NC DEPARTMENT OF HEALTH AND HUMAN SERVICES

ROY COOPER • Governor
MANDY COHEN, MD, MPH • Secretary
MARK T. BENTON • Assistant Secretary for Public Health
Division of Public Health

MEMORANDUM

DATE: July 30, 2021

TO: Interested Persons

FROM: Virginia Niehaus, Director of Regulatory and Legal Affairs, Division of Public Health

RE: Notice of Petition for Declaratory Ruling

The North Carolina Department of Health and Human Services (NCDHHS) received a Petition for Declaratory Ruling submitted by Infiltrator Water Technologies, LLC (Infiltrator) on June 29, 2021. In accordance with NCGS 150B-4 and 10A NCAC 45B .0104, NCDHHS has 30 days to grant or deny a request to issue a declaratory ruling. If the request is granted, NCDHHS has 45 additional days to consider the merits of the petition and make a declaratory ruling.

NCDHHS granted Infiltrator's request to issue a declaratory ruling on July 29, 2021 and will issue a declaratory ruling within 45 days of that date. As part of the process of issuing a written ruling, in accordance with 10A NCAC 45B .0104, NCDHHS is providing notice to and sharing the attached Petition with interested persons who may be affected by the ruling. NCDHHS will accept public comments on Infiltrator's Petition from July 30, 2021 to August 13, 2021. You may submit comments by email to cphcomment@lists.ncmail.net.

Should you have questions related to this notice or the Petition, please contact Mr. Jon Fowlkes, On-Site Water Protection Branch Head, Environmental Health Section, Division of Public Health at jon.fowlkes@dhhs.nc.gov.

Attachment

cc: Mr. Mark Benton, Assistant Secretary for Public Health, Division of Public Health
Mr. Larry Michael, Environmental Health Section Chief, Division of Public Health
Mr. Jon Fowlkes, On-Site Water Protection Branch Head, Division of Public Health
Mr. John Barkley, Assistant Attorney General

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June 29, 2021

Via Federal Express and Electronic Mail

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c/o Virginia Niehaus
Chief, Office of Regulatory and Legal Affairs
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Raleigh, North Carolina 27699-1915
Email: virginia.niehaus@dhhs.nc.gov

Re: Infiltrator Water Technologies, LLC – Petition for Declaratory Ruling

Dear Ms. Niehaus:

Pursuant to N.C. Gen. Stat. § 150B-4 and 10A NCAC 45B .0104, I am writing on behalf of Infiltrator Water Technologies, LLC ("Infiltrator") to request that the Division of Public Health issue a declaratory ruling that Infiltrator's Advanced Treatment Leachfield ("ATL") system when (i) configured in two horizontally or vertically oriented 8-inch-diameter units and (ii) when sited, sized, and installed in accordance with Rule 15A NCAC 18A 1956(3)(a)(ii) is a Prefabricated, Permeable Block Panel System ("PPBPS" or "Panel Block System") as defined by Rule 15A NCAC 18A .1956(3)(a)(ii) (the "Panel Block Rule"). Infiltrator's ATL system will: (i) utilize both horizontal and vertical air chambers; (ii) be constructed to promote downline and horizontal distribution of effluent; (iii) be configured in two horizontally or vertically oriented 8-inch-diameter units; and (iv) be installed in accordance with the manufacturer's specifications.

In support this Petition for Declaratory Ruling, Infiltrator states as follows.

I. STATEMENT OF FACTS

A. Petitioner's Name and Address

Infiltrator Water Technologies, LLC
Attention: David Lentz, Regulatory Director
4 Business Park Road
P.O. Box 768
Old Saybrook, Connecticut 06475

B. Manufactured Product Description

The Infiltrator ATL is a patent-pending, proprietary system consisting of seven components. The system has been demonstrated to produce high-quality treated effluent when installed within sand. The ATL system is NSF/ANSI 40-certified and listed for the production of Class I effluent in accordance with the standard. Third-party testing of the ATL in accordance with the NSF/ANSI 40 protocol took place at the Massachusetts Alternative Septic System Test Center (MASSTC). The components of the ATL system are listed below and shown in Figure 1 showing the inside of the device.

- 3-inch pipe
- large synthetic aggregate
- diamond netting
- Bio-Accelerator
- coarse geotextile
- small synthetic aggregate
- fine geotextile

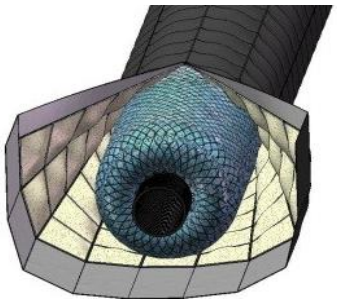


Figure 1 – Infiltrator ATL

The components are manufactured with 10-feet-long, 8-inch-wide, and 8-inch-tall installed dimensions. The components are connected end-to-end using couplers, which, when installed within a sand-filled trench, create a block panel treatment and dispersal system that complies with the requirements of 15A NCAC 18A .1956(3)(A)(ii).

Similar to the accepted EZflow product, the ATL materials of construction are fully secured during the manufacturing process, both at the ends and along the long axis of the product, keeping the product bundled together in the trench. The ends are secured using tie wraps. The quilted black outer layer that envelopes the inner netted cylinder, as illustrated in Figure 1, is sewn at the Infiltrator production facility. Tie-wrap end connections and sewn lateral seam fabrication are approved methods under Accepted Wastewater System Approval Number: AWWS-2005-02-R6 and Innovative Wastewater System Approval Number: IWWS-2012-01, respectively.

