater system may be located closer than 100 feet ~~under the following conditions:~~ when a variance for a reduced separation has been issued for the private drinking water well in accordance with Rule 15A NCAC 02C .0118.

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

~~(2) a variance for a reduced separation has been issued for the private drinking water well in accordance with 15A NCAC 02C .0118.~~

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

(d) 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.

(e) 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) a minimum of Schedule 40 pipe (PVC, Polyethylene, or ABS) sleeved in DIP;

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

(4) a minimum of 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.

(f) In addition to the requirements of Paragraph (a) of this Rule, wastewater systems with a proposed DDF 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 system source utilizing a shallow (under 50 feet) groundwater aquifer	500
Any other public water system 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 DDF greater than 3,000 gpd shall not apply to one or more field(s) that are designed for less than or equal to 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.

(g) ~~In addition to the requirements of Paragraph (a) of this Rule, collection~~ 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 system 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,~~ marsh, coastal water, lakes, ponds, and other impoundments, or other surface waters	10
Geothermal aqueous closed loop wells	25
Geothermal direct expansion closed loop wells	25
Horizontal closed loop geothermal wells	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.

(h) 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 within the trench.

(i) 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 a minimum of 10 feet on each side of the point of crossing, with full sections of pipe centered at the point of crossing.

(j) 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 equal to water main standards; or

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

(k) Collection sewers may cross over a under a stream if:

(1) a minimum of 36 inches of stable cover is maintained;

(2) sewer line is constructed of DIP with mechanical joints or restrained push-on joints equal to water main standards; or

(3) sewer line is encased in concrete or DIP for a minimum of 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.

(l) Collection sewer aerial crossings shall be constructed of DIP with mechanical joints or restrained push-on ~~joints.~~ Joints equal to water main standards and freeze protected. Pipe shall be anchored for a minimum of 10 feet on either side of the crossing.

(m) 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.

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

15A NCAC 18E .0602 APPLICABILITY OF SETBACKS

(a) The minimum setback requirements in Table IX of Rule.0601 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 DDF 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 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 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 of this Section does not apply.

Authority G.S. 130A-335(e).

SECTION .0700 – COLLECTION SEWERS, RAW SEWAGE LIFT STATIONS, SEPTIC TANK EFFLUENT PUMP SYSTEMS, AND PIPE MATERIALS

15A NCAC 18E .0701 COLLECTION SEWERS

(a) 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 minimum 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 minimum 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(e) 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 gravity collection sewers at any bends, junctions, and a maximum of every 425 feet along the sewer lines. Drop manholes are required where the inlet to outlet elevation difference exceeds two and one half 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 system 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 design units, or as otherwise allowed by the North Carolina Plumbing Code. Cleanouts are required a maximum of 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.

(b) STEP systems may be used as an alternative to gravity collection sewers.

Authority G.S. 130A-335(e), (f), and (f1).

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(g) 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 a minimum of 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~~ capacity shall be two and one half times the average daily flow;

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

(7) 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

(8) 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.

Authority G.S. 130A-335(e), (f), and (f1).

15A NCAC 18E .0703 PIPE MATERIALS

(a) The gravity pipe between a septic tank, gravity distribution device, and the dispersal field shall be a minimum of three-inch Schedule 40 PVC, Schedule 40 polyethylene, Schedule 40 ABS, or alternative pipe material as specified in this Rule.

(b) Three-inch or greater non-perforated polyethylene corrugated tubing, PVC SDR 21 and SDR 26 pressure rated at 160 psi or greater and labeled as compliant with ASTM D2241, PVC SDR 35 gravity sewer pipe rated as compliant with ASTM D3034, or alternative pipe materials described in Paragraph (d) of this Rule, may be substituted for Schedule 40 between the distribution device and the dispersal field when the following minimum installation criteria are met:

(1) the pipe is placed on a compacted, smooth surface at a uniform grade, and with an 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) 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.

(d) 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.~~ D2729 or ASTM F810. 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.

(e) Pump discharge piping, including the force main to the next component in the wastewater system, shall be of Schedule 40 PVC or stronger material and pressure rated for water service at a minimum of 160 psi or two times the maximum operating pressure, whichever is greater. The pipe shall meet ASTM D1784, ASTM D1785, and ASTM D2466.

(f) Alternative pipe materials may be proposed when designed and certified by a PE, including any installation and testing procedures. Gravity pipe materials shall be shown to meet the requirements of Paragraphs (a), (b), and (c) of this Rule. Alternative pressure rated pipe materials shall be constructed of PVC, polyethylene, or other pressure rated pipe and comply with applicable ASTM standards for pipe material and methods of joining. 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 for any line exceeding 500 feet in length and shall comply with the requirements of Rule .0701(4) of this Section.

Authority G.S. 130A-335(e), (f), and (f1).

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

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) The minimum capacity of any septic tank serving an individual dwelling unit with five bedrooms or less shall be sized determined on Table XIII.

TABLE XIII. Minimum septic tank liquid capacity for dwelling units

Number of bedrooms	Minimum liquid capacity (gallons)
4 or less	1,000
5	1,250

(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. Individual wastewater systems serving dwelling units with more than five bedrooms or more than one design unit shall have a minimum septic tank capacity of 1,500 gallons.

~~(4) Septic tanks for PIA and RWTS Systems shall be sized in accordance with the RWTS or PIA Approval.~~

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)
$Q \leq 600$	$V = 2Q$
$600 < Q < 1,500$	$V = 1.17Q + 500$
$1,500 \leq Q \leq 4,500$	$V = 0.75Q + 1,125$
$Q > 4,500$	$V = Q$

(4) Septic tanks for PIA and RWTS Systems shall be sized in accordance with the RWTS or PIA Approval.

(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. 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 a minimum of two thirds of the total required liquid capacity.~~ Each tank shall have a minimum liquid capacity of 1,000 gallons.

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

(e) A State approved effluent filter shall be in the final 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) the outlet of the initial tank shall consist of an outlet sanitary tee extending down 25 to 50 percent of the liquid depth.~~

(f) 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 final compartment; and

(2) the outlet of the initial tank shall consist of an outlet sanitary tee extending down 25 to 50 percent of the liquid depth.

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

15A NCAC 18E .0802 PUMP TANK CAPACITY REQUIREMENTS

(a) The minimum pump tank liquid capacity shall be greater than or equal to the required septic tank liquid capacity.

(b) A pump tank liquid capacity that is less than the capacity specified in Paragraph (a) may be proposed. The volume of the following criteria shall be added together to calculate the ~~may be used to propose a~~ pump tank liquid ~~capacity that is less than the liquid capacity specified in Paragraph (a) of this Rule:~~ capacity:

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

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

~~(3) flow equalization storage, if applicable; and~~

~~(4)~~(3) emergency storage capacity in accordance with Paragraph ~~(c)~~ (d) of this Rule.

(c) The volume of the following criteria shall be added together to calculate the minimum pump tank liquid capacity for flow equalization:

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

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

(3) flow equalization storage; and

(4) emergency storage capacity in accordance with Paragraph (d) of this Rule.

~~(c)~~(d) The pump tank emergency storage capacity requirement shall be determined based on the following criteria and 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

~~(d)~~(e) A PE may propose an alternate method to Paragraph (b) of this Rule to calculate the minimum pump tank liquid capacity required. The emergency storage capacity requirement in Paragraph (c) of this Rule may also be calculated to include the volume of freeboard space in the following: previous tankage, the pump tank above the high-water alarm activation level, 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.

~~(e)~~(f) Telemetry shall be demonstrated to be operational ~~during the final inspection of the wastewater system by the authorized agent~~ prior to issuance of the operation permit.

Authority G.S. 130A-335(e), (f), and (f1).

15A NCAC 18E .0803 GREASE TANK CAPACITY REQUIREMENTS

(a) Grease tanks or grease tanks used with grease traps shall be required at food preparation facilities, food processing facilities, meat markets, churches with ~~commercial kitchen equipment,~~ a full kitchen, institutions, places of public assembly with a full kitchen, and other facilities with a full kitchen, or 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 minimum 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 minimum 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 and a minimum 2:1 length to width ratio.

(e) The minimum 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:

$$LC = D \times GL \times ST \times HR/2 \times LF$$

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 Highway or recreational areas; 0.8 if along other roads)

(f) An approved grease rated effluent filter shall be in the final 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 final ~~compartment immediately prior to discharge;~~ compartment; and

(2) the outlet of the initial tank shall consist of a sanitary tee extending down 40 to 60 percent of the liquid depth.

(g) The grease tank liquid capacity may be reduced by up to 50 percent when grease traps 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 that the grease trap is projected to reduce the FOG concentration by 50 percent.

(h) Grease traps shall be maintained by a septage management firm permitted in accordance with G.S. 130A-291.1 and the contents disposed of in accordance with 15A NCAC 13B .0800.

Authority G.S. 130A-335(e), (f), and (f1).

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.

Authority G.S. 130A-335(e), (f), and (f1).

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

(a) All tanks installed under the following conditions shall be leak tested at the site:

(1) when a SWC is present within five feet of the elevation of the top of a mid-seam pump tank;

(2) with advanced pretreatment when required in the RWTS or PIA Approval;

(3) when required in the approved plans and specifications for a wastewater system designed by a PE;

(4) when the tank is constructed in place; or

(5) as required by the authorized agent based upon site or system specific conditions, such as misaligned ~~seams~~ seams, ~~or~~ exposed ~~reinforcement.~~ Reinforcement, or damage observed that may have occurred during transport or installation.

(b) 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)(16) and (e)(8) of this Subchapter marked over.

(c) The tank outlet pipe shall be inserted through the outlet pipe penetration, creating a watertight joint, and extending a minimum of two feet beyond the tank outlet.

(d) The tank outlet pipe shall be placed on undisturbed soil or bedded in accordance with Rule .0703(b) of this Subchapter to prevent differential settling of the pipe. The pipe shall be level for a minimum of two feet after exiting the tank.

(e) The bottom of the tank shall be installed level in undisturbed or compacted soil, or bedded using sand, gravel, stone, or other approved equivalent material. When rock or other protruding ~~obstacles~~ obstructions 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.~~ obstruction.

(f) The tank excavation shall be separated from the dispersal system by at least two feet of undisturbed soil. Piping from the tank to the next component shall be placed on undisturbed soil, compacted soil, or bedded using sand, gravel, stone, or other approved equivalent material.

(g) Effluent filters and risers shall be installed in accordance with the design and construction criteria of Rule .1402(b) and (c) of this Subchapter.

~~(f)~~(h) Any system serving a facility with a DDF greater than 3,000 gpd shall have access manholes that extend at a minimum to finished grade. The access manholes shall be designed and maintained to prevent surface water inflow and sized to allow access for routine inspections, operation, and maintenance.

Authority G.S. 130A-335(e), (f), and (f1).

SECTION .0900 – SUBSURFACE DISPERSAL

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 sizing and siting criteria in this Section are based on soil receiving DSE. The site shall meet the following minimum criteria:

(1) 12 inches of naturally occurring soil between the infiltrative surface and any ~~LC or SWC;~~ LC; and

(2) 18 inches of separation between the infiltrative surface and any SWC if more than six inches of separation consists of Group I soils.

(b) If any part of the trench or bed media extends above the naturally occurring soil surface, the system shall be a fill system and must meet the requirements of Rule .0909 of this Section.

(c) The LTAR shall be determined in accordance with the following:

(1) Tables XVI and XVII shall be ~~used;~~ used, as applicable;

(2) the LTAR shall be assigned based upon soil textural class, structure, consistence, SWC, depth, percent coarse rock, landscape position, topography, and system type;

~~(2)~~(3) LTARs determined from Table XVI shall be based on the soil textural class of the most limiting, naturally occurring soil horizons ~~horizon within the trench and~~ to a depth of 12 inches below the infiltrative surface (18 inches to any SWC if more than six inches of the separation consists of Group I soils);

~~(3)~~(4) LTARs determined from Table XVII shall be based on the saprolite textural class of the most limiting, naturally occurring saprolite to a depth of 24 inches (or less if combined with ~~soil)~~ soil in accordance with Rule .0506(b) of this Subchapter) below the infiltrative surface; and

~~(4) the LTAR shall be assigned based upon soil textural class, structure, consistence, SWC, depth, percent coarse rock, landscape position, topography, and system type; and~~

(5) 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 of this ~~Subchapter.~~ Subchapter or for a facility with a full kitchen.

