15A NCAC 18E .1104 SIPHON DOSING

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

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

(2) All siphon parts shall be installed in accordance with the manufacturer's specifications. All materials shall be corrosion-resistant, of cast iron, high-density plastic, fiberglass, stainless steel, or equal as approved by the Department when documentation is provided which shows the materials meet the requirements of this Rule.

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

History Note: *Authority G.S. 130A-335(e), (f), and (f1).*

15A NCAC 18E .1105 TIMED DOSING

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

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

(2) flow equalization systems;

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

(4) when specified by the authorized designer.

(b) The timed dosing system shall be integrated with the pump tank control sensors to ensure that the minimum dose volume calculated in accordance with Rule .1101(d) of this Section is present prior to the start of any scheduled dose event and to provide that a full dose is delivered.

(c) The float configuration of a flow equalization system using timed dosing shall be adjusted by the LHD, authorized designer, or PE, to provide for equalization capacity in the system.

History Note: *Authority G.S. 130A-335(e), (f), and (f1).*

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

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

(1) uniform distribution of flow proportional to lateral length with a minimum of two feet of residual pressure head;

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

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

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

(5) a method to visually verify the flow to each individual lateral;

(6) the feeder lines from the pressure manifold shall be of sufficient size and slope for effluent to flow by gravity to each lateral; and

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

(b) A distribution box or a drop box may be used to dissipate or distribute flow in a pressure dosed gravity dispersal system for parallel, serial, or sequential distribution. Such devices shall be watertight, corrosion resistant, constructed to withstand active and passive loads, and the volume of the device shall be such that when the dose volume is delivered, the box shall not overflow. The authorized agent shall approve the distribution device when it has been determined to be in accordance with Rule .0901(g)(9) through (11) of this Subchapter.

History Note: *Authority G.S. 130A-335(e), (f), and (f1).*

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

15A NCAC 18E .1201 ADVANCED PRETREATMENT SYSTEM STANDARDS

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

(1) have an RWTS or PIA Approval;

(2) be designed to comply with the effluent standard specified in the OP and defined in Table XXV prior to effluent dispersal to the soil;

(3) comply with the siting and sizing requirements of this Section; and

(4) comply with Rules .1302(f) and .1710 of this Subchapter.

TABLE XXV. Effluent standards for advanced pretreatment systems

Constituent	Effluent Standards		
	NSF/ANSI 40	TS-I	TS-II
CBOD	≤ 25 mg/L	≤ 15 mg/L	≤ 10 mg/L
TSS	≤ 30 mg/L	≤ 15 mg/L	≤10 mg/L
NH_3		≤ 10 mg/L or 80% removal of NH_3 if influent TKN exceeds 50 mg/L	≤ 10 mg/L
TN			≤ 20 mg/L
Fecal Coliform		≤ 10,000 colonies/100 mL	≤ 1,000 colonies/100 mL

(b) The effluent applied to advanced pretreatment systems shall not exceed DSE as specified in Table III of Rule .0402(a) of this Subchapter, unless the system is designed to treat HSE and approved by the Department on a product or project-specific basis in accordance with the rules of this Subchapter and engineering practices.
(c) The effluent standards in Table XXV, or modifications to these effluent standards, may be proposed by a PE for systems with a design flow greater than 3,000 gpd or IPWW. The Department shall review and approve the proposed effluent standards in accordance with Rule .0302(e) of this Subchapter. Documentation shall also be provided that the proposed system meets the requirements of Rule .0510(e) of this Subchapter.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-342; 130A-343.*

15A NCAC 18E .1202 SITING AND SIZING CRITERIA FOR ADVANCED PRETREATMENT SYSTEMS WITH A DESIGN DAILY FLOW LESS THAN OR EQUAL TO 1,500 GALLONS/DAY

(a) Wastewater systems utilizing advanced pretreatment with a DDF less than or equal to 1,500 gpd may only use one of the following modifications to system siting and sizing criteria, unless otherwise identified in this Rule:
(1) reduction in depth to LC or vertical separation to LC in accordance with Paragraph (b) of this Rule;
(2) LTAR increase in accordance with Paragraph (c) of this Rule; or
(3) setback reductions in accordance with Paragraph (d) of this Rule.

