

#### **15A NCAC 02U .0404 DESIGN CRITERIA FOR CLOSED-LOOP RECYCLE SYSTEMS**

- (a) The requirements in this Rule shall apply to all new and expanding closed-loop recycle facilities.
- (b) Design criteria related to closed-loop recycle systems in general.
  - (1) The public shall be prohibited access to the wastewater treatment equipment, wastewater storage structures, or to the wastewater within a closed-loop recycle facility.
  - (2) If potable water is used to supplement a closed-loop recycle water system, there shall be no direct cross-connections between the closed-loop system and potable water systems, unless such connection has been approved by the Department pursuant to 15A NCAC 18C .0406.
- (c) Design criteria related to treatment and storage units used in closed-loop recycle systems.
  - (1) The facility shall have the ability to stop production of effluent, return the effluent back to the treatment facility, store the effluent, or discharge the effluent to another permitted wastewater treatment facility when recycling cannot be conducted.
  - (2) Essential treatment units shall be provided in duplicate if proper operation of the treatment unit is essential to the operation of the closed-loop recycle system and the operation cannot safely or efficiently be immediately stopped or altered to operate without the closed-loop recycle system.
  - (3) An automatically activated standby power source, system shutdown, or other means shall be employed to prevent improperly treated wastewater from entering a treated waste water storage structure or from being recycled if loss of power would create an unsafe condition.
  - (4) If they are suitable for reuse, residues recovered during the treatment process may be recycled through the processes that generated the wastewater rather than disposed of as a waste.
  - (5) A water tight seal on all treatment and storage units or two feet of protection from the 100-year flood elevation shall be provided.
  - (6) Storage units in a closed-loop recycle system shall be designed to contain the accumulation of water from a 25-year, 24-hour storm event with 1 foot freeboard, unless the system is protected from rainfall and runoff.
  - (7) The bottoms of earthen impoundments, trenches, or other similar excavations shall be at least four feet above the bedrock surface, except that the bottom of excavations that are less than four feet above bedrock shall have a liner with a hydraulic conductivity no greater than  $1 \times 10^{-7}$  centimeters per second. Liner thickness shall be that thickness necessary to achieve a leakage rate consistent with the sensitivity of classified groundwaters. Liner requirements may be reduced if the applicant demonstrates through predictive calculations or modeling that construction and use of these treatment and disposal units will not result in contravention of surface water or groundwater standards.
  - (8) Treatment works and disposal systems using earthen basins, lagoons, ponds, or trenches, excluding holding ponds containing non-industrial treated effluent prior to irrigation, for treatment, storage, or disposal, shall have either a liner of natural material at least one foot in thickness and having a hydraulic conductivity of no greater than  $1 \times 10^{-6}$  centimeters per second when compacted, or a synthetic liner of sufficient thickness to exhibit structural integrity and an effective hydraulic conductivity no greater than that of the natural material liner.

*History Note: Authority G.S. 143-215.1; 143-215.3(a);  
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