TABLE XVI. LTAR for wastewater systems based on Soil Group and texture class

Soil Group	USDA Soil Textural Class		LTAR (gpd/ft^2)
I	Sands	Sand	0.8 – 1.2
		Loamy Sand	
II	Coarse Loams	Sandy Loam	0.6 – 0.8
		Loam	
III	Fine Loams	Sandy Clay Loam	0.3 – 0.6
		Silt Loam	
		Clay Loam	
		Silty Clay Loam	
		Silt	
IV	Clays	Sandy Clay	0.1 – 0.4
		Silty Clay	
		Clay	

TABLE XVII. LTAR for wastewater systems in saprolite based on Saprolite Group and texture class

Saprolite Group	Saprolite Textural Class		LTAR (gpd/ft^2)
I	Sands	Sand	0.6 – 0.8
		Loamy Sand	0.5 – 0.7
II	Loams	Sandy Loam	0.4 – 0.6
		Loam	0.2 – 0.4
III	Fine Loams	Silt Loam	0.1 – 0.2
		Sand ~~Clay*~~ Clay Loam*	0.05 – 0.15

* Sandy clay loam saprolite can only be used with advanced pretreatment in accordance with Section .1200 of this Subchapter.

(d) 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 DDF by the LTAR.

(2) The minimum trench length shall be calculated by dividing the minimum required infiltrative surface area by the equivalent trench width. The authorized agent may approve trench widths between two and three feet. The following equation shall be used to calculate the minimum trench 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, drop boxes, and supply lines shall not be included as part of the minimum required infiltrative surface area.

(4) The total trench length required for trench products other than conventional gravel shall be as follows:

(A) for trench products identified in Section .0900 of this Subchapter, the minimum line length shall be calculated in accordance with this Section; or

(B) for trench products approved under Section .1700 of this Subchapter, the minimum line length shall be calculated in accordance with the PIA Approval.

(5) When HSE is proposed to be discharged to a dispersal field with no advanced ~~pretreatment,~~ pretreatment and has not been reclassified as DSE in accordance with Rule .0402(c), a licensed professional, if required in G.S. 89C, 89E, or 89F, shall calculate the ~~mass loading on the soil~~ adjusted LTAR in accordance with Rule .0402(b) of this Subchapter.

(e) Systems with less than 30 inches of soil (or 36 inches in Group I soils) shall not be installed on slopes greater than 30 percent. ~~percent and shall be installed in accordance with Paragraph (f) of this Rule and 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.~~

(f) Soil cover above the original grade shall be placed over the entire dispersal field and shall extend laterally five feet beyond the trenches. On level sites, the final grade of the dispersal field shall be crowned at one-half percent as measured from the centerline of the dispersal field.

~~(f)~~(g) 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 ground 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) trenches shall be installed with 12 inches of naturally occurring suitable soil between the infiltrative surface and any unsuitable ~~LC or SWC.~~ LC. If the separation between the infiltrative surface and any SWC is less than 18 inches, and if more than six inches of the separation consists of Group I soils, pressure dispersal system shall be required;

(3) 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 LC ~~or SWC~~ along the entire trench length in accordance with Subparagraph (f)(2) of this Rule;

(4) the lateral shall be centered horizontally in the trench;

(5) final soil cover over the dispersal field shall be a minimum of six inches deep after settling. The finished grade over the tanks and dispersal field shall be sloped to shed surface water. Surface water runoff, including stormwater, gutter drains, or downspouts, shall be diverted away from the wastewater ~~system;~~ No depressions shall be allowed over the dispersal field area;

(6) 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;

(7) 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;

(8) gravity effluent distribution components including distribution boxes, drop boxes, and flow diversion devices shall be of sound construction, watertight, corrosion resistant, and meet the following criteria:

(A) separated by a minimum of 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;

(9) when parallel distribution is used to distribute effluent to the trenches, the installer shall demonstrate that the distribution devices perform as designed;

(10) serial and sequential distribution may be used when approved by the authorized agent. The step-down or drop box 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 (f)(11) and (f)(12) of this Rule;

(11) step-downs shall be constructed of a minimum 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 in accordance with Rule .0703 of this Subchapter. The installer shall demonstrate that the step-downs perform as designed;

(12) drop boxes shall be separated from the trench by a minimum of two feet of undisturbed soil and constructed so that the invert of the inlet supply pipe is a minimum of 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; and

(13) trench products other than conventional gravel shall be installed as follows:

(A) for trench products identified in Section .0900, the trench products shall be installed in accordance with this Section; or

(B) for trench products approved under Section .1700 of this Subchapter, the trench products shall be installed in accordance with their PIA Approval.

~~(g)~~(h) 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 (f) 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 each sized at a minimum of 75 percent of the total trench length 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 shall be installed below finished grade in a valve box and be accessible and 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 trench length is 25 ~~percent,~~ percent as compared to a conventional gravel system, unless a greater percentage is ~~specifically~~ identified in a PIA Approval or this Subchapter.

Authority G.S. 130A-335(e), (f), and (f1).

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(c) of this Section. ~~An equivalent trench width of three feet shall be used to determine trench length in accordance with Rule .0901(d) of this Section.~~

(d) The minimum required infiltrative surface and trench length shall be calculated in accordance with Rule .0901(d) of this Section.

~~(d)~~(e) Conventional wastewater system installation shall be in accordance with Rule .0901(e) 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; and

(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 a minimum of six inches below the pipe and two inches over the pipe.

Authority G.S. 130A-335(e) and (f).

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 DDF unless ~~specifically~~ approved for a greater DDF in accordance with a PIA Approval. 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) design options for the site are limited by topography or available space.

(c) The LTAR shall be determined in accordance with Rule .0901(c) of this Section. The number of square feet of infiltrative surface area required shall be increased by 50 percent over that required for a trench system as calculated in accordance with Rule .0901(d) of this Section.

(d) Bed system installation shall be in accordance with Rule .0901(f) 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 ~~a minimum of~~ one and one-half feet from the side of the bed;

(3) laterals shall be placed on three-foot centers;

(4) the ~~lateral design criteria shall meet the~~ requirements of Rule ~~.0902(d)(3) and (4)~~ .0902(e)(4) of this Section; ~~Section for gravity and pressure dosed gravity distribution systems;~~

(5) 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) the lateral design criteria shall meet the minimum requirements of Rules .0907(d) and (e) or .0908(c) and (e) of this Section or in accordance with a PIA Approval when pressure dispersal is used.

Authority G.S. 130A-335(e), (f), and (f1).

15A NCAC 18E .0904 LARGE DIAMETER PIPE SYSTEMS

(a) Large diameter pipe (LDP) systems consist of laterals composed of eight-inch inside diameter (10-inch outside diameter) or 10-inch ~~(inside diameter)~~ inside diameter (12-inch outside 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 DSE. 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(c) of this Section except the LTAR shall not exceed 0.8 gpd/ft^2. To calculate the minimum trench length in accordance with Rule .0901(d) of this Section, an equivalent trench width of two feet shall be used for eight-inch LDP and an equivalent trench width of two and one-half feet shall be used for 10-inch LDP.

(d) LDP pipe, filter wrap, and fittings shall meet the following criteria:

(1) pipe and fittings shall comply with the requirements of ASTM F667;

(2) the corrugated pipe 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) pipe shall be marked with a visible top location indicator, 120 degrees away from each row of holes;

(4) corrugated pipe shall be covered with filter wrap at the factory;

(5) filter wrap shall be spun, bonded, or spunlaced nylon, polyester, or nylon/polyester blend filter wrap meeting the minimum requirements in Table XVIII; and

(6) the LDP with filter wrap shall be ~~wrapped~~ 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 LDP

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(f)~~ .0901(g) of this Section and the following:

(1) eight-inch LDP trenches shall be a minimum of 10 inches and a maximum of 18 inches wide. Ten-inch LDP trenches shall be a minimum of 12 inches and a maximum of 24 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 I, II, or III;

(4) the LDP shall be connected to the collection sewer or a stepdown pipe using an offset adapter to create a mechanical joint; and

(5) minimum on center spacing for eight-inch LDP shall be five feet and 10-inch LDP shall be six feet.

Authority G.S. 130A-335(e) and (f).

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 DSE. 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(c) of this Section except that the LTAR shall not exceed 0.8 gpd/ft^2. An equivalent trench width of six feet shall be used to determine trench length in accordance with Rule .0901(d) of this Section.

(d) PPBPS installation shall be in accordance with Rule ~~.0901(f)~~ .0901(g) of this Section, the following, and the manufacturer's specifications:

(1) PPBPS trenches shall be located a minimum of eight feet on ~~center;~~ center or three times the trench width, whichever is greater;

(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 or whenever the DDF exceeds 480 gpd;~~ 70; and

(4) pressure dispersal shall be used when the individual trench lengths are greater than 70 feet.

Authority G.S. 130A-335(e) and (f).

15A NCAC 18E .0906 SAND LINED TRENCH SYSTEMS

(a) Sand lined trench systems may be used on sites originally classified unsuitable due to SWC, soil morphology, restrictive horizon, or soil depth, and which may be reclassified suitable in accordance with this Rule. Sand lined trenches can be used with a DDF less than or equal to 1,500 gpd DDF. Sand lined trench systems with advanced pretreatment shall comply with Rule ~~.1207~~ .1205 of this Subchapter. 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 naturally occurring soil surface. If the receiving permeable horizon is greater than 60 inches below the

naturally occurring soil surface, advanced pretreatment shall be used in accordance with Rule .1205 of this Subchapter;

(6) artificial drainage shall be provided, as needed, to maintain the following minimum vertical separation distances from the infiltrative surface to a SWC:

(A) 18 inches with gravity or pressure dosed 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 SWC that is not related to lateral water movement, design plans and specifications shall be prepared by a licensed professional if required in G.S. 89C, 89E, or 89F. The following conditions apply to the groundwater lowering system:

(1) shall extend into the receiving permeable horizon;

(2) shall have a suitable outlet. The outlet location and elevation must be shown on the artificial drainage system plan with relative water level elevations and wastewater system site elevations labeled; and

(3) all groundwater lowering system components are integral to the wastewater system and subject to ownership and control 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. An equivalent trench width of three feet shall be used to determine trench length in accordance with Rule .0901(d) of this Section. The LTAR shall be based on one of the following:

(1) LTAR set forth in Table XIX based on the most hydraulically limiting, naturally occurring soils overlying the permeable receiving 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~~ compared to a conventional wastewater system when Accepted or Innovative gravelless trench product is used.

TABLE XIX. LTAR for sand lined trench systems based on the most hydraulically limiting, naturally occurring soils overlying the permeable receiving horizon

Soil Group	Texture of Most Hydraulically Limiting Overlying Soil Horizon	Distribution Type	LTAR (gpd/ft$^{2)}$
I	Sands	Gravity or Pressure Dosed Gravity	0.7 - 0.9
		Pressure Dispersal	0.8 - 1.2

II	Coarse Loams	Gravity or Pressure Dosed Gravity	0.5 - 0.7
		Pressure Dispersal	0.6 - 0.8
III	Fine Loams	Gravity or Pressure Dosed Gravity	0.2 - 0.4
		Pressure Dispersal	0.3 – 0.6
IV	Clays	Gravity or Pressure Dosed Gravity	0.1 – 0.2
		Pressure Dispersal	0.15 – 0.3

(f) A Special Site Evaluation in accordance with Rule .0510 of this Subchapter is required for the following conditions to field verify the LTAR:

(1) texture of the receiving permeable horizon is sandy loam or loam and the system DDF 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(f)~~ .0901(g) 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 be located not less than three times the trench width on centers. The minimum spacing for trenches is five feet on centers;

(3) drip dispersal systems in sand lined trenches shall require multiple runs per trench of drip tubing with emitters: a minimum of two runs within a trench between one and one half and two feet wide; and a minimum of 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 a minimum of six inches of sand lined trench media meeting the requirements of Subparagraph (6) of this Paragraph. Drip dispersal systems shall comply with the requirements of Section .1600 of this Subchapter and this Rule;

(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 trench media shall be at or below the naturally occurring soil surface. Drip tubing shall be installed a minimum of 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 a minimum of 90 percent in sizes ranging from 0.1 to 2.0 millimeters, with no more than one percent smaller than 0.074 millimeters (No. 200 Sieve);

(7) pressure dosed gravity distribution or pressure dispersal shall be used when the total dispersal field line length exceeds 750 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 trench width shall comply with this Paragraph. The total line length shall be calculated based on infiltrative surface area;

(10) 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

(11) 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 on a site-specific basis in accordance with Rule .0509(f) of this Subchapter.