(b) The minimum required vertical separation to a LC in natural soil may be reduced with the use of advanced pretreatment in accordance with Table XXVI. Table XXVII provides the minimum depths and vertical separation for new and existing fill. A special site evaluation shall be submitted and approved in accordance with Rule .0510 of this Subchapter when a reduction in vertical separation to a LC is proposed in accordance with this Rule.

Table XXVI. Minimum vertical separation to LC based on effluent standards for wastewater systems with a DDF less than or equal to 1,500 gpd

Minimum vertical separation in inches from infiltrative surface to LC					
Soil Group	Distribution Method	Effluent Standard**			
		DSE*	NSF/ANSI 40	TS-I	TS-II
I	Gravity	18	12	12	12
	LPP	12	12	9	6
	Drip	12	12	9	6
II-IV	Gravity	12	12	9	9
	LPP	12	12	9	6
	Drip	12	12	9	6

*For comparison
**12-inch vertical separation shall always be maintained to rock or tidal water

Table XXVII. Minimum depth to LC and vertical separation to SWC in new or existing fill based on effluent standards for wastewater systems with a DDF less than or equal to 1,500 gpd for new fill and less than or equal to 480 gpd for existing fill

Minimum depth in inches from naturally occurring soil surface or existing fill surface to LC					
Type of Fill	Distribution Method		Effluent Standard		
		DSE**	NSF/ANSI 40	TS-I	TS-II
New Fill	Gravity	18 to LC 12 to SWC	18 to LC 12 to SWC	14 to LC 12 to SWC	14 to LC 12 to SWC
	LPP	18 to LC 12 to SWC	18 to LC 12 to SWC	12	12
	Drip	18 to LC	18 to LC	12	12

		12 to SWC	12 to SWC		
Existing Fill	Gravity LPP Drip	24 of Group I Fill or Soil to LC 18 of Group I Fill or Soil to SWC			

Minimum vertical separation in inches from infiltrative surface to LC*

Type of Fill	**Distribution Method**	**Effluent Standard**			
		DSE**	**NSF/ANSI 40**	**TS-I**	**TS-II**
New Fill	Gravity	24 to LC 18 to SWC	18 to LC 18 to SWC	18 to LC 14 to SWC	18 to LC 14 to SWC
	LPP	18 to LC 12 to SWC	18 to LC 12 to SWC	12 to LC 9 to SWC	9 to LC 6 to SWC
	Drip	18 to LC 12 to SWC	18 to LC 12 to SWC	12 to LC 9 to SWC	9 to LC 6 to SWC
Existing Fill	Gravity	48	36	24	24
	LPP	24	18	12	12 to LC 9 to SWC
	Drip	24	18	12	12 to LC 9 to SWC

*Minimum depth after adjustment for slope correction
**For comparison

(c) The LTAR shall be based on the effluent standard and dispersal field type proposed in accordance with the following:

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

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

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

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

(2) A special site evaluation, if required in accordance with Rule .0510 of this Subchapter, shall be submitted and approved.

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

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

(5) When using pressure dispersal systems, the proposed LTAR increases in Subparagraph (c)(1) may be used concurrently with the reduced setbacks for TS-II Systems in Table XXVIII.

(6) The DDF shall not be increased by the addition of advanced pretreatment to an existing wastewater system by more than 33 and one-third percent on a site without repair area or by more than 50 percent on a site with 100 percent repair area.

(d) Advanced pretreatment systems shall meet the following setback requirements:

(1) minimum setback requirements of Section .0600 of this Subchapter shall be met, except as shown in Table XXVIII; and

(2) when any other siting or sizing modifications are applied, such as reduced depth to LC, vertical separation, or increased LTAR, for a TS-I or TS-II system in accordance with Paragraphs (b) and (c) of this Rule, no setback reductions shall be taken except those to artificial drainage systems described in Table XXVII, unless otherwise specified in this Section.

