(e) Pursuant to S.L. 2013-413, s.34, as revised by S.L. 2014-120, s.53, a PE may propose an adjusted DDF for new or existing dwelling units or facilities identified in Table II of Rule .0401(b) of this Section in accordance with the following:

(1) DDF less than those listed in Rule .0401 of this Section that are achieved through engineering design that utilizes low-flow fixtures and low-flow technologies;
(2) comparison of flow from proposed fixtures and technologies to flow from conventional fixtures and technologies;
(3) the signed and sealed proposal shall account for the site-specific impact on the wastewater system based on projected increased constituent concentrations resulting from reduction in water use in accordance with Rule .0402(b) of this Section;
(4) inspection of the existing wastewater system and verification that the system meets the Rules of this Subchapter and can accept the increase in constituent loading, as applicable;
(5) proposed adjusted DDF for wastewater systems determined to be less than or equal to 3,000 gpd shall not require Department review in accordance with Rule .0302(e) of this Subchapter unless requested by the LHD; and
(6) neither the Department nor any LHD shall be liable for any damages caused by a system approved or permitted in accordance with this Paragraph.

(f) A PE may propose, and the Department shall approve an adjusted DDF for a facility made up of individual dwelling units in accordance with this Rule when the following criteria are met:

(1) DDF calculated in accordance with this Section is greater than 3,000 gpd;
(2) adjusted DDF is based on information in Paragraphs (b) or (c) of this Rule; and
(3) increase in wastewater strength is accounted for in accordance with Paragraph (d) of this Rule.

(g) Adjusted DDF based upon use of water-conserving fixtures shall apply only to design capacity requirements of the dosing system and dispersal fields. The DDF set forth in Rule .0401 of this Section shall be used to determine minimum tank and advanced pretreatment component capacities.

*History Note:* *Authority G.S. 130A-335(e); S.L. 2013-413, s.34; S.L. 2014-120, s.53.*

## SECTION .0500 – SOIL AND SITE EVALUATION

### 15A NCAC 18E .0501 SITE EVALUATION

(a) Upon receipt of an application, an authorized agent shall investigate each proposed site in accordance with this Section to determine whether the site is suitable or unsuitable for the installation of a wastewater system. The field investigation shall include the evaluation of the following soil and site features with written field descriptions including:

(1) topography, slope, and landscape position;
(2) soil morphology:
    (A) depth of horizons;
    (B) texture;
    (C) structure;
    (D) consistence;
    (E) color; and
    (F) organic soils, as applicable;
(3) SWC;
(4) soil depth;
(5) restrictive horizons;
(6) the suitability for each profile description;
(7) LTAR; and
(8) available space.

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

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

(1) 48 inches from the ground surface; or
(2) to a LC determined in accordance with this Section.

(d) Owners may be required to provide pits when necessary for evaluation of the site as determined by the authorized agent, such as for evaluation of saprolite or soil structure.

(e) Based on the evaluation of the soil conditions and site features listed in Paragraph (a) of this Rule, each soil profile shall be classified suitable or unsuitable. The authorized agent shall specify the overall site suitability and classification in accordance with Rule .0509 of this Section.

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

(g) A LC initially classified unsuitable may be reclassified suitable if the requirements of Rule .0509(b) or (c) of this Section are met.

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

**15A NCAC 18E .0502 TOPOGRAPHY AND LANDSCAPE POSITION**

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

(b) The following shall be unsuitable with respect to topography:

(1) slopes greater than 65 percent; and

(2) areas subject to surface water convergence. The site shall be considered suitable when the surface water can be diverted from the site with berms or other surface water diversion devices;

(c) The following shall be unsuitable with respect to landscape position:

(1) depressions, except when with site modifications in accordance with Rule .0910 of this Subchapter, the site complies with the requirements of this Section;

(2) a jurisdictional wetland as determined by the U.S. Army Corps of Engineers or DEQ, unless the proposed use is approved in writing by the U.S. Army Corps of Engineers or DEQ; and

(3) complex slope patterns, such as areas affected by erosion which have rills or evidence of drainage, and slopes dissected by gullies that prohibit the design, installation, maintenance, monitoring, or repair of the wastewater system.