C. Overview of ATL Installation

The ATL horizontal configuration is installed within a 3-foot-wide trench over a 6-inch sand layer placed at the bottom of the trench before ATL placement (Figure 2). Horizontal trenches are spaced at a minimum center-to-center distance of 8 feet. Two rows of ATL are placed side-by-side directly on the system sand, with ATL ends connected via coupler. Influent flow is split equally between the ATL corrugated pipes, with inlet pipes connected to the ATL corrugated pipes. The distal ends of the ATL rows are looped horizontally to promote air flow throughout the

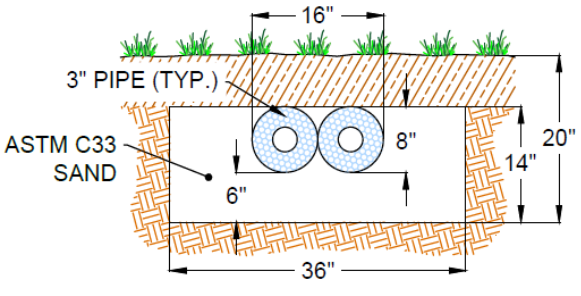


Figure 2 - Horizontal ATL PPBPS

system, which provides a permeable exterior surface. The ATL corrugated pipe and looped ends allow for the unobstructed flow of air (and other fluids, including septic tank effluent) from end to end. System sand is placed laterally from the ATL panel to the trench sidewalls. Appropriate placement of this material in conformance with the manufacturer's specifications is critical to treatment performance and support of the ATL bundles. The system sand surrounding the ATL provides lateral and horizontal stabilization to the system components, allowing them to stay in the proper horizontal configuration.

The ATL vertical configuration is installed within a 3-foot-wide trench over a 6-inch sand layer placed at the bottom of the trench before ATL row placement (Figure 3). Vertical trenches are spaced at a minimum center-to-center distance of 8 feet. ATL segments are placed one above the other along the entire trench axis, with ends connected via coupler. Influent flow is piped into the upper ATL corrugated pipe only at the proximal end of the trench, with the proximal end of the lower ATL corrugated pipe capped. The distal ends of the ATL rows are looped vertically via pipe and couplers to promote air and effluent flow throughout the system, which provides a permeable exterior surface. The ATL corrugated pipe and looped ends allow for the unobstructed flow of air (and other fluids, including septic tank effluent) from end to end. System sand is placed laterally from the ATL panel to the trench sidewalls. Appropriate placement of this material in conformance with the manufacturer's specifications is critical to treatment performance and support of the ATL bundles. The system sand surrounding the ATL provides lateral and horizontal stabilization to the system components, allowing them to stay in the proper vertical configuration.

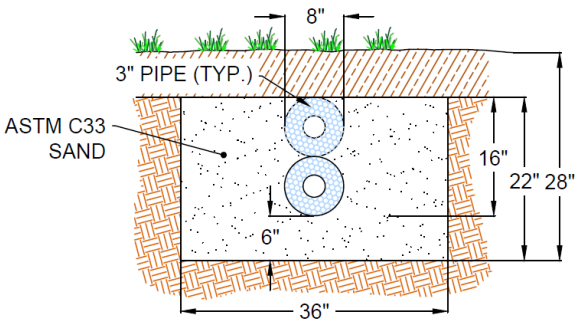


Figure 3 - Vertical ATL PPBPS

The length of an ATL trench would meet the minimum length requirements set forth in the Panel Block Rule. The same minimum trench lengths are applicable to horizontal and vertical ATL orientations, per rule requirements.

Installation of the ATL manufactured product as a PPBPS would be performed in accordance with the manufacturer's specifications, as required by the Panel Block Rule. Manufacturer's specification are provided in Exhibit A, which is attached hereto and incorporated herein.

II. PANEL BLOCK RULE

Effective August 1, 1988, the Commission for Public Health promulgated 15A NCAC 18A .1956. Subsection (3) of the rule provides:

(3) MODIFIED TRENCHES: Modified nitrification trenches or lines, including large diameter pipe (greater than four inches I.D.), and specially designed porous block systems may be permitted by the local health department as follows:

* * * * *

(ii) A Prefabricated, Permeable Block Panel System (PPBPS), ***utilizing both horizontal and vertical air chambers and constructed to promote downline*** and ***horizontal distribution of effluent***, may be used under the following conditions:

(A) the soil and site criteria of this Section shall be met;

(B) in calculating the required linear footage for a PPBPS's nitrification field, the linear footage for the nitrification line as determined in Rule .1955 (b) and (c), or in Rule .1956 (6)(b), Table III(a) of this Section when applicable, shall be multiplied by 0.5 for a ***16 inch PPBPS***;

(C) installation of the PPBPS shall be in accordance with Rule .1955 except:

(I) the PPBPS trench shall be located not less than eight feet on centers;

(II) ***the installation shall be in accordance with the manufacturer's specifications***; and

(III) the sidewalls of nitrification trenches placed in Group IV soils shall be raked to open pores which were damaged or sealed during excavation;

(D) where design sewage flow is more than 480 gallons per day, the system shall be pressure-dosed; and

(E) the long-term acceptance rate shall not exceed 0.8 gallons per day per square foot.

(emphasis added). The requirements for a PPBPS system are limited: as long as the system is sited, sized, and installed in accordance with Rule 15A NCAC 18A 1956(3)(a)(ii), the system must only (i) utilize both horizontal and vertical air chambers; (ii) be constructed to promote downline and horizontal distribution of effluent; (iii) achieve a 16-inch dimension; and (iv) be installed in accordance with the manufacturer's specifications.

III. INFILTRATOR IS AGGRIEVED BY THE BRANCH'S APPLICATION OF THE PANEL BLOCK RULE.

Infiltrator is directly and substantially affected in its property rights by the Branch's application of the Panel Block Rule. None of the systems under the 1956 Rule require approval. If the system meets the requirements set forth in the rule, the system is deemed approved. However, without a declaratory ruling from the Division, Infiltrator is unable to install its ATL system in North Carolina because local public health departments will not recognize the system as qualifying under the Panel Block Rule. The Branch is unwilling to provide a compliance or other informal determination recognizing that the ATL system meets these requirements.