Table XXVIII: Setbacks for wastewater systems meeting NSF/ANSI 40, TS-I, or TS-II effluent standards

Site Features	**Setback in feet according to Effluent Standard****			
	DSE*	**NSF/ANSI 40**	**TS-I**	**TS-II**

Surface waters classified WS-I, from ordinary high-water mark	100	70	70	50
Waters classified SA, from mean high-water mark	100	70	70	50
Any Class I or Class II reservoir, from normal water level	100	70	70	50
Any other stream, non-water supply spring, or other surface water, from the ordinary high-water mark	50	35	35	25
Tidal influenced waters, such as marshes and coastal water, from mean high-water mark	50	35	35	25
Lake or pond, from normal water level	50	35	35	25
Groundwater lowering system, as measured on the ground surface from the edge of the feature	25	25	20	15
Downslope interceptor drains and surface water diversions with a vertical cut of more than two feet, as measured on the ground surface from the edge of the feature	15	15	10	10
Upslope and side slope interceptor drains and surface water diversions with a vertical cut of more than two feet, as measured on the ground surface from the edge of the feature	10	10	7	5
A stormwater collection system as defined in 15A NCAC 02H .1002(48), excluding gutter drains that connect to a stormwater collection system, with a vertical cut of more than two feet as measured from the center of the collection system	10	10	7	5
Permanent stormwater retention basin, from normal water level	50	50	35	25
Any other dispersal field, except designated dispersal field repair area for project site	20	20	10	5

*For comparison

**May require a variance from DEQ based on local buffer rules.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-342; 130A-343.*

15A NCAC 18E .1203 SITING AND SIZING CRITERIA FOR ADVANCED PRETREATMENT SYSTEMS WITH A DESIGN DAILY FLOW GREATER THAN 1,500 GALLONS/DAY AND LESS THAN OR EQUAL TO 3,000 GALLONS/DAY

(a) Wastewater systems utilizing advanced pretreatment with a DDF greater than 1,500 gpd and less than or equal to 3,000 gpd may utilize the system siting and sizing in this Rule.

(b) The LTAR shall be based on the effluent standard and dispersal field type proposed in accordance with the following:

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

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

(B) up to 2.5 for TS-II effluent standards when there is a minimum of 48 inches of Group I soils from the naturally occurring soil surface and a minimum of 30 inches to a SWC below the naturally occurring soil surface.

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

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

(1) a special site evaluation required in accordance with Rule .0510 of this Subchapter shall be submitted and approved;

(2) pressure dispersal shall be utilized;

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

(4) 25-foot setback shall be maintained to all property lines unless a site-specific nitrogen migration analysis for a TS-I system indicates that the nitrate-nitrogen concentration at the property line will not exceed 10 mg/L or a TS-II system is used.

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

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

(f) Wastewater systems utilizing advanced pretreatment with a DDF greater than 3,000 gpd may propose LTAR adjustments in accordance with Paragraphs (a) through (c) of this Rule. The Department shall review and approve the proposed LTAR adjustments in accordance with Rule .0302(e) of this Subchapter. Documentation shall also be provided that the proposed system meets the requirements of Rule .0510(e) of this Subchapter.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-342; 130A-343.*

15A NCAC 18E .1204 ADVANCED PRETREATMENT DRIP DISPERSAL SYSTEMS

(a) This Rule provides for the permitting of drip dispersal systems receiving advanced pretreatment effluent with a DDF less than or equal to 3,000 gpd. Drip dispersal systems shall comply with the provisions of this Rule and Section .1600 of this Subchapter.
(b) Drip dispersal systems with a DDF less than or equal to 1,500 gpd shall utilize the siting and sizing criteria in this Paragraph when used with advanced pretreatment.