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

SD = MSD + (TW x S)

Where SD = soil depth required with slope correction, in inches
MSD = minimum soil depth, in inches
TW = proposed trench width, in inches
S = percent slope, in decimal form

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

**15A NCAC 18E .0503 SOIL MORPHOLOGY**

The soil morphology shall be evaluated in accordance with the following:

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

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

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

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

(2) Structure – Soil structure shall be determined in the field for each soil horizon in the soil profile and shall be classified and suitability determined in accordance with Table V. If an authorized agent determines that the soil structure cannot be determined from auger borings, pits shall be required.

**Table V.** Soil structure and associated suitability classification

| Structure | Diameter | Classification |
|---|---|---|
| Granular | N/A | suitable |

| | | |
|---|---|---|
| Blocky | ≤ 1 inch or 2.5 cm | suitable |
| | > 1 inch or 2.5 cm | unsuitable |
| Platy | N/A | unsuitable |
| Prismatic | ≤ 2 inches or 5 cm | suitable |
| | > 2 inches or 5 cm | unsuitable |
| Absence of structure: Single Grain | N/A | suitable |
| Absence of Structure: Massive - no structural peds | N/A | unsuitable |

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

**Table VI.** Clay mineralogy field method results, associated mineralogy, and suitability classification

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

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

(a) Laboratory testing of ACEC may be substituted for field testing to determine clay mineralogy. The laboratory testing shall be conducted in accordance with USDA-NRCS Soil Survey Laboratory Information Manual, Soil Survey Investigations Report No. 45, and Kellogg Soil Survey Laboratory Methods Manual, Soil Survey Investigation Report No. 42, page 229, or EPA Method 9080. Table VII shall be used to determine the clay mineralogy suitability when laboratory testing is used. When using laboratory testing to determine clay mineralogy, the clay content of the soil shall be greater than 35 percent and the organic matter component shall be less than 0.5 percent.

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

| ACEC in cmol/kg | Mineralogy | Classification |
|---|---|---|
| ≤ 16.3 | Slightly expansive | suitable |
| > 16.3 | Expansive | unsuitable |

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

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

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

**15A NCAC 18E .0504 SOIL WETNESS CONDITION[12]**

(a) SWC, such as those caused by a seasonal high-water table, a perched water table, tidal water, seasonally saturated soil, or by lateral water movement, shall be determined by field observations of soil wetness indicators as follows:

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

[12] Changed by S.L. 2023-77, Section 11

(2) the observation or indication of saturated soils, a perched water table, or lateral water movement flowing into a bore hole, monitoring well, or open excavation above a less permeable horizon, that may occur without the presence of colors with a ~~value 4 or more or~~ chroma 2 or less at greater than or equal to two percent of soil volume as redox depletions or as the matrix of a horizon.

(3) The shallowest depth to SWC determined in this Paragraph shall be used.

(b) Initial site suitability as to SWC shall be determined by field observations of soil wetness indicators in accordance with Paragraph (a) of this Rule. Sites where the SWC is less than 12 inches below the naturally occurring soil surface, or less than 18 inches if more than six inches of Group I soils are present, shall be considered unsuitable with respect to SWC.

(c) Monitoring or modeling procedures as set forth in this Rule may be used to reclassify the site as suitable with respect to SWC.

(d) Monitoring or modeling procedures as set forth in this Rule shall be required when the owner proposes to use a wastewater system requiring a greater depth to a SWC than the depth observed by soil wetness indicators in accordance with Paragraph (a) of this Rule.

(e) Modeling procedures as set forth in this Rule shall be required when the owner proposes to use sites with Group III or IV soils within 36 inches of the naturally occurring soil surface with artificial drainage, or on sites when fill is proposed to be used in conjunction with an artificial drainage system.

(f) Monitoring or modeling procedures may include the following:

(1) direct monitoring procedure as set forth in Paragraph (g) of this Rule;

(2) modeling procedure as set forth in Paragraph (h) of this Rule;

(3) monitoring and modeling procedure as set forth in Paragraph (i) of this Rule; or

(4) other modeling procedures as set forth in Paragraph (j) of this Rule.