Authority G.S. 130A-335(e) and (f).

15A NCAC 18E .0907 LOW PRESSURE PIPE SYSTEMS

(a) LPP systems utilize a network of small diameter pipes with three to six-feet 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. Any subsurface dispersal system listed in this Section may incorporate LPP dispersal. LPP systems with advanced pretreatment shall comply with Rules .1202, .1203, .1205, and .1206 of this Subchapter.

(b) The site has been classified suitable in accordance with Rule .0509 of this Subchapter.

(c) The LTAR shall be determined as follows:

(1) Tables XX and XXI shall be used to determine the LTAR for LPP systems, as applicable;

~~(1)~~(2) the LTAR shall be based on the soil textural class of the most limiting, naturally occurring soil horizon from the top of the trench to a depth of 12 inches below the infiltrative surface;

(3) LTARs determined from Table XVII shall be based on the saprolite textural class of the most limiting, naturally occurring saprolite to a depth of 24 inches (or less if combined with soil) below the infiltrative surface; and

~~(2) the LTAR shall be assigned based upon soil textural class, structure, consistence, depth, percent rock, landscape position, and topography;~~

~~(3) Tables XX and XXI shall be used to determine the LTAR for LPP systems; and~~

(4) 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 of this Subchapter.

TABLE XX. LTAR for LPP systems based on Soil Group and texture

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 XXI. LTAR for LPP systems in saprolite based on Saprolite Group and texture class

Saprolite Group	Saprolite Textural Class		LTAR (gpd/ft^2)
I	Sands	Sand	0.3 – 0.4
		Loamy Sand	0.25 – 0.35
II	Loams	Sandy Loam	0.2 – 0.3
		Loam	0.1 – 0.2
		Silt Loam	0.05 – 0.1

(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 DDF 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.

$$TL = (DDF \div LTAR) \div LS$$

Where TL = length of trench (feet)

DDF = design daily flow (gpd)

LTAR = in gpd/ft^2

LS = five feet

(3) When HSE is proposed to be discharged to a dispersal field with no advanced pretreatment, a licensed professional, if required in G.S. 89C, 89E, or 89F, shall calculate the ~~mass loading on the soil~~ adjusted LTAR in accordance with Rule .0402(b) of this Subchapter.

(e) LPP system design and installation shall be in accordance with Rule ~~.0901(f)~~ .0901(g) of this Section and the following, unless otherwise allowed in a PIA Approval:

(1) the LPP distribution network shall be constructed of small diameter (one to two inches) pressure rated Schedule 40 PVC laterals placed in gravel that meets the requirements in Rule .0902(d)(4) of this Section or other approved media filled trenches;

(2) the trench width shall be one to two feet;

(3) trenches shall be located not less than three times the trench width on center. The minimum spacing for trenches is five feet on center:

(4) trenches shall include a minimum of nine inches of approved gravel or other approved media, either from a PIA Approval or subsurface dispersal system listed in Section .0900 of this Subchapter. There shall be a minimum of five inches vertical separation distance from the lateral 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 orifice delivery rate between the first and last orifice along the lateral;

(B) no more than 1/3 of the total number of holes may be less than 5/32- inch, ~~minimum orifice size shall be 5/32-inch for a minimum of 2/3 of the field lateral lines,~~ with no orifices sized smaller than 1/8-inch in any lateral line;

(C) all orifices shall face upwards, except for two orifices, 1/3 of the way from the beginning and end of each lateral, which should face down; and

(D) 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 a three or four-inch perforated corrugated or smooth wall tubing meeting the requirements of Rule .0703 of this Subchapter;

(B) State-approved equivalent tubing or pipe; or

(C) specially designed and approved orifice shields;

(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 lines at the lowest elevation receiving more effluent at the beginning and end of a dosing cycle;

(C) the lateral network on a sloping site shall be designed to achieve a reduction in steady state (pipe full) flow from uppermost to lowest lateral that accommodates volume the lower laterals will receive during pressurization of the system and the volume expected to drain from the distribution network at the end of a dosing cycle; ~~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 pressure regulating valves in separate locations, 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 shall terminate at the ground surface and be installed in a valve box or equivalent that provides access for operation and maintenance;

(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 20 percent variation in pressure head between the first and last laterals due to losses within the manifold when feeding the manifold from a lower elevation;

(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;~~ 0.7:1 as measured from where the supply line enters the manifold to the distal end of the manifold;

(B) the reduction between the manifold and connecting laterals shall be made directly off the manifold using reducing tees or fittings; and

(C) cleanouts shall be installed at the distal ends of the supply manifold and shall be enclosed in valve boxes accessible from the ground surface;

(12) pressure regulating valves shall be provided for pressure adjustment at the fields;

(13) valves shall be installed in a valve box or other approved access device and be accessible and operable from the ground surface. Valves serving contiguous subfields shall be in a common valve box that facilitates simultaneous adjustment of pressure head;

(14) the LPP dosing system shall comply with the following design criteria:

(A) the pump operating flow rate shall be based upon delivering three feet to six feet of residual 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; and

(15) the trenches shall be covered to a minimum depth of four inches after settling.

(f) Drip dispersal systems used in LPP trenches and other LPP designs may be approved on a site-specific basis.

Authority G.S. 130A-335(e) and (f).

15A NCAC 18E .0908 DRIP DISPERSAL SYSTEMS

(a) This Rule provides for the permitting of drip dispersal systems receiving DSE. Drip dispersal systems shall comply with the provisions of Section .1600 of this Subchapter. Except as otherwise required in this Rule, the requirements of Rule .0901 of this Section shall apply. Drip dispersal systems with advanced pretreatment shall comply with Rule .1204 of this Subchapter.

(b) Drip dispersal systems shall meet the following soil and site criteria:

(1) A minimum of 18 inches of naturally occurring suitable soil above a LC, 13 inches of naturally occurring suitable soil above a SWC, and the minimum vertical separation distance to any unsuitable LC ~~or SWC~~ shall be 12 inches. A groundwater lowering system may be used to meet the vertical separation distance to a SWC only when Group I or II soils with suitable structure are present within 36 inches of the naturally occurring soil surface.

(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 SWC 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 SWC only when Group I or II soils with suitable structure are present within 36 inches of the naturally occurring soil surface;~~ shall not be used to meet the initial site requirements for a new fill system; and

(C) minimum vertical separation distance to any unsuitable soil horizon or rock shall be 18 inches and 12 inches for any SWC.

(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 LC ~~or SWC~~ 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 DDF 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 shall be required in accordance with Rule .0510 of this Subchapter, as applicable.

(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 a minimum of 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) a minimum of six inches of cover shall be maintained over the dripline:

(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) drip dispersal fields shall be graded to shed surface water;

(7) if cover material is required and the slope is greater than 30 percent, a slope stabilization plan must be provided by a licensed ~~professional;~~ professional if required in G.S. 89C, 89E, or 89F; and

(8) the drip dispersal system shall be field tested after installation in accordance with Rule .1603 of this Subchapter.

Authority G.S. 130A-335(e) and (f).

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 slope in all directions.

(b) New fill systems may be installed on sites that meet the following requirements:

(1) a minimum of the first 18 inches below the naturally occurring soil surface consist of suitable soil with the exception of no SWC exists within the first 12 inches below the naturally occurring soil surface and a groundwater lowering system is not used to meet this requirement;

(2) systems shall be installed only on sites with uniform slopes less than four percent;

(3) 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 slope in all directions.

(c) New fill system design and installation shall be in accordance with the following criteria:

(1) trenches shall be installed with a minimum of 24 inches separating the infiltrative surface and any LC. If pressure dispersal is used, the minimum separation distance shall be 18 inches ~~with the exception of trenches shall be installed with a minimum of 18 inches separating~~ between the infiltrative surface and any SWC 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;

(2) fill systems with a DDF greater than 480 gpd shall use pressure dispersal systems;

(3) 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;

(4) minimum cover shall be six inches of settled soil;

(5) 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;

(6) 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;

(7) the fill system shall be constructed as an elongated berm with the long axis parallel to the ground elevation contours of the slope;

(8) 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;

(9) the outside edge of the trench shall be located a minimum of five feet horizontally from the top of the side slope;

(10) the fill system shall be shaped to shed surface water and shall be stabilized with a vegetative cover;

(11) trench products approved under Section .1700 of this Subchapter shall be installed in accordance with PIA Approval; and

(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 does 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.

(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 minimum 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, and shall not have discreet layers containing greater than 35 percent of shell fragments;

(4) if a minimum of 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) SWC, 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 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 DDF 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 LC ~~or SWC~~ 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 for new and existing fill systems shall be determined in accordance with Rule .0901(c) of this Section and the following:

(1) the LTAR shall be based on 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 a minimum of 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 or pressure dosed gravity distribution or 0.5 gpd/ft^2 for pressure dispersal systems.

(g) Other fill systems may be approved on a site-specific basis in accordance with a PIA Approval or Rule .0509(f) of this Subchapter.

Authority G.S. 130A-335(e) and (f).

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 SWC or lateral water movement. 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 SWC as specified in Rule ~~.0901(f)(2)~~ .0901(g)(2) of this Section.

(c) Plans and specifications for the use of a groundwater lowering system to meet the vertical separation to a SWC shall be prepared by a licensed professional if required in G.S. 89C, 89E, or 89F in accordance with Rule .0303 of this Subchapter.

(1) Gravity 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 drainage system design;

(B) 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 groundwater lowering systems 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) drainage equation input parameters shall be based upon field descriptions 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.~~ Field Office Technical Guides available online at: efotg.sc.egov.usda.gov/efotg_locator.aspx. 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 groundwater lowering system effectiveness at sites with the following conditions: three or 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;~~ groundwater lowering system using pumps; and

(F) the modeling procedure set forth in Rule .0504(g) of this Subchapter shall be followed.

(2) Groundwater lowering 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 two and one half times the projected peak inflow rate to the pump tank.

(3) Plans and specifications for groundwater lowering systems shall include the following information in addition to the information in Subparagraphs (c)(1) and (c)(2) of this Rule:

(A) location of existing and proposed 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 groundwater lowering system materials and installation procedures;

(E) the entire groundwater lowering system, including the outlet, 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 groundwater lowering systems serving two or more lots shall have adequate width, in no case less than 20 feet plus the width of the groundwater lowering system.

(d) Interceptor drains shall be used on sites where a SWC results from laterally flowing groundwater that can be ~~intercepted and~~ diverted away from the dispersal field.

(e) Other artificial drainage systems, including surface water diversions, shall comply with USDA-NRCS guidance documents.

Authority G.S. 130A-335(e) and (f).

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 minimum bottom surface area of three and one half 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 a ~~LC or SWC;~~ LC;

(4) 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;

(5) wood construction of the floor shall be acceptable. The floor 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) floors shall be anchored to the sills. The minimum sill size is four-inch by four-inch;

(6) 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

(7) 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 and hinged door shall be provided and kept closed when the privy is not in use;

(3) flies shall always be excluded from the pit;

(4) garbage and trash shall be kept out of the pit; and

(5) privy building shall not be used as a storage building.

(d) When a new pit is required, a CA and OP shall be obtained.

Authority G.S. 130A-335(e) and (f).

SECTION .1000 – NON-GROUND ABSORPTION WASTEWATER TREATMENT SYSTEMS

15A NCAC 18E .1001 ALTERNATIVE TOILETS

(a) Incinerating, composting, and mechanical toilets, and vault privies shall comply with the North Carolina Plumbing Code.

(b) Use of chemical or portable toilets are governed by G.S. 130A-335(h).

~~(b)~~(c) 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.