Further, if Infiltrator's ATL system meets the requirements of the Panel Block Rule, it does not need to be approved under Rule 1969, and in fact, cannot be approved under Rule 1969. *See* 15A NCAC 18A .1969(a) ("Experimental, controlled demonstration, and innovative wastewater systems (hereinafter referred to as E & I systems) are any wastewater systems, system components, or devices ***that are not specifically described in Rules*** .1955, ***.1956***, .1957, or .1958 of this Section.") (emphasis added); 15A NCAC 18A .1956(b) ("Other types of nitrification trenches or lines may be approved by the local health department on a site-specific basis in accordance with Rule .1969 of this Section."); *see also T & J Panel Inc. v. DHHS*, 16 DHR 11241 (OAH Feb. 2, 2018) (recognizing that a Panel Block System approved under .1969 could only receive a 25% trench reduction compared to a 50% trench reduction under .1956).

IV. IF THE DIVISION FAILS TO ISSUE A DECLARATORY RULING, INFILTRATOR WILL CONTINUE TO BE AGGRIEVED.

Without a declaratory ruling from the Division, Infiltrator's property rights will continue to be impaired. Despite its ATL system meeting the clear and unambiguous requirements of the Panel Block Rule, Infiltrator is not able to market, sell and install its ATL system in North Carolina.

V. RATIONALE FOR DECLARING THAT INFILTRATOR'S ATL SYSTEM MEETS THE PANEL BLOCK RULE STANDARDS

Infiltrator's ATL system meets each of the four (4) requirements set forth in 15A NCAC 18A .1956(3)(a)(ii). There are no PPBPS product-related requirements expressed in Title 15A Subchapter 18A other than what is set forth in the Panel Block Rule. All other references to PPBPS in Title 15A Subchapter 18A establish parameters relating to operation and maintenance and allowable conditions of use in different situations (*e.g.*, 15A NCAC 18A .1970(d)(2) describing sizing when combined with an NSF/ANSI 40 treatment system). N.C. General Statutes Chapter 130A does not address Panel Block systems; therefore, no PPBPS-related requirements are set forth in this chapter.

The four PPBPS product-related requirements are emphasized in the Panel Block Rule above: (i) utilize both horizontal and vertical air chambers; (ii) be constructed to promote downline and horizontal distribution of effluent; (iii) achieve a 16-inch dimension; and (iv) be installed in accordance with the manufacturer's specifications. Although the Panel Block Rule includes more

information than these four requirements, none of this information establishes a requirement related to the design of the manufactured product that would be installed within the trench deemed to be a PPBPS. Non-product-related requirements describe such parameters as minimum trench length, trench spacing, and state-mandated installation and soil requirements. These non-product-related requirements do not affect the design, configuration, or manufacture of a product that would be installed as a PPBPS under the Panel Block Rule. The Panel Block Rule does not define any requirement associated with PPBPS geometry, materials of construction, shape, component certifications, external markings, or packaging. A PPBPS trench consists of a manufactured product installed within a trench having dimensions defined in the Panel Block Rule. Therefore, the only factors that regulate the design, manufacture, configuration, and compliance status of the manufactured product in a PPBPS trench are the four requirements set forth in the Panel Block Rule.

A. Infiltrator's ATL System Utilizes Both Horizontal and Vertical Air Chambers.

The ATL contains compartmentalized horizontal and vertical air chambers that are separated by permeable layers of geosynthetics. As shown in Figure 4, each ATL bundle in the two-bundle PPBPS configuration contains three distinct air chambers that extend both horizontally and vertically within the cross section of the product. Additionally, since there are always two ATL rows per PPBPS trench, the air chambers extend along the trench axis. The air chambers are numbered 1 through 3 in Figure 4, which represents a cross-sectional view of the ATL, and described below. A three-dimension illustration of an ATL PPBPS horizontal trench system is shown in Exhibit B (attached hereto and incorporated herein), along with a compliant horizontal PPBPS system manufactured by T&J Panel.

- **Air Chamber No. 1: Pipe** – The pipe is corrugated polyethylene, extending the entire length of the double row of ATL with pipe and fittings connecting the ends of the ATL rows. The pipe is perforated to allow air movement from within the pipe to Air Chamber No. 2, the large aggregate.

- **Air Chamber No. 2: Large aggregate** – Large aggregate is manufactured using expanded polystyrene synthetic aggregate. Expanded polystyrene synthetic aggregate has been approved for used in North Carolina wastewater systems since 2005 as an accepted system (Accepted Wastewater System Approval Number: AWWS-2005-02-R6). Air Chamber No. 2 provides approximately 50% interstitial air space to create the horizontal and vertical boundaries of the air chamber and to facilitate the movement of air between Air Chamber No. 1, the pipe and Air Chamber No. 3, the small aggregate.

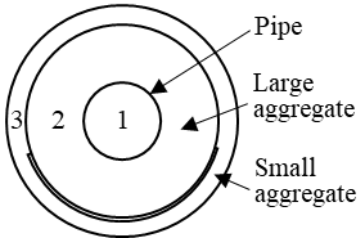


Figure 4 – ATL cross-section showing Air Chamber Nos. 1 through 3

- **Air Chamber No. 3: Small aggregate** – The outermost air chamber consists of a smaller-dimension synthetic aggregate than used in Air Chamber No. 2. Similar to Air

Chamber No. 2, the air space between aggregate particles provides air space to create the horizontal and vertical boundaries of the air chamber and create a pathway for air movement from Air Chamber No. 2 to the sand backfill surrounding the ATL system.

The three air chambers described above are partitioned via four different gas- and liquid-permeable materials, as described below and shown in Figure 5, which represents a cross-sectional view of the ATL:

- **Pipe wall** – The pipe wall separates Air Chamber Nos. 1 and 2. This partition serves as a separation layer between the large synthetic aggregate and air inside of the pipe. Perforations in the pipe wall allow air and liquid movement between Air Chamber Nos. 1 and 2.