(g) The direct monitoring procedure involves determining the SWC by observation of water surface elevations in wells during periods of high-water in accordance with the following:

(1) no later than 30 days prior to the start of the monitoring period, the owner shall notify the LHD of the intent to monitor water surface elevations by submitting a proposal prepared by a licensed professional, if required in G.S. 89C, 89E, or 89F, that includes a site plan, well and soil profile at each monitoring site, and a monitoring plan as follows:

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

(B) the monitoring plan shall include the proposed number, installation depth, screening depth, soil and well profile, materials, and installation procedures for each monitoring well. A minimum of three water level monitoring wells shall be installed for water surface observation at each site. Sites handling systems with a DDF greater than 600 gpd shall have one additional well per 600 gpd increment. Well locations shall include portions of the initial and repair dispersal field areas containing the most limiting soil and site conditions. The monitoring plan shall also provide for monitoring of the water surface elevations in the wells and all precipitation at the site; and

(C) notification of whether the owner or a licensed professional will perform the monitoring, including the name of the licensed professional, if applicable.

(2) prior to installation of the monitoring wells, the authorized agent shall approve the plan. Plan approval shall be based upon a site visit and compliance with this Rule. If the plan is denied, a signed, written report shall be provided to the owner that describes the reasons for denial, the changes necessary for approval of the plan, and notice of the right to appeal under G.S. 130A-24 and 150B;

(3) wells shall extend a minimum of five feet below the naturally occurring soil surface, or existing ground surface for existing fill determined in accordance with Rule .0909(d) of this Subchapter, except that wells that extend down only 40 inches from the ground surface may be used if a continuous record of the water table is provided for a minimum of half of the monitoring period. One or more shallower wells may be required on sites where shallow lateral water movement or a perched SWC is anticipated based on the site investigation;

(4) the water elevation in the monitoring wells shall be recorded daily from January 1 to April 30, taken at the same time during the day, plus or minus three hours. Rain gauges shall be located within two miles of the site. Daily rainfall measurements shall also be recorded from December 1 through April 30; and

(5) the most recent information available from the SCO shall be used to determine the recurrence frequency of the total amount of rainfall at the site for the 120-day period ending April 15 based upon the site's historic rainfall record. This shall be done when the 120-day cumulative rainfall for the monitoring period ending on April 15 equals or exceeds the site's historic rainfall for the same period with a 30 percent frequency. The recurrence frequency shall be determined with one of the following methods:

(A) the licensed professional shall determine the 120-day SPI for April 15 by using the Integrated Water Portal located on the SCO's website at: http://climate.ncsu.edu/water/map. The licensed professional shall click on the map pixel that corresponds closest to the site's location. The Department will assist in obtaining this information upon request; or

(B) the recurrence frequency of the site's cumulative precipitation for the 120-day monitoring period ending on April 15 shall be determined for the site on a case-by-case basis from the most recent master grid provided to the Department by the SCO. The master grid contains probability distribution parameters that shall be used

by the Department based upon guidance from the SCO. Based on the master grid, the Department shall derive the recurrence frequency values for the grid point that corresponds closest to the site's latitude and longitude.

(6) The SWC shall be determined by the shallowest level that is continuously saturated for the number of consecutive days during the January through April well monitoring period shown in Table VIII as follows:

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

| April 15 SPI 120-day range | Recurrence frequency range 120-day cumulative April 15 rainfall | Number of consecutive days of continuous saturation for SWC |
|---|---|---|
| SPI -0.543 to 0 | 30% to 49.9% duration | 3 days or 72 hours |
| SPI 0 to 0.545 | 50% to 69.9% duration | 6 days or 144 hours |
| SPI 0.546 to 0.864 | 70% to 79.9% duration | 9 days or 216 hours |
| SPI ≥ 0.865 | 80% to 100% duration | 14 days or 336 hours |

(7) If monitoring well data is collected during monitoring periods that span multiple years, the year that yields the shallowest SWC shall apply.

(h) The modeling procedure may be used to determine SWC by using DRAINMOD, a groundwater simulation model, to predict daily water levels over a minimum 30-year period using site-specific input parameters as outlined in the DRAINMOD User's Guide. The SWC shall be determined as the shallowest level predicted by DRAINMOD to be saturated for a 14-day continuous period between January 1 and April 30 with a recurrence frequency of 30 percent, an average of a minimum of nine years in 30, and in accordance with the following:

(1) weather input files shall consist of hourly rainfall and daily temperature data collected over the entire period of record but for a minimum of a 30-year period from a measuring station site, such as the National Weather Service or SCO. The measuring station used shall be the station located closest to the owner's site;

(2) soil and site inputs for DRAINMOD shall include the following:

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

(B) soil horizon depths determined on site;

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

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

(E) all other model parameters based upon the DRAINMOD User's Guide; and

(F) a sensitivity analysis shall be conducted for the following model parameters: soil input files for a minimum of two other most closely related soil profiles; in-situ Ksat of each horizon; drain depth and spacing; and surface storage and depth of surface flow inputs.