(d) Residual removal from incinerating toilets, composting toilets, mechanical toilets, vault privies, chemical toilets, or portable toilets shall be performed only by person that holds a current NC Septage Management Firm permit in accordance with Rule 15A NCAC 13B .0832(a)(1). All waste shall be taken to an approved disposal site per G.S. 130A-291.1(d). This requirement also applies to removal of wastewater from a temporary domestic wastewater holding tank approved pursuant to G.S. 130A-291.2.

Authority G.S. 130A-335(e).

15A NCAC 18E .1002 RECLAIMED WATER SYSTEMS

(a) A RCW system shall be one of the following:

(1) an alternate management option as identified in 15A NCAC 02U .0401(c) for use with a system permitted in accordance with 15A NCAC 02U;

(2) a conjunctive wastewater system permitted under the rules of this Subchapter that:

(A) incorporates a beneficial use component; and

(B) the beneficial use component is not necessary to meet the wastewater disposal needs of the facility; ~~or~~

(3) a conjunctive wastewater system permitted under the rules of this Subchapter when there is a non-conjunctive use system permitted for the facility's wastewater and approved in accordance with 15A NCAC 02H or 15A NCAC 02T; or

~~(3)~~(4) a wastewater system designed for the complete recycle or reuse of DSE.

(b) The wastewater system shall be designed to produce an effluent prior to discharge that complies with the effluent standards for a Type I treatment process in accordance with 15A NCAC 02U .0301(b) and a TS-II system in accordance with Table XXIV of Rule .1201 of this Subchapter, whichever is more restrictive. The wastewater system shall be approved in accordance with Section .1700 of this Subchapter or designed by a PE and approved by the State.

(c) When utilizing a TS-II system, the ~~The~~ dispersal field and repair area shall comply with the siting and sizing requirements of Section .1200 of this Subchapter for a TS-II system and the following criteria:

(1) ~~the LTAR increase and~~ setback reductions ~~for a TS-II system in Section .1200 of this Subchapter~~ may be concurrently ~~taken;~~ taken with either of the following:

(A) LTAR; or

(B) vertical separation distance reduction;

~~(2) the depth to LC and vertical separation distance and setback reductions for a TS-II system in Section .1200 of this Subchapter may be concurrently taken;~~

~~(3)~~(2) for systems designed to meet a TN standard of 10 mg/L the following siting and sizing criteria may be utilized:

(A) the property line setback may be reduced to five feet and the SA waters setback may be reduced to 50 feet for wastewater systems with a DDF less than or equal to 3,000 gpd;

(B) the property line setback may be reduced to 10 feet, the SA waters setback may be reduced to 100 feet, and the other surface waters setback may be reduced to 50 feet for systems with a DDF greater than 3,000 gpd; or

(C) the vertical separation to a SWC may be reduced to 12 inches for wastewater systems with a DDF greater than 3,000 gpd that use pressure dispersal;

~~(4)~~(3) the LTAR may be increased up to a factor of four compared to that assigned by the LHD for a system using DSE in Group I soils with a wastewater system that uses pressure dispersal when the following site conditions are met:

(A) 48 inches of Group I soils from the naturally occurring soil surface; and

(B) 30 inches to a SWC below the naturally occurring soil surface; ~~or~~ and

~~(5)~~(4) requirements to comply with an effluent TN standard set forth in this paragraph may be waived when a site-specific nitrogen migration analysis based on projected or measured effluent nitrogen levels demonstrates that the nitrate-nitrogen concentration at the property line will not exceed 10 mg/L.

(d) Approved conjunctive uses include toilet and urinal flushing and landscape irrigation by drip dispersal. Wastewater from a system designed for complete recycling of DSE shall be used only for flushing of toilets and urinals. RCW shall ~~be~~ not be used for body contact or human consumption.

(1) Toilet and urinal flushing components shall be approved by the local building inspections department and be in compliance with the North Carolina Plumbing Code, including pipe marking requirements and back-siphon protection provisions for proximate potable water supplies.

(2) Siting, sizing, setbacks, and installation requirements of this Subchapter may be modified for the landscape irrigation component if they comply with the requirements for conjunctive use irrigation systems in 15A NCAC 02U, based upon information provided by the licensed professionals, if required in G.S. 89C, 89E, or 89F.

(3) System design, operation, and management requirements shall comply with requirements for comparable systems in 15A NCAC 02U, including provisions for continuous on-line monitoring and recording for turbidity and a mechanism to prevent effluent utilization if the turbidity exceeds 10 ~~NTUs or~~ NTUs, if the E. Coli or fecal coliform levels are not being ~~met.~~ met, or the disinfection unit is not operable.

(4) Requirements to comply with an effluent TN standard may be waived.

(e) All RCW systems approved in accordance with this rule shall be designed by a licensed professional and the plans approved by the State prior to LHD permit issuance.

(f) An RCW system may also be permitted in accordance with Rule .0207 of this Subchapter.

Authority G.S. 130A-335(e).

SECTION .1100 – SYSTEM DOSING AND CONTROLS

15A NCAC 18E .1101 GENERAL DOSING SYSTEM REQUIREMENTS

(a) A pump or siphon shall be used to deliver 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 pumps or siphons shall be used and discharge to separate dispersal fields for the following:

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

(d) The dose volume 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 LDP systems and 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 a dosing system shall be designed to achieve scour velocity in the supply line ~~at a minimum.~~ and to distribute effluent in accordance with the wastewater system design criteria.

(f) All dosing 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 or siphon operating flow rate;

(2) float control levels;

(3) high water alarm, including sound;

~~(3)~~(4) operating pressure head, if applicable; and

~~(4)~~(5) water to the dispersal field.

Authority G.S. 130A-335(e), (f), and (f1).

15A NCAC 18E .1102 PUMP DOSING

(a) The effluent pump shall be:

(1) capable of handling a minimum of ½-inch solids or be a screened, high head pump designed for effluent;

(2) designed to meet the pump operating flow rate and total dynamic head 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. A PE may propose a pump model not listed by a third-party electrical testing and listing agency.

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

(c) Inside the pump tank, 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 into the pump tank. A system may be designed and approved for the supply line to drain back to the pump tank based on site specific considerations, such as freeze protection.

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

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

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

(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.

Authority G.S. 130A-335(e), (f), and (f1).

15A NCAC 18E .1103 CONTROL PANELS

(a) A control panel shall be provided for all systems which use a pump. The control panel enclosure shall be NEMA 4X or equivalent. Underwriter's Laboratory or an equivalent third-party electrical testing and listing agency shall list the control panel. The control panel shall include for each pump:

(1) an independent overload protection (if not integral with the pump motor);

(2) a circuit breaker(s);

(3) a motor contactor which breaks all the current to the pump or solid-state relay which controls current to the pump;

(4) a hand-off automatic (H-O-A) switch or alternate method to enable manual or automatic pump operation and for the pump to be deactivated manually;

(5) a pump run light;

(6) an elapsed time meter; and

(7) an event counter.

(b) An automatic pump sequencer shall be provided in systems requiring multiple pumps and shall remain operable whenever any pump is inoperable.

(c) When telemetry is required in accordance with Sections .0800, .1500, .1600, and .1700 of this Subchapter, the control panel shall be connected to an active phone line, wireless internet router, dedicated cellular line, or any other form of telemetry that allows the Management Entity ~~to properly monitor system performance~~ to, at a minimum, be notified and respond to alarm conditions. The telemetry shall remain active for the life of the wastewater system.

(d) The control panel bottom shall be mounted a minimum of 24 inches and no more than 36 inches above finished grade, within 50 feet of and in direct view of the pump tank. The control panel shall always be accessible to the Management ~~Entity and LHD.~~ LHD.

(e) When the control panel is located more than 10 feet from the pump tank access riser, and one or more electrical splices are to be used, a NEMA 4X junction box shall be installed above grade on or adjacent to the pump tank access riser. Under no conditions are electrical splices to be within the conduit piping.

(f) Wiring shall be conveyed to the control panel or outside junction box through waterproof, gasproof, and corrosion-resistant conduits, with no splices or junction boxes inside the tank. Wire 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 a pump tank shall be provided to control pump cycles and trigger notification of alarm conditions;

(1) a minimum of 12 inches of effluent shall be maintained in the bottom of the pump tank;

(2) pump-off level shall be set to keep the pump submerged or in accordance with the manufacturer's written specifications;

(3) a separate control float shall be provided to activate the high-water alarm;

(4) the high-water alarm float shall be set to activate within six inches of the pump-on level or higher, if applicable, if providing design equalization capacity in a timed dosing system;

(5) the lag pump float switch, where provided, shall be located at or above the high-water alarm activation level; and

(6) floats shall be supported utilizing durable, corrosion resistant material, and designed to be adjustable, removable, and replaceable from the ground surface without requiring dewatering, entrance into the tank, or pump removal.

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

(1) be audible and visible to the system users and the Management Entity;

(2) have a silencer button or device that is 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 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) 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.

Authority G.S. 130A-335(e), (f), and (f1).

15A NCAC 18E .1104 SIPHON DOSING

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

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

(2) all siphon parts shall be installed in accordance with the manufacturer's specifications. All materials shall be corrosion-resistant, of cast iron, high-density plastic, fiberglass, stainless steel, or equal; and

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

Authority G.S. 130A-335(e), (f), and (f1).

15A NCAC 18E .1105 TIMED DOSING

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

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

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

(3) when specified by the authorized designer.

(b) Flow equalization systems designed under a PIA Approval 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 ensure 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 and to provide that a full dose is delivered.

(d) The float setup for a timed dosing system may be adjusted from the criteria listed in Rule .1103(h) of this Section to provide for equalization capacity in the system.

Authority G.S. 130A-335(e), (f), and (f1).

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

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

(1) uniform distribution of flow among individual laterals with a minimum of two feet of residual pressure head;

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

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

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

(5) a method to visually verify the flow to each individual lateral prior to the discharge into the collection sewer. Such methods may include but are not limited to observation ports. ~~Observation~~ Observation ports may be located inside or outside of the pressure manifold ~~box to verify flow to individual laterals;~~ box; ~~and~~

(6) feeder lines from pressure manifold with sufficient slope and size to convey effluent by gravity to laterals; and

~~(6)~~(7) the pressure manifold and appurtenances shall be designed and installed to be accessible for inspection, operation, maintenance, and monitoring.

(b) A distribution box or a drop box may be used to dissipate flow in a pressure dosed gravity dispersal system for parallel, serial, or sequential distribution, as applicable. Such devices shall be of sound construction, watertight, not subject to excessive corrosion, adequate capacity, demonstrated to perform as designed, and approved by the authorized agent.

Authority G.S. 130A-335(e), (f), and (f1).

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

15A NCAC 18E .1201 ADVANCED PRETREATMENT SYSTEM STANDARDS

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

(1) RWTS or PIA Approval;

(2) design that meets the effluent standard specified in 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(e) and .1710 of this Subchapter.

TABLE XXIV. Effluent standards for advanced pretreatment systems

Constituent	**Effluent 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			≤ 30 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 of this Subchapter, unless the system is designed to treat HSE and approved by the State on a product or project-specific basis.

(c) Wastewater systems with a DDF greater than 3,000 gpd, proposed to meet TS-II effluent standards shall meet a TN standard of less than or equal to 20 mg/L.

Authority G.S. 130A-334; 130A-335; 130A-342; 130A-343.

15A NCAC 18E .1202 SITING AND SIZING CRITERIA FOR ADVANCED PRETREATMENT 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 LC ~~or SWC~~ 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 LC or ~~of~~ vertical separation distance to ~~LC or SWC;~~ LC;

(2) LTAR increases; or

(3) setback reduction.

(c) The minimum required vertical separation distance to a LC ~~or SWC~~ in natural soil 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 LC ~~or SWC~~ is proposed in accordance with this Rule.