(1) The soil and site characteristics shall meet the following criteria based on effluent standards:
  (A) NSF/ANSI 40 Systems
    (i) a minimum of 18 inches of naturally occurring suitable soil above a LC and 13 inches of naturally occurring suitable soil above a SWC, and the minimum vertical separation to any LC shall be 12 inches;
    (ii) for new fill, the requirements of Rules .0909(b) and (c) of this Subchapter shall be met; or
    (iii) for existing fill, the requirements of Rules .0909(d) and (e) of this Subchapter shall be met, except that the minimum vertical separation to any LC shall be 18 inches;
  (B) TS-I Systems
    (i) a minimum of 15 inches of naturally occurring suitable soil above a LC and a minimum of 13 inches of naturally occurring suitable soil above a SWC, and the minimum vertical separation to any LC shall be nine inches;
    (ii) for new fill, the requirements of Rules .0909(b) and (c) of this Subchapter shall be met, except there shall be a minimum of 12 inches of naturally occurring suitable soil above a LC, a minimum of nine inches vertical separation to a SWC, and a minimum of 12 inches vertical separation to a LC; or
    (iii) for existing fill, the requirements of Rules .0909(d) and (e) of this Subchapter shall be met, except that the minimum vertical separation to any LC shall be 12 inches; or
  (C) TS-II Systems
    (i) a minimum of 13 inches of naturally occurring suitable soil above a LC and the minimum vertical separation to any LC shall be six inches;
    (ii) for new fill, the requirements of Subpart (B)(ii) of this Paragraph shall be met, except there shall be a minimum of nine inches of vertical separation to a LC, and a minimum of six inches of vertical separation to a SWC; or
    (iii) for existing fill, the requirements of Subpart (B)(iii) of this Paragraph shall be met, except there shall be a minimum vertical separation of nine inches to a SWC.

(2) Site modifications for advanced pretreatment drip dispersal systems shall meet the following criteria based on effluent standards:
  (A) NSF/ANSI 40 Systems may utilize a groundwater lowering system to comply with the vertical separation requirements to a SWC only when Group I or II soils with suitable structure are present within 36 inches of the naturally occurring soil surface. The minimum vertical separation to the projected, or drained, SWC shall be 12 inches. The addition of fill material shall not be used to comply with this requirement; and
  (B) TS-I and TS-II Systems may utilize a groundwater lowering system to comply with the vertical separation requirements to a SWC. The minimum vertical separation to the projected, or drained, SWC shall be 12 inches. The groundwater lowering system may be used with the following: Group III soils are present at any depth above the invert elevation of the highest point of the artificial drainage system or within 36 inches of the naturally occurring soil surface, whichever is deeper; or on new fill sites.

(3) Table XXIX shall be used to determine the LTAR for advanced pretreatment drip dispersal systems based on Soil Group. Limitations in adjustment allowances for NSF/ANSI 40, TS-I, and TS-II systems are listed in Parts (E), (F), and (G) of this Subparagraph.

TABLE XXIX. LTAR for advanced pretreatment drip dispersal systems based on Soil Group

Soil Group	USDA Soil Textural Class		LTAR in gpd/ft^2		
			NSF/ANSI 40	TS-I	TS-II
I	Sands	Sand	0.6 – 1.0	0.8 – 1.2	0.8 – 1.5
		Loamy Sand			
II	Coarse Loams	Sandy Loam	0.4 – 0.6	0.5 – 0.8	0.6 – 1.0
		Loam			
III	Fine Loams	Sandy Clay Loam	0.15 – 0.4	0.2 – 0.6	0.2 – 0.8
		Silt Loam			
		Clay Loam			
		Silty Clay Loam			
		Silt			
IV	Clays	Sandy Clay	0.05 – 0.2	0.05 – 0.2	0.05 – 0.2
		Silty Clay			
		Clay			

(A) The LTAR shall be based on the most limiting, naturally occurring soil horizon within 18 inches of the naturally occurring soil surface or to a depth of 12 inches below the infiltrative surface.

(B) The DDF shall be divided by the LTAR, determined from Table XXIX or XXX, to calculate the minimum dispersal field area required. The minimum dripline length shall be calculated by dividing the required area by the maximum line spacing of two feet. The following equations shall be used to calculate the minimum dispersal field area and dripline length required:

MA = DDF / LTAR

DL = MA / LS

Where MA = minimum dispersal field area, in ft^2

DDF = design daily flow, in gpd

LTAR = in gpd/ft^2

DL = dripline length, in feet

LS = two-foot line spacing

(C) The minimum dripline length calculated in Part (B) of this Subparagraph shall not be less than 0.5 x DDF for Group I soils, 0.83 x DDF for Group II soils, 1.25 x DDF for Group III soils, or 3.33 x DDF for Group IV soils. The dripline spacing may be adjusted in accordance with Rule .1602(e)(3) of this Subchapter and the PIA Approval so that the minimum required dispersal field area calculated in Part (B) of this Subparagraph does not need to be increased.