The sensitivity analysis shall be used to evaluate the range of soil and site characteristics for choosing input parameters related to the soil profiles, Ksat input values based upon the range of in-situ Ksat values measured on the site, and inputs for surface and subsurface drainage features based upon the range of possible elevations and distances that occur or may occur after installation of improvements. The sensitivity analysis shall establish which parameters are most critical for determination of the depth to SWC. Conservative values for the most critical parameters shall be used in applying the model to the site;

(3) for sites designed to receive over 600 gpd, the SWC determination using DRAINMOD shall take into consideration the impact of wastewater application on the projected water table surface; and

(4) the groundwater simulation analysis shall be prepared and submitted to the LHD by licensed professionals, if required in G.S. 89C, 89E, or 89F, qualified to use DRAINMOD by training and experience. The LHD shall submit the groundwater simulation analysis to the Department for technical review prior to approval of the SWC determination.

(i) The monitoring and modeling procedure is a combination of the direct monitoring procedure and the modeling procedure. The SWC shall be determined as the shallowest level predicted by DRAINMOD to be saturated for a 14-day continuous period between January 1 and April 30 with a recurrence frequency of 30 percent, an average of a minimum of nine years in 30, and in accordance with the following:

(1) the procedures set forth in Paragraph (g) shall be used to monitor water surface elevation and precipitation. The rain gauges and monitoring wells required by Subparagraph (g)(4) shall use a recording device and a data file that is DRAINMOD compatible. The recording devices shall record rainfall hourly or daily and well water levels daily. The data file shall be submitted with the report to the LHD;

(2) DRAINMOD shall be used to predict daily water levels. The DRAINMOD modeling shall be in accordance with the following:

(A) weather input files shall be developed from daily temperature and hourly or daily rainfall data collected over a minimum 30-year period from a measuring station, such as the National Weather Service or SCO. The measuring station used shall be the station located closest to the site. Daily maximum and minimum

temperature data for the December 1 through April 30 monitoring period shall be obtained from the closest available weather station;

(B) soil and site inputs for DRAINMOD, including a soils data file closest to the soil series identified, depths of soil horizons, in-situ Ksat of each horizon, depth and spacing of drainage features, and depression storage shall be selected in accordance with procedures outlined in the DRAINMOD User's Guide;

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

(D) for sites intended to receive greater than 1,500 gpd, the SWC determination using DRAINMOD shall take into consideration the impact of wastewater application on the projected water table surface; and

(E) the DRAINMOD analysis shall be prepared and submitted to the LHD by licensed professionals, if required in G.S. 89C, 89E, or 89F, qualified to use DRAINMOD by training and experience. The LHD or owner may request a technical review by the Department prior to approval of the SWC determination.

The monitoring and modeling procedure may also be used to re-evaluate a SWC that was previously evaluated by the direct monitoring procedure.

(j) Modeling procedures other than those set forth in this Rule may be used to determine SWC upon approval by the Department. Other modeling procedures shall be approved if the following requirements are met:

(1) the modeling procedures use daily water levels or weather records over a 30-year period to predict future daily water levels;

(2) the proposed model and prediction are shown to be as accurate as the prediction from DRAINMOD, calculated in accordance with Paragraph (h) of this Rule; and

(3) documentation is provided in accordance with Rule .0509(c) of this Section.

(k) A report of the investigations made for the direct monitoring procedure, modeling procedure, or monitoring and modeling procedure in accordance with Paragraphs (g), (h), or (i) of this Rule shall be prepared prior to approval of the SWC determination. A request for technical review of the report by the Department shall include digital copies of monitoring data, model inputs, output data, and graphic results, as applicable.

