

LAWS AND RULES
FOR
SANITARY SEWAGE COLLECTION, TREATMENT, AND DISPOSAL
SECTION .1900

OF THE
NORTH CAROLINA ADMINISTRATIVE CODE
TITLE 10
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CHAPTER 10
HEALTH SERVICES; ENVIRONMENTAL HEALTH
SUBCHAPTER 10A
SANITATION

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ARTICLE 11 OF CHAPTER 130A
OF THE GENERAL STATUTES OF NORTH CAROLINA

SANITARY SEWAGE SYSTEMS

§ 130A-333. Purpose.--The General Assembly finds and declares that continued installation, at a rapidly and constantly accelerating rate, of septic tank systems and other types of sanitary sewage systems in a faulty or improper manner and in areas where unsuitable soil and population density adversely affect the efficiency and functioning of these systems, has a detrimental effect on the public health and environment through contamination of land, groundwater and surface waters. Recognizing, however, that sewage can be rendered ecologically safe and the public health protected if methods of sewage collection, treatment and disposal are properly regulated and recognizing that sanitary sewage collection, treatment and disposal will continue to be necessary to meet the needs of an expanding population, the General Assembly intends to ensure the regulation of sewage collection, treatment and disposal systems so that these systems may continue to be used, where appropriate, without jeopardizing the public health.

§ 130A-334. Definitions.--The following definitions shall apply throughout this Article:

(1) "Construction" means any work at the site of placement done for the purpose of preparing a residence, place of business or place of public assembly for initial occupancy, or subsequent additions or modifications which increase sewage flow.

(2) Repealed by Session Laws 1985, c. 462, s. 18, effective June 24, 1985.

(3) "Location" means the initial placement for occupancy of a residence, place of business or place of public assembly.

(4), (5) Repealed by Session Laws 1985, c. 462, s. 18, effective June 24, 1985.

(6) "Place of business" means a store, warehouse, manufacturing establishment, place of amusement or recreation, service station, office building or any other place where people work.

(7) "Place of public assembly" means a fairground, auditorium, stadium, church, campground, theater or any other place where people assemble.

(8) "Public or community sewage system" means a single system of sewage collection, treatment and disposal owned and operated by a sanitary district, a metropolitan sewage district, a water and sewer authority, a county or municipality or a public utility.

(9) "Relocation" means the displacement of a residence or place of business from one site to another.

(10) "Residence" means a private home, dwelling unit in a multiple family structure, hotel, motel, summer camp, labor work camp, manufactured home, institution or any other place where people reside.

(11) "Sanitary sewage system" means a complete system of sewage collection, treatment and disposal including approved privies, septic tank systems, connection to public or community sewage systems, sewage reuse or recycle systems, mechanical or biological treatment systems, or other such systems.

Properly managed chemical toilets used only for human waste at mass gatherings, construction sites and labor work camps are considered sanitary sewage systems.

(12) "Septic tank system" means a subsurface sanitary sewage system consisting of a settling tank and a subsurface disposal field.

(13) "Sewage" means the liquid and solid human body waste and liquid waste generated by water-using fixtures and appliances, including those associated with foodhandling. The term does not include industrial process wastewater or sewage that is combined with industrial process wastewater.

§ 130A-335. Sanitary sewage collection, treatment and disposal; rules.

(a) A person owning or controlling a residence, place of business or a place of public assembly shall provide a sanitary sewage system. A sanitary sewage system may include components for collection, treatment and disposal of sewage.

(b) Any public or community sanitary sewage system and any sanitary sewage system which is designed to discharge effluent to the land surface or surface waters shall be approved by the Department of Natural Resources and Community Development under rules adopted by the Environmental Management Commission. All other sanitary sewage systems shall be approved by the Department of Human Resources under rules adopted by the Commission for Health Services.

(c) A sanitary sewage system subject to approval under rules of the Commission shall be reviewed and approved under rules of a local board of health in the following circumstances:

- (1) The local board of health, on its own motion, has requested the Department to review its proposed rules concerning sanitary sewage systems; and
- (2) The local board of health has adopted by reference the sanitary sewage system rules adopted by the Commission, with any more stringent modifications or additions deemed necessary by the local board of health to protect the public health; and
- (3) The Department has found that the rules of the local board of health concerning sanitary sewage collection, treatment and disposal systems are at least as stringent as the Commission's rules, and are sufficient and necessary to safeguard the public health.

(d) The Department may, upon its own motion, upon the request of a local board of health or upon the request of a citizen of an affected county, review its findings under subsection (c) of this section. The Department shall review its findings

under subsection (c) of this section upon modification of the Commission's sanitary sewage system rules. The Department may deny, suspend, or revoke the approval of local board of health sanitary sewage system rules upon a finding that the local sewage rules are not as stringent as the Commission's rules, are not sufficient and necessary to safeguard the public health, or are not being enforced. Suspension and revocation of approval shall be in accordance with G.S. 130A-23.

(e) The rules of the Commission and the rules of the local board of health shall address at least the following: Sewage characteristics; Design unit; Design capacity; Design volume; Criteria for the design, installation, operation, maintenance and performance of sanitary sewage collection, treatment and disposal systems; Soil morphology and drainage; Topography and landscape position; Depth to seasonally high water table, rock and water impeding formations; Proximity to water supply wells, shellfish waters, estuaries, marshes, wetlands, areas subject to frequent flooding, streams, lakes, swamps and other bodies of surface or groundwaters; Density of sanitary sewage collection, treatment and disposal systems in a geographical area; Requirements for issuance, suspension and revocation of permits; and Other factors which affect the effective operation and performance of sanitary sewage collection, treatment and disposal systems. The rules regarding required design capacity and required design volume for sanitary sewage systems shall provide that exceptions may be granted upon a showing that a system is adequate to meet actual daily water consumption.

(f) The rules of the Commission and the rules of the local board of health shall classify sanitary systems of sewage collection, treatment and disposal according to size, type of treatment and any other appropriate factors. The rules shall provide construction requirements, standards for operation and ownership requirements for each classification of sanitary systems of sewage collection, treatment and disposal in order to prevent, as far as reasonably possible, any contamination of the land, groundwater and surface waters. The Department and local health departments may impose conditions on the issuance of permits and may revoke the permits for failure of the system to satisfy the conditions, the rules or this Article. The permits shall be valid for a period prescribed by the rules and may be renewed upon a showing satisfactory to the Department or the local health department that the system is in compliance with the current rules and this Article.

§ 130A-336. Improvement permit required.

(a) No person shall commence or assist in the construction, location or relocation of a residence, place of business or place of public assembly in an area not served by an approved sanitary sewage system unless an improvement permit is obtained from the local health department. This requirement shall not apply to a residence exhibited for sale or stored for later sale and intended to be located at another site after sale.

(b) The local health department shall issue an improvement permit authorizing work to proceed and the installation or repair of a sanitary sewage system when it has determined after a field investigation that the system can be installed and operated in compliance with the rules and this Article. No person shall commence or assist in the installation, construction, or repair of a sanitary sewage system, other than a connection to an approved public or community sewage system, or a repair of a sanitary sewage system, which repair is not an expansion or improvement of the system and which is made entirely within the property of the person making or contracting for the repair, unless the improvement permit has been obtained from the local health department. The Department and the local health department may impose conditions on the issuance of an improvement permit.

§ 130A-337. Inspection; operation permit required.

(a) No sanitary system of sewage collection, treatment and disposal shall be covered or placed into use by any person until an inspection by the local health department has determined that the system has been installed or repaired in accordance with any conditions of the improvement permit, the rules and this Article.

(b) Upon determining that the system is properly installed or repaired and that the system is capable of being operated in accordance with the conditions of the improvement permit, the rules, this Article and any conditions to be imposed in the operation permit, the local health department shall issue an operation permit authorizing the residence, place of business or place of public assembly to be occupied and for the system to be placed into use. However, if the system is limited to a single septic tank system without a pump or other appurtenances serving a single one-family dwelling, then a certificate of completion shall be issued instead of an operation permit; also, if the system is limited to a single septic tank system without a pump or other appurtenances serving a single residence other than a one-family dwelling, or serving a place of business or a place of public assembly and having a design daily flow of not more than 480 gallons, then a certificate of completion shall be issued instead of an operation permit. A certificate of completion shall be issued when the septic tank system is properly installed or repaired and is capable of being operated in accordance with the conditions of the improvement permit, the rules and this Article.

(c) Upon determination that an existing sanitary sewage system has a valid operation permit or a valid certificate of completion and is operating properly in a manufactured home park, the local health department shall issue authorization in writing for a manufactured home to be connected to the existing system and to be occupied. Notwithstanding G.S. 130A-336, an improvement permit is not required for the connection of a manufactured home to an existing system with a valid operation

permit or a valid certificate of completion in a manufactured home park.

(d) No person shall occupy a residence, place of business or place of public assembly, or place a sanitary sewage system into use or reuse for a residence, place of business or place of public assembly until an operation permit or a certificate of completion has been issued or authorization has been obtained pursuant to G.S. 130A-337(c).

§ 130A-338. Improvement permit or authorization required before other permits to be issued.--Where construction, location or relocation is proposed to be done upon a residence, place of business or place of public assembly, no permit required for electrical, plumbing, heating, air conditioning or other construction, location or relocation activity under any provision of general or special law shall be issued until an improvement permit has been issued under G.S. 130A-336 or authorization has been obtained under G.S. 130A-337(c).

§ 130A-339. Limitation on electrical service.--No person shall allow permanent electrical service to a residence, place of business or place of public assembly upon construction, location or relocation until the official electrical inspector with jurisdiction as provided in G.S. 143-143.2 certifies to the electrical supplier that the required improvement permit and an operation permit, a certificate of completion or authorization under G.S. 130A-337(c) has been obtained. Temporary electrical service necessary for constructing a residence, place of business or place of public assembly can be provided upon compliance with G.S. 130A-338.

§ 130A-340 to 130A-345: Reserved for future codification purposes.

10 NCAC 10A .1934 - .1968; SANITARY SEWAGE COLLECTION, TREATMENT, AND DISPOSAL; has been adopted and reads as follows:

.1934 GENERAL

(a) The rules contained in this section shall govern the treatment and disposal of domestic type sewage from septic tank systems, privies, incinerating toilets, mechanical toilets, composting toilets, recycling toilets, or other such systems serving single or multiple-family residences, places of business, or places of public assembly, the effluent from which is designed not to discharge to the land surface or surface waters. The purpose of these rules is to:

- (1) Insure that sewage, as defined in this section, shall be collected, treated, and disposed of in a manner to protect the health, environment, and well-being of the general public;
- (2) Provide minimum requirements for the design, installation, and use of ground absorption sewage treatment and disposal systems, including septic tank systems and other on-site systems, which serve any residence, place of business, or place of public assembly;
- (3) Provide the state and local public health agencies with minimum standards to be used in determining whether a site or system can be utilized for the treatment and disposal of sewage; and
- (4) Provide the public with the minimum requirements necessary to secure a permit for a sewage treatment and disposal system.