(D) Sections of blank tubing without emitters required to comply with site-specific conditions shall not count towards the minimum length of dripline needed when laying out the system or when calculating the linear footage of dripline needed.

(E) LTAR adjustment limitations for NSF/ANSI 40 Systems

(i) the LTAR for new fill shall not exceed 0.6 gpd/ft^2 for Group I soils, 0.4 gpd/ft^2 for Group II soils, 0.15 gpd/ft^2 for Group III soils, or 0.05 gpd/ft^2 for Group IV soils; and

(ii) the LTAR for existing fill shall not exceed 0.8 gpd/ft^2.

(F) LTAR adjustment limitations for TS-I Systems

(i) the LTAR for new fill shall not exceed 1.0 gpd/ft^2 for Group I soils, 0.6 gpd/ft^2 for Group II soils, 0.4 gpd/ft^2 for Group III soils, or 0.1 gpd/ft^2 for Group IV soils;

(ii) the LTAR for existing fill shall not exceed 1.0 gpd/ft^2; and

(iii) the LTAR for sites with less than 18 inches of naturally occurring soil to any unsuitable LC shall not exceed the lowest LTAR for Soil Groups I, II, and III, and 0.1 gpd/ft^2 for Group IV soils.

(G) LTAR adjustment limitations for TS-II Systems

(i) the LTAR for new fill shall not exceed 1.2 gpd/ft^2 for Group I soils, 0.8 gpd/ft^2 for Group II soils, 0.5 gpd/ft^2 for Group III soils, or 0.12 gpd/ft^2 for Group IV soils;

(ii) the LTAR for existing fill shall not exceed 1.0 gpd/ft^2; and

(iii) the LTAR for sites with less than 18 inches of naturally occurring soil to any unsuitable LC shall not exceed the lowest LTAR for Soil Groups I, II, and III, and 0.12 gpd/ft^2 for Group IV soils.

(4) Table XXX shall be used in determining the LTAR for advanced pretreatment drip dispersal systems installed in saprolite. The LTAR shall be based on the most limiting, naturally occurring saprolite to a depth of 24 inches below the infiltrative surface.

TABLE XXX. LTAR for advanced pretreatment drip dispersal systems based on Saprolite Group

Saprolite Group	Saprolite Textural Class	LTAR, area basis, in gpd/ft^2		
		NSF/ANSI 40	TS-I	TS-II
I	Sand	0.4 – 0.5	0.4 – 0.6	0.4 – 0.8
	Loamy sand	0.3 – 0.4	0.3 – 0.5	0.3 – 0.6
II	Sandy loam	0.25 – 0.35	0.25 – 0.4	0.25 – 0.5
	Loam	0.2 – 0.25	0.2 – 0.3	0.2 – 0.4
	Silt loam	0.05 – 0.1	0.05 – 0.15	0.05 – 0.2
III	Sandy clay loam	0.05 – 0.1	0.05 – 0.12	0.05 – 0.15

(5) A special site evaluation shall be required in accordance with Rule .0510 of this Subchapter, as applicable.

(6) Setbacks allowed in Table XXVIII of Rule .1202(d) of this Section may be used with advanced pretreatment drip dispersal systems when no reduction in the depth to a LC or vertical separation reduction is proposed compared to the requirements for DSE in Table XXVI or Table XXVII of Rule .1202(b) of this Section. A minimum of 18 inches of naturally occurring soil to an unsuitable LC shall be required to take setback reductions. The following LTAR limitations shall be applicable:

(A) for NSF/ANSI 40 systems, with the exception of the setback reductions to artificial drainage systems, when reductions are taken in setbacks, the LTAR shall not exceed the lowest LTAR for Soil Groups I, II, and III, and 0.1 gpd/ft^2 for Group IV soil;

(B) for TS-I Systems, with the exception of setback reductions to artificial drainage systems, when reductions are taken in setbacks, the LTAR shall not exceed the mid-range LTAR for Soil Groups I, II, and III, and 0.1 gpd/ft^2 for Group IV soils;

(C) for NSF/ANSI 40 and TS-I Systems, Table XXIX may be used to determine the LTAR when no other setback reductions are taken aside of those to artificial drainage systems; and

(D) for TS-II Systems, Table XXIX shall be used to determine the LTAR. The LTAR from Table XXIX and reduced setbacks for TS-II Systems from Table XXVIII of Rule .1202(d) of this Section may be taken concurrently.