- **Coarse geotextile** – Manufacture of the product includes the production of a 6-inch-diameter cylinder that contains Air Chamber Nos. 1 and 2, encapsulated with a permeable thermoplastic diamond-shaped netting. The 6-inch-diameter cylinder is subsequently wrapped with a 1-inch-thick quilted outer layer that represents Air Chamber No. 3 in Figure 5. The inner layer of Air Chamber No. 3 consists of a coarse, permeable geotextile that is capable of allowing air and liquid flow between Air Chamber Nos. 2 and 3. The coarse geotextile separates the large and small synthetic aggregate in Air Chamber Nos. 2 and 3, respectively.

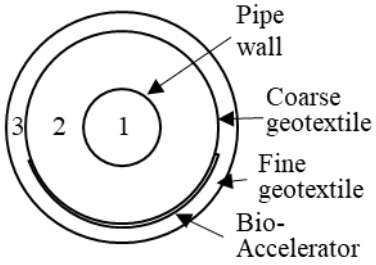


Figure 5 – ATL cross-section showing air chamber partitioning

- **Bio-Accelerator** – The Bio-Accelerator is a layer of geotextile positioned between the boundaries of Air Chamber Nos. 2 and 3. The Bio-Accelerator geotextile speeds the development of a biomat within the ATL to enhance downline and horizontal distribution of wastewater along the entire length of the system. The Bio-Accelerator is a DHHS-approved component of the Presby Advanced Enviro-Septic system under Innovative Wastewater System No: IWWS 2015-02. The Bio-Accelerator nominal arc length is 6 inches, so it is only located along the bottom of the ATL bundle and by design does not extend around the entire circumference of Air Chamber No. 2.

- **Fine geotextile** – The outermost geotextile of Air Chamber No. 3 is a fine, permeable geotextile. The fine geotextile separates the small synthetic aggregate in Air Chamber No. 3 from the sand backfill around the ATL bundle. The outer layer of Air Chamber No. 3 is capable of allowing air and liquid flow between Air Chamber No. 3 and the surrounding sand backfill.

In summary, the ATL provides multiple distinct horizontal and vertical air chambers. All chambers are air-and liquid-permeable and capable of inter-chamber fluid flow across the permeable chamber partition materials. Air Chamber Nos. 1 through 3 extend the entire length

of the PPBPS trench, with connections between individual bundles, facilitating complete and uninterrupted horizontal and vertical integration of the air chamber system.

B. Infiltrator's ATL System Will be Constructed to Promote Downline and Horizontal Distribution of Effluent.

Downline effluent distribution: The ATL employs two means of promoting downline effluent distribution: (1) corrugated polyethylene pipe; and (2) Bio-Accelerator, as shown in Figure 5 and described above. As shown in a side view of an ATL PPBPS vertical trench, the pipe and Bio-Accelerator extend from the inletting point, along the entire top ATL bundle, and along the entire bottom ATL bundle, with the two bundles hydraulically connected via pipe and fittings. A similar interconnected design is provided for a horizontal ATL PPBPS configuration, as shown in Figure 7. The only difference is that flow for a horizontal geometry is split between the two ATL bundles.

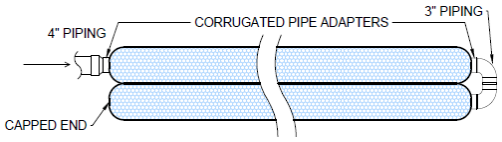


Figure 6 – Vertical ATL PPBPS side view trench

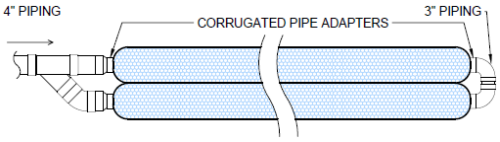


Figure 7 – Horizontal ATL PPBPS trench top view

Wastewater systems allowed under Title 15A Subchapter 18A and described in G.S. 130A-343 currently employ pipes to promote the downline distribution of effluent. The use of piping to promote the downline distribution of effluent is neither new nor novel and mirrors other allowable North Carolina wastewater systems.

The use of the Bio-Accelerator to promote the downline distribution of effluent has been approved by DHHS for 6 years as part of an innovative wastewater system. Similar to the use of pipe, the use of the Bio-Accelerator to promote the downline distribution of effluent is not new or novel and has been evaluated and accepted by DHHS for the purpose of effluent conveyance and dispersal under Innovative Wastewater System No: IWWS 2015-02.

Horizontal effluent distribution: The horizontal distribution of effluent is promoted by a combination of the ATL system components described above, as well as the sand used to occupy the space between the ATL bundles and trench sidewall. A key contributor to the promotion of horizontal effluent distribution is the Bio-Accelerator geotextile layer. This channel-shaped system component moves effluent laterally within the ATL bundle to Air Chamber Nos. 2 and 3, and toward the sand surrounding the ATL bundle. Capillary action in the geotextiles contributes to horizontal and vertical effluent movement. The use of circumferentially applied geosynthetics to promote effluent movement is approved for large diameter pipe in 15A NCAC 18A .1956(3)(a)(i).

Capillary action in the sand surrounding the ATL bundle also contributes to the horizontal and vertical movement of effluent. "System sand" is the term used to describe the material placed between, beside and below the ATL bundles. As described in Exhibit A, the manufacturer's specifications for installation strictly limit materials used to backfill the ATL to sand gradations

known to promote three-dimensional movement of effluent through capillary action. The ATL installation instructions allow system sand conforming with ASTM C33, North Carolina Department of Transportation No. 2S, or South Carolina Department of Transportation FA-10 specifications. These materials must be purchased at an Infiltrator-approved sand supplier. The manufacturer's specifications do not allow other system sand specifications to be used.

C. Infiltrator's ATL System Will be Configured in Two Horizontally or Vertically Oriented 8-Inch Diameter Units.

In accordance with the Panel Block Rule, a PPBPS must be either 16-inches wide (W) by 8-inches high (H) or 8-inches W by 16-inches H in a trench length determined by state rule. In order to comply with this requirement, the nominal dimension of ATL used for PPBPS installations is 8 inches. ATL rows are placed side-by-side for horizontal configurations (16 in W x 8 in H), and stacked for vertical configurations (8 in W x 16 in H).