Table XXV. Minimum vertical separation distance to LC ~~or SWC~~ based on effluent standards

Minimum vertical separation distance (inches) from infiltrative surface to LC ~~or SWC~~					
Soil Group	**Distribution Method**	**Effluent 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 standard

Minimum depth (inches) from naturally occurring soil surface to LC ~~or SWC~~					
Type of Fill	**Distribution Method**		**Effluent Standard**		
		DSE* *	**NSF-40**	**TS-I**	**TS-II**
New Fill	Gravity	18 to LC	18 to LC	14 to LC	14 to LC

(≤1,500 gpd)		12 to SWC	12 to SWC	12 to SWC	12 to SWC
(slope ≤ 4%)	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	Gravity	36 of Group I Fill/Soils			
(≤480 gpd)	LPP	24 of Group I Fill/Soils			
	Drip	24 of Group I Fill/Soils			

Minimum vertical separation distance (inches) from infiltrative surface to LC ~~or SWC~~

Type of Fill	**Distribution Method**	**Effluent Standard**			
		DSE*	**NSF-40**	**TS-I**	**TS-II**
New Fill	Gravity	24 to LC 18 to SWC	18 to LC 18 to SWC	18 to LC 14 to SWC	18 to LC 14 to SWC
(≤1,500 gpd)					
(slope ≤ 4%)	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

*Minimum depth after adjustment for slope correction

**For comparison

(d) The LTAR shall be based on the effluent standard and dispersal field type proposed.

(1) The LTAR may be increased by the following factors when compared to the rate assigned by the authorized agent for a new system using DSE:

(A) up to 1.33 for NSF-40 effluent standards in soils which are Group I or II with suitable structure;

(B) up to 2.0 for TS-I or TS-II effluent standards when pressure dispersal is utilized; or

(C) up to 2.5 for TS-II effluent standards when all the following conditions are met: minimum of 36 inches of Group I soils from the naturally occurring soil surface; minimum depth to a SWC below the naturally occurring soil surface is 24 inches; space shall be available for an equivalently sized dispersal field repair area; and pressure dispersal shall be utilized.

(2) A Special Site Evaluation ~~as~~ if required in accordance with Rule .0510 of this Subchapter shall be submitted and approved.

(3) The LTAR for an aerobic drip system shall be assigned in accordance with Rule .1204 of this Section.

(4) Trench dispersal products approved for a specific dispersal field reduction in area or trench length when receiving DSE in accordance with this Subchapter or a PIA Approval shall not be reduced by more than 50 percent when any LTAR adjustments are taken in accordance with this Rule.

(5) The DDF 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 ~~LC or SWC,~~ LC, 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 standards

Feature (structure, water source, etc.)	**Setback (feet) according to Effluent 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
Interceptor drain - upslope	10	10	7	7
Interceptor drain – sideslope	15	15	10	10
Interceptor drain – downslope	25	25	20	15
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 repair area~~ field, except designated dispersal field repair area for project site	20	20	10	10

*For comparison

Authority G.S. 130A-334; 130A-335; 130A-342; 130A-343.

15A NCAC 18E .1203 SITING AND SIZING CRITERIA FOR ADVANCED PRETREATMENT 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 ~~LC or SWC,~~ LC, 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 shall be based on the effluent standard and dispersal field type proposed.

(1) The LTAR may be increased by the following factors when compared to the rate assigned by the authorized agent for a new system using DSE:

(A) up to 2.0 for TS-I or TS-II effluent standards;

(B) up to 2.5 for TS-II effluent standards when all the following conditions are met: minimum of 48 inches of Group I soils from the naturally occurring soil surface; and minimum of 30 inches to a SWC below the naturally occurring soil surface.

(2) The LTAR for an aerobic drip system shall be assigned in accordance with Rule .1204 of this Section.

(c) When the LTAR for a system is proposed to be increased in accordance with Paragraph (b) of this Rule, the following conditions shall be met:

(1) a Special Site Evaluation required in accordance with Rule .0510 of this Subchapter shall be submitted and approved;

(2) pressure dispersal shall be utilized;

(3) space shall be available for an equivalently sized dispersal field repair area; and

(4) 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.

(d) Trench dispersal products approved for a specific dispersal field reduction in area or trench length when receiving DSE in accordance with this Subchapter or a PIA Approval shall not be reduced by more than 50 percent as a result of increased LTAR in accordance with this Rule.

(e) The DDF shall not be increased by the addition of advanced pretreatment to an existing wastewater system.

Authority G.S. 130A-334; 130A-335; 130A-342; 130A-343.

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 DDF 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 standards:

(1) NSF-40 Systems

(A) a minimum of 18 inches of naturally occurring suitable soil above a LC and 13 inches of naturally occurring suitable soil above a SWC, and the minimum vertical separation distance to any LC ~~or SWC~~ 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: a minimum of 18 inches of naturally occurring suitable soil above a LC and a minimum of 12 inches of naturally occurring suitable soil above a SWC; and the minimum vertical separation distance shall be 18 inches to a LC and 12 inches to a SWC; 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 LC ~~or SWC~~ shall be 18 inches;

(2) TS-I Systems

(A) a minimum of 15 inches of naturally occurring suitable soil above a LC and a minimum of 13 inches of naturally occurring suitable soil above a SWC, and the minimum vertical separation distance to any LC ~~or SWC~~ 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: a minimum of 12 inches of naturally occurring suitable soil above a ~~LC or SWC;~~ LC; a minimum of nine inches vertical separation distance to a SWC, and a minimum of 12 inches vertical separation distance to a LC; 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 LC ~~or SWC~~ shall be 12 inches; and

(3) TS-II Systems

(A) a minimum of 13 inches of naturally occurring suitable soil above a LC ~~and SWC~~ and the minimum vertical separation distance to any LC shall be six inches;

(B) for new fill, the requirements of Part (2)(B) of this Paragraph shall be met; or

(C) for existing fill, the requirements of Part (2)(C) of this Paragraph shall be met.

(c) Site modifications for advanced pretreatment drip dispersal systems shall meet the following criteria based on effluent standards:

(1) NSF-40 Systems may utilize a groundwater lowering system to meet the vertical separation distance requirements to a SWC 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) SWC 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 SWC. The minimum vertical separation distance to the projected (drained) SWC 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 – 0.2	0.05 – 0.2	0.05 – 0.2
		Silty Clay			
		Clay			

(1) 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 greater.

(2) The DDF 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. The dripline spacing may be adjusted in accordance with Rule .1602(e)(3) of this Subchapter and the PIA Approval so that the minimum required dispersal field area calculated in Subparagraph (d)(2) of this Rule does not need to be increased.

(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 LC ~~or SWC~~ 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 LC ~~or SWC~~ 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
	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 shall be required in accordance with Rule .0510 of this Subchapter, as applicable.

(f) Setback reductions allowed in Table XXVII of Rule .1202 of this Section may be used with advanced pretreatment drip dispersal systems when no reduction in the required minimum depth to a LC ~~or SWC~~ or vertical separation distance reduction is proposed compared to the requirements for DSE in Table XXV or Table XXVI of Rule .1202 of this Section. A minimum of 18 inches of naturally occurring soil to an unsuitable LC ~~or SWC~~ 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 no other setback reductions are taken aside of those to artificial drainage systems.

(g) Drip dispersal installation shall be in accordance with Rule .0908(e) of this Subchapter.

(h) Drip dispersal systems with a DDF 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 ~~LC or SWC,~~ LC, 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.

Authority G.S. 130A-334; 130A-335; 130A-342; 130A-343.

15A NCAC 18E .1205 ADVANCED PRETREATMENT SAND LINED TRENCH SYSTEMS

(a) Sand lined trench systems receiving TS-I or TS-II effluent 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 SWC 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 SWC 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 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 ~~most hydraulically limiting overlying soil~~ 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 texture of the most hydraulically limiting overlying soil horizon

Soil Group	Texture of Most Hydraulically Limiting Overlying Soil Horizon	LTAR (gpd/ft^2) *
I	Sand	0.9 – 1.4
II	Coarse Loams	0.7 – 1.0
III	Fine Loams	0.4 – 0.8
IV	Clays	0.2 – 0.4

*There shall be no reduction in trench length compared to a conventional gravel trench when Accepted or Innovative gravelless trench product is used.

(e) A Special Site Evaluation in accordance with Rule .0510 of this Subchapter is required for the following conditions to field verify the LTAR:

(1) texture of the receiving permeable horizon is sandy loam or loam, and the system DDF 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 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 dispersal shall be required.

Authority G.S. 130A-334; 130A-335; 130A-342; 130A-343.

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, or better, on sites with a DDF 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(f)(2)~~ .0901(g)(2) 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)~~ .0901 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 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 on sites with a DDF 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) a minimum of 30 inches of suitable Group I or II soils below the naturally occurring soil surface and no SWC 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 SWC 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(c)~~ .0901 of this Subchapter shall be used to determine the initial LTAR for a bed system and shall be based on the most limiting, naturally occurring soil horizon within 36

inches of the naturally occurring soil 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 DDF 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 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; Group I Soil is present in the first 36 inches of naturally occurring soil; no SWC 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~~ LC is reduced and on sites with slopes greater than two percent.

(4) Setback reductions allowed in Table XXVII of Rule .1202 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 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,~~ a LC, 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)(8) 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 on sites with a DDF 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 minimum following criteria:

(A) Group I soils are present for 54 inches below the naturally occurring soil surface;

(B) no SWC exists within the first 48 inches below the naturally occurring soil surface; and

(C) vertical separation distance of 24 inches to any SWC 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 of this Subchapter shall be used to determine the initial LTAR for a bed system and shall be based on the most limiting, naturally occurring soil horizon within 36 inches of the naturally occurring soil 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 DDF 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 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 standards; the hydraulic assessment demonstrates that a 24-inch minimum vertical separation distance to a SWC 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 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 ~~m/L,~~ 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 SWC exists within 18 inches of the existing fill surface;

(2) 18 inches of vertical separation exists to the SWC;

(3) the DDF 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 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.

Authority G.S. 130A-334; 130A-335; 130A-342; 130A-343.

SECTION .1300 – OPERATION AND MAINTENANCE

15A NCAC 18E .1301 OPERATION AND MAINTENANCE OF WASTEWATER SYSTEMS

(a) Wastewater 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 commission governing operators of pollution control facilities.

(e) The State may modify operation and maintenance requirements, such as Management Entity inspection frequency or certification level, effluent sampling frequency, etc., from the minimum requirements in Table XXXI on a project specific basis with justification based on the wastewater system classification, size, classification type, and complexity. The wastewater system shall be designed by PE and reviewed by the State.

~~(e)~~(f) The site for the wastewater system shall be accessible for monitoring, maintenance, inspection, and repair.

~~(f)~~(g) The system shall be maintained to meet the effluent standards specified in Table XXIV of Rule .1201 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)~~(h) The owner 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. The written request should include documentation showing that the wastewater system is compliant with its operation permit and Rule .1302(e) of this Section.

~~(h)~~(i) 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 by the Management Entity, this activity shall be reported to the owner and LHD within 30 days.

~~(i)~~(j) All residuals shall be removed as specified in the OP, the RWTS or PIA Approval, Rule .1303 of this Section, 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 or equal to 750 linear feet of trench~~	~~N/A~~	~~Owner~~	~~N/A~~
~~IIc Conventional system with shallow placement~~	~~N/A~~	~~Owner~~	~~N/A~~
~~IId~~ IIb – 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 – Gravity groundwater lowering system	5 years	Owner	5 years
IVa – LPP distribution	3 years	Private Certified Operator or Public Management Entity with a Certified Operator	2/year
IVb – System with more than one pump or siphon	3 years	Private Certified Operator or Public Management Entity with a Certified Operator	2/year
IVc – Off-site system serving two or more facilities with any components under common or joint control	5 years	Private Certified Operator or Public Management Entity with a Certified Operator	1/year

IVd –Alternating dual fields with pressure dosed gravity distribution including off-site systems	3 years	Private Certified Operator or Public Management Entity with a Certified Operator	1/year
Va – Advanced pretreatment meeting NSF-40, TS-I, or TS-II ~~or RWTS meeting TS-I or TS-II~~ (approved under Section .1700 of this Subchapter) ≤ 3,000 gpd	~~1 year~~ 1/year	Private Certified Operator or Public Management Entity with a Certified Operator	~~<~~≤ 1,500 gpd - 2/year* ~~=~~≥ 1,500 gpd and ~~<~~≤ 3,000 gpd - 4/year
Vb – DSE wastewater systems > 3,000 gpd with dispersal field > 1,500 gpd	~~1 year~~ 1/year	Private Certified Operator or Public Management Entity with a Certified Operator	≥ 3,000 – and ≤ 10,000 gpd - monthly > 10,000 gpd flow - weekly
Vc – RWTS (approved under Section .1500 of this Subchapter) meeting NSF-40 ≤ 1,500 gpd	~~1 year~~ 1/year	Private Certified Operator or Public Management Entity with a Certified Operator	~~<~~≤ 1,500 gpd - 2year* ~~≥ 1,500 gpd and < 3,000 gpd – 4/year~~
Vd – Anaerobic drip dispersal systems	~~1 year~~ 1/year	Private Certified Operator or Public Management Entity with a 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
~~Ve – IPWW designed by a PE and reviewed by the State and determined to be IPWW~~	~~1 year~~	~~Certified Operator or~~	~~< 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~~ Ve - Flow equalization	≤ 1,500 gpd – once every three years > 1,500 gpd – 1/year	Private Certified Operator or Public Management Entity with a 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
~~Vh~~ Vf – Sand lined trench system with no advanced pretreatment or drip dispersal	~~1 year~~ 1/year	Private Certified Operator or Public Management Entity with a Certified Operator	~~Once/year~~ 1/year

