

**NORTH CAROLINA DEPARTMENT OF HEALTH AND HUMAN SERVICES
DIVISION OF PUBLIC HEALTH
ENVIRONMENTAL HEALTH SECTION
ON-SITE WATER PROTECTION BRANCH**

ACCEPTED WASTEWATER SYSTEM APPROVAL
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Accepted Wastewater System Approval Number: AWWWS 2005-01-R12

Issued To: Infiltrator Water Technologies, LLC
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For: Infiltrator Standard, Standard SideWinder, Standard SC, High Capacity, Contour Wedge, Standard Contour Swivel, Quick4 Standard-W, Quick4 Plus Standard, Quick4 Standard MultiPort Endcap, Quick4 High Capacity MultiPort Endcap, and Quick4 Plus Standard All-in-One 12 Endcap, Quick4 Equalizer 36, Quick5 Equalizer 36, Quick4 EQ 36 MultiPort Endcap, Equalizer 36, BioDiffuser Standard Model 11" High Unit, Angle Chamber Section, Arc 36 Model, Arc 36 Side Port Coupler (SPC) Unit, and Arc 36 SPC Endcap chamber effluent dispersal systems

Approval Dates:	April 2, 2005	Accepted Status First Granted for Quick4 and Predecessor Models
	May 21, 2008	Accepted Status Granted for BioDiffuser and Arc Models*
	July 18, 2008	Addition of Hancor, Inc. to AWWWS-2008-01-R1
	June 19, 2009	Elimination of Arc 36 Model Mold Restrictions
	November 2, 2010	Addition of Quick4 Plus Standard
	August 15, 2012	Addition of Sizing for LTARs Greater Than 1.0 gpd/sq ft
	September 26, 2012	Change of BioDiffuser and Arc Ownership to Infiltrator Systems Inc.*
	October 27, 2014	Additional of Area Credits for End Cap Parts to both AWWWS 2005-01-R3 and AWWWS 2008-01-R4
	February 20, 2015	Merge AWWWS-2008-01-R4 BioDiffuser model specifications into AWWWS 2005-01-R4; retire AWWWS-2008-01-R4
	August 12, 2015	Add alternating dual-field systems, update trench levelness requirements, and change company name from Infiltrator Systems, Inc. to Infiltrator Water Technologies, LLC
	August 8, 2019	Addition of Quick4 Equalizer 36 and Equalizer 36
	May 6, 2020	Equalizer 36 and Quick4 Equalizer36 Trench Spacing

	Change
February 2, 2022	Clarification of System Classification in Accordance with Table V(a) of 15A NCAC u .1961(b)
May 4, 2022	Approval of Modifications to the Arc 36 Chamber
November 2, 2022	Addition of Quick5 Equalizer 36
August 2, 2023	Addition of Deep Trench Installation Requirements
November 6, 2024	Updated for 15A NCAC 18E

*The May 21, 2008 accepted system approval was issued to Advanced Drainage Systems, Inc. and transferred to Infiltrator Systems, Inc., predecessor to Infiltrator Water Technologies, LLC, on September 26, 2012.

In accordance with G.S. 130A-343 and 15A NCAC 18E, Section .1700, a petition to the Commission for Public Health by Infiltrator Water Technologies, LLC (previously Infiltrator Systems Inc.) of Old Saybrook, CT for modification of its approved accepted status for Infiltrator chamber systems has been reviewed by the Department and approved by the Commission. The Infiltrator chamber systems have been found to perform in a manner that is equal or superior to a conventional wastewater system and to meet the standards of an accepted system when the following conditions are met.

I. General

A. Scope of this Accepted Approval

Use, design, and installation requirements for Infiltrator chamber trench systems for new and repair systems, inclusive of Quick4, Arc, and BioDiffuser models as well as respective predecessor designs.