Each individual Infiltrator ATL bundle is 8-inches in nominal diameter. Two bundles are either stacked vertically or placed side-by-side to achieve the Panel Block Rule dimension of 16-inches for a vertical or horizontal PPBPS. Achievement of the 16-inch dimension is illustrated in Figures 2 and 3 for horizontal and vertical configurations, respectively. DHHS wastewater system regulations includes multiple instances of curved products being recognized as meeting a dimensional requirement. This applies to several innovative and accepted wastewater products, including chambers (arch recognized as 12 inches high), multi-pipe products (tapered pipe stack and cylinders recognized as constant width and height), and EZflow (cylinders recognized as constant width and height).

Figure 8 – T&J Panel height

The permanent, installed dimensions of the PPBPS are an important consideration for achieving compliance with the Panel Block Rule. To determine how this regulatory language is interpreted by the Branch, it is important to consider how PPBPS is being permitted by North Carolina counties under the Panel Block Rule. Figures 8 and 9 show measurements of the height and width aspects, respectively, of a PPBPS system manufactured by T&J Panel and eligible to be permitted. In Figure 8, the PPBPS height, excluding the cap, which has been previously defined by DHHS to be part of the PPBPS cover, is 15.38 inches. In Figure 9, the measured width dimension is 7.56 inches, which would correspond to the height of a horizontal system having a recognized height of 8 inches. When rotated to construct a horizontal PPBPS, the system height would be 7.56 inches.

Figure 9 – T&J Panel width

Based on the measurements shown in Figures 8 and 9, specifications described in the Panel Block Rule, and *dicta* in *T & J Panel Inc. v. DHHS*, 16 DHR 11241 (OAH Feb. 2, 2018), there is an established tolerance associated with the 16- and 8-inch height dimensions for vertical and horizontal configurations, respectively.

Testing conducted on behalf of Ring Industrial Group on EZflow 1203V in 2001 by BPI, pllc showed a deformation of approximately 2.2% under a 2-foot soil cover. Reducing the ATL vertical PPBPS height by 2.2% would result in a height of 15.65 inches (16 in * 0.978 = 15.65 in), which is greater than the height of the PPBPS product being permitted today. Applying the same percentage of dimensional reduction for an 8-inch-high configuration, the horizontal ATL PPBPS would be 7.82 inches high (8 in * 0.978 = 7.82 in), which is also greater than the height of the PPBPS product being permitted today. Alternatively, Infiltrator has the ability to manufacture the ATL in a range of diameters. An available manufacturing option would be to produce the ATL PPBPS using a diameter greater than 8 inches to address potential DHHS concerns associated with post-installation dimensions.

Infiltrator proposes discussing the aspect of product dimensions with DHHS to identify a mutually agreeable specification for the ATL PPBPS product. In these discussions, identification of definitive dimensional requirements will be essential, given that the PPBPS permitted by North Carolina counties has been, at least in some instances as shown in Figures 8 and 9, non-conforming with 15A NCAC 18A .1956(3)(a)(ii)(B) specifications and the description of the product in *T & J Panel Inc. v. DHHS*, 16 DHR 11241 (OAH Feb. 2, 2018). If the Branch strictly interprets the dimensional standards in the Panel Block Rule in connection with this declaratory ruling request, the same standards must apply to all PPBPS systems.

D. Infiltrator's ATL System Will be Installed in Accordance with the Manufacturer's Specifications.

The requirement to install a PPBPS are straightforward: it must be installed in accordance with the manufacturer's specifications. With no detail on what is included in "manufacturer's specifications" in 15A NCAC 18A .1956(3)(a)(ii), the scope of manufacturer's specifications *is defined by the manufacturer for any unregulated PPBPS system parameter* (see Exhibit A). Installation specifications for PPBPS do not need to be reviewed or approved by the Branch or any other government body.

The term "manufacturer's specifications" is limited only by requirements established in Title 15A Subchapter 18A, and may therefore include manufactured system design, configuration, materials of construction, and system component details. Collectively, these manufacturer-defined specifications may be used to establish: (1) the design and configuration of the horizontal and vertical air chambers; (2) the mechanism by which the system promotes downline and horizontal distribution of effluent; and (3) how the system achieves and maintains the 16-inch dimensional requirement. Manufacturer's specifications may also be used by the manufacturer to define the

material with which to backfill the manufactured product within the PPBPS trench, trench preparation methods, and method for interconnecting product segments within the trench.

The manufacturer's specifications for the Infiltrator ATL are provided in Exhibit A. This document illustrates the configuration of the system and horizontal and vertical air chambers, how the system promotes downline and horizontal distribution of effluent, how the system components are to be placed to achieve the 16-inch dimensional requirement, and how the system sand is installed to ensure proper treatment and product dimension stability. The manufacturer's specifications also define trench sizing, step-by-step installation methodology, and trench backfill materials. ATL PPBPS trench sizing and other installation-related information is provided in Exhibit A.

Thus, the Infiltrator ATL meets the clear and unambiguous requirements of set forth in 15A NCAC 18A .1956(3)(a)(ii).

E. Any Requirements Imposed by the Division that Go Beyond the Express Standards in the Panel Block Rule are Unlawful.

The Panel Block Rule does not specify how the product must be designed – it merely requires that the product must "utilize both horizontal and vertical air chambers," "promote downline and horizontal distribution of effluent," must be 16-inches in dimension, and must be installed in accordance with the manufacturer's specifications. If the Commission for Public Health (the "Commission") wanted to define requirements for ***how*** these four criteria were to be met, then the rule would include such specifications. For example, in Rule 1956, the Commission describes large-diameter pipe prescriptively. *See* 15A NCAC 18A .1956(3)(a)(i). Unlike large-diameter pipes, the PPBPS specifications are not specific. *See* 15A NCAC 18A .1956(3)(a)(ii).[1] Because the Panel Block Rule does not specify how the air chamber and distribution requirements must be met, the Branch lacks authority to create requirements that are not described in the rule. *See T & J Panel Inc. v. DHHS*, 16 DHR 11241 (OAH Feb. 2, 2018).