(b) Any public or community sewage system and any system which discharges to the land surface or surface waters shall be approved by the Department of Natural Resources and Community Development under rules promulgated by the Environmental Management Commission.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.

.1935 DEFINITIONS

The following definitions shall apply throughout this section:

- (1) "Alluvial soils" means stratified soils without distinct horizons, deposited by flood waters.
- (2) "Alternative system" means any approved ground absorption sewage treatment and disposal system other than an approved privy or an approved septic tank system.
- (3) "Approved" means that which has been considered acceptable to the state or local health department.
- (4) "Approved privy" means a fly-tight structure consisting of a pit, floor slab, and seat riser constructed in accordance with .1959 of this section.
- (5) "Approved public or community sewage system" means a single system of sewage collection, treatment, and disposal owned and operated by a sanitary district, a metropolitan sewage district, a water and sewer authority,

- a county or municipality, or a public utility, constructed and operated in compliance with applicable requirements of the Department of Natural Resources and Community Development.
- (6) "Areas subject to frequent flooding" means those areas inundated at a ten-year or less frequency and includes alluvial soils and areas subject to tidal or storm overwash.
 - (7) " 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.
 - (8) "Effluent" means the liquid discharge of a septic tank or other sewage treatment device.
 - (9) "Ground absorption sewage treatment and disposal system" means a system that utilizes the soil for the subsurface disposal of partially treated or treated sewage effluent.
 - (10) "Horizon" means a layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil forming processes.
 - (11) "Local health department" means any county, district, or other health department authorized to be organized under the General Statutes of North Carolina.
 - (12) "Nitrification field" means the area in which the nitrification lines are located.
 - (13) "Nitrification lines" means approved pipe, specially designed porous blocks, or other approved materials which receive partially treated sewage effluent for distribution and absorption into the soil beneath the ground surface.
 - (14) "Non-ground absorption sewage treatment system" means a facility for waste treatment designed not to discharge to the soil, land surface, or surface waters, including but not limited to, approved vault privies, incinerating toilets, mechanical toilets, composting toilets, chemical toilets, and recycling systems.
 - (15) "Organic soils" means those organic mucks and peats consisting of more than 20 percent organic matter to depths of 18 inches or greater.
 - (16) "Parent material" means the mineral matter that is in its present position through deposition by water, wind, gravity or by decomposition of rock and exposed at the land surface or overlain by soil or saprolite.
 - (17) "Ped" means a unit of soil structure, such as an aggregate, crumb, prism, block, or granule formed by natural processes.
 - (18) "Perched water table" means a saturated zone, generally above the natural water table, as identified by drainage mottles caused by a restrictive horizon.
 - (19) "Person" means any individual, firm, association, organization, partnership, business trust, corporation, company, or unit of local government.

- (20) "Place of business" means any store, warehouse, manufacturing establishment, place of amusement or recreation, service station, foodhandling establishment, or any other place where people work or are served.
- (21) "Place of public assembly" means any fairground, auditorium, stadium, church, campground, theater, school, or any other place where people gather or congregate.
- (22) "Privy building" means and includes any and all buildings which are used for privacy in the acts of urination and defecation which are constructed over pit privies and are not connected to a ground absorption sewage treatment and disposal system or a public or community sewage system.
- (23) "Relocation" means the displacement of a residence, place of business, or place of public assembly from one location to another.
- (24) "Repair area" means an area, either in its natural state or which is capable of being modified, consistent with these rules, which is reserved for the installation of additional nitrification fields and is not covered with structures or impervious materials.
- (25) "Residence" means any home, hotel, motel, summer camp, labor work camp, mobile home, dwelling unit in a multiple-family structure, or any other place where people reside.
- (26) "Restrictive horizon" means a soil horizon that is brittle and strongly compacted or strongly cemented with iron, aluminum, silica, organic matter, or other compounds capable of perching ground water or sewage effluent.
- (27) "Rock" means the consolidated or partially consolidated mineral matter or aggregate, including bedrock or weathered rock, not exhibiting the properties of soil and exposed at the land surface or overlain by soil or saprolite.
- (28) "Sanitary system of sewage treatment and disposal" means a complete system of sewage collection, treatment and disposal, including approved privies, septic tank systems, connection to public or community sewage systems, incinerators, mechanical toilets, composting toilets, recycling toilets, mechanical aeration systems, or other such systems.
- (29) "Saprolite" means thoroughly decomposed earthy mineral matter, weathered in place from igneous or metamorphic rock and usually overlain by soil and exhibiting some properties of rock.
- (30) "Septage" means a waste that is a fluid mixture of partially treated sewage solids, liquids, and sludge of human or domestic waste origin pumped from septic tanks, residential grease traps, or privies.
- (31) "Septic tank" means a water-tight, covered receptacle designed for primary treatment of sewage and constructed to:

- (a) Receive the discharge of sewage 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 clarified liquids to discharge for additional treatment and final disposal.
- (32) "Septic tank system" means a subsurface sanitary sewage system consisting of a settling tank and a subsurface disposal field.
 - (33) "Sewage" means the liquid and solid human waste and liquid waste generated by water-using fixtures and appliances, including those associated with food handling. The term does not include industrial process wastewater or sewage that is combined with industrial process wastewater.
 - (34) "Site" means the area in which the sewage treatment and disposal system is to be located and the area required to accommodate repairs and replacement of nitrification field and permit proper functioning of the system.
 - (35) "Soil" means the naturally occurring, unconsolidated mineral and organic material of the land surface developed from rock or other parent material and consists of sand, silt, and clay-sized particles and variable amount of organic materials. Soil does not exhibit properties of rock or parent material. However, zones of transition in which soil characteristics predominate shall be considered soil.
 - (36) "State" means the Department of Human Resources, Division of Health Services.
 - (37) "Structure," as it relates to soil, means the arrangement of primary soil particles into compound particles, peds, or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles.
 - (38) "Subsurface disposal" means the application of sewage effluent beneath the surface of the ground by distribution through approved nitrification lines.

History Note: Statutory Authority G.S. 130A-335(e);
 Eff. July 1, 1982;
 Amended Eff. August 1, 1988;
 April 1, 1985; January 1, 1984;
 October 1, 1983.

.1936 REQUIREMENTS FOR SEWAGE TREATMENT AND DISPOSAL

(a) Every residence, place of business, or place of public assembly shall be provided with an approved sanitary system of sewage collection, treatment, and disposal as defined in this section that is properly designed, installed, operated, and maintained to assure adequate performance.

(b) Nothing in this section shall prohibit the state or local health department from permitting approved alternative ground absorption sewage treatment and disposal systems or approved non-ground absorption treatment systems.

(c) Nothing in this section shall prohibit the state or local public health agency from permitting the use of portable toilets at construction sites or at mass gathering events of a temporary nature, provided such use shall be contingent upon the provision of adequate cleaning and disposal service in accordance with the directions of the state or local health department.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.

.1937 PERMITS

(a) An Improvement Permit shall be required before a ground absorption or a nonground absorption sewage treatment and disposal system is initially installed to serve a residence, place of business, or place of public assembly and before subsequent additions thereto which increase sewage flow and any repairs or renovations to a sewage treatment and disposal system.

(b) No person shall construct, install, repair, or renovate, or cause to be constructed, installed, repaired, or renovated any ground absorption sewage treatment and disposal system without first having obtained an Improvement Permit from the local health department. The local health department shall issue an Improvement Permit only after it has determined that the system is designed and can be installed so as to meet the provisions of these rules. An Improvement Permit shall be valid for 36 months from the date of issue. If the installation has not been completed during that time period, the information submitted in the application for an Improvement Permit is falsified or changed, or the site is altered, the permit shall become invalid. When an Improvement Permit has become invalid, the installation shall not be commenced or completed until a new Improvement Permit has been obtained.

(c) Application for an Improvement Permit shall be submitted to the local health department. The application shall contain at least the following information: name of owner, mailing address, location of property, plat of property (if not readily available to local health department), type of facility, estimated sewage flow based on number of bedrooms or number of persons served, type of water supply, and signature of owner or authorized agent.

(d) Application for an Improvement Permit for a ground absorption sewage treatment and disposal system to serve a condominium or other multiple-family development where the system will be under common or joint control shall be made by submitting a properly executed agreement (tri-party) among the local health department, developer, and homeowners association to the local health department which addresses ownership, transfer of ownership, maintenance, repairs, operation, and performance, and necessary funds.

(e) No residence, place of business, or place of public assembly shall be occupied nor shall any sanitary sewage system be covered or placed into use until the local health department finds that the system is in compliance with Article 11 of G.S. Chapter 130A, these rules, and all conditions prescribed by the Improvement Permit, and issues a Certificate of Completion or an Operation Permit. The Operation Permit shall be valid as long as the sanitary sewage system is in compliance with Article 11 of G.S. Chapter 130A, these rules, and all conditions imposed by the Operation Permit.

(f) Upon determining that an existing sanitary sewage system has a valid Operation Permit or a valid Certificate of Completion and is operating satisfactorily in a mobile home park, the local health department shall issue a written authorization for a mobile home to be connected to the existing system and to be occupied.

(g) Any person other than the owner or controller of a residence, place of business, or place of public assembly, who engages in the business of constructing, installing, or repairing sewage treatment and disposal systems, or the collection, hauling, and disposal of septage from septic tanks shall register with the local health department in each county where he operates before constructing, installing, or repairing sewage treatment and disposal systems, or collecting and disposing of septage from septic tanks.

(h) Systems which exceed 3,000 gallons per day and other systems which are required to be designed by a professional engineer shall be reinspected annually.

History Note: Statutory Authority G.S. 130A-294; 130A-335(e);
Eff. July 1, 1982;
Amended Eff. January 1, 1984.

.1938 RESPONSIBILITIES

(a) The design, construction, operation, and maintenance of sewage treatment and disposal systems, whether septic tank systems, privies or alternative systems, shall be the responsibility of the designer, owner, developer, installer, or user of the system as applicable.

(b) Actions of representatives of state or local health departments engaged in the evaluation and determination of measures required to effect compliance with the provisions of this section shall in no way be taken as a guarantee that sewage treatment and disposal systems approved and permitted will function in a satisfactory manner for any given period of time, or that such employees assume any liability for damages, consequential or direct, which are caused, or which may be caused, by a malfunction of such systems.

(c) Plans and specifications prepared by a person with a demonstrated knowledge of ground absorption sewage treatment disposal systems, soil and rock characteristics, ground-water hydrology, and drainage systems may be required for review and approval by the local health department where the design sewage

flow exceeds 600 gallons per day and shall be required for alternative systems and extensive drainage systems prior to the issuance of an Improvement Permit.