B. The following chamber system models have been found to meet the standards of an accepted system:

- Infiltrator Standard and Standard SideWinder (polyethylene) with 12-inch cover
- Infiltrator High Capacity (polyethylene) with 12-inch cover
- Quick4 Plus Standard, Quick4 Standard-W, Standard SC and Standard SideWinder SC (polypropylene) Models with 6-inch cover
- High Capacity SideWinder (polypropylene) with 12-inch cover
- Contour Wedge
- Contour Swivel – Standard
- Quick4 Standard MultiPort Endcap with 6-inch cover
- Quick4 High Capacity MultiPort Endcap with 6-inch cover
- Quick4 Plus Standard All-in-One 12 Endcap with 6-inch cover
- Quick4 Equalizer 36 with 6-inch cover
- Quick5 Equalizer 36 with 6-inch cover
- Quick4 Equalizer 36 MultiPort Endcap with 6-inch cover
- Equalizer 36 with 6-inch cover
- EQ36 Swivel
- BioDiffuser Standard Model (polyethylene) with 6-inch cover
- BioDiffuser Angle Chamber section with 6-inch cover
- Arc 36 (polypropylene or polyethylene) with 6-inch cover

- Arc 36 Side Port Coupler (SPC) with 6-inch cover
- Arc 36 SPC Endcap with 6-inch cover

II. System Description

- A. Minimum pretreatment by septic tank and sized in accordance with 15A NCAC 18E .0801.
- B. The chambers must meet the following requirements as specified, including the chamber dimensions identified in Table I.
1. Infiltrator Standard and Standard SideWinder chamber units (including High Capacity Model) consist of injection molded high density polyethylene.
 2. The Quick4 Plus Standard, Quick4 Standard-W, and Standard SC and Standard SideWinder SC units consist of injection molded polypropylene.
 3. Equalizer 36, Quick4 Equalizer 36, and Quick5 Equalizer 36 chamber units consist of injection molded polyethylene or polypropylene.
 4. Sixteen Infiltrator Standard or High Capacity chambers are approximately equal to 100 linear feet.
 5. Twelve Equalizer 36 chambers are approximately equal to 100 linear feet.
 6. Twenty-five Quick4 Plus Standard, Quick4 Standard-W, and Quick4 Equalizer 36 chambers are approximately equal to 100 feet.
 7. Twenty Quick5 Equalizer 36 chambers are approximately equal to 100 linear feet.
 8. BioDiffuser units consist of high-density polyethylene arch-shaped injection molded chambers.
 9. Arc units consist of polypropylene or high-density polyethylene arch-shaped injection molded chambers, with chamber sidewall slopes approximately 20 degrees toward the chamber center and away from the trench sidewall.
 10. Sixteen BioDiffuser Standard chamber units are approximately equal to 100 linear feet.
 11. Twenty Arc 36 units are approximately equal to 100 linear feet.
 12. The chamber sidewall slope is approximately 20 degrees toward the chamber center or away from the trench sidewall.
- C. Each chamber unit shall be permanently marked in compliance with the appropriate standard, and conditions of this approval as follows:
- Standard or Standard SideWinder
 - Quick4 Plus Standard, Quick4 Standard-W, Standard SC or Standard SideWinder SC
 - Quick4 Equalizer 36, Quick5 Equalizer 36, or Equalizer 36
 - High Capacity or High Capacity SideWinder
 - Contour Wedge
 - Contour Swivel – Standard
 - Arc 36

Table I –Chamber Dimensions¹

Model	Height (in)	Invert ² Height (in)
Standard and Standard SideWinder	12.3	6.9
Standard SC and Standard SideWinder SC	12.3	6.9
Quick4 Plus Standard	12.0	5.3, 8.0
Quick4 Standard-W	12.5	8.0
Quick4 Equalizer 36 and Quick5 Equalizer 36	12.5	1.25, 6.0, 9.0, or 10
Equalizer 36	13.6	6.0 or 9.0
High Capacity and High Capacity SideWinder	15.9	10.2
Standard	11	6
Arc 36	13	6