In *T & J Panel Inc. v. DHHS*, the petitioner challenged the Branch's decision that a 50% reduction for a "16 inch PPBPS" provided in 15A NCAC 18A .1956(3)(a)(ii)(B) applies only to vertical installations of the Panel Block System, not horizontal installation of such systems. In rejecting the Branch's interpretation, the Office of Administrative Hearings ("OAH") relied on traditional statutory construction principles. First,

> [I]t is a well-established rule of statutory construction that where the language of a statute is clear and unambiguous, there is no room for judicial construction, and the courts must give the statute its plain and definite meaning, and are without power to interpolate, or superimpose, provisions and limitations not contained therein.

[1] For a more detailed comparative evaluation analysis and additional technical and regulatory considerations, see Exhibit C, which is attached hereto and incorporated herein.

T & J Panel, Conclusion of Law 12 (citing *Walker v. Bd. of Tr. of the N.C. Local, Gov. Emps.' Ret. Sys.*, 348 N.C. 63, 65-66, 499 S.E.2d 429, 430-31 (1998)). Thus, when interpreting a regulation, a court must first look to the plain language of the regulation and where it is clear, give the regulation its plain meaning. *See Frye Reg'l Med. Ctr., Inc. v. Hunt*, 350 N.C. 39, 45, 510 S.E.2d 159, 163 (1999); *Luna v. N.C. Dept. of Env. and Nat. Res.*, 185 N.C. App. 291, 295, 648 S.E.2d 280, 282 (2007) (rules of statutory construction apply when interpreting administrative regulations). "If the language of a [regulation] is clear, the court must implement the [regulation] according to the plain meaning of its terms so long as it is reasonable to do so." *Lenox, Inc. v. Tolson*, 353 N.C. 659, 664, 548 S.E.2d 513, 517 (2001). Courts should "give effect to the words actually used in a [regulation] and should neither delete words used nor insert words not used in the relevant [regulatory] language during the statutory construction process." *Midrex Techs., Inc., v. N.C. Dept. of Revenue*, 369 N.C. 250, 258, 794 S.E.2d 785, 792 (2016) (citation and quotation marks omitted).

Second, in *T & J Panel*, OAH recognized that "the North Carolina Supreme Court 'has long held that governmental restrictions on the use of land are construed strictly in favor of the free use of real property.'" *T & J Panel*, Conclusion of Law 12 (quoting *Morris Commc'ns Corp. v. City of Bessemer City Zoning Bd. of Adjustment*, 365 N.C. 152, 157, 712 S.E.2d 868, 871 (2011)); *see also Donaghue v. N.C. Dep't of Envtl. and Natural Res.*, No. 09 EHR 0568, 2009 WL 4912682, ¶ 26 (N.C.O.A.H. Nov. 5, 2009); *Pamlico Marine Co., Inc. v. N.C. Dep't of Natural Res.*, 80 N.C. App. 201, 206, 341 S.E.2d 108, 112 (1986). Applying this standard to the Panel Block System rule, OAH concluded:

> Because Rule .1956(3)(a)(ii)(B) is a governmental restriction on the use of land, this ALJ shall also construe it strictly in favor of free use of property. In other words, this ALJ shall construe the rule in its least restrictive form while still carrying out the intent of the Commission.

T & J Panel, Conclusion of Law 17.

Applying these principles of statutory construction, OAH concluded that the 50% trench reduction applies to vertical and horizontal installations.

> [T]he words '16 inch PPBPS' do not, by their plain language, require vertical installation. Had the Commission intended vertical installation to be a prerequisite to receiving the 50% reduction, it could have easily included the words 'high' or 'vertical' in the rule. This ALJ does not have the authority to superimpose additional restrictions into the rule that are not contained in its plain language.

T & J Panel, Conclusion of Law 22.

The language of the Panel Block Rule is clear and unambiguous. To meet the requirements of this rule, such systems must: (i) utilize both horizontal and vertical air chambers; (ii) be constructed to promote downline and horizontal distribution of effluent; (iii) must be 16-inch-in dimension to qualify for the 50% trench reduction; and (iv) be installed in accordance with the

manufacturer's specifications. Infiltrator's ATL System meets the requirements of the Panel Block Rule. If the Commission for Public Health intended to specify the ***design*** of a Panel Block System (like it did for a large-diameter pipe), such requirements would be set forth in the rule. Any interpretation by the Division or the Branch that imposes such requirements violates the plain meaning of the Panel Block Rule.

A determination that Infiltrator's ATL system meets the requirements of the Panel Block Rule is also consistent with the spirit and intent of the rule. The primary purpose of the Panel Block Rule and the benefit of the Panel Block System is to provide a septic system option where usable space is limited. *T & J Panel*, Conclusion of Law 32. Infiltrator's ATL system provides another option where usable space is limited.

Finally, a determination by the Division that Infiltrator's ATL system complies with the Panel Block Rule is consistent with North Carolina law that governmental restrictions on the use of private property, such as the Panel Block Rule, be constructed strictly in favor of free use of real property. *See T & J Panel*, Conclusion of Law 34.

Infiltrator respectfully requests that the Division issue an order declaring that Infiltrator's Advanced Treatment Leachfield system when (i) configured in two horizontally or vertically oriented 8-inch-diameter units and (ii) when sited, sized, and installed in accordance with Rule 15A NCAC 18A 1956(3)(a)(ii) is a Prefabricated, Permeable Block Panel System as defined by Rule 15A NCAC 18A .1956(3)(a)(ii)

Sincerely,

Todd S. Roessler

cc: John Barkley, Assistant Attorney General
David Lentz, Infiltrator Water Technologies

Exhibit A

JUNE 2021

North Carolina

The North Carolina Department of Health and Human Services Onsite Water Protection Branch recognizes the Infiltrator Advanced Treatment Leachfield (ATL) product as complying with requirements set forth for prefabricated, permeable block panel system (PPBPS) under 15A NCAC 18A .1956(3)(a)(ii). This document describes the manufacturer's recommended installation instructions for ATL PPBPS installations, which must be conducted in compliance with 15A NCAC 18A .1956(3)(a)(ii).