(d) Sewage treatment and disposal systems not specifically described in the rules of this section or any systems which require complex pumping, treatment, or pretreatment before disposal, other than by a conventional septic tank, collection sewers, structures which have not been pre-engineered, and any other systems so specified by the local health department shall be designed by a professional engineer currently licensed by the State of North Carolina and approved by the local health department. Application rates for such systems shall be in accordance with this section unless other rates are certified acceptable by the professional engineer or by a soil scientist and approved by the local health department. Plans and specifications for such systems, including methods of operation and maintenance, shall be approved prior to issuance of an Improvements Permit, and the Certificate of Completion shall not be issued until the design engineer certifies to the local health department that the system was installed in accordance with the approved plans and specifications.

(e) The state (DHR) shall review the plans and specifications for any sanitary sewage system where the design sewage flow exceeds 3,000 gallons per day, except where the sanitary sewage system is limited to an individual septic tank system serving an individual dwelling unit or several individual septic tank systems each serving an individual dwelling unit.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.
Amended Eff. April 1, 1985.

.1939 SITE EVALUATION

(a) The local health department shall investigate each proposed site. The investigation shall include the evaluation of the following factors:

- (1) Topography and landscape position;
- (2) Soil characteristics (morphology) which includes texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of various horizons, and the thickness and arrangement of the horizons in a soil profile;
- (3) Soil drainage which includes both external (surface) and internal (soil);
- (4) Soil depth;
- (5) Restrictive horizons; and
- (6) Available space.

(b) Site evaluations shall be made in accordance with .1940-.1948 of this section. Based on this evaluation, each of the factors listed in paragraph (a) of this rule shall be classified as SUITABLE (S), PROVISIONALLY SUITABLE (PS), or UNSUITABLE (U).

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.

.1940 TOPOGRAPHY AND LANDSCAPE POSITION

(a) Uniform slopes under 15 percent shall be considered SUITABLE with respect to topography. When slopes are less than two percent, provisions shall be made to insure adequate surface drainage. When slopes are greater than four percent, the nitrification lines shall follow the contour of the ground.

(b) Uniform slopes between 15 percent and 30 percent shall be considered PROVISIONALLY SUITABLE with respect to topography, if the soils are deep (36 inches or more). Slopes within this range may require installation of interceptor drains upslope from the soil absorption system to remove all excess water that might be moving laterally through the soil during wet periods of the year. Usable areas larger than minimum are ordinarily required in this slope range.

(c) Slopes greater than 30 percent shall be considered UNSUITABLE except when a thorough study of the soil characteristics indicates that a soil absorption system will function satisfactorily and sufficient ground area is available to properly install such a system. Slopes greater than 30 percent may be classified as PROVISIONALLY SUITABLE when:

- (1) The slope can be terraced or otherwise graded or the nitrification lines located in naturally occurring soil so as to maintain a minimum 10-foot horizontal distance from the nitrification trench and the top edge of the fill embankment;
- (2) The soil characteristics can be classified as SUITABLE or PROVISIONALLY SUITABLE to a depth of at least one foot below the bottom of the nitrification trench;
- (3) Surface water runoff is diverted around the nitrification field so that there will be no scouring or erosion of the soil over the field;
- (4) If necessary, ground-water flow is intercepted and diverted to prevent such water from running into or saturating the soil absorption system; and
- (5) There is sufficient ground area available to install the septic tank system with these modifications.

(d) Complex slope patterns and slopes dissected by gullies and ravines shall be considered UNSUITABLE with respect to topography.

(e) Areas subject to frequent flooding shall be considered UNSUITABLE with respect to landscape position.

(f) Depressions shall be considered UNSUITABLE with respect to landscape position except when the site complies essentially with the requirements of this section and is specifically approved by the local health department.

(g) The surface area on or around a ground absorption sewage treatment and disposal system shall be landscaped to provide adequate drainage if directed by the local health department. The interception of perched or lateral ground-water movement shall be provided where necessary to prevent soil saturation on or around the ground absorption sewage treatment and disposal system.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.

.1941 SOIL CHARACTERISTICS (MORPHOLOGY)

Soil borings shall be taken at the site to be used for soil absorption systems. Such borings shall be taken to a depth of 48 inches or as required to determine the soil characteristics. Soil borings and core samples shall be evaluated and a determination made as to the suitability of the soil to treat and absorb septic tank effluent. The important soil characteristics which shall be evaluated by the local health department are as follows:

- (1) Texture - The relative amounts of the different sizes of mineral particles in a soil are referred to as soil texture. All soils are composed of sand, (2.0 - 0.05 mm in size); silt, which includes intermediate-sized particles that cannot be seen with the naked eye, but feels like flour when pressed between the fingers, (0.05 - 0.002 mm in size); and clay, which is extremely small in size and is the mineral particle that gives cohesion to a soil (less than 0.002 mm in size). The texture of the different horizons of soils may be classified into four general groups and shall be used for determining the application rates shown in Tables II and III.
 - (a) SOIL GROUP I - Sandy texture soils contain more than 70 percent sand-sized particles in the soil mass. These soils do not have enough clay to be cohesive. Sandy soils have favorable sewage application rates, but may have a low filtering capacity leading to malfunction due to contamination of ground water. The sandy group includes the sand and loamy sand soil textural classes and shall generally be considered SUITABLE with respect to texture.
 - (i) Sand: Sand has a gritty feel, does not stain the fingers, and does not form a ribbon or ball when wet or moist.
 - (ii) Loamy Sand: Loamy sand has a gritty feel, stains the fingers (silt and clay), forms a weak ball, and cannot be handled without breaking.
 - (b) SOIL GROUP II - Coarse loamy texture soils contain more than 30 percent sand-sized particles and less than 20 percent clay-sized particles in the soil mass. They exhibit slight or no stickiness. The coarse loamy group includes sandy loam and loam soil textural classes and shall generally be considered SUITABLE with respect to texture.
 - (i) Sandy Loam: Sandy loam has a gritty feel and forms a ball that can be picked up with the fingers and handled with care without breaking.
 - (ii) Loam: Loam may have a slightly gritty feel but does not show a fingerprint and forms only short ribbons of from 0.25 inch to 0.50 inch in length. Loam will form a ball that can be handled without breaking.
 - (c) SOIL GROUP III - Fine loamy texture soils contain less than 40 percent clay-sized particles and not

more than 30 percent sand-sized particles in a soil mass. They exhibit slight to moderate stickiness. The fine loamy group includes sandy clay loam, silt loam, clay loam, and silty clay loam textural classes and shall generally be considered PROVISIONALLY SUITABLE with respect to texture.

- (i) Silt Loam: Silt loam has a floury feel when moist and will show a fingerprint but will not ribbon and forms only a weak ball.
 - (ii) Silt: Silt has a floury feel when moist and sticky when wet but will not ribbon and forms a ball that will tolerate some handling.
 - (iii) Sandy Clay Loam: Sandy clay loam has a gritty feel but contains enough clay to form a firm ball and may ribbon to form 0.75-inch to one-inch long pieces.
 - (iv) Silty Clay Loam: Silty clay loam is sticky when moist and will ribbon from one to two inches. Rubbing silty clay loam with the thumbnail produces a moderate sheen. Silty clay loam produces a distinct fingerprint.
 - (v) Clay Loam: Clay loam is sticky when moist. Clay loam forms a thin ribbon of one to two inches in length and produces a slight sheen when rubbed with the thumbnail. Clay loam produces a nondistinct fingerprint.
- (d) SOIL GROUP IV - Clayey texture soils contain 40 percent or more clay-sized particles and include sandy clay, silty clay, and clay. There are two major types of clays: the 1:1 clays (Kaolinite) which do not shrink or swell extensively when dried or wetted; and the 2:1 clays (Montmorillonite) including mixed mineralogy clays, with both Kaolinite and Montmorillonite, that will shrink and swell when dried and wetted. The 1:1 clays, when wet, are slightly sticky to sticky; when moist, are friable to firm; and when dry, are slightly hard to hard. The 1:1 clays (Group IVa) shall generally be considered PROVISIONALLY SUITABLE as to texture. The 2:1 and mixed mineralogy clays, when wet, are very sticky and very plastic; and, when moist, these clays are very firm to extremely firm; and when dry, are very hard to extremely hard. The 2:1 and mixed mineralogy clays (Group IVb) shall be considered UNSUITABLE as to texture.
- (i) Sandy Clay: Sandy clay is plastic, gritty, and sticky when moist and forms a firm ball and produces a thin ribbon to over two inches in length.
 - (ii) Silty Clay: Silty clay is both plastic and sticky when moist and lacks any gritty feeling. Silty clay forms a firm ball and readily ribbons to over two inches in length.

- (iii) Clay: Clay is both sticky and plastic when moist, produces a thin ribbon over two inches in length, produces a high sheen when rubbed with the thumbnail, and forms a strong ball resistant to breaking.
- (e) The soil texture shall be estimated by field testing, as described in .1941(1). Laboratory estimation of texture by particle-size analysis may be substituted for field testing when conducted in accordance with ASTM (American Society for Testing and Materials) C-136 and D-422 standards for sieve and hydrometer analyses which are hereby adopted by reference. Copies of the standards may be inspected in and copies obtained from the Office of Administrative Procedures, Division of Health Services, P.O. Box 2091, Raleigh, N.C. 27602-2091.
- (2) Soil Consistence - Soil consistence comprises the attributes of soil material, typically clay, that are expressed by the degree and kind of cohesion and adhesion or by the resistance to deformation or rupture.
 - (a) SOIL CONSISTENCE WHEN WET
 - (i) Stickiness - Stickiness is the quality of adhesion to other objects. For field evaluation of stickiness, wet soil material is pressed between thumb and finger and its adherence noted. Degrees of stickiness are described as follows:
 - (A) Slightly sticky: After pressure, soil material adheres to both thumb and finger but comes off one or the other rather cleanly. It is not appreciably stretched when the digits are separated.
 - (B) Sticky: After pressure, soil material adheres to both thumb and finger and tends to stretch somewhat and pull apart rather than pulling free from either digit.
 - (C) Very sticky: After pressure, soil material adheres strongly to both thumb and finger and is decidedly stretched when they are separated.
 - (ii) Plasticity - Plasticity is the ability to change shape continuously under the influence of an applied stress and to retain the impressed shape on removal of the stress. For field determination of plasticity, roll the soil material between thumb and finger and observe whether or not a wire or thin rod of soil can be formed. Degree of resistance to deformation at or slightly above field capacity as follows:
 - (A) Slightly plastic: Wire formable but soil mass easily deformable.
 - (B) Plastic: Wire formable and moderate pressure required for deformation of the soil mass.