¹Refer to the manufacturer’s installation procedures document for additional dimensions

²Invert Height is for a 4-inch diameter Schedule 40 PVC Pipe

- D. Each chamber unit is designed to mechanically interlock with the downstream chamber, forming a complete trench that consists of an inlet plate with a splash plate located below the inlet on the trench bottom and a solid end plate to be located at the distal end of any chamber trench line.
- E. The contour wedge or standard contour swivel can be utilized as accessories to achieve turns as necessary in all applications including, but not limited to, shallow cover with six inches of soil, or with 12 inches of soil with the standard and high capacity units.
- F. The Angle Chamber Section may be utilized as an accessory for the BioDiffuser Standard model to achieve turns as necessary in all applications including, but not limited to, shallow cover with six inches of soil.
- G. The Side Port Coupler (SPC) may be utilized as an accessory for the Arc 36 model chambers to decrease the turning radius of a chamber line, as a drop-box in serial distribution, and for mid-line distribution pipe entry and exit in all applications where the Arc 36 model chambers may be utilized. A maximum of three consecutive SPC units can be used in series.

III. Siting Criteria

Chambers may be utilized on any site on which a conventional wastewater system can be installed, and which meets the following criteria.

- A. Sites which are classified as Suitable for a conventional wastewater system in accordance with 15A NCAC 18E .0509(a) through (c).
- B. Sites which meet the criteria for new or existing fill in accordance with 15A NCAC 18E .0909. The provisions of 15A NCAC 18E .0909 are applicable whenever any portion of the chamber in a

trench extends into fill material. There shall be no reduction in trench length compared to a conventional gravel trench. This reference to fill material applies to the site fill and not the backfill placed between the trench and the chamber sidewall.

- C. The required vertical separation shall be measured from the bottom edge of the chamber.
- D. Where required by soil or site conditions and approved by the local health department (LHD), chamber systems may be installed in lieu of conventional gravel trenches or another accepted system at depths deeper than 36 inches up to a maximum of 60 inches, as measured from the base of the trench. There shall be no reduction in trench length compared to a conventional gravel trench as computed per 15A NCAC 18E .0901(c) for chamber systems installed greater than 36 inches deep. Sizing for all models shall be based on the minimum excavated trench width in Table III, Section IV.C of this approval, without the application of an equivalency factor. Deep installation details shall be in accordance with the manufacturer’s specifications and applicable federal and state safety procedures for underground excavations.

IV. Dispersal Field System Sizing

- A. The maximum long-term acceptance rate (LTAR) shall be as follows:

Table II – LTAR for Chambers

Textural Group		LTAR (gpd/sq ft)	
		Natural Soil	Saprolite
Soil/Group I	Sands	0.8-1.0*	0.6-0.8
	Loamy Sand		0.5-0.7
Soil Group II	Sandy Loam	0.6-0.8	0.4-0.6
	Loam		0.2-0.4
Soil Group III	Silt Loam	0.3-0.6	0.1-0.3
	Other Fine Loams		NA
Soil Group IV	Clays	0.1-0.4	NA

* When the LTAR exceeds 1.0 gpd/sq ft, the trench system shall be sized using the Equivalency Factors in Table IV.

- B. The LTAR shall be based on the most hydraulically limiting naturally occurring soil horizon within three feet of the ground surface or to a depth of one foot below trench bottom, whichever is deeper.
- C. For LTAR values equal to or less than 1.0, the total trench bottom area (ft²) required shall be determined by dividing the design daily flow by the applicable LTAR shown in Table II. The minimum linear footage for chamber systems shall be determined by dividing the total trench bottom area by an equivalency factor in Table III.