~~Vi~~ Vg – Wastewater system with pump groundwater lowering systems	~~1 year~~ 1/year	Private Certified Operator	2/year with one visit during the wet season
Vh – IPWW designed by a PE and reviewed by the State and determined to be IPWW	1/year	Private Certified Operator or Public Management Entity with a 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
VIa – Advanced pretreatment, ~~including RWTS, ≥~~ ≥ 3,000 gpd meeting NSF-40, TS-I, or TS-II	6 months	~~Certified Operator~~ Media Filters Private Certified Operator or Public Management Entity with a Certified Operator All other advanced pretreatment Public Management Entity with a Certified Operator	Media filters > 3,000 gpd – and ≤ 10,000 gpd - 12/year ≥10,000 gpd – 1/week All other advanced pretreatment ~~≥~~≥ 3,000 gpd – and ≤ 10,000 gpd - 12/year ≥ 10,000 – and ≤ 25,000 gpd - 2/week ≥ 25,000 – and ≤ 50,000 gpd - 3/week > 50,000 gpd - 5/week
VIb – Any system using RCW	6 months	~~Certified Operator~~ Public Management Entity with a Certified Operator	~~<~~≤ 3,000 gpd - 12/year ~~≥~~≥ 3,000 – and ≤ 10,000 gpd - 1/week ~~≥~~≥ 10,000 – and ≤ 25,000 gpd - 2/week ~~≥~~≥ 25,000 – and ≤ 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.~~

*Quarterly Management Entity inspections shall be required for the first year. The quarterly inspections may be reduced to twice a year if the wastewater system is in compliance with all OP conditions after the first year.

Authority G.S. 130A-335(e) and (f).

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) prior to the issuance or re-issuance of an OP for an advanced pretreatment system, the owner shall provide to the LHD documentation that a contract for operation and maintenance of the system is in place with a Management Entity. For proprietary advanced pretreatment systems, 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. For non-proprietary advanced pretreatment systems, the contract shall be with an operator certified for the classification indicated on the OP; and

(2) the Management Entity shall notify the ~~LHD and~~ LHD, the ~~State~~ State, and the proprietary advanced pretreatment manufacturer, as applicable, 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 during one or more of the required Management Entity inspection 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 all critical treatment components and of the 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 actual flow shall be recorded in accordance with the RWTS or PIA Approval 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) The results of all effluent sampling shall be reported by the Management Entity to the owner, ~~LHD and the State.~~ LHD, State, and the proprietary advanced pretreatment manufacturer.

(e) An individual advanced pretreatment system at a single site shall be considered compliant when the following conditions are met:

(1) annual VIP specified in the RWTS or PIA Approval indicates compliant conditions; and

(2) arithmetic mean (geometric mean for Fecal Coliform) of each constituent across three or more consecutive sampling dates does not exceed the designated effluent standard in Table XXIV in Rule .1201 of this Subchapter. Non-compliant data may be substituted with a new data set found to meet the designated effluent standard upon re-sampling within 30 days of receipt of the non-compliant data results for purposes of meeting the effluent quality standard.

(f) Mass loading for BOD_5, TSS, or TN may be used to show site compliance with Subparagraph ~~(d)(2)~~ (e)(2) of this Rule for ~~TN for~~ a ~~TS II~~ wastewater system with a DDF less than or equal to 3,000 gpd. The mass loading to the wastewater system shall be based on site specific water use data and effluent sampling results. At least one year of water use data shall be used in this calculation. The mass loading to the wastewater system shall be calculated as follows:

EML = Flow x ~~TN~~ EFF mg/L

AML = 0.6 x DDF x ~~30~~ TS mg/L

If EML ≤ AML, the site is compliant

Where EML = effective mass loading

AML = allowable mass loading

Flow = average daily flow during the peak water use month or the average of the peak 30 consecutive day period during the prior year

~~TN~~ EFF = average of the most recent effluent sampling ~~results.~~ results for the constituent (BOD_5, TSS, or TN). A minimum of two effluent sampling results shall be required

TS = the effluent limit based on the constituent and effluent standard from Table XXIV in Rule .1201 of this Subchapter

(g) The Management Entity may record daily wastewater flow and may sample influent to the advanced pretreatment system as needed to determine compliance with this Rule and OP conditions.

Authority G.S. 130A-335(e) and (f).

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,~~ Rule 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) 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.

Authority G.S. 130A-335(e) and (f).

15A NCAC 18E .1304 MANAGEMENT ENTITY RESPONSIBILITIES FOR WASTEWATER SYSTEM OPERATION AND MAINTENANCE

(a) When a Management Entity is required to be or to employ a certified operator as specific in Table XXXI in Rule .1301 of this Section, the operator shall at a minimum be certified as a subsurface operator in accordance with G.S. 90A, Article 3, and the rules in 15A NCAC 08G. Operators of systems classified as Type V or VI in Table XXXI may be required to have additional certifications by the State, upon consultation with the commission governing operators of water pollution control facilities, if required by G.S. 90A.

(b) The Management Entity shall inspect the wastewater system at the frequency specified in Table XXXI in Rule .1301 of this Section or in accordance with the RWTS or PIA Approval.

(c) The Management Entity shall provide a copy of the inspection ~~report~~ report, including results of the VIP and effluent sampling, 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.

(g) The Management Entity shall submit their written report to the State centralized data management system.

Authority G.S. 130A-335(e) and (f).

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~~ Vb, Vc, Vd, Ve, Vf, and Vg 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 and 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.

(d) The LHD may provide the owner with the option for a private Management Entity to perform the on-site compliance inspection for Type IIIb and ~~IIIi~~ IIIh systems in accordance with Table XXXI in Rule .1301 of this Section instead of the LHD. The Management Entity shall provide to the owner and LHD a written compliance inspection report.

(e) The LHD or State may issue a written notice of non-compliance to the owner when the wastewater system is non-compliant with the performance standards listed in the CA and OP.

Authority G.S. 130A-335(e) and (f).

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~~ the date on the NOV issued by the State or LHD unless the NOV specifies a different time frame for the repair.

(c) The owner shall apply for a repair permit in accordance with Section .0200 of this Subchapter.

(d) After investigating the malfunction, the State or LHD shall use its best professional judgement in requiring repairs that will enable the system to function.

(e) 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.

(f) If no repair options are available for the wastewater system, the LHD may issue a CA for a permanent pump and haul system.

(1) Prior to issuing the CA, the LHD shall receive the following information from the owner:

(A) confirmation that a septage management firm permitted in accordance with G.S. 130A-291.1 is under contract to pump and haul the sewage from the pump and haul tanks;

(B) documentation 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 or 02T; and

(C) documentation from the facility receiving the sewage confirming that the facility has the capacity for the additional sewage.

(2) 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,~~ nonrepairable the dispersal system shall not be used. Tanks may be approved by the LHD for permanent pump and haul if shown to be structurally sound and watertight. 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.

Authority G.S. 130A-291.1; 130A-291.2; 130A-335(e) and (f).

15A NCAC 18E .1307 WASTEWATER SYSTEM ABANDONMENT

If a wastewater system is ~~found to be non-repairable or is~~ no longer ~~required,~~ required to be used, the tanks shall have the contents removed by a septage management firm permitted in accordance with G.S. 130A-291.1, the tanks collapsed, backfilled, or otherwise secured, and the aboveground components de-energized and removed as directed by the authorized agent to protect public health and safety.

Authority G.S. 130A-335.

SECTION .1400 – APPROVAL OF TANKS, RISERS, EFFLUENT FILTERS, AND PIPE PENETRATIONS

15A NCAC 18E .1401 PLANS FOR PREFABRICATED TANKS

(a) All tanks, risers, effluent filters, ~~or~~ and pipe penetrations proposed for use in a wastewater system shall be approved by the State. All tanks, risers, effluent filters, and pipe penetrations approved by the State shall maintain the materials, design, and construction specified in 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 and approved by the State prior to being offered for sale or use in North Carolina.

(c) Plans and specifications for tanks with a total liquid capacity less than or equal to 4,000 gallons shall show the design in detail, including the following:

(1) all pertinent dimensions in inches, including:

(A) top, bottom, and sidewall 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~~ bedding, recommend methods for additional sealing, as ~~applicable.~~ and leak testing procedures.

(d) Plans and specifications for tanks with a total liquid capacity greater than 4,000 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 and maximum soil cover, water table, and traffic load the tank is designed to support.

(e) Plans for prefabricated tanks other than those approved for general use and issued an identification number 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.

(f) 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.

(g) Tanks found to be out of compliance shall be brought back into compliance by the tank manufacturer or the installer as directed by the State or LHD. Tanks that are not brought into compliance shall not be used in a wastewater system. The imprint detailed in Rule .1402 of this Section shall be permanently marked over by the authorized agent.

Authority G.S. 130A-335(e), (f), and (f1).

15A NCAC 18E .1402 TANK DESIGN AND CONSTRUCTION

(a) Tanks shall be watertight, structurally sound, and not subject to excessive corrosion or decay.

(b) Septic tanks and grease tanks shall have State approved effluent filters and access devices. An effluent filter and support case shall be installed level in the outlet end of the septic tank or grease tank and shall meet the following criteria:

(1) solvent welded to a minimum of three-inch PVC Schedule 40 outlet pipe;

(2) installed in accordance with filter manufacturer's specifications and effluent filter approval; and

(3) accessible and removable without entering the septic tank or grease tank.

(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. Risers shall be installed in accordance with the rules of this Subchapter, the manufacturer's specifications, and a product specific approval.

(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 a minimum of 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) outlet openings shall have cast or manufactured penetration point and include resilient, watertight, sealed, non-corrodible, and flexible connective sleeve. The connective sleeve shall meet ASTM C1644 for precast concrete tanks or ASTM C1644, C923, or C564 for thermoplastic or glass-fiber-reinforced polyester tanks and be approved by the State;

(7) 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;

(8) no ~~pipe penetration points or~~ openings shall be permitted below the septic tank operating liquid level;

(9) 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 measured from the top of the liquid level;

(10) invert of the outlet shall be a minimum of two inches lower in elevation than the invert of the inlet;

(11) 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;

(12) 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, manufactured, installed, and maintained to remain in position when subjected to a liquid capacity in one ~~compartment;~~ compartment that corresponds with the lowermost elevation of the water passage slot or holes;

(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 create a water passage slot four inches high for the full interior width of the tank;

(E) a minimum of two four or five-inch openings, or one four or five-inch opening per 30 horizontal 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 in the partition wall shall be located between 25 and 50 percent of the liquid depth of the tank, as measured from the top of the liquid level; and

~~(G) there shall be no other openings in the partition wall below the water passage slot or openings; and~~

~~(H)~~(G) 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;

(13) access openings shall be provided in the top of the tank, located over each compartment, and having a minimum 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;

(14) access risers and covers shall be designed and maintained to prevent surface water infiltration;

(15) tank lids and riser covers shall be locked, secured, or weigh a minimum of 40 pounds, but no more than 80 pounds; and

(16) 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. The imprint shall be located to the right of the blockout made for the outlet pipe on the top or end of outlet end of the tank.

(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 a minimum of six inches above finished grade, and be designed and maintained to prevent surface water infiltration;

(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 a minimum of 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 located 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. The imprint shall be located to the left of the blockout made for the outlet pipe on the top or end of outlet end of the tank; and

(9) the pump tank working capacity shall be the entire internal tank volume.