- (C) Very plastic: Wire formable and much pressure required for deformation of the soil mass.
- (b) SOIL CONSISTENCE WHEN MOIST - Consistence when moist is determined at a moisture content approximately midway between air dry and field capacity. At this moisture content most soil materials exhibit a form of consistence characterized by: tendency to break into smaller masses rather than into powder; some deformation prior to rupture; absence of brittleness; and ability of the material after disturbance to cohere again when pressed together. To evaluate this consistence, select and attempt to crush in the hand a mass that appears slightly moist.
- (i) Friable: Soil material crushes easily under gentle to moderate pressure between thumb and finger, and coheres when pressed together.
 - (ii) Firm: Soil material crushes under moderate pressure between thumb and finger but resistance is distinctly noticeable.
 - (iii) Very firm: Soil material crushes under strong pressure; barely crushable between thumb and finger.
 - (iv) Extremely firm: Soil material crushes only under very strong pressure; cannot be crushed between thumb and finger and must be broken apart bit by bit.
- (c) SOIL CONSISTENCE WHEN DRY - The consistence of soil materials when dry is characterized by rigidity, brittleness, maximum resistance to pressure, more or less tendency to crush to a powder or to fragments with rather sharp edges, and inability of crushed material to cohere again when pressed together. To evaluate, select an air-dry mass and break in the hand.
- (i) Slightly Hard: Weakly resistant to pressure; easily broken between thumb and finger.
 - (ii) Hard: Moderately resistant to pressure; can be broken in the hands without difficulty but is barely breakable between thumb and finger.
 - (iii) Very Hard: Very resistant to pressure; can be broken in the hands only with difficulty; not breakable between thumb and finger.
 - (iv) Extremely hard: Extremely resistant to pressure; cannot be broken in the hands.
- (3) Organic Soils - Organic soils shall be considered UNSUITABLE.
- (4) Soil Structure - In many soils, the sand, silt, and clay particles tend to cling or stick to one another to form a ped or a clump of soil. This is known as soil structure. Soil structure may have a significant effect on the movement of effluent through a soil. The structure may determine the rate of movement of liquids through clayey soils. Structure is usually not important in

soil Groups I and II, and these types of soils shall generally be considered SUITABLE as to structure. The three kinds of soil structure that are most significant in movement of sewage effluent through Groups III and IV soils are block-like, platy, and the absence of soil structure or massive conditions are described as follows:

- (a) BLOCK-LIKE SOIL STRUCTURE
 - (i) In Groups III and IV soils, if the soil exhibits many peds of angular and subrounded peds, then the soils have block-like structure. The sewage effluent may move between the cracks of these types of peds. Block-like soil structure in Groups III and IV soils is frequently destroyed by mechanical equipment manipulating the soil when it is too wet. Trenches for nitrification lines being placed in Groups III and IV soils with block-like structure should only be dug when soils are moist or dry. Block-like soil structure in Groups III and IV soils shall be considered PROVISIONALLY SUITABLE as to structure.
 - (ii) Some rocks, even though weathered, such as slates or creviced or fractured rocks, exhibit block-like structure, which is not changed by moving water, thereby allowing fluids to move downward without filtration. Rock shall be considered UNSUITABLE as to structure.
- (b) PLATY SOIL STRUCTURE - If Groups III and IV soils fall out into plate-like sheets, then the soil would have platy structure. Water or effluent movement through these soils would be extremely slow, and the structure shall be considered UNSUITABLE.
- (c) ABSENCE OF SOIL STRUCTURE - Some Groups II, III, and IV soils are massive and exhibit no structural aggregates. In these kinds of soils, water or effluent movement would be negligible. Such structure shall be considered UNSUITABLE.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.

.1942 SOIL DRAINAGE

Soils with seasonally high water tables are of major concern in evaluating sites for sewage effluent disposal. These are the soil areas that give good sewage absorption rates during dry seasons of the year but force sewage effluent to the surface during the wetter seasons. The depth of the seasonal high water table can commonly be recognized by those examining soil profiles. The criterion for recognition of high water tables is that of soil color. Subsurface horizons that are in colors of reds, yellows, and browns generally indicate good soil aeration and drainage throughout the year. Subsurface horizons that are in colors of grey, olive or bluish colors indicate

poor aeration and poor soil drainage. These dull or greyish colors may occur as a solid mass of soil or may be in mottles of localized spots. The volume of greyish colors is indicative of the length of time that free water stands in that soil profile. There are soils that have light-colored mottles which are relic from the light-colored rock from which the soils have weathered. These soils would not have high water tables, so one must distinguish between a true soil composed of sand, silts and clays, or the rock material that may still exist in the soil profile. Any soil profile that has the greyish colors of chroma 2 or less (Munsell color chart) indicative of high water tables, or is subject to tidal or periodic high water, within 36 inches of the surface, shall be considered UNSUITABLE as to drainage. Soils where the seasonally high water table is less than 48 inches and more than 36 inches below the naturally occurring soil surface shall be considered PROVISIONALLY SUITABLE with respect to soil drainage. Soils where the seasonally high water table is greater than 48 inches below the naturally occurring soil surface shall be considered SUITABLE with respect to soil drainage. Where the soil is considered suitable as to structure and texture, (Soil Groups I and II) and modifications can be made to maintain the ground-water table at least 12 inches below the bottom of the nitrification trench at all times, such soils may be reclassified PROVISIONALLY SUITABLE as to drainage. Drainage systems installed for ground-water lowering shall be maintained so that a minimum separation of one foot occurs between the nitrification trench bottom and the seasonally high water table. For extensive drainage systems, such as ground-water lowering in subdivisions, easements shall be recorded and shall have adequate width for reasonable egress and ingress for maintenance.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.

.1943 SOIL DEPTH

(a) Soil depths to saprolite, rock, or parent material greater than 48 inches shall be considered SUITABLE as to soil depth. Soil depths to saprolite, rock, or parent material between 36 inches and 48 inches shall be considered PROVISIONALLY SUITABLE as to soil depth. Soil depths to saprolite, rock, or parent material less than 36 inches shall be classified UNSUITABLE as to soil depth.

(b) Where the site is UNSUITABLE with respect to depth, it may be reclassified PROVISIONALLY SUITABLE after a special investigation indicates that a modified or alternative system can be installed in accordance with rule .1956 or rule .1957 of this section.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982;
Amended Eff. August 1, 1988.

.1944 RESTRICTIVE HORIZONS

Restrictive horizons in soils are recognized by their apparent resistance in excavation or in using a soil auger. Restrictive horizons may occur as fragipans or iron pans. These horizons are compacted soil or are cemented with iron oxide or other oxides and vary in color from red to grey. Other common restrictive horizons are ones in which materials, composed of organic matter and aluminum with or without iron, have precipitated. These materials cement the mineral soils and tend to fill the voids with silt-sized particles. These horizons are commonly referred to as organic hardpans. They may be black, dark reddish-brown, or grey in color.

Restrictive horizons that are greater than three inches thick severely restrict the movement of water and sewage effluent and do not adequately respond to ground-water lowering drainage systems. Where these horizons are less than three inches thick, they do not severely restrict the movement of water and sewage effluent, but rather indicate the presence of a seasonally high water table and after special investigation may be modified as required in .1942 of this section.

Soils in which restrictive horizons are three inches or more in thickness and at depths greater than 48 inches below the ground surface shall be considered SUITABLE as to depth to restrictive horizons. Restrictive horizons three inches or more in thickness and at depths between 48 inches and 36 inches shall be considered PROVISIONALLY SUITABLE as to depth to restrictive horizons. Restrictive horizons three inches or more in thickness encountered at depths less than 36 inches and greater than 12 inches below the ground surface shall be considered UNSUITABLE as to depth to restrictive horizons.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982;
Amended Eff. October 1, 1983.

.1945 AVAILABLE SPACE

(a) Sites shall have sufficient available space to permit the installation and proper functioning of ground absorption sewage treatment and disposal systems, based upon the square footage of nitrification field required for the application rate determined in accordance with these rules.

(b) Sites shall have sufficient available space for a repair area equal to the area determined in .1945(a) of this section.

(c) The repair area requirement of paragraph (b) of this rule shall not apply to a lot or tract of land:

- (1) which is specifically described in a document on file with the local health department on July 1, 1982, or which is specifically described in a recorded deed or a recorded plat on January 1, 1983; and
- (2) which is of insufficient size to satisfy the repair area requirement of paragraph (b) of this Rule, as determined by the local health department; and
- (3) on which a ground absorption sewage treatment and disposal system with a design daily flow of:

- (A) no more than 480 gallons is to be installed; or
- (B) more than 480 gallons is to be installed if application for an improvement permit which meets the requirements of Rule .1937(c) of this subchapter is received by the local health department on or before April 1, 1983.

(d) Although a lot or tract of land is exempted under paragraph (c) from the repair area requirement of paragraph (b), the maximum feasible area, as determined by the local health department, shall be allocated for a repair area.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982;
Amended Eff. July 1, 1983; January 1, 1983.

.1946 OTHER APPLICABLE FACTORS

The site evaluation should include consideration of any other applicable factors involving accepted public health principles, such as:

- (1) The proximity of a large-capacity water-supply well, the cone of influence of which would dictate a larger separation distance than the minimum distance specified in .1950 of this section;
- (2) The potential public health hazard of possible failures of soil absorption systems involving large quantities of sewage, which would dictate larger separation distances than the minimums specified in .1950 of this section;
- (3) The potential public health hazard of possible massive failures of soil absorption systems proposed to serve large numbers of residences, as in residential subdivisions or mobile home parks.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.

.1947 DETERMINATION OF OVERALL SITE SUITABILITY

All of the criteria in .1940-.1946 of this section shall be determined to be SUITABLE, PROVISIONALLY SUITABLE, or UNSUITABLE, as indicated. If all criteria are classified the same, that classification will prevail. Where there is a variation in classification of the several criteria, the following shall be used in making the overall site classification. The lowest of the uncorrectable characteristics will determine the overall site classification.

- (1) If the topography is classified as unsuitable, it may be reclassified provisionally suitable under the conditions outlined in .1940 of this section.
- (2) If the soil texture is classified as unsuitable, the overall classification will be unsuitable regardless of the other criteria unless the provisions of .1948(c) of this section are met.
- (3) If the soil structure is classified as unsuitable, the overall classification will be unsuitable, regardless of the classification of the other criteria unless provisions of .1948(c) of this section are met.

- (4) When soil depth is classified as unsuitable, it may be reclassified as provisionally suitable under the conditions outlined in .1943 of this section.
- (5) When the restrictive horizon is classified unsuitable, it may be reclassified as provisionally suitable under the conditions outlined in .1948(c) of this section.
- (6) When drainage (ground-water level) is unsuitable, it may be reclassified as provisionally suitable under the conditions outlined in .1942 of this section.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.