Table III – Chamber Trench Width and Equivalency Factors

Product	Excavated Trench Width (inches)	Equivalency Factor* (SF/LF)
Quick4 Plus Standard	36	4.00
Quick4 Standard-W	36	4.00
Standard	36	4.00
Standard SC	36	4.00
Standard Sidewinder	36	4.00
Standard Sidewinder SC	36	4.00
High Capacity	36	4.00
High Capacity SideWinder	36	4.00
BioDiffuser Standard	36	4.00
Arc 36	36	4.00
Quick4 Equalizer 36	24	3.00
Quick5 Equalizer 36	24	3.00
Equalizer 36	24	3.00

* Reductions in trench length allowed by use of these Equivalency Factors, as compared to sizing requirements delineated in 15A NCA 18E .0901(c) for conventional systems, apply only to dispersal fields receiving effluent of domestic strength or better quality. For chamber models having an equivalency factor of 4.00 SF/LF, the system may be used in an alternating dual field application pursuant to 15A NCAC 18E .0901(h) provided that the equivalency factor for sizing each of the two dispersal fields does not exceed 4.61 SF/LF. Any proposed use of the system for facilities producing higher strength wastewater shall be sized in accordance with conditions set forth in 15A NCAC 18E .1711(5) and (6).

Example:

Three bedroom residence with a design daily sewage flow of 360 gallons on a sandy clay loam (Group III) soil

Total computed trench bottom area is:

$$360 \text{ gpd} / 0.5 \text{ gpd/ft}^2 = 720 \text{ ft}^2$$

The required linear footage for Infiltrator Standard chamber systems is:

$$720 \text{ ft}^2 / 4.0 = 180 \text{ linear ft}$$

Where 4.0 SF/LF is the equivalency factor for the Infiltrator Standard chamber system

- D. For LTAR values greater than 1.0, the minimum total trench bottom area (ft²) required shall be determined by dividing the design daily flow by the applicable LTAR shown in Table II. The minimum linear footage for chambers shall be determined by dividing the total trench bottom area by an equivalency factor in Table IV.

Table IV –Trench Width and Equivalency Factors for LTAR Values Greater than 1.0

Product	Excavated Trench Width (inches)	Equivalency Factor (SF/LF)
Quick4 Plus Standard	36	3.00
Quick4 Standard-W	36	3.00
Standard	36	3.00
Standard SC	36	3.00
Standard Sidewinder	36	3.00
Standard Sidewinder SC	36	3.00
High Capacity	36	3.00
High Capacity SideWinder	36	3.00
BioDiffuser Standard	36	3.00
Arc 36	36	3.00
Quick4 Equalizer 36	24	2.00
Quick5 Equalizer 36	24	2.00
Equalizer 36	24	2.00

- E. The sizing for the Quick4 and Arc chamber end cap and mid-line connection systems shall be determined by the equivalency factors in Table V.

Table V – Equivalency Factors for End Cap Systems and Mid-Line Connections

Product	Excavated Trench Width (inches)	Approved Chamber Equivalency Factor Linear Foot Basis ^{1,2} (SF/LF)	Linear Feet of Chamber Credit per Pair when Placed at Ends of Chamber Line (LF) ³	Linear Feet of Chamber Credit per Unit when Placed as a Mid-Line Connection (LF)
Quick4 Standard MultiPort Endcap	36	4.0	1	NA
Quick4 Plus Standard All-in-One 12 Endcap	36	4.0	2	1 ⁴
Quick4 HC MultiPort Endcap	36	4.0	2	NA
Quick4 Equalizer 36 MultiPort Endcap	24	3.0	1	NA
Arc 36 SPC and SPC Endcap	36	4.0	2	1 ⁵

¹ Actual linear-foot equivalency rating of compatible chamber part

² End cap models not listed do not receive bottom area credit for beds

³ Must install two end cap parts to get approved linear feet of chamber credit

⁴ Single end cap part installed within chamber line receives one linear foot of chamber credit

⁵ Single SPC installed within chamber line receives one linear foot of chamber credit

- F. The minimum area (without reduction or equivalency factor) for a bed system shall be determined as required in 15A NCAC 18E .0903 except that the chambers shall be placed in rows next to each other. The requirements of 15A NCAC 18E .0903 shall be met for the installation of a bed system.