*History Note:* *Authority G.S. ~~130A-335(e).~~ 130A-335(e); S.L. 2023-77, s.11.*

**15A NCAC 18E .0505 SOIL DEPTH**

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

(b) Soil depth to saprolite, rock, or parent material greater than or equal to 18 inches shall be suitable.

(c) Soil depth to saprolite, rock, or parent material less than 18 inches shall be unsuitable.

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

**15A NCAC 18E .0506 SAPROLITE[13]**

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

(b) Saprolite shall be evaluated for suitability by the LHD ~~Sites with saprolite shall be classified as suitable if an investigation of the site~~ using pits at locations approved by the authorized ~~agent~~ agent. An LSS, other than an LSS employed as an authorized agent, may use either borings or pits to evaluate saprolite. Sites with saprolite shall be classified as suitable if ~~confirms that~~ the following conditions are met:

(1) a 24-inch minimum vertical separation shall be maintained in saprolite from the infiltrative surface to an unsuitable LC, unless any of the vertical separation consists of a suitable soil horizon, in which case, the 24-inch separation may be calculated based on one inch of suitable soil being equivalent to two inches of saprolite; and

(2) the following physical properties and characteristics shall be present in the saprolite below the proposed infiltrative surface:

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

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

(C) greater than two-thirds of the saprolite by volume shall have a moist consistence of loose, very friable, friable, or firm;

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

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

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

[13] Changed by S.L. 2023-77, Section 12

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

*History Note:* *Authority G.S. 130A-335(e); S.L. 2015-147, ~~s.3.~~ s.3; S.L. 2023-77, s.12.*

**15A NCAC 18E .0507 RESTRICTIVE HORIZONS**

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

(b) Soils in which restrictive horizons are three inches or more in thickness and at depths less than 18 inches below the naturally occurring soil surface shall be unsuitable.

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

**15A NCAC 18E .0508 AVAILABLE SPACE[14]**

(a) Sites shall have available space to allow for the installation of the initial wastewater system and repair area for a system identified or approved in Sections .0900, .1500, or .1700 of this Subchapter. The available space provided shall meet all required setbacks in Sections .0600 or .1200 of the Subchapter and provide access to the wastewater system for operation and maintenance activities. A site with sufficient available space shall be suitable.

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

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

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

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

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

(4) the proposed facility will generate DSE.

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

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

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

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

(f) Notwithstanding the criteria for when a repair area is required in accordance with Paragraph (e) of this Rule, a site shall remain exempt from the repair area requirements of Paragraph (a) of this Rule when all of the following conditions are met:

(1) an owner submits an application to the LHD for an increase in flow to an existing facility permitted in accordance with Paragraph (c) of this Rule and the facility DDF remains less than or equal to 480 gpd of DSE;

(2) there is sufficient available space for the existing system to be modified pursuant to the Rules of this Subchapter;

(3) the site for the existing system complies with the Rules of this Subchapter and the existing system is not malfunctioning in accordance with Rule .1303(a)(2) of this Subchapter; and

(4) the conditions set forth in Paragraph (d) of this Rule are met.

(g) Prior to the issuance of the IP, the proposed dispersal field shall be field located and staked on-contour, as applicable, to verify that initial and repair wastewater systems can be installed in the area delineated. The dispersal field may be installed level but off contour if an authorized agent has determined that there is sufficient vertical separation to a LC along the entire trench length in accordance with Rule .0901(g)(2) of this Subchapter.

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

(i) A wastewater system certified in accordance with NSF/ANSI Standard 350 or that has data from a two-year field demonstration documenting that the wastewater system meets NSF/ANSI Standard 350 or better may eliminate the requirement for a repair area when installed in Group I soils. A wastewater system that does not have a repair area in accordance with this Paragraph shall only be used to treat DSE, shall meet a TN effluent standard of 20 mg/L, and shall be classified as a Type VI(b) pursuant to Table XXXII of Rule .1301(b) of this Subchapter.