.1948 SITE CLASSIFICATION

(a) Sites classified as SUITABLE may be utilized for a ground absorption sewage treatment and disposal system consistent with these rules. A suitable classification generally indicates soil and site conditions favorable for the operation of a ground absorption sewage treatment and disposal system or have slight limitations that are readily overcome by proper design and installation.

(b) Sites classified as PROVISIONALLY SUITABLE may be utilized for a ground absorption sewage treatment and disposal system consistent with these rules but have moderate limitations. Sites classified provisionally suitable require some modifications and careful planning, design, and installation in order for a ground absorption sewage treatment and disposal system to function satisfactorily.

(c) Sites originally classified as UNSUITABLE may be used for soil absorption disposal systems, provided engineering, hydrogeologic, and soil studies indicate to the local health department that a suitable septic tank system or a suitable alternate system can reasonably be expected to function satisfactorily. Such sites may be reclassified as PROVISIONALLY SUITABLE upon submission to the local health department and when requested by the local health department to the state agency of the following:

- (1) Adequate substantiating data to indicate that a ground absorption system can be installed so that the effluent will receive adequate treatment;
- (2) Adequate substantiating data to indicate that the effluent will not contaminate any drinking water supply, ground water used for drinking water, or any surface water;
- (3) Adequate substantiating data to indicate that the effluent will not be exposed on the ground surface or be discharged to surface waters where it could come in contact with people, animals, or vectors.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.

.1949 SEWAGE FLOW RATES FOR SEWAGE SYSTEMS

(a) In determining the volume of sewage from dwelling units, the flow rate shall be 120 gallons per day per bedroom. The minimum volume of sewage from each dwelling unit shall be 240 gallons per day and each additional bedroom above two bedrooms shall increase the volume of sewage by 120 gallons per day. In determining the number of bedrooms in a dwelling unit, each bedroom and any other room or addition that can reasonably be expected to function as a bedroom shall be considered a bedroom for design purposes. When the occupancy of a dwelling unit exceeds two persons per bedroom, the volume of sewage shall be determined by the maximum occupancy at a rate of 60 gallons per person per day.

(b) Table No. I shall be used to determine the design daily flow of sewage that are minimums required for use in calculating the design volume of septic tanks and the design capacity of nitrification fields to serve selected types of establishments. Design of sewage treatment and disposal systems not identified below shall be determined using available flow data, water-using fixtures, occupancy or operation patterns, and other measured data.

TABLE NO. I

<u>TYPE OF ESTABLISHMENT</u>	<u>DAILY FLOW FOR DESIGN</u>
Airports.....	5 gal/passenger
(Also R.R. stations, bus terminals--not including food service facilities)	
Barber Shops.....	50 gal/chair
Bars, Cocktail Lounges (Not including food service).....	20 gal/seat
Beauty Shops (Style Shops).....	125 gal/chair
Bowling Alleys.....	50 gal/lane
Camps	
Construction or Work Camps.....	60 gal/person
Summer Camps.....	60 gal/person
Campgrounds.....	150 gal/campsite
Churches.....	5 gal/seat
Country Clubs	
Resident Members.....	60 gal/resident member
Nonresident Members.....	20 gal/person
Day Care Facilities.....	15 gal/person
Factories (Exclusive of industrial waste).....	25 gal/person/shift
Add for showers.....	10 gal/person/shift
Hospitals.....	300 gal/bed
Marinas.....	10 gal/boat slip
With bathhouse.....	30 gal/boat slip
Motels/Hotels.....	120 gal/room
With cooking facilities.....	175 gal/room
Offices (per shift).....	25 gal/person
Residential Care Facilities.....	60 gal/person
Restaurants.....	40 gal/seat or 40 gal/15 ft ² of dining area (which- ever is greater)
Rest Homes and Nursing Homes	
With laundry.....	120 gal/bed
Without laundry.....	60 gal/bed
Schools	
Day Schools	
With cafeteria, gym and showers.....	15 gal/student
With cafeteria only.....	12 gal/student
With neither cafeteria nor showers.....	10 gal/student
Boarding Schools.....	60 gal/person
Service Stations.....	250 gal/water closet or urinal
Stores, Malls, Shopping Centers	200 gal/1000 ft ²
(Exclusive of food service)	
Stadium, Auditorium, Theater, Drive-in.....	5 gal/seat or space
Swimming Pools and Bathhouses.....	10 gal/person
Travel Trailer Parks.....	120 gal/space

(c) An adjusted design daily sewage flow may be granted upon a showing that a sewage system is adequate to meet actual daily water consumption from a facility included in .1949(b). Documented data from that facility or a comparable facility shall be submitted to the state and the local health department. The submitted data shall consist of at least 12 consecutive monthly total water consumption readings and at least 30 consecutive daily total water consumption readings. The daily readings shall be taken during a projected peak sewage flow month. The adjusted design daily sewage flow shall be determined by taking the numerical average of the daily readings that fall within the upper 10 percent of the daily readings when ranked in descending order.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982;
Amended Eff. January 1, 1984.

.1950 LOCATION OF GROUND ABSORPTION SYSTEMS

(a) Every ground absorption sewage treatment and disposal system shall be located at least the minimum horizontal distance from the following:

- (1) Any private water supply source-----100 feet;
- (2) Any public water supply source-----100 feet;
- (3) Streams classified as A-II-----50 feet;
- (4) Waters classified as S.A.-----100 feet from normal high tide mark;
- (5) Any other stream, canal, marsh, or coastal waters-----50 feet;
- (6) Any Class I or Class II impounded reservoir used as a source of drinking water-----100 feet from normal high water line;
- (7) Any other lake or impoundment-----50 feet from normal high water line;
- (8) Any building foundation-----5 feet;
- (9) Any basement-----15 feet;
- (10) Any property line-----10 feet;
- (11) Top of slope of embankments or cuts of 2 feet or more vertical height-----15 feet;
- (12) Any water line-----10 feet;
- (13) Drainage Systems:
 - (A) Interceptor drains-----10 feet upslope and 25 feet downslope,
 - (B) Ground water lowering and surface drainage ditches -----25 feet.
- (14) Any swimming pool-----5 feet;
- (15) Any other nitrification field (except repair area) -----20 feet.

(b) Nitrification line may be installed in fill ground where at least one foot of naturally occurring soil is present with suitable or provisionally suitable soil characteristics with respect to texture, structure, and drainage as required by

these rules and is specifically approved by the state or local health department. Areal fill must be installed such that there is a minimum separation of two feet between the trench bottom and any soil horizon with unsuitable soil characteristics. In such areal fill sites, the soil used for fill and the areal extent of fill shall be approved by the local health department before placement and shall have such soil texture to be classified as sand, loamy sand, loam, or sandy loam. There shall be a mix of the fill soil and the original soil at the interface of the two soils.

(c) Ground Absorption Sewage Treatment and Disposal Systems:

- (1) Shall not be installed in sites where the seasonal high water is within one foot of the ground surface at any time of the year;
- (2) May be located closer than 100 feet from a private water supply for repairs, space limitations, and other site-planning considerations but shall be located the maximum feasible distance and in no case less than 50 feet.

(d) Septic tank systems shall not be located under paved areas or driveways. Cast iron or other suitable pipe may be permitted to convey the effluent under a driveway or other paved areas.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982;
Amended Eff. October 1, 1982.

.1951 APPLICABILITY OF RULES

(a) Except as required in subsection (b) of this rule, the minimum horizontal distance requirements in .1950(a)(4), (9), (10), or (11) shall not apply to the installation of a single septic tank system serving a single-family residence not to exceed four bedrooms on a lot or tract of land:

- (1) Which, on July 1, 1977, is specifically described in a deed, contract, or other instrument-conveying fee title or which is specifically described in a recorded plat; and
- (2) Which, on July 1, 1977, is of insufficient size to satisfy the minimum horizontal distance requirements in .1950(a)(4), (9), (10), or (11) of this section; and
- (3) Which, on the date system construction is proposed to begin, is not capable of being served by a community or public sewerage system.

(b) For those lots or tracts of land described in .1951(a) of this section, where any of the minimum horizontal distance requirements prescribed in .1950(a)(4), (9), (10), or (11) of this section can be met, such minimum horizontal distances shall be required.

(c) For those lots or tracts of land described in .1951(a) of this section, where a specific minimum horizontal distance requirement prescribed in .1950(a)(4), (9), (10), or (11) of this section cannot be met, the maximum feasible horizontal

distance, as determined by the local agency, shall be required. Provided, however, that at least the following minimum horizontal distances shall be required in all cases:

- (1) .1950(a)(4) of this section, the minimum horizontal distance shall be not less than 50 feet;
- (2) .1950(a)(9) of this section, the minimum horizontal distance shall be not less than 8 feet;
- (3) .1950(a)(10) and (11) of this section, the minimum horizontal distance shall be not less than 5 feet.

(d) All other provisions of this section except as exempted by this rule shall apply to the lots or tracts of land described in .1951(a) of this section. Any rules and regulations of the Commission for Health Services 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 .1950(a)(4), (9), (10), or (11) of this section do not apply.

(e) It shall be the responsibility of any owner of a lot or tract of land, who applies for a permit required by .1937 of this section, and who seeks, under the provisions of .1951(a) of this section, to exempt his lot or tract of land from any of the minimum horizontal distance requirements of .1950(a)(4), (9), (10), or (11) of this section to provide to the local health department necessary records of title to the lot or tract of land for which the exemption is sought in order that the local agency may determine whether the applicant is entitled to any such exemption.

(f) For those lots or tracts of land which, on the effective date of this section, are specifically described in a deed or recorded plat, and the minimum horizontal distance requirements prescribed in .1950(a)(13)(b) cannot be met, the maximum feasible horizontal distance, as determined by the local health department, shall be required, but shall not be less than 10 feet.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.

.1952 SEPTIC TANK CONSTRUCTION

(a) A septic tank shall be watertight, structurally sound, and not subject to excessive corrosion or decay. Septic tanks shall be of two-compartment design. The inlet compartment of a two-compartment tank shall be between two-thirds and three-fourths of the total tank capacity. A properly designed dosing syphon or pump shall be used for discharging sewage effluent into nitrification lines when the total length of such lines exceeds 750 linear feet in a single system. When the design daily flow from a single system exceeds 3,000 gallons per day, alternating syphons or pumps shall be used which shall discharge to separate nitrification fields. Discharges from syphon systems shall be of such design so as to fill the nitrification lines from 60 percent to 75 percent of their capacity

at each discharge or as required for pressure distribution systems. Discharges from pump systems shall be designed to maximize the distribution of the effluent throughout the system. Septic tanks installed where the top will be deeper than 30 inches below the finished grade shall have an access manhole, with cover, extending to within 12 inches of the finished grade, having a minimum opening adequate to accommodate the installation or removal of the septic tank lid. Pump or dosing chambers shall have an access manhole having a minimum diameter of 30 inches extending a minimum of six inches above the finished grade. Syphon dosing chambers shall be designed in accordance with the minimum dose requirements in this rule. Effluent pump chambers shall meet the construction requirements of this section and shall have a minimum liquid capacity equivalent to the septic tank liquid capacity required in this rule. All effluent pump chambers shall have a properly functioning high-water alarm installed independent of the electrical circuit for the pump.