Materials & Equipment Needed

- 8-inch ATL
- Internal Pipe Couplers and PVC-to-Corrugated Couplers
- Pipe and Glue for Header and ATL Connections
- Stakes or Frame
- Excavation Equipment
- Laser, Transit, or Level
- Shovel, Rake, and Hammer

Configuration and Installation

The instructions for installation of ATL products as a PPBPS are presented below. This product must be installed in accordance with these installation instructions, 15A NCAC 18A .1956(3)(a)(ii), and Onsite Water Protection Branch requirements, as applicable. The following information applies to ATL PPBPS orientations. See Table 1 for system construction specifications.

1. The minimum soil depth varies based upon system orientation (see Figure 1) as follows:
    - Horizontal – 26 inches; and
    - Vertical – 34 inches.
2. The minimum center-to-center trench spacing distance is 8 feet for horizontal and vertical orientations
3. The minimum soil cover depth over the ATL is 4 to 6 inches, depending upon the site slope.
4. For trenches installed in Group IV soils, the sidewalls must be raked or scarified to open pores damaged or sealed during excavation.
5. ATL PPBPS are capable of being constructed using gravity flow, pump to gravity flow, pressure manifold with gravity flow to the ATL lines, or pump to low-pressure pipe (LPP) distribution, where the LPP pipe is installed within the ATL corrugated pipe.
6. The maximum ATL PPBPS line length is 100 feet.
7. The length for multiple trenches should be equal.
8. ATL PPBPS lines should be installed on grade and follow the contour of the site.

Installation Instructions for ATL Prefabricated Permeable Block Panel Systems

9. ATL PPBPS lines are flexible and can be curved to follow the contour of the site or avoid obstructions.

System Sand Specification

"System sand" is the term used to describe the material placed between, beside and below and the ATL. Acceptable system sand shall be material conforming with ASTM C33, North Carolina Department of Transportation No. 2S, or South Carolina Department of Transportation FA-10 specifications purchased at an Infiltrator-approved system sand supplier. No other system sand specifications may be used. The ATL system installer must verify that the system sand meets the specification requirements. The system sand supplier must be identified on the system warranty form.

The following minimum system sand dimensions are required for all ATL PPBPS configurations:

- 6 inches below the ATL panel;
- 10 inches adjacent to the ATL panel for horizontal installations, from ATL panel to trench sidewalls; and
- 14 inches adjacent to the ATL panel for vertical installations, from ATL panel to trench sidewalls.

There is no requirement for system sand on top of the ATL panel. The ATL at the top of the panel system can be backfilled with soil from the site.

Installation Instructions – Horizontal System

1. Stake or mark the trench locations with paint per plan and permit. Set the elevations for the: system sand bed bottom, header pipe or distribution box, invert pipe, and tank excavation.

2. Excavate a 3-foot-wide trench at the depth required per plan and permit. The minimum trench depth to accommodate 6 inches of system sand, 8-inch ATL panel, and 6 inches of soil cover is 20 inches.
3. For trenches installed in Group IV soils, rake or scarify the sidewalls. For installations in clayey soil textures, if smearing or glazing of trench sidewalls and bottom has occurred, it is recommended that these soil surfaces be raked or scarified. No lime is required.
4. The proper elevation of solid PVC header pipe shall be determined to ensure compliance with the required trench bottom depth as shown on the permit.
5. Excavate trenches at a minimum center-to-center distance of 8 feet.
6. Trenches shall be installed level in all directions plus or minus one-half-inch tolerance from side-to-side and with a 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 follow the contour of the ground surface elevation (uniform depth).
7. Place a 6-inch-deep layer of system sand across the entire trench bottom.
8. Remove packaging prior to placing the ATL in the trench. Remove all packaging from the trench before the system is covered and dispose of properly.
9. Place two rows of ATL side-by-side in the configuration shown on the permit specified for the particular site. Place the ATL directly on the system sand.
10. Join the ATLs end- to-end with an internal pipe coupler. The ATL shall be placed with the sides in contact. See Figure 1.
11. Connect header lines to both of the side-by-side ATL rows using a 3-inch corrugated pipe adapter compatible with either 4" SDR 35 or 4" Schedule 40 pipe. Use a standard primer and glue connection. See Figure 1.
12. For low-pressure pipe distribution, insert the pressurized pipes into both ATL corrugated pipes.
13. At the distal end of the trench, loop the ends of the side-by-side ATL corrugated pipes to allow effluent and air flow throughout the panel. Connect header lines using a 3-inch corrugated pipe adapter.
14. When surface slopes are greater than two percent, the bottom of the trenches shall follow the contour of the ground.
15. Place system sand around the ATL to the top of panel.
16. The soil cover depth shall be at least 4 to 6 inches.
17. The finished grade shall be landscaped to prevent the ponding of surface water.
18. Soil cover above the original grade shall be placed at a uniform depth over the system, except as required to prevent the ponding of surface water.
19. The soil cover shall be placed over the drainfield after proper preparation of the original ground surface.
20. As required by state or local requirements, obtain a proper installation inspection from the health department prior to covering the system.
21. Record the name and location of the system sand supplier and system sand specification on the warranty form.

After the system has been completely covered, only drive across the trenches when necessary. Never drive parallel to the direction of the trench. To avoid additional soil compaction, prevent heavy equipment from driving across or parallel to the direction of the trench.

Sod or seed the system installation area to control erosion, as may be required by permit or local requirement.