(c) Drip dispersal systems with a DDF greater than 1,500 gpd and less than or equal to 3,000 gpd used with advanced pretreatment may propose an adjusted LTAR if the following criteria are met:

(1) no reduction in the depth to a LC, vertical separation, or setback reduction is proposed;

(2) proposed LTAR is supported by a special site evaluation in accordance with Rule .0510 of this Subchapter; and

(3) 25-foot setback shall be maintained to all property lines, unless one of the following criteria is met:

(A) site-specific nitrogen migration analysis for a TS-I system indicates that the nitrate-nitrogen concentration at the property line will not exceed 10 mg/L; or

(B) TS-II system is used.

(d) Drip dispersal installation shall be in accordance with Rule .0908(f) of this Subchapter.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-342; 130A-343.*

15A NCAC 18E .1205 ADVANCED PRETREATMENT SAND LINED TRENCH SYSTEMS

(a) Sand lined trench systems with a DDF less than or equal to 1,500 gpd receiving TS-I or TS-II effluent shall meet the requirements of this Rule.

(b) The site meets the criteria in Rule .0906(c) of this Subchapter and the receiving permeable horizon may be deeper than 60 inches below the natural grade.

(c) If a groundwater lowering system is used to comply with the vertical separation to a SWC, the following conditions shall apply:

(1) the site shall comply with the requirements of Rule .0906(d) of this Subchapter; and

(2) the vertical separation requirement to a SWC shall be reduced to nine inches with pressure dosed gravity distribution or six inches with pressure dispersal.

(d) Table XXXI shall be used to determine the LTAR for a sand-lined trench system and shall be based on the most limiting, naturally occurring soils overlying the permeable receiving layer. An equivalent trench width of three feet shall be used to determine trench length in accordance with Rule .0901(d) of this Subchapter. The LTAR shall be one of the following:

(1) the rate set forth in Table XXXI; or

(2) 20 percent of the in-situ Ksat of the receiving permeable horizon, whichever is less.

TABLE XXXI. LTAR for advanced pretreatment sand lined systems based on texture of the most hydraulically limiting overlying soil horizon

Soil Group	Texture of Most Hydraulically Limiting Overlying Soil Horizon	LTAR in gpd/ft^{2*}
I	Sand	0.9 – 1.4
II	Coarse Loams	0.7 – 1.0
III	Fine Loams	0.4 – 0.8
IV	Clays	0.2 – 0.4

*There shall be no reduction in trench length compared to a conventional gravel trench when Accepted or Innovative gravelless trench product is used.

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

(1) when the texture of the receiving permeable horizon is sandy loam or loam, and the system DDF is greater than 600 gpd; or

(2) when the texture of the receiving permeable horizon is silt loam.

(f) Setbacks in accordance with Table XXVIII of Rule .1202(d) of this Section shall be applied to sand lined trench systems.

(g) Sand lined trench system installation shall be in accordance with Rule .0906(h) of this Subchapter.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-342; 130A-343.*

15A NCAC 18E .1206 ADVANCED PRETREATMENT BED SYSTEMS

(a) This Rule shall apply to bed systems receiving advanced pretreatment.

(b) Bed systems receiving NSF/ANSI 40 effluent, or better, on sites with a DDF less than or equal to 600 gpd shall meet the following requirements:

(1) the soil and site shall meet the following criteria:
  (A) the vertical separation requirements of Rule .0901(g)(2) of this Subchapter;
  (B) soil texture is Group I, II, or III; and
  (C) design options for the site are limited by topography or available space;
(2) Table XVII in Rule .0901(c) of this Subchapter shall be used to determine the LTAR for a bed system. On sites where the soil texture is Group I or II, the initial LTAR shall be increased by a factor of 1.125 with no further reduction in bed size allowed;
(3) setbacks allowed in Table XXVIII of Rule .1202(d) of this Section shall be used; and
(4) bed system installation shall be in accordance with Rule .0903(e) of this Subchapter.