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

Number of Bedrooms	Minimum Liquid Capacity	Equivalent Capacity Per Bedroom
2 or less	750 gallons	375 gallons
3	900 gallons	300 gallons
4	1,000 gallons	250 gallons
5	1,250 gallons	250 gallons

These figures provide for use of garbage grinders, automatic clothes washers, and other household appliances.

(2) Septic tanks for large residences or places of business or public assembly shall be in accordance with the following:

(A) The minimum liquid capacity of septic tanks for places of business or places of public assembly with a design sewage flow of 600 gallons per day or less shall be determined in accordance with the following: $V = 2Q$; where V is the liquid capacity of the septic tank and Q is the design daily sewage flow.

(B) Individual residences with more than five bedrooms, multiple-family residences, or any place of business or public assembly where the design sewage flow is greater than 600 gallons per day, but less than 1,500 gallons per day, the liquid capacity of the septic tank shall be designed in accordance with the following: $V = 1.17Q + 500$; where V is the liquid capacity of the septic tank and Q is the design daily sewage flow.

(C) Where the design sewage flow is 1,500 gallons per day or greater, the liquid capacity of the septic tank shall be designed in accordance with

the following: $V = 0.75Q + 1,125$; where V is the liquid capacity of the septic tank and Q is the design daily sewage flow.

- (3) The minimum capacity of any septic tank or effluent pump chamber shall be 750 gallons.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.

.1953 PREFABRICATED TANKS

When prefabricated concrete tanks or tanks of other material are used, they shall be constructed in accordance with the plans which have been approved by the State Department of Human Resources and shall comply with all requirements of this section. Three complete sets of plans and specifications for the design of the prefabricated septic tank shall be submitted to the Environmental Health Section, Division of Health Services, P. O. Box 2091, Raleigh, North Carolina 27602-2091. These plans and specifications shall show the design of the septic tank in detail, including:

- (1) All pertinent dimensions;
- (2) Reinforcement material;
- (3) Material strength;
- (4) Liquid depth;
- (5) Cleanout provisions;
- (6) Other design features.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.

.1954 MINIMUM STANDARDS FOR PREFABRICATED SEPTIC TANKS

(a) The following are minimum standards of design and construction of precast reinforced concrete septic tanks:

- (1) The minimum requirement for the liquid depth is 36 inches.
- (2) A minimum of nine inches freeboard is required, the freeboard being the air space between the top of the liquid and the bottom side of the lid or cap of the tank.
- (3) The length of the septic tank shall be at least twice as long as the width.
- (4) There shall be three inlet openings in the tank, one on the tank end and one on each sidewall of the inlet end of the tank. The blockouts for these openings shall leave a concrete thickness of not less than one inch in the tank wall. The blockouts shall be made for a minimum of four-inch pipe or a maximum of six-inch pipe.
- (5) The inlet in the tank shall be a straight pipe.
- (6) The outlet shall be a cast-in-place concrete sanitary tee, a polyvinyl chloride (PVC) sanitary tee, or a polyethylene (PE) sanitary tee, made of not less than class 160 pipe or equivalent fittings and pipe.

Class 160 pipe shall have a wall thickness of not less than 0.183 inches. The cast-in-place concrete sanitary tee shall have a minimum thickness of not less than two inches. The tee shall extend down one-fourth of the liquid depth. The invert of the outlet shall be at least two inches lower in elevation than the invert of the inlet.

- (7) All tanks shall be manufactured with a cast-in-place partition so that the tank contains two compartments. The partition shall be located at a point not less than two-thirds nor more than three-fourths the length of the tank from the inlet end. The top of the partition shall terminate two inches below the bottom side of the tank top in order to leave space for air or gas passage between compartments. The top and bottom halves of the partition shall be cast in such manner as to leave a water passage slot four inches high for the full width of the tank. The partition (both halves) shall be reinforced by the placing of six-inch by six-inch No. 10 gage welded reinforcing wire. The reinforcing wire shall be bent to form an angle of 90 degrees on the ends in order to form a leg not less than four inches long. When the wire is placed in the mold, the four-inch legs should lay parallel with the sidewall wire and adjacent to it. It is recognized that there are other methods of constructing a partition or two-compartment tank. Any method other than the one described will be considered on an individual basis for approval by the division of health services. However, the tank wall thickness must remain not less than two and one-half inches thick throughout the tank except for block-outs.
- (8) Adequate access openings must be provided in the tank top. Access shall be provided for cleaning or rodding out of the inlet pipe, for cleaning or clearing the air or gas passage space above the partition, an entrance for inserting the suction hose for tank pumping, and for entrance of a person if internal repairs are needed after pumping. This shall be accomplished by properly locating two manholes with each having a minimum opening of 18 inches by 18 inches as the opening cuts the plane of the bottom side of the top of the tank. The manhole covers shall be beveled on all sides in such manner as to accommodate a uniform load of 150 pounds per square foot without damage to the cover or the top of the tank. If the top of the tank is to be multislab construction, the slabs over the inlet of the tank, partition, and outlet of the tank must not weigh in excess of 150 pounds each. Multislab construction allows for the elimination of the manholes. Manhole covers, opening covers, or slabs shall have a handle of steel or other rot-resistant material equivalent in strength to a No. 3 reinforcing rod (rebar).

- (9) The tank shall be reinforced by using a minimum reinforcing of six-inch by six-inch No. 10 gage welded steel reinforcing wire in the top, bottom ends, and sides of the tank. The reinforcing wire shall be lapped at least six inches. The tank top must be able to withstand a uniform loading of 150 pounds per square foot. If additional reinforcing is required to accomplish this, it is the responsibility of the manufacturer to install the added reinforcing.
 - (10) The top, bottom, ends, and sides of the tank must have a minimum thickness of two and one-half inches.
 - (11) A minimum end product strength of 3,000 pounds per square inch shall be used in the construction of a septic tank. The strength of 3,000 pounds per square inch must have been reached within 10 percent or 300 pounds per square inch prior to the tank's being removed 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 septic tank shall be subject to testing to ascertain the strength of the concrete prior to its being approved for installation. Recognized devices for testing the strength of concrete include a properly calibrated Schmidt Rebound Hammer or Windsor Probe Test. Accelerated curing in the mold by use of propane gas or other fuels is prohibited, except in accordance with accepted methods and upon prior approval of the division of health services.
 - (12) After curing, tanks manufactured in two sections shall be joined and sealed at the joint by the manufacturer, or by the installer, by using a mastic sealant or pliable sealant that is both waterproof and corrosion resistant.
 - (13) All tanks produced shall bear an imprint identifying the manufacturer, the serial number assigned to the manufacturer's plans and specifications approved by the division of health services, and the liquid or working capacity of the tank. This imprint shall be located to the right of the blockout made for the outlet pipe on the outlet end of the tank.
- (b) Plans for prefabricated tanks, other than those for precast reinforced concrete tanks, shall be approved on an individual basis as determined by the information furnished by the designer which indicates the tank will provide equivalent effectiveness as those designed in accordance with the provisions of .1954(a).
- (c) Septic tanks other than approved prefabricated tanks shall be constructed consistent with the provisions of this rule except as follows:
- (1) Cast-in-place concrete septic tanks shall have a minimum wall thickness of six inches.
 - (2) Concrete block or brick septic tanks shall have a minimum wall thickness of at least six inches when the design volume is less than 1,000 gallons and a

minimum wall thickness of at least eight inches when the design volume is 1,000 gallons or more. All septic tanks constructed of block or brick shall be plastered on the inside with a 1:3 mix (one part cement, three parts sand) of Portland cement at least three-eighths-inch thick or the equivalent using other approved waterproofing material.

- (3) The bottom of the built-in-place septic tank shall be poured concrete with a minimum thickness of four inches.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.

.1955 DESIGN CRITERIA FOR CONVENTIONAL SEWAGE SYSTEMS

(a) Conventional Septic Tank Systems - Conventional septic tank systems utilize a septic tank of adequate construction and design volume in accordance with the provisions of these rules which provides primary treatment of the sewage. The effluent from the septic tank flows by gravity to an approved nitrification line where the soil provides for final treatment and disposal of the sewage.

(b) Table II shall be used in determining the application rate for septic tank systems of conventional design.

SOIL GROUP	TABLE NO. II SOIL TEXTURE CLASSES		APPLICATION RATE
			gpd/ft ²
I	Sands	Sand	1.2 - 0.8
		Loamy Sand	
II	Coarse Loams	Sandy Loam	0.8 - 0.6
		Loam	
III	Fine Loams (With PS structure)	Sandy Clay Loam	0.6 - 0.4
		Silt Loam	
		Clay Loam	
		Silty Clay Loam	
IV a	Clays (Kaolinite or 1:1 with PS structure)	Sandy Clay	0.4 - 0.2
		Silty Clay	
		Clay	
IV b	Clays (Montmorillonite or Mixed Mineralogy)	Sandy Clay	Unsuitable
		Silty Clay	
		Clay	

(c) In calculating the number of square feet of area needed for the nitrification field in trench system, the maximum trench width used in the calculations shall be 36 inches. Trenches shall be located not less than three times the trench width on centers with a minimum spacing of five feet on centers.

(d) The local health department may permit the use of a bed system on sites where the soil texture can be classified into either Soil Groups I, II, or III, meeting essentially the other requirements of this section, and only on lots which are limited by topography, space, or other site-planning considerations. In such cases, the number of square feet of bottom area needed shall be increased by 50 percent over what would be required for a trench system. Nitrification lines shall be at least 18 inches from the side of the bed and shall have lines on three-foot centers. When the design volume of sewage exceeds 600 gallons per day, adequate space shall be provided to accommodate a trench system for the nitrification field.

(e) The pipe or tubing used between the septic tank and the nitrification line shall be a minimum of four-inch nominal size Schedule 40 polyvinyl chloride (PVC), polyethylene (PE), or acrylonitrile-butadiene-styrene (ABS) or equivalent with a minimum fall of one-eighth inch per foot. Where an effluent distribution device is used between the septic tank and nitrification line, four-inch or greater nonperforated polyethylene (PE) corrugated tubing may be substituted for Schedule 40 pipe between the distribution device and the nitrification line if the following conditions are met:

- (1) the trench has a minimum bottom width of one foot;
- (2) the trench bed is compacted, smooth, and at a uniform grade;
- (3) the pipe is placed in the middle of the trench with a minimum of three inches of clearance between the pipe and the trench walls;
- (4) crushed stone or gravel envelope is placed in the trench on both sides of the pipe and up to a point at least two inches above the top of the pipe;
- (5) a minimum of six inches of soil cover is placed and compacted over the gravel envelope; and
- (6) earthen dams consisting of two feet of undisturbed or compacted soil are placed at both ends of the trench separating the trench from the distribution device and the nitrification line.