- G. The available space requirements of 15A NCAC 18E .0508 shall be met, and this approved

accepted system may be designated as the required repair system.

V. Special Site Evaluation

A special site evaluation may be required based on the proposed dispersal field. Refer to 15A NCAC 18E .0510.

VI. Design Criteria

Refer to the Siting Criteria in Section III and Installation information in Section VII for design details.

VII. Installation

- A. Chamber systems used in trenches shall be installed according to the minimum and maximum dimensions in Table VI.
- B. The inlet to the chamber shall be in the uppermost portion of the end cap. For dosed systems receiving effluent from a pump or siphon, manufacturer’s installation procedures shall be followed, including provisions to dissipate the inflow rate so as to minimize soil scouring and modifications that enable the presence and effectiveness of these provisions to be field verified.

Table VI – Trench Installation Requirements

Model	Maximum Trench Width (in)	Minimum Trench Depth (in)	Minimum Trench Spacing (ft on center)	Minimum Soil Cover (in)
Standard	36	24	9	12
Standard SideWinder	36	24	9	12
Quick4 Plus Standard, Quick4 Standard-W, Standard SC, and Standard SideWinder SC	36	18	9	6
High Capacity and High Capacity SideWinder	36	30	9	12
BioDiffuser Standard	36	17	9	6
Arc 36	36	18	9	6
Quick4 Equalizer 36	24	18.5	6	6
Quick5 Equalizer 36	24	18.5	6	6
Equalizer 36	24	19.5	6	6

- C. Backfill shall be placed between the trench and chamber sidewall to a minimum compacted and carefully walked in height that is equal to the top of the chamber louvers. Chamber systems can be installed utilizing native soil backfill. Backfill shall be free of trash or debris. The area adjacent to the louvers shall be free of large clods, eight inches or greater, that do not break apart during the walk in procedure. The latest version of the manufacturer’s installation procedure shall be followed. The Standard, Standard SideWinder, High Capacity, and High Capacity SideWinder chamber models require additional soil backfill to a minimum compacted cover of 12 inches above the chamber. The Quick4 Plus Standard, Quick4 Standard-W, Standard SC, Standard SideWinder SC, BioDiffuser Standard, Arc 36, Quick4 Equalizer 36, Quick5 Equalizer 36, and Equalizer 36 chamber models may be installed with a minimum compacted cover of six inches

when the following conditions are met:

1. Quick4 Plus Standard, Quick4 Standard-W, Standard SC, Standard SideWinder SC, BioDiffuser Standard, Arc 36, Quick4 Equalizer 36, Quick5 Equalizer 36, and Equalizer 36 chamber units are used.
2. The person installing or constructing the system is authorized by Infiltrator Water Technologies, LLC or its authorized representative as specially trained and qualified to install chamber units.
3. The person installing the chamber system shall produce documentation of authorization upon request by the State or LHD.
4. When installing the chambers with six inches of soil cover in Group I soils, including the specially constructed Infiltrator Contour Wedge and Swivel units, the installer shall follow the manufacturer's installation guidelines for installation with six inches of cover.

Vehicular traffic or construction equipment may traverse the chamber system only when the load is bridged over the trench so as not to disturb the chambers. The load may be bridged with a minimum of six inches of compacted soil cover over shallow chamber models (Quick4 Plus Standard, Quick4 Standard-W, Standard SC, Standard SideWinder SC, BioDiffuser Standard, Arc 36, Quick4 Equalizer 36, Quick5 Equalizer 36, and Equalizer 36) and a minimum of 12 inches of compacted soil cover over other approved chamber models.