(f) Grease tanks shall be septic tanks approved in accordance with Paragraph (d) of this Rule with the following modifications:

(1) the liquid passage between chambers shall be located between 40 and 60 percent of the operating liquid depth measured from the top of the liquid level. The liquid passage between chambers may be made using a sanitary tee extending down between 40 and 60 percent of the liquid depth measured from the top of the liquid level;

(2) when sanitary tees are used as the liquid passage through an interior compartment partition, an access opening and riser to grade over the tees shall be provided for servicing and routine maintenance.

(3) when two or more tanks are used, in series 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;

(4) 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 DDF and have opening of 1/32-inch or less; and

(5) 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. Aluminum hatches or manhole rings and covers shall be designed and maintained to prevent surface water infiltration. Locks shall be the responsibility of the person owning or controlling the system.

(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 nominal clear opening of 24 inches, extending to finished grade, and designed to prevent surface water inflow.

Authority G.S. 130A-335(e), (f), and (f1).

15A NCAC 18E .1403 TANK MATERIAL REQUIREMENTS

(a) Tanks designed to hold sewage shall be structurally sound and constructed with materials capable of resisting corrosion from sewage and sewage gases, and the active and passive loads on tank walls.

(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 a minimum of 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. Reinforcement shall be placed to maximize the structural integrity of the tank;

(3) alternative reinforcement designs may be used when shown to be equal to or greater than the reinforcement design in Subparagraph (2) of this Paragraph;

(4) 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;

(5) 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;

(6) the concrete shall achieve a minimum 28-day compressive strength of 3,500 psi. The concrete shall meet the compressive strength of 3,500 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;

(7) 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

(8) tank lids and riser covers shall have a durable handle made of ~~rot-resistant~~ corrosion-resistant materials and capable of pull capacity for the weight of the lid or cover.

(c) Thermoplastic tanks shall either be IAPMO/ANSI Z1000 or CSA B66 certified and enrolled in a third-party quality assurance and quality control program, which includes material testing and unannounced annual audits.

(d) Glass-fiber-reinforced polyester tanks shall meet the following requirements:

(1) top, bottom, ends, and sides of the tank shall have a minimum thickness of 1/5-inches. The baffle wall shall be a minimum of 3/16-inch thick;

(2) material and laminate requirements specified in ~~IAMPO/ANSI~~ IAPMO/ANSI Z1000 for glass-fiber-reinforced polyester tanks; and

(3) enrolled in a third-party quality assurance and quality control program, which include material testing and unannounced annual audits.

(e) Cast or manufactured in place tanks shall be designed by a PE, if required by G.S. 89C, and approved by the State.

Authority G.S. 130A-335(e), (f), and (f1).

15A NCAC 18E .1404 PLANS AND SPECIFICATIONS FOR RISERS, EFFLUENT FILTERS, AND PIPE PENETRATIONS

(a) Risers and riser lids shall be able to withstand a uniform live loading of 150 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 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, and pipe penetrations;

(3) material type and strength including reinforcement material and location as required;

(4) documentation that the riser can meet the load required specified in Paragraph (a) of this Rule shall be provided by a third-party;

(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, primary and secondary safety mechanisms shall be provided. The primary safety mechanism shall be a locking riser lid, ring and lock, or other State approved riser lid locking mechanism. The secondary safety mechanism shall be a secondary lid, concrete plug, or other State approved safety device to be provided inside the pump tank riser; and

(7) specifications for application, installation, operation, and maintenance for both new and retrofit applications for single and multiple riser sections.

(c) Effluent filter plans and specifications submitted for review and approval shall show the design of the effluent filter in detail, including:

(1) manufacturer's name, address, phone, and fax numbers;

(2) documentation and a written certification that the effluent filter is designed, constructed, and performs in compliance with G.S. 130A-335.1(a);

(3) capacity and wastewater strength for all models of proposed filters to be approved; and

(4) specifications for application, installation, operation, and maintenance.

(d) Pipe penetration plans and specifications submitted for review and 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 ensure the seal, such as non-corrodible adjustable bands;

(5) documentation that the pipe penetration meets the requirements of ASTM C1644 for precast concrete tanks or ASTM C1644, C923, or C564 for thermoplastic or glass-fiber-reinforced polyester tanks; 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.

Authority G.S. 130A-335(e), (f), and (f1); 130A-335.1.

15A NCAC 18E .1405 RISERS, EFFLUENT FILTERS, AND PIPE PENETRATION APPROVAL RENEWAL

~~(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.~~

(a) All riser, effluent filter, and pipe penetration approvals shall expire on December 31 of each year. Riser, effluent filter, and pipe penetration manufacturers who wish to continue product approval shall submit annually a proprietary product renewal form provided by the ~~State.~~ State no later than November 30 of each year. The renewal form shall include the following updated information: company's name, address, contact information, contact name, model number(s) approved, and a notarized statement that the product(s) has not changed from the previous year.

(b) The Department shall notify the manufacturer of the pending PIA Approval expiration in writing no later than September 30 of each year. The notification shall provide the manufacturer with information describing how and where to request renewal.

(c) The riser, effluent filter, and pipe penetration approval shall be deemed to be renewed upon receipt of a completed renewal form in accordance with this Rule.

Authority G.S. 130A-335(e) and (f); 130A-343.

15A NCAC 18E .1406 MODIFICATION, SUSPENSION, AND REVOCATION OF APPROVALS

The State shall modify, suspend, or revoke the approval for tanks, risers, effluent filters, or pipe penetrations 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;~~ information;

(2) the product has been altered;

~~(2) experience with the product or component results in altered conclusions about system performance, reliability, safety, or design;~~

(3) the product ~~or component~~ fails to perform in compliance with performance standards established for the ~~product or component;~~ product; or

(4) the product ~~product, component, or the applicant~~ fails to meet conditions of its approval or comply with ~~G.S. 130A, Article 11, Rule .1405 of this Section, this Subchapter, or conditions of the approval.~~ applicable laws and rules.

Authority G.S. 130A-335(e), (f), and (f1).

SECTION .1500 – APPROVAL AND USE OF RESIDENTIAL WASTEWATER TREATMENT SYSTEMS

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 DDF 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 to certify RWTS in accordance with NSF Standard 40.

(d) For approval of an RWTS as a Provisional or Innovative System, a manufacturer shall apply in accordance with Section .1700 of this Subchapter.

Authority G.S. 130A-342.

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 Rule .1401 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.

Authority G.S. 130A-342.

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 requiring maintenance 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 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 a minimum of half of the DDF 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.

Authority G.S. 130A-342.

15A NCAC 18E .1504 SAMPLING REQUIREMENTS FOR RESIDENTIAL WASTEWATER TREATMENT SYSTEMS

Effluent from an approved RWTS shall be grab or 24-hour composite sampled annually for all effluent standards listed in Table XXIV of Rule .1201 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.

Authority G.S. 130A-342.

15A NCAC 18E .1505 RESIDENTIAL WASTEWATER TREATMENT SYSTEM APPROVAL RENEWAL

(a) All RWTS Approvals shall expire on December 31 of each year. RWTS manufacturers who wish to continue product approval shall submit annually a proprietary product renewal form provided by the ~~State.~~ State no later than November 30 of each year. The renewal form includes the following updated information: company's name, address, contact information, contact name, model number(s) approved, and a notarized statement that the product(s) has not changed from the previous year. The renewal request shall include verification of the manufacturer's continued certification and listing by a nationally recognized certification body, including compliance with NSF Standard 40.

(b) The Department shall notify the manufacturer of the pending RWTS Approval expiration in writing no later than September 30 of each year. The notification shall provide the manufacturer with information describing how and where to request renewal.

(c) The RWTS approval shall be deemed renewed upon receipt of the completed renewal form and verification of certification in accordance with this Rule.

~~(b)~~(d) The State may suspend or revoke a system approval upon a finding that the system fails to perform in compliance with established effluent ~~standards.~~ standards or as provided for in Rule .1708(b) of this Subchapter.

Authority G.S. 130A-342.

SECTION .1600 – APPROVAL OF PRE-ENGINEERED PACKAGE DRIP DISPERSAL SYSTEMS

15A NCAC 18E .1601 GENERAL

(a) Drip dispersal systems for DDF 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 recording of system operation.

(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) design plans and specifications for all components;

(4) installation specifications; and

(5) operation and maintenance manuals.

(d) The system manufacturer shall provide 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 .1700 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 of this Subchapter, and this Section, as applicable.

(g) Drip dispersal systems for DDF 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.

Authority G.S. 130A-343.

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, TS-II, or RCW as specified in Table III of Rule .0402, Rule .1002, and Table XXIV of Rule .1201 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~~ 15 to 60 psi of pressure during dosing events;

(3) minimum flow and 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~~ provisions 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 ~~DDF,~~ operating flow rate, ~~typically~~ during network forward flushing. Filter number and size shall operate during both dosing and flushing conditions at a pump operating 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,~~ septic tank, or settling tank prior to being returned to the pretreatment unit;

(5) a totalizing flow meter shall be used to record total flow through the system. The meter shall also be used to monitor pump operating 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 five 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 in a PIA Approval or 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 ensure 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 drainback prevention; 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 and to accommodate the DDF. 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) provide a minimum dose volume per zone that is a minimum of five times the liquid capacity of the drip laterals or 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. Automatic forward flushing frequency and duration shall be adjustable;

(6) monitor pump cycles and run times;

(7) for systems with a DDF 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 DDF 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) for 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 are to be configured to ensure the minimum dose is available prior to initiating a dosing cycle to the dispersal field or zone and to provide that a full dose is delivered.

(g) A single source manufacturer may propose alternatives to the design criteria in this Rule for review and approval during the PIA Approval process.

Authority G.S. 130A-343.

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) after the system is pressurized, dosing and flushing flow rates and pressures for each zone 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 and highest point in the return manifold;

(B) minimum and maximum emitter pressure shall be verified to be within emitter design parameters;

(C) flushing pressures at the ends of each supply and return manifold within each zone;

(D) dosing and flushing flow rates measured with the flow meter after the system is pressurized; and

(E) all dosing and flushing flow rates and pressures shall be recorded.

(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.

Authority G.S. 130A-343.

SECTION .1700 – APPROVAL AND PERMITTING OF WASTEWATER SYSTEMS, TECHNOLOGIES, COMPONENTS, OR DEVICES

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) reduced minimum setbacks;

(2) reduced depth to ~~LC or SWC;~~ LC;

(3) reduced vertical separation distance requirements; or

(4) increased LTAR.

This Section shall provide for the approval and permitting of PIA Systems.

Authority G.S. 130A-335(e) and (f); 130A-343.

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 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 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~~ 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.

Authority G.S. 130A-335(e) and (f); 130A-343.

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 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).

Authority G.S. 130A-335(e) and (f); 130A-343.

15A NCAC 18E .1704 APPROVAL CRITERIA FOR PROVISIONAL SYSTEMS

(a) Trench and dispersal systems shall be approved for use as a Provisional System when the following criteria have been met:

(1) Documentation of one of the following:

(A) a minimum of 50 installations operational and in use for a minimum of 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: material physical properties and chemical durability; field installed permeable sidewall area and bottom infiltrative area; method and manner of function for conveyance and application of effluent; structural integrity; and 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) 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. The protocol shall include the following:

(A) a minimum of 100 installations operational and in use for a minimum of 12 months; and

(B) sufficient information collected to evaluate the system's hydraulic performance, structural integrity and rate of malfunction compared with a conventional trench system.

(b) Advanced pretreatment systems shall be approved for use as a Provisional System when the following criteria have been met:

(1) Documentation of one of the following for designs complying with TS-I, TS-II, or RCW effluent standards:

(A) a minimum of 50 complete third-party field verification data sets from a minimum of 15 sites in operation for six months, including all constituents necessary to verify compliance with the applicable effluent standard. Two to five data sets may be from the same site if collected a minimum of three months apart, with no data excluded from the field sampling sites. The data sets shall demonstrate compliance with TS-I, TS-II, or RCW effluent standards in accordance with ~~Rule .1709 of this Section;~~ Rules .1002 and .1709 of this Subchapter, as applicable;

(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: material physical properties and chemical durability; structural integrity; biological, chemical, or physical treatment processes;

method and manner of function for conveyance and application of effluent through the system; and 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.