All joints from the septic tank to the nitrification line shall be watertight.

(f) When four or six-inch diameter corrugated plastic tubing is used for nitrification lines, it shall be certified as complying with applicable ASTM standards. The corrugated tubing shall have three rows of holes, each hole between one-half inch and three-fourths 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 periphery, or three rows may be located in the lower portion of the tubing, the outside rows being approximately on 120-degree centers.

(g) Nitrification trenches shall be constructed as level as possible but in no case shall the fall in a single trench bottom exceed one-fourth inch in 10 feet as determined by an engineer's level. The nitrification trench shall not exceed a width of three feet and a depth of three feet, except as approved by the local health department.

(h) Rock used in soil absorption systems shall be clean, washed gravel or crushed stone and graded or sized between three-fourths inch to two and one-half inches. The rock shall be placed a minimum of one foot deep with at least six inches below the pipe and two inches over the pipe and distributed uniformly across the trench bottom and over the pipe.

(i) The soil cover over the nitrification field shall be to a depth of at least six inches. The finished grade over the nitrification field shall be landscaped to prevent the ponding of surface water and runoff of surface water shall be diverted away from the nitrification field.

(j) Effluent distribution devices, including distribution boxes, flow dividers, and flow diversion devices, shall be of sound construction, watertight, not subject to excessive corrosion, and of adequate design as approved by the local health department. Effluent distribution devices shall be separated from the septic tank and nitrification lines by a minimum of two feet of undisturbed or compacted soil and shall be placed level on a solid foundation of soil or concrete to prevent differential settlement of the device.

(k) Grease traps or grease interceptors shall be required at certain places of business, including restaurants and meat markets, where the accumulation of grease can cause premature failure of a soil absorption system. Specially designed grease interceptors may be used in lieu of grease traps where it has been demonstrated that they will provide equal or improved performance.

(l) Stepdowns or drop boxes may be used where topography prohibits the placement of nitrification trenches on level grade. Stepdowns shall be constructed of two feet of undisturbed soil and constructed to a height level with the top of the upper nitrification line. Drop boxes shall be constructed so that the inlet supply pipe is one inch above the invert of the outlet supply pipe which is connected to the next lower drop box. The top of the trench outlet laterals, which allow effluent to move to the nitrification lines, shall be two inches below the invert of the outlet supply line. It is recommended that drop boxes be designed to close off the trench outlets to provide for periods of resting when the nitrification trench becomes saturated.

(m) Nitrification trenches shall be installed with at least one foot of naturally occurring soil between the trench bottom and saprolite, rock, or any soil horizon unsuitable as to texture, structure, soil consistence or drainage.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982;
Amended Eff. August 1, 1988;
February 1, 1987.

.1956 POSSIBLE MODIFICATIONS TO CONVENTIONAL SEPTIC TANK SYSTEMS

Possible modifications to conventional septic tank systems which may be utilized to overcome selected soil and site limitations and must be approved by the local health department include the following:

- (1) Shallow placement of nitrification trenches shall be utilized where insufficient depth to seasonally high, or perched, water table or where insufficient soil depth prevents the placement of conventional nitrification lines in accordance with this section. Shallow trenches shall be designed and constructed to provide at least one foot of natural soil separation between the trench bottom and the uppermost elevation of the seasonally high, or perched, water table and rock.
- (2) Alternating dual field nitrification systems may be utilized where soils are limited by high clogging potentials (soil groups III and IV) and where the potential for malfunction and need for immediate repair is required. Alternating dual field nitrification systems shall be designed with two complete nitrification fields, each sized a minimum of 75 percent of the total area required for a single field and separated by an effluent flow diversion valve. The diversion valve shall be constructed to resist 500 pounds crushing strength, structurally sound, and resistant to corrosion. Valves placed below ground level shall be provided with a valve box and suitable valve stem so that it may be operated from the ground surface.
- (3) Modified nitrification trenches or lines, including large diameter pipe (greater than four inches I.D.), and specially designed porous block systems may be permitted by the local health department.
 - (a) Gravelless nitrification trench systems may be substituted for conventional trench systems on any site found to be suitable or provisionally suitable in accordance with .1940 to .1948 to eliminate the need for gravel, minimize site disturbance, or for other site planning considerations. Gravelless nitrification trench systems shall not be used, however, where wastes contain high amounts of grease and oil, such as restaurants.
 - (i) Large diameter pipe systems shall consist of 8-inch or 10-inch (inside diameter), corrugated, polyethylene tubing encased in a nylon, polyester, or nylon/polyester blend filter wrap installed in a nitrification trench, 12 or more inches wide and backfilled with soil classified as soil group I, II, or III. Nitrification area requirement shall be determined in accordance with .1955(b) and .1955(c), or in .1956(4)(b), Table III, when applicable, with eight-inch tubing considered equivalent to a two-foot-wide conventional trench and 10-inch tubing

considered equivalent to a three-foot-wide conventional trench. The long-term acceptance rate shall not exceed 0.8 gallons per day per square foot. Tubing and fittings shall comply with the requirements of ASTM F-667. ASTM F-667 has been adopted by reference in accordance with G.S. 150B-14(c). Copies of the standards may be inspected in and copies obtained from the Sanitation Branch, Division of Health Services, P. O. Box 2091, Raleigh, NC 27602-2091. The corrugated tubing shall have two rows of holes, each hole between 3/8's and 1/2-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. The tubing shall be marked with a visible top location indicator, 120 degrees away from each row of holes. Filter wrap shall be spun, bonded, or spunlaced nylon, polyester, or nylon/polyester blend nylon filter wrap meeting the following minimum requirements:

Unit Weight: Oz/yd² = 1.0

Sheet Grab Tensile: MD - 23 lbs.

SD - 14 lbs.

Trapezoid Tear: MC - 6.2 lbs.

XD - 5.1 lbs.

Mullen Burst: PSI = 40

KPa = 276

Frazier Air Perm, CFM/ft @ 0.5 "H₂O: 500"

Corrugated tubing shall be covered with filter wrap at the factory and each joint shall be immediately encased in a black polyethylene sleeve which shall continue to encase the large diameter pipe and wrap until just prior to installation in the trench. Large diameter pipe systems shall be installed in accordance with this rule and the manufacturer's guidelines. The trench bottom and pipe shall be level (with a maximum fall of one inch in 100 feet). Filter wrap encasing the tubing shall not be exposed to sunlight (ultraviolet radiation) for extended periods. Rocks and large soil clumps shall be removed from backfill material prior to being used. Clayey soils (soil group IV) shall not be

used for backfill. The near end of the large diameter pipe shall have an eight-inch by four-inch or 10-inch by four-inch offset adaptor (small end opening at top) suitable for receiving the pipe from the septic tank or distribution device and making a mechanical joint in the nitrification trench.

- (ii) A Prefabricated, Permeable Block Panel System (PPBPS), utilizing both horizontal and vertical air chambers and special construction to promote downline and horizontal distribution of effluent, may be used under the following conditions:
 - (A) the soil and site criteria of this section shall be met;
 - (B) in calculating the required linear footage for a PPBPS's nitrification field, the linear footage for the nitrification line as determined in .1955 (b) and (c), or in .1956 (4)(b), Table III when applicable, shall be multiplied by 0.5 for a 16 inch PPBPS;
 - (C) installation of the PPBPS shall be in accordance with these rules except:
 - (I) the PPBPS trench shall be located not less than 8 feet on centers;
 - (II) the installation shall be in accordance with the manufacturer's specifications; and
 - (III) the sidewalls of nitrification trenches placed in Group IVa soils shall be raked to open pores which were damaged or sealed during excavation;
 - (D) where design sewage flow is more than 480 gallons per day, the system shall be pressure-dosed; and
 - (E) the long-term acceptance rate shall not exceed 0.8 gallons per day per square foot.
- (b) Other types of nitrification trenches or lines may be approved by the local health department on a site-specific basis provided substantiating data in accordance with .1948(c) are submitted which indicate that the proposed nitrification trench or line will perform equal to or better than a conventional trench or line.
- (4) Sites classified UNSUITABLE as to soil depth, with saprolite present, may be reclassified PROVISIONALLY SUITABLE as to soil depth when the provisions of this paragraph are met.
 - (a) An investigation of the site using pits or trenches at locations and to depths specified by the local health department shall be conducted. The following physical properties and characteristics must be present:

- (i) the saprolite shall be weathered from acidic (granite, gneiss, or schist) parent rock types of metamorphic or igneous origin;
 - (ii) the saprolite texture shall be suitable and saprolite shall have less than 20 percent clay;
 - (iii) clay mineralogy shall be suitable;
 - (iv) the saprolite consistence shall be loose, friable to very friable when moist as determined in place and nonsticky or nonplastic when wet;
 - (v) the saprolite shall be overlain by at least one foot of SUITABLE or PROVISIONALLY SUITABLE naturally occurring soil; and
 - (vi) the saprolite shall have no joints or fractures relic of parent rock to a depth two feet below the proposed trench bottom.
- (b) Table III shall be used in determining the long-term acceptance rate for septic tank systems installed pursuant to paragraph (5). The long-term acceptance rate shall be based on the most hydraulically limiting, naturally occurring saprolite to a depth of two feet below trench bottom.

SAPROLITE GROUP	TEXTURAL CLASSES	LONG-TERM ACCEPTANCE RATE GPD/FT ²
I	Sands	Sand 0.6 - 0.5
		Loamy Sand 0.5 - 0.4
II	Coarse Loams (with less than 20% clay)	Sandy Loam 0.4 - 0.3
		Loam 0.3 - 0.2

Saprolite textural classifications shall be determined from disturbed materials and determined by .1941(1). The local health department may require low-pressure distribution in conventional nitrification trenches, or other modifications to provide adequate effluent treatment and disposal.

- (c) Only ground absorption systems with a design daily flow of 480 gallons or less shall be installed on sites reclassified pursuant to this paragraph [.1956(4)].
- (d) The nitrification field shall be constructed using nitrification trenches with a maximum width of three feet and a maximum depth of two feet on the downslope side of the nitrification trench. The bottom of a nitrification trench shall be a minimum of two feet above rock. However, where SUITABLE or PROVISIONALLY SUITABLE soil underlies the trench bottom, this separation distance may be reduced by subtracting the actual soil depth beneath the trench bottom from 24 inches to establish the minimum separation distance from the trench bottom to rock.
- (e) The bottom of any nitrification trench shall be a minimum of two feet above any wetness condition.
- (f) Surface and subsurface interceptor drains may be required.