*History Note:* *Authority G.S. 130A-335(e) and (f); S.L. 2015-147, ~~s.1.~~ s.1; S.L. 2023-77, s.13.*

**15A NCAC 18E .0509 SITE SUITABILITY AND CLASSIFICATION**

[14] Changed by S.L. 2023-77, Section 13

(a) A site evaluated in accordance with Rules .0502 through .0508 of this Section with all parameters determined as suitable shall result in an overall site classification of suitable. Any parameter determined as unsuitable shall result in an overall site classification of unsuitable.
(b) Sites classified as unsuitable may be reclassified as suitable as follows:
(1) when site modifications are made that meet the requirements in Sections .0900 or .1200 of this Subchapter for the minimum vertical separation to the SWC;
(2) if installation of an interceptor drain will intercept and divert lateral water to prevent saturation of the wastewater system;
(3) with the use of advanced pretreatment based on the modified siting and sizing criteria in Section .1200 of this Subchapter; or
(4) with the use of a wastewater system identified or approved in Sections .0900 or .1700 of this Subchapter
(c) For sites that are classified as unsuitable in accordance with this Rule, a special site evaluation in accordance with Rule .0510 of this Section may be provided that demonstrates that the proposed wastewater system can be expected to overcome the unsuitable site conditions and function in accordance with this Subchapter.
(d) An IP shall not be issued for a site which is classified unsuitable.

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

**15A NCAC 18E .0510 SPECIAL SITE EVALUATIONS**
(a) A special site evaluation shall demonstrate that the proposed use of the site with a specific wastewater system design and configuration will not result in effluent discharge to the ground surface or contravention of groundwater or surface water standards. Special site evaluations shall be performed by a licensed professional, if required in G.S. 89C, 89E, or 89F.
(b) The owner may submit a special site evaluation for a site classified as unsuitable as set forth in Rule .0509 of this Section to an authorized agent. The special site evaluation shall include written documentation and demonstrate that the proposed wastewater system can be expected to overcome the unsuitable site conditions and function in accordance with this Subchapter.
(c) Any site that is proposed with one or more of the following shall require a special site evaluation:
(1) proposal submitted in accordance with Rule .0509(c) of this Section;
(2) sand lined trench systems when the texture of the receiving permeable horizon is sandy loam or loam and the DDF is greater than 600 gpd, or when the texture of the receiving permeable horizon is silt loam;
(3) DSE drip dispersal systems meeting the following soil and site conditions:
(A) depth from the naturally occurring soil surface to any LC is greater than or equal to 18 inches and the LTAR is proposed to exceed 0.5 gpd/ft$^2$ for Group I, 0.35 gpd/ft$^2$ for Group II, or 0.2 gpd/ft$^2$ for Group III soils;
(B) depth from the naturally occurring soil surface to any SWC is less than 18 inches and the LTAR is proposed to exceed 0.5 gpd/ft$^2$ for Group I, 0.3 gpd/ft$^2$ for Group II, or 0.15 gpd/ft$^2$ for Group III soils;
(C) Group IV soils are encountered within 18 inches of the naturally occurring soil surface or within 12 inches of the infiltrative surface, whichever is deeper, and the LTAR is proposed to exceed 0.05 gpd/ft$^2$;
(D) Group IV soils are encountered within 18 inches of the naturally occurring soil surface and the depth from the naturally occurring soil surface to any LC is less than 24 inches;
(E) Group IV soils are encountered within 18 inches of the naturally occurring soil surface and the driplines are installed in new fill material;
(F) groundwater lowering system is used to comply with soil depth and vertical separation requirements to a SWC;
(G) proposed LTAR exceeds that assigned by the LHD; or
(H) DDF is greater than 1,500 gpd;
(4) advanced pretreatment systems meeting the following soil and site conditions:
(A) vertical separation to a LC is proposed to be reduced. The vertical separation to rock or tidal water shall not be reduced to less than 12 inches;
(B) less than 18 inches of naturally occurring soil to a LC, excluding SWC;
(C) increased LTAR is proposed for a site with Group III or IV soils within three feet of the infiltrative surface;
(D) increased LTAR is proposed for a site with Group II or III soils that requires a groundwater lowering system;
(E) proposed use of a groundwater lowering system to comply with vertical separation requirements to a SWC;
(F) bed systems located beneath the advanced pretreatment unit on a site with uniform slope exceeding two percent except in Group I soils with a SWC greater than 36 inches;
(G) bed systems with a DDF greater than 1,500 gpd; or
(H) increased LTAR is proposed on a site with a DDF greater than 1,500 gpd;
(5) drip dispersal systems and Group IV soils are within 18 inches of the naturally occurring soil surface or within 12 inches of the infiltrative surface, whichever is deeper, and the LTAR is proposed to exceed 0.1 gpd/ft$^2$ for NSF/ANSI 40, 0.12 gpd/ft$^2$ for TS-I, or 0.15 gpd/ft$^2$ for TS-II;
(6) NSF/ANSI 40 and drip dispersal systems when the LTAR is proposed to exceed 0.8 gpd/ft$^2$ for Group I soils, 0.5 gpd/ft$^2$ for Group II soils, 0.25 gpd/ft$^2$ for Group III soils, or 0.1 gpd/ft$^2$ for Group IV soils;
(7) TS-I and drip dispersal systems which meet the following criteria:

(A) site has less than 18 inches of naturally occurring soil to any unsuitable LC;
(B) Group III soils are present and a groundwater lowering system is used to comply with the vertical separation requirements to a SWC;
(C) Group IV soils are encountered within 18 inches of the naturally occurring soil surface, the LTAR is proposed to exceed 0.05 gpd/ft$^2$, and the system is proposed to be installed in new fill; or
(D) LTAR is proposed to exceed 1.0 gpd/ft$^2$ for Group I soils, 0.6 gpd/ft$^2$ for Group II soils, 0.3 gpd/ft$^2$ for Group III soils, or 0.12 gpd/ft$^2$ for Group IV soils;

(8) TS-II and drip dispersal systems which meet the following criteria:
(A) Subparagraphs (7)(A), (B), or (C) of this Rule; or
(B) LTAR is proposed to exceed 1.2 gpd/ft$^2$ for Group I soils, 0.7 gpd/ft$^2$ for Group II soils, 0.4 gpd/ft$^2$ for Group III soils, or 0.15 gpd/ft$^2$ for Group IV soils;

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

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

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

(d) The special site evaluation shall include hydrologic or hydraulic testing, as applicable, and analysis, in accordance with Rule .0304(2)(b) of this Subchapter.

(e) For wastewater systems with a DDF greater than 3,000 gpd, the special site evaluation shall include sufficient site-specific data to predict the height of the water table mound that will develop beneath the field on level sites and the rate of lateral and vertical flow away from the trenches on sloping sites, unless the conditions in Paragraph (f) of this Rule are met. The data submitted may include deep soil borings to an impermeable layer or to a depth to support the hydrologic testing and modeling, permeability, in-situ Ksat measurements, water level readings, and other information determined to be necessary by the LHD or the Department, such as the impact of projected wastewater constituents on the trench and receiving soil. The site shall be considered unsuitable if the data indicate any of the following:

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

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

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

(f) For wastewater systems with a DDF greater than 3,000 gpd and dispersal fields designed for less than or equal to 1,500 gpd, in-situ Ksat measurements and groundwater mounding or lateral flow analysis shall not be required if a special site evaluation demonstrates that the dispersal fields are in separate lateral flow windows or are shown to not be hydraulically connected.

(g) The Department shall review the special site evaluation if requested by the LHD or if required in accordance with Rule .0302(e) of this Subchapter.

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

## SECTION .0600 – LOCATION OF WASTEWATER SYSTEMS

### 15A NCAC 18E .0601 LOCATION OF WASTEWATER SYSTEMS

(a) Every wastewater system shall be located the minimum setbacks from the site features specified in Table IX. The setback shall be measured on the ground surface, unless otherwise specified in this Rule, from the nearest wastewater system component sidewall or as otherwise specified in a system specific rule or PIA Approval.

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

| Site Features | Setback in feet |
|---|---|
| Any transient or non-transient non-community water supply well, community well, shared water supply well, well that complies with 15A NCAC 18A .1700, or water supply spring | 100 |
| A private drinking water well or upslope spring serving a single family dwelling unit | 50 |
| Any other well or source not listed in this table, excluding monitoring wells | 50 |
| Surface waters classified WS-I, from ordinary high-water mark | 100 |
| Waters classified SA, from mean high-water mark | 100 |
| Any Class I or Class II reservoir, from normal water level | 100 |
| Lake or pond, from normal water level | 50 |
| Any other stream, non-water supply spring, or other surface waters, from the ordinary high-water mark | 50 |
| Tidal influenced waters, such as marshes and coastal waters, from mean high-water mark | 50 |