- D. The Standard Contour Swivel shall be installed on undisturbed soil which is level with the adjacent dispersal field trench bottoms. The installer shall be responsible for compacting the trench bottom beneath the Swivel units according to the manufacturer's guidelines when the units are installed in Group I soils. Backfill for the Swivel units shall be hand-compacted and carefully walked in up to the top of the adjacent chamber units. Backfill shall be native soil. Backfill for the Swivel units shall be free of trash or debris and clods larger than three inches which do not break apart during the hand-compaction procedure.
- E. Chamber trenches shall be constructed level in all directions with a plus or minus one-half-inch tolerance from side-to-side and maximum fall in a single trench bottom not exceeding one-fourth inch in 10 feet end-to-end for any continuous contoured segment. Trenches shall have a uniform depth that follows the contours of the ground surface elevation. Trenches shall be constructed with continuous interlocking chambers, including appurtenances, without any dams, stepdowns, or other water stops.
- F. Chamber systems installed on a sloping site may use distribution devices or stepdowns as described in 15A NCAC 18E .0901(g)(9) and (11) when it is necessary to change level trench line segments from upper to lower elevations. The requirement to fully utilize the upstream trench applies to an elevation that is at least equal to the top of the chamber louvers.
- G. After installation of chambers in a trench or bed configuration, a filter fabric barrier shall be installed to cover the chambers (except Quick4 and Arc Chamber models) if the chambers are installed in uncompacted, fine or very fine uniform sand and at least one of the following conditions are present:
 1. Installations are left uncovered and subject to a major rain event;
 2. Systems are subject to not being sodded (or stabilized) in a timely manner after final cover-up has occurred; or

3. The dispersal field is not protected from surface drainage.

The filter fabric shall be non-woven, with a weight 0.35 oz./square yard to 1 oz./square yard, have an apparent opening size of 20-30 U.S. Sieve (ASTM D-4571), or alternate with equal or better performance characteristics. An alternate fabric shall be approved in writing by the manufacturer on a case-by-case basis.

- H. Manufacturer's installation instructions for the applicable chamber system used in on-site wastewater systems shall be followed except as required herein or by 15A NCAC 18E.
- I. All chamber systems shall be installed by an installer authorized in writing by Infiltrator Water Technologies or its designated representative.
- J. All chamber systems shall be installed with compatible end caps at the inlet and distal ends of each chamber row.
- K. For low-pressure pipe applications, follow the manufacturer's guidelines. Sleeving the pressurized pipe within a larger-diameter pipe is not required, recommended, or prohibited.

VIII. Operation, Maintenance, and Monitoring

The accepted chamber system shall have a System Classification of IIb in accordance with 15A NCAC 18E .1301(b), Table XXXII.

IX. Responsibilities and Permitting

- A. The LHD shall permit these accepted systems in an equivalent manner as a conventional system, when the requirements of 15A NCAC 18E, laws, and conditions of this accepted system approval are met.
- B. When use of this accepted system is requested in the application for a Construction Authorization (CA), the LHD shall include a design for the designated accepted system in accordance with the approved siting, sizing, and design criteria on the CA.
- C. When an Improvement Permit (IP) or CA is issued for a conventional system, the IP or CA shall contain a statement that indicates that an accepted system may also be used.
- D. When substitution with an accepted system is made, IP or CA modification, prior approval of the LHD, or separate owner sign-off is not required as long as the accepted system can be installed in the permitted initial dispersal field area in accordance with this accepted system approval and without unauthorized product alteration, and no changes are proposed for any of the following:
 1. Trench depth;
 2. Slope correction;
 3. Effluent distribution method;
 4. Design daily flow; or
 5. Wastewater strength.

- E. Notwithstanding Paragraphs C and D above, when a substitution in system type compared to a previously permitted system type shall result in a change in any of the items listed in Paragraph D, prior approval by the LHD is required before system installation. The LHD shall modify the IP and/or CA upon a finding that all provisions of this approval and all other applicable rules are met.

- F. The system type installed shall be indicated on the Operation Permit, including designation of the manufacturer and model or unique code.

X. Repair of Systems

The provisions of 15A NCAC 18E .1306 shall apply to the use of chamber systems for repairs to existing malfunctioning on-site wastewater systems.

Approved by: _____ Date: _____