- (g) Exceptions to the provisions of .1950(a) found in .1950 and .1951 shall not apply to systems installed pursuant to this paragraph [.1956(4)].

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982;
Amended Eff. August 1, 1988;
October 1, 1983.

.1957 DESIGN CRITERIA FOR DESIGN OF ALTERNATIVE SEWAGE SYSTEMS

(a) Low-pressure pipe (LPP) system - A low-pressure (two to four-foot pressure head) pipe system may be utilized where soil and site conditions prohibit the installation of a conventional or modified septic tank system due to the presence of shallow soil conditions, seasonally high water table conditions, and slow soil permeability.

(1) The LPP shall consist of the following basic components:

- (A) A network of small-diameter (1 inch to 2 inches) perforated PVC 160 psi pipe or equivalent placed in natural soil at shallow depths (generally 6 inches to 12 inches) in narrow trenches not less than 6 inches in width;
- (B) A properly designed, two-compartment septic tank or other approved pretreatment system and a pumping or dosing tank;
- (C) An approved submersible effluent pump with appropriate on-off controls for controlled dosing and a high-water alarm or other approved pressure dosing and distribution system;
- (D) A watertight supply manifold pipe for conveying effluent from the pump to the low-pressure network.

(2) The soil and site criteria for low-pressure pipe systems shall meet the following minimum requirements:

- (A) LPP nitrification fields shall not be installed on slopes in excess of 10 percent. LPP nitrification fields may be installed on slopes greater than 10 percent but require special design procedures to assure proper distribution of effluent over the nitrification field.
- (B) There shall be at least 24 inches of separation between the naturally occurring soil surface and rock, water-impeding formation, or seasonally high water table. This 24-inch depth shall consist of suitable or provisionally suitable soil with respect to texture, structure, and drainage.
- (C) Components of the LPP shall not be located in depressions or areas subject to frequent flooding. Surface water, perched ground water, and other subsurface lateral water movement shall be intercepted or diverted away from all components

of the LPP. Final shape of the LPP distribution field shall be such that rainwater or runoff is shed.

- (D) Location of the septic tank, pumping or dosing chamber, and LPP nitrification field is subject to the same horizontal setbacks specified in .1950(a). Horizontal distances from the LPP nitrification field shall be measured from a margin two and one-half feet beyond the lateral and manifold pipes.
 - (E) An area that is at least equal in size to the LPP distribution field area (plus a two and one-half foot margin beyond lateral and manifold pipes) and meeting all other site and soil criteria shall be set aside for a replacement field.
 - (F) There shall be no soil disturbance to an approved site for an LPP system except the minimum required for installation.
- (3) Application rates - Table III shall be used in determining the maximum application rate for low-pressure pipe systems.

SOIL GROUP	TABLE NO. III		APPLICATION RATE gpd/ft ²
	SOIL TEXTURAL CLASSES		
I	Sands	Sand	0.6 - 0.4
		Loamy Sand	
II	Coarse Loams	Sandy Loam	0.4 - 0.3
		Loam	
III	Fine Loams	Sandy Clay Loam	0.3 - 0.2
		Silt Loam	
		Clay Loam	
		Silty Clay Loam	
IV a	Clays	Sandy Clay	0.2 - 0.1
		Silty Clay	
		Clay	

- (4) In calculating the number of square feet for the nitrification field, the design sewage flow shall be divided by the application rate from Table III. The nitrification lines shall have a minimum spacing of five feet on centers.
 - (5) Design of the LPP shall comply with accepted practices and be specifically approved by the local health department.
- (b) Alternative systems other than the low-pressure pipe system shall be approved by the local health department in accordance with .1948(c).

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.

.1958 NON-GROUND ABSORPTION SEWAGE TREATMENT SYSTEMS

(a) Where an approved privy, an approved septic tank system, or a connection to an approved public or community sewage system is impossible or impractical, this section shall not prohibit the state or local health department from permitting approved nonground absorption treatment systems utilizing heat or other approved means for reducing the toilet contents to an inert or stabilized residue or to an otherwise harmless condition, rendering such contents noninfectious or noncontaminating. Alternative systems shall be designed to comply with the purposes and intent of this section.

(b) Holding tanks shall not be considered as an acceptable sewage treatment and disposal system and their use is prohibited.

(c) Incinerating, composting, vault privies, and mechanical toilets shall be approved by the state agency or local health department only when all of the sewage will receive adequate treatment and disposal.

(d) Sewage recycling systems which discharge treated wastewater meeting the state drinking water standards may be used only for toilet flushing and recycled sewage shall not be used for body contact or human consumption. Such systems must be specifically approved by the state or local health department.

(e) Chemical toilets shall be used temporarily for mass gatherings, construction sites, or other places of business or public assembly for nonpermanent use.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.

.1959 PRIVY CONSTRUCTION

(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.

(1) The pit shall consist of an excavation at least 42 inches square and in no case shall the bottom of an excavation be closer than one foot from the seasonally high water table or rock.

(2) The pit shall be properly curbed to prevent caving. In sandy or loose soil, the curb should extend the full depth of the pit. In tight soils, partial curbing is acceptable if it prevents caving.

(3) The privy floor slab shall be constructed of reinforced concrete. Where it is impractical to secure or construct reinforced concrete floor assemblies, wood construction will be accepted provided the floor slab is made of rough sub-flooring and covered with tight tongue-and-groove flooring or other type flooring materials to provide strength and prevent entrance of flies and mosquitoes to the privy pit. Where wood construction is used, floors shall be anchored to at least four-inch by four-inch sills. All wood material within 12 inches of finished grade

should be treated to prevent rot or insect infestation.

- (4) Wood used for riser, seat assemblies, and the floor slab shall be tongue-and-groove or plywood (exterior or marine) material.
- (5) Privies shall not be used for the disposal of water-carried sewage.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.

.1960 MAINTENANCE OF PRIVIES

(a) Any person owning or controlling the property upon which a privy is located shall be responsible for these 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 must be moved to a new pit and the old pit completely covered with earth.
- (3) If the pit should cave in, a new pit shall be provided.

(b) The tenant or person occupying the property shall be responsible for these requirements:

- (1) The walls, floors, and seat of the privy and grounds immediately adjacent to the building must be kept in a clean and decent condition.
- (2) Fowl and other animals shall not be harbored in the privy building.
- (3) Seat cover shall be hinged and closed at all times when the privy is not in use.
- (4) Flies shall be excluded from the pit at all times. The application of a cupful of kerosene or used oil once each week will assist in controlling mosquito breeding and keep down odors.
- (5) Ashes, garbage, and trash shall be kept out of the pit.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.

.1961 MAINTENANCE OF SEWAGE SYSTEMS AND SEPTAGE DISPOSAL

(a) Any person owning or controlling the property upon which a ground absorption sewage treatment and disposal system is installed shall be responsible for the following items regarding the maintenance of the system:

- (1) Ground absorption sewage treatment and disposal systems shall be maintained at all times to prevent seepage or discharge of sewage or effluent to the surface of the ground or to surface waters.
- (2) Ground absorption sewage treatment and disposal systems need occasional cleaning and should be checked

at least once every three years to determine if septage needs removing (once a year if garbage grinders are discharging to the tank).

(b) Septage removed from ground absorption sewage treatment and disposal systems shall be properly disposed of only at approved locations in accordance with applicable laws, rules, and regulations and consistent with good public health practice. If septage is applied to the land, it shall be buried or plowed under at an approved location within 24 hours. Proper disposal of septage shall be the responsibility of the person providing the septage pumping service.

(c) A sewage collection, treatment, and disposal system that creates or has created a public health hazard or nuisance by surfacing of effluent or discharge directly into ground water or surface waters, or that is partially or totally destroyed shall be repaired within 30 days of notification by the state or local health department unless the notification otherwise specifies a repair period in writing. If a system described in the preceding sentence has for any reason been disconnected, the system shall be repaired prior to reuse. The state or local health department shall use its best professional judgment in requiring repairs that will reasonably enable the system to function properly. If, for any reason, a sewage collection, treatment, and disposal system is nonrepairable, the system shall not be used.

History Note: Statutory Authority G.S. 130A-335(e);
G.S. 130A-294;
Eff. July 1, 1982;
Amended Eff. August 1, 1988.

.1962 EXEMPTION

The provisions of this section shall not apply to properly functioning sewage treatment and disposal systems in use or for which a valid permit has been issued prior to the effective date of these rules. This exemption is applicable only where the sewage flow and sewage characteristics are unchanged.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.

.1963 DISUSE OF SEWAGE SYSTEM

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982;
Repealed Eff. Aug. 1, 1988.

.1964 INTERPRETATION AND TECHNICAL ASSISTANCE

(a) The provisions of this section shall be interpreted, as applicable, in accordance with the recognized principles and practices of soil science, engineering, and public health.

(b) The state will provide technical assistance. Local health departments may obtain technical information and assistance from appropriate personnel as may be needed for interpretation of this section.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.

.1965 APPEALS PROCEDURE

Appeals concerning the interpretation and enforcement of the rules in this Section shall be made in accordance with G.S. 150B and 10 NCAC 1B.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982;
Amended Eff. February 1, 1987.

.1966 SEVERABILITY

If any provision of these rules or the application thereof to any person or circumstance is held invalid, the remainder of the rules or the application of such provisions to other persons or circumstances shall not be affected thereby.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.

.1967 INJUNCTIONS

A person who violates any Rule of this Section is subject to the injunctive relief provisions of G.S. 130A-18.

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.
Amended Eff. January 1, 1985.

.1968 PENALTIES

A person who violates any Rule of this Section is subject to the penalty provisions contained in G.S. 130A-22(c) (Administrative Penalties), 130A-23 (Suspension and Revocation of Permits), and 130A-25 (Criminal Penalties).

History Note: Statutory Authority G.S. 130A-335(e);
Eff. July 1, 1982.
Amended Eff. January 1, 1985.

NOTE: "ALL READERS OF THESE REGULATIONS SHOULD BE AWARE THAT THE ATTORNEY GENERAL MAY MAKE EDITORIAL CHANGES IN THE ORDER, TITLES, NUMBERING OR OTHER SUCH CHANGES UNDER G.S. 150A-61; HOWEVER, SUCH CHANGES DO NOT ALTER THE EFFECTIVE DATE OR THE SUBSTANCE OF THE RULE."

STATE OF NORTH CAROLINA
JAMES G. MARTIN, GOVERNOR
N. C. DEPARTMENT OF HUMAN RESOURCES
DAVID T. FLAHERTY, SECRETARY
DIVISION OF HEALTH SERVICES
SANITATION BRANCH

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