(c) Bed systems receiving TS-I or TS-II effluent on sites with a DDF less than or equal to 1,500 gpd shall meet the following requirements:

(1) The soil and site meet the following criteria:
  (A) there is a minimum of 30 inches of suitable Group I or II soils below the naturally occurring soil surface and no SWC within the first 36 inches below the naturally occurring soil surface or 36 inches of Group I soils below the naturally occurring soil surface and no SWC exists within the first 12 inches below the naturally occurring soil surface;
  (B) the requirement for 30 inches of Group I or II soils or 36 inches of Group I soils in Part (A) of this Subparagraph may be reduced to 18 inches when a special site evaluation in accordance with Rule .0510 of this Subchapter is provided;
  (C) sites shall have a uniform slope not exceeding two percent, unless a special site evaluation submitted and approved in accordance with Rule .0510 of this Subchapter is provided; and
  (D) the bed system shall be considered to be a fill system if the infiltrative surface is installed less than six inches below the naturally occurring soil surface. For bed systems in fill, the requirements of Paragraph (e) of this Rule shall also be met.
(2) Table XVII in Rule .0901(c) of this Subchapter shall be used to determine the initial LTAR for a bed system and shall be based on the most limiting, naturally occurring soil horizon within 36 inches of the naturally occurring soil surface or to a depth of 12 inches below the bed bottom, whichever is deeper. The minimum bed size shall be determined in accordance with the following:
  (A) the minimum amount of bottom area square feet shall be determined by dividing the DDF by the LTAR;
  (B) when the bed is a fill system, the lowest LTAR for the applicable Soil Group shall be used. The LTAR shall not exceed 1.0 gpd/ft^2;
  (C) fill shall not be added to the naturally occurring soil surface in order to increase the LTAR of a bed system;
  (D) the minimum bed size shall be reduced by up to 25 percent when the system is designed to comply with TS-I or TS-II effluent and is not installed in existing fill; and
  (E) the minimum bed size may be reduced by up to 40 percent when the following criteria are met: the system is designed to comply with TS-II effluent; Group I Soil is present in the first 36 inches of naturally occurring soil; no SWC exists within the first 30 inches below the naturally occurring soil surface or within 24 inches of the bed bottom; the bed or beds are not located beneath the advanced pretreatment components, and pressure dispersal is used; effluent is distributed to the beds by a pump and timer control system designed to distribute flow evenly over a 24-hour period; and there is 100 percent dispersal field repair area.
(3) A special site evaluation shall be submitted and approved in accordance with Rule .0510 of this Subchapter when the vertical separation to a LC is reduced and on sites with slopes greater than two percent.
(4) Setbacks as set forth in Table XXVIII of Rule .1202(d) of this Section shall apply as follows:
  (A) the setbacks shall be measured from the nearest edge of the bed;
  (B) for bed systems using fill, the setbacks shall be measured from a point five feet from the nearest edge of the bed sidewall, or from the projected toe of the slope that is required to comply with the soil and site limitations, whichever is greater;
  (C) the minimum separation between initial and repair dispersal field areas serving a single system and facility shall be two feet of naturally occurring soil. Ten feet of naturally occurring soils shall separate the initial and repair dispersal field areas serving separate facilities when these bed systems are on a common site or tract of land; and
  (D) whenever the bed size is reduced in accordance with this Rule, only reduced setbacks to artificial drainage systems in accordance with Table XXVIII of Rule .1202(d) of this Section shall be allowed.
(5) Bed system installation shall be in accordance with Rule .0903(e) of this Subchapter and the following:
  (A) pressure dispersal shall be used whenever effluent is distributed to a bed not located beneath the advanced pretreatment component; and
  (B) when new fill is required for the installation of a bed system, suitable Group I fill material shall be used to comply with the vertical separation requirements from the bed bottom to a LC, when all of the following conditions are met: a groundwater lowering system is not used to comply with the vertical separation requirements; new fill material is sand or loamy sand, containing not more than 10 percent by volume fibrous organics, building rubble, or other debris and does not have discreet layers containing greater than 35 percent

of shell fragments by volume; and the requirements of Rule .0909(c)(8) of this Subchapter, for the projected side slope of the fill are met, as determined beginning at a point six inches above the top edge of the bed.