Installation Instructions – Vertical System

1. Stake or mark the trench locations with paint per plan and permit. Set the elevations for the: system sand bed bottom, header pipe or distribution box, invert pipe, and tank excavation.
2. Excavate a 3-foot-wide trench at the depth required per plan and permit. The minimum trench depth to accommodate 6 inches of system sand, the double-stacked 8-inch ATL panel (16-inch total height), and 6 inches of soil cover is 28 inches. See Figure 1.
3. For trenches installed in Group IV soils, the sidewalls shall be raked or scarified. For installations in clayey soil textures, if smearing or glazing of trench sidewalls and bottom has occurred, it is recommended that these soil surfaces be raked or scarified. No lime is required.
4. The proper elevation of solid PVC header pipe shall be determined to ensure compliance with the required maximum trench bottom depth as shown on the permit.
5. Excavate trenches at a minimum center-to-center distance of 8 feet.
6. Trenches shall be installed level in all directions plus or minus one-half-inch tolerance from side-to-side and with a 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 follow the contour of the ground surface elevation (uniform depth).

7. Place a 6-inch-deep layer of system sand across the entire trench bottom.
8. Remove packaging prior to placing the ATL in the trench. Remove all packaging from the trench before the system is covered and dispose of properly.
9. Place a single line of ATL within the trench stacked vertically in the configuration shown on the permit specified for the particular site. Place the ATL directly on the system sand. See Figure 1.
10. Stacked ATL can be installed using either of two methods:
    - staking or a frame; or
    - sequenced backfilling.
11. For the staking or frame method, drive stakes at an 8-inch spacing along the length of the panel alignment (place ATL between stakes) or place a frame such that the panel position is maintained as system sand is placed around the panel. Place system sand horizontally to the trench sidewalls. Remove stakes or frame when system sand has been placed to the top of the panel.
12. For sequenced backfilling, place the lower ATL row directly on the surface of the 6-inch sand layer. Place system sand to the top of the lower ATL row. Place the upper ATL row directly on top of the lower ATL row. Place system sand to the top of the panel. Place system sand horizontally to the trench sidewalls.
13. Join the ATL end-to-end with an internal pipe coupler.
14. Connect header lines to the upper ATL corrugated pipe using a 3-inch corrugated pipe adapter compatible with either 4" SDR 35 or 4" Schedule 40 pipe. Use a standard primer and glue connection. See Figure 1.
15. For low-pressure pipe distribution, insert the pressurized pipe into the corrugated pipe in the upper ATL.
16. For the lower ATL that is not connected to the header line, place a cap on the ATL pipe at the proximal end of the trench.
17. At the distal end of the trench, loop the ends of the upper end lower ATL to allow effluent and air to flow throughout the panel. Connect header lines using a 3-inch corrugated pipe adapter.
18. When surface slopes are greater than two percent, the bottom of the trenches shall follow the contour of the ground.
19. The soil cover depth shall be at least 4 to 6 inches.
20. The finished grade shall be landscaped to prevent the ponding of surface water.
21. Soil cover above the original grade shall be placed at a uniform depth over the system, except as required to prevent the ponding of surface water.
22. The soil cover shall be placed over the drainfield after proper preparation of the original ground surface.
23. As required by state or local requirements, obtain a proper installation inspection from the health department prior to covering the system.
24. Record the name and location of the system sand supplier and system sand specification on the warranty form.

After the system has been completely covered, only drive across the trenches when necessary. Never drive parallel to the direction of the trench. To avoid additional soil compaction, prevent heavy equipment from driving across or parallel to the direction of the trench.

Sod or seed the system installation area to control erosion, as may be required by permit of local requirement.

Sizing

Sizing of the ATL PPBPS shall be in accordance with 15A NCAC 18A .1956(3)(a)(ii)(B) for the four allowable long-term acceptance rates (LTARs), ranging from 0.4 to 0.1 gallons per day per square foot. In calculating the required linear footage for an ATL PPBPS trench system, the linear footage of trench required as determined in 15A NCAC 18A .1955 (b) and (c), or in 15A NCAC 18A .1956 (6)(b), Table III(a) when applicable, shall be multiplied by 0.5.

1. ATL PPBPS sizing as a function of soil texture and system configuration is provided in Table 2.
2. For repairs, the minimum ATL PPBPS total trench length is 45 ft per bedroom. This applies to horizontal and vertical orientations.
3. The LTAR shall be as shown in the permit for the site.
4. To determine the minimum total trench bottom area (sf) required, divide the design daily sewage flow by the applicable LTAR shown on the permit. The total trench bottom area shall be multiplied by a factor of 0.5 in accordance with 15A NCAC 18A .1956(3)(a)(ii)(B). The minimum linear footage for ATL PPBPS shall be determined by dividing the minimum required trench bottom area by the trench width, which is 3 feet for horizontal and vertical configurations.

5. The following is a representative sizing 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 gpd/0.4 gpd/sf LTAR = 900 sf

Apply PPBPS sizing factor:
900 sf x 0.5 sizing factor = 450 sf

The required linear footage for a 3-ft-wide ATL PPBPS trench system is:
450 sf/3.0 ft-wide trench = 150 ft
Since 150 ft meets the 125-ft minimum length for an LTAR of 0.4 gpd/sf, use 150 ft of ATL

Operation and Maintenance

Operation and maintenance for ATL PPBPS shall have a minimum classification of Type lll in accordance with Rule 15A NCAC 18A. Operation and maintenance recommendations include: avoiding excessive household water usage, avoid improper grease excessive grease and non-biodegradable materials disposal in the system, promoting even wastewater distribution, avoiding chemical or biological additives to the system, promoting ready access to the septic tank for maintenance and periodic inspection and pumping of the septic tank.

Warranty

When installed as a PPBPS, the ATL includes a 3-year limited warranty. A valid warranty form for a site must include the physical address of the system installation or lot number, business name of the system installer, Infiltrator-approved system sand source and facility location, and system sand specification used for the installation. The triplicate form includes a copy for retention by the local health department, system owner, and Infiltrator