(2) 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. The protocol shall include 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, a minimum of 50 complete third-party field verification data sets from a minimum of 15 sites in operation for a minimum of six months, including all constituents necessary to verify compliance with the applicable effluent standard. Two to five data sets may be from the same site if collected a minimum of three months apart, with no data excluded from the field sampling sites. The data may be collected from systems in-state or out-of-state. The data sets shall show compliance with TS-I, TS-II, or RCW effluent standards in accordance with ~~Rule .1709 of this Section,~~ Rules .1002 and .1709 of this Subchapter, as applicable; or

(B) a minimum of 150 complete third-party field verification data sets from a minimum of 50 sites in operation for a minimum of six months, including all constituents necessary to verify compliance with the applicable effluent standard. Two to five data sets may be from the same site if collected a minimum of three months apart, with no data excluded from the field sampling sites. The data may be collected from systems in-state or out-of-state. The data sets shall demonstrate compliance with TS-I, TS-II, or RCW effluent standards in accordance with Rule .1709 of this Section, as applicable

(c) 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.

Authority G.S. 130A-335(e) and (f); 130A-343.

15A NCAC 18E .1705 APPROVAL CRITERIA FOR INNOVATIVE SYSTEMS

(a) A trench and dispersal system shall be approved for use as an Innovative System when 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~~ 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:

(A) the results of AASHTO Standard H-5 and H-10 load testing that demonstrate structural integrity comparable to a conventional trench system;

(B) a minimum of 100 installations operational and in use for a minimum of 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.

(b) Advanced pretreatment systems requesting Innovative Approval for designs complying with TS-I, TS-II, or RCW effluent standards the following information is provided:

(1) information required in Paragraphs (a)(1) through (a)(4) of this Rule; and

(2) 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, a minimum of 50 complete third-party field verification data sets from a minimum of 15 sites in operation for a minimum of six months, including all constituents necessary to verify compliance with the applicable effluent standard. Two to five data sets may be from the same site if collected a minimum of three months apart, with no data excluded from the field sampling sites. The data may be collected from systems in-state or out-of-state. The data sets shall demonstrate compliance with TS-I, TS-II, or RCW effluent standards, as applicable; or

(B) a minimum of 150 complete third-party field verification data sets from a minimum of 50 sites in operation for a minimum of six months, including all constituents necessary to verify compliance with the applicable effluent standard. Two to five data sets may be from the same site if collected a minimum of 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, TS-II, or RCW effluent standards, as applicable.

(c) 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.

Authority G.S. 130A-335(e) and (f); 130A-343.

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 a minimum 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 and other stakeholders 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 a minimum of 250 randomly selected Innovative Systems compared with a minimum of 250 comparably aged randomly selected conventional systems, with a minimum of 100 of each type of surveyed system currently in use and in operation for a minimum of 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 Innovative Systems is a minimum of five percentage points higher than the failure rate in the sample of 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.

Authority G.S. 130A-335(e) and (f); 130A-343.

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.

Authority G.S. 130A-335(e) and (f); 130A-343.

15A NCAC 18E .1708 MODIFICATION, SUSPENSION, AND REVOCATION OF APPROVALS

(a) The Department may modify the PIA Approval of a system as provided for in G.S. 130A-343(c) and as follows:

(1) to comply with subsequent changes in laws ~~or rules~~ which affect their approval;

(2) based upon a written application from 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. 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; or

(3) based upon a written application from the manufacturer of an approved Accepted System that seeks to modify their system or its conditions of approval, including siting or sizing criteria. 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.

(b) The Department may suspend or revoke the PIA Approval of a system as provided for in G.S. 130A-343(c) and as follows:

~~(1) subsequent experience with the system results in altered conclusions about system performance, reliability, or design;~~

~~(2)~~(1) the advanced pretreatment system fails to ~~perform in compliance with established effluent standards;~~ meet the compliance criteria in Rule .1710 of this Section;

~~(3)~~(2) the modified system fails to perform in a manner equal or superior to the previously approved PIA System;

~~(4)~~(3) the system ~~or the system petitioner~~ fails to ~~comply with wastewater system laws, rules, or conditions of the PIA Approval;~~ meet the conditions of its PIA Approval or comply with applicable laws and rules; or

~~(5)~~(4) the manufacturer ~~lost~~ loses their approval or discontinues their listing by any nationally recognized certification body, if applicable. The manufacturer shall notify the Department in writing within 30 days of any changes in their approval status with a nationally recognized certification body.

(c) 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.

(d) Modification, suspension, or revocation of a PIA Approval shall not affect systems previously installed in accordance with the approval.

Authority G.S. 130A-335(e) and (f); 130A-343.

15A NCAC 18E .1709 WASTEWATER SAMPLING REQUIREMENTS FOR ADVANCED PRETREATMENT SYSTEMS, INCLUDING REDUCED SAMPLING REQUIREMENTS

(a) Wastewater sampling requirements shall vary in accordance with system classification, designated effluent standard, system DDF, and system performance history.

(1) Provisional Systems shall be grab or composite sampled quarterly for all applicable influent and effluent constituents listed in Table XXIV of Rule .1201 of this Subchapter until the system receives Innovative Approval, unless ~~adjusted sampling requirements have been requested and approved in accordance with this Rule.~~ otherwise specified in the Provisional Approval.

(2) When the DDF is less than or equal to 1,500 gpd, Innovative Systems shall be grab or composite sampled annually for all applicable influent and effluent constituents, unless adjusted sampling requirements have been requested and approved in accordance with this Rule.

(3) When the DDF is greater than 1,500 gpd and less than or equal to 3,000 gpd, Innovative Systems shall be grab or composite sampled twice a year for all applicable influent and effluent constituents listed in Table XXIV of Rule .1201 of this Subchapter, unless adjusted sampling requirements have been requested and approved in accordance with this Rule.

(4) Provisional Systems shall be sampled for Fecal Coliforms. A manufacturer with a Provisional Approval may apply for elimination of Fecal Coliform sampling based on a written application and documentation submitted to the Department that includes the following information:

(A) data from a minimum of five separate North Carolina sites in operation for a minimum of six months;

(B) a minimum of 25 data sets including results for fecal coliforms. No data sets shall be ~~excluded, including all data sets that do not meet the effluent standards.~~ excluded. Data sets may be from the same site if collected a minimum of three months apart; and

(C) analysis indicating compliant system performance in accordance with Rule .1710 of this Section.

(5) If an effluent sample for a Provisional System that does not have to sample for Fecal Coliforms is determined to be non-compliant, the effluent must be sampled for Fecal Coliforms when re-sampled. If the re-sampled effluent indicates compliance, no further Fecal Coliform sampling is required from that site.

(6) Innovative Systems shall not be sampled for Fecal Coliforms at any site that is found to be compliant with the effluent standards for all other constituents required to be analyzed. If an effluent sample is determined to be non-compliant, the effluent must be sampled for Fecal Coliforms when re-sampled. If the re-sampled effluent indicates compliance, no further Fecal Coliform sampling is required from that site.

(7) 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.

(8) Effluent may be re-sampled within 30 days of receipt of 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.

(9) The Management Entity may record daily wastewater flow and sample influent to the advanced pretreatment system as needed to determine compliance with Rule .1302(f) of this Subchapter.

(b) The manufacturer of an approved Innovative System may request an adjustment in sampling requirements (constituents or frequency), including reducing to field parameters only, based on a written application submitted to the Department that includes the following information:

(1) data from a minimum of 25 separate North Carolina sites in operation for a minimum of six months after the Innovative Approval has been issued;

(2) written reports summarizing results of the VIP inspections for all North Carolina sites submitted as part of this Rule;

(3) a minimum of 50 complete data sets, ~~including all data sets that do not meet the effluent standards.~~ <u>with no data excluded.</u> Data sets may be from the same site if collected a minimum of 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.

(c) Systems approved for field parameters only shall only be required to sample the field parameters listed in Table XXXII at the site during a VIP Management Entity inspection, or ~~more frequently~~ as specified in the PIA Approval. The results shall be recorded in the written report. If the field parameters fall outside the approved range, an effluent sample shall be collected and analyzed for all parameters as necessary to demonstrate system compliance with the site's applicable effluent standard.

TABLE XXXII. Field parameters advanced pretreatment systems

Field Parameter	Effluent Criteria
pH	~~6 10~~ 5 - 9
Turbidity	≤ 10
DO	~~≤~~ ≥ 2

(d) Manufacturers of proprietary advanced pretreatment systems with Innovative Approval that have ~~previously~~ demonstrated compliant system performance in accordance with Rule .1710 of this Section may submit a written application to the Department requesting field parameters sampling only.

(e) Manufacturers of proprietary advanced pretreatment systems with Innovative Approval that are also certified and listed by a nationally recognized certification body 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.

(f) Manufacturers of proprietary advanced pretreatment systems that comply with Paragraphs (b) or (c) 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.

(g) 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.

(h) 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 ~~tandards.~~ standards.

Authority G.S. 130A-335(e) and (f); 130A-343.

15A NCAC 18E .1710 ~~OMPLIANCE~~ COMPLIANCE CRITERIA FOR ADVANCED PRETREATMENT SYSTEMS

An approved system shall be considered in compliance with the effluent 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 standard;

(2) no more than 20 percent of all data from all sites shall exceed the designated effluent standard for any applicable constituent. Non-compliant data may be substituted with a new data set meeting the designated effluent 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 standard for all applicable constituents;

(4) when determining compliance with system effluent standards in Items (1), (2), and (3) of this Rule, 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 of this Subchapter.

Authority G.S. 130A-335(e) and (f); 130A-343.

15A NCAC 18E .1711 PROVISIONAL AND INNOVATIVE APPROVAL RENEWAL

(a) All PIA Approvals shall expire on December 31 of each year. PIA manufacturers or other parties who wish to continue product approval shall submit annually a ~~proprietary~~ product renewal form provided by the ~~Department.~~ Department no later than November 30 of each year. The renewal form includes the following updated information: ~~company's~~ company or organization's name, address, contact information, contact name, model number(s) approved, and a notarized statement that the product(s) has not changed from the previous year.

(b) The Department shall notify the manufacturer of the pending PIA Approval expiration in writing no later than September 30 of each year. The notification shall provide the manufacturer with information describing how and where to request renewal.

~~(b)~~(c) Manufacturers of proprietary products with Provisional Approvals shall additionally submit with its renewal form an annual report to the State with the following information:

(1) list of all systems ~~currently~~ installed under the Provisional Approval;

(2) results of all effluent samples collected, as applicable;

(3) copies of all Management Entity inspection reports, as applicable;

(4) assessment of system performance in relation to this Subchapter;

(5) summary of progress made to complete installations, research, and testing as outlined in the approved evaluation protocol;

(6) any conditions and limitations related to the use of the system; and

(7) a list of all authorized designers, installers, and management entities.

~~(c)~~(d) A PIA Approval shall be deemed to be renewed upon receipt of the completed renewal form and annual report in accordance with Paragraphs (a) and (b) of this Rule, as applicable.

~~(d)~~(e) The Department shall review all annual reports for Provisional Approvals for compliance with its approval conditions, including its approved evaluation protocol, and determine whether any action to modify, suspend, or revoke the approval is warranted in accordance with Rule .1708 of this Section.

Authority G.S. 130A-335(e) and (f); 130A-343.

15A NCAC 18E .1712 AUTHORIZED DESIGNERS, INSTALLERS, AND MANAGEMENT ENTITIES

(a) Designers, installers, and Management Entities shall be authorized in writing by the manufacturer when required 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 and submit with the product renewal form required in accordance with Rule .1711(a) of this Section.

Authority G.S. 130A-335(e) and (f); 130A-343.

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) Notify the Department of all OPs issued for Innovative Systems.

(4) 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.

(5) 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. A facility with a full kitchen shall not be granted a permit reduction in total trench length.

(6) Grant facilities generating HSE the 25 percent reduction allowed for Innovative or Accepted Systems if the system includes an approved advanced pretreatment system designed to ensure effluent strength equal to or better than DSE.

(7) 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.

(8) Inform the Department as well as the manufacturer or their authorized representative of any system determined to be malfunctioning.

(9) 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 specify further enforcement possibilities if compliance is not achieved.

(10) 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.

Authority G.S. 130A-335(e) and (f); 130A-343.