

## **15A NCAC 18E .0910 ARTIFICIAL DRAINAGE SYSTEMS**

(a) Artificial drainage systems are a site modification and may be proposed to reclassify sites as suitable that were originally classified unsuitable due to a SWC, lateral water movement, saturated soils, a perched water table, or other oxyaquic conditions. Artificial drainage systems include groundwater lowering systems, interceptor drains, and surface water diversions.

(b) Groundwater lowering systems may be used when the following criteria are met:

- (1) the site has Group I or II soils with suitable structure and clay mineralogy; and
- (2) the groundwater lowering system shall be designed to maintain the vertical separation to a SWC as specified in Rule .0901(g)(2) of this Section.

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

- (1) Gravity groundwater lowering systems shall be designed in accordance with the following:
  - (A) substantiating information, calculations, and data shall be provided justifying the effectiveness of the proposed drainage system design;
  - (B) design and devices shall comply with accepted standards of practice as set forth in the USDA-NRCS National Engineering Handbook, Part 624 - Drainage, Chapter 10 - Water Table Control, and Part 650 - Engineering Field Handbook, Chapter 14 - Water Management, Drainage;
  - (C) the effectiveness of groundwater lowering systems shall be determined by use of the Ellipse, Hooghoudt, or equivalent drainage equations for sites with Group I or II soils. Justification for use of a specific drainage equation shall be provided;
  - (D) drainage equation input parameters shall be based upon field descriptions of soil profiles and in-situ Ksat measurements. The drainage coefficient used in these equations shall be calculated from the highest monthly rainfall value with a 30-percent exceedance probability from the closest available National Weather Service or SCO. A source of these data is the WETS tables published in the Natural Resource Conservation Service Field Office Technical Guides available online at: [efotg.sc.gov.usda.gov/efotg\\_locator.aspx](http://efotg.sc.gov.usda.gov/efotg_locator.aspx). This monthly value shall be divided by 14 to give the drainage coefficient in inches per day. For systems with a DDF greater than 1,500 gpd, the projected contribution of wastewater application shall be added to the drainage coefficient used in the equations;
  - (E) DRAINMOD shall be used to determine the groundwater lowering system effectiveness at sites with three or more effective soil layers, Group III or IV soils within 36 inches of the naturally occurring soil surface, or sites requiring a groundwater lowering system using pumps; and
  - (F) the modeling procedure set forth in Rule .0504(h) of this Subchapter shall be followed.
- (2) Groundwater lowering systems using pumps shall be designed in accordance with the following:
  - (A) plan and profile detail drawings of pump tank, showing all dimensions, pumps, discharge piping, floats, and float and alarm activation levels;
  - (B) calculations and supporting information shall be provided as the basis for sizing the pumps, dose volume, emergency storage capacity, and overall tank capacity;
  - (C) the high-water alarm in the control panel shall automatically contact a 24-hour maintenance service;
  - (D) information on discharge pipe line, line location, materials, and provisions for erosion control at the discharge point;
  - (E) except as otherwise provided in this Paragraph, the requirements of Section .1100 of this Subchapter shall apply to artificial drainage systems using pumps; and
  - (F) dual alternating pumps shall be required when serving two or more design units. Each pump shall be sized at a capacity of two and one half times the projected peak inflow rate to the pump tank.
- (3) Plans and specifications for all groundwater lowering systems shall include the following:
  - (A) location of existing and proposed drainage systems in relation to all facilities and wastewater system components. Plans shall indicate flow direction, slope and drain outlet location;

- (B) profile drawings showing drainage trench dimensions, depth, pipe size, aggregate envelope, and filter fabric detail, cover, and cleanout detail;
- (C) elevations with reference to an established benchmark;
- (D) specifications for all groundwater lowering system materials and installation procedures;
- (E) the entire groundwater lowering system, including the outlet, shall be on property owned or controlled by the person owning or controlling the system. Necessary legal agreements shall be provided in accordance with Rule .0301(c) of this Subchapter; and
- (F) easements for egress, ingress, and regress for maintenance of groundwater lowering systems serving two or more lots shall be at least 20 feet wide plus the width of the groundwater lowering system.

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

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

*History Note: Authority G.S. 130A-335(e) and (f);  
Eff. January 1, 2024.*