(d) Bed systems receiving TS-I or TS-II effluent on sites with a DDF greater than 1,500 gpd and less than or equal to 3,000 gpd shall meet the following requirements:

(1) The soil and site shall meet the minimum following criteria:
  (A) Group I soils are present for 54 inches below the naturally occurring soil surface;
  (B) no SWC exists within the first 48 inches below the naturally occurring soil surface; and
  (C) vertical separation of 24 inches to any SWC is maintained below the bed bottom, unless a site-specific groundwater mounding analysis is performed and demonstrates a 12-inch separation or 18-inch minimum for a fill system in accordance with Rule .0909(c) of this Subchapter shall be maintained.

(2) Table XVII in Rule .0901(c) of this Subchapter shall be used to determine the initial LTAR for a bed system and shall be based on the most limiting, naturally occurring soil horizon within 36 inches of the naturally occurring soil surface or to a depth of 12 inches below the bed bottom, whichever is deeper. The minimum bed size shall be determined in accordance with the following:
  (A) the minimum number of square feet of bed bottom area shall be calculated by dividing the DDF by the LTAR;
  (B) the minimum bed size shall be reduced by up to 25 percent when the system is designed and approved to comply with TS-I or TS-II effluent standards and will be installed in naturally occurring soil; and
  (C) the minimum bed size may be reduced by up to 40 percent when all of the following criteria are met: the system is designed and approved to comply with TS-II effluent standards; the hydraulic assessment demonstrates that a 24-inch minimum vertical separation to a SWC is maintained after accounting for projected groundwater mounding; and there is 100 percent dispersal field repair area.

(3) A special site evaluation shall be submitted and approved in accordance with Rule .0510 of this Subchapter.

(4) No setback reductions shall be allowed in accordance with Table XXVIII of Rule .1202(d) of this Section. The following horizontal setbacks shall be met:
  (A) the minimum setback between initial and repair dispersal field areas serving a single system and facility shall be two feet of naturally occurring soil. Ten feet of naturally occurring soil shall separate the initial and repair dispersal field areas serving separate facilities when these bed systems are on a common site or tract of land;
  (B) when two beds are used, the minimum separation between two beds shall be 20 feet. When three or more beds are used, the minimum separation between beds shall be 10 feet; and
  (C) a 25-foot setback shall be maintained from edge of the bed to the property line unless a site-specific nitrogen migration analysis indicates that the nitrate-nitrogen concentration at the property line will not exceed 10 mg/L or TS-II or better effluent is produced by the approved system.

(5) Bed system installation shall be in accordance with Rule .0903(e) of this Subchapter and the following criteria:
  (A) two or more equally sized beds shall be used and the beds shall not be located beneath the advanced pretreatment components; and
  (B) effluent shall be distributed to the beds by a pressure dispersal system. A timed dosed system shall be used to distribute flow evenly to the beds over a 24-hour period.

(e) Bed systems receiving TS-I or TS-II quality effluent may be proposed for a site with existing fill that meets the requirements of Rule .0909(d) of this Subchapter under the following conditions:

(1) no SWC exists within 18 inches of the existing fill surface;
(2) 18 inches of vertical separation exists to the SWC;
(3) the DDF does not exceed 480 gpd; and
(4) pressure dispersal is used. The requirement for pressure dispersal shall not be required if the advanced pretreatment system PIA Approval allows for advanced pretreatment unit(s) to discharge directly to the underlying bed and for multiple units, where applicable, when the advanced pretreatment units are spaced at equal intervals across the entire bed area.

History Note: *Authority G.S. 130A-334; 130A-335; 130A-342; 130A-343.*

SECTION .1300 – OPERATION AND MAINTENANCE

15A NCAC 18E .1301 OPERATION AND MAINTENANCE OF WASTEWATER SYSTEMS

(a) Wastewater systems shall be operated and maintained in accordance with the conditions of the OP, PIA Approval, and the Rules of this Section, including the manufacturer's operation and maintenance instructions, as applicable. Dispersal field repair areas shall be maintained in accordance with the Rules of this Subchapter.

(b) System management in accordance with Table XXXII shall be required for all systems installed or repaired after July 1, 1992. System management in accordance with Table XXXII shall also be required for all Type V and VI systems installed on or before July 1, 1992.

TABLE XXXII. Management responsibilities based on wastewater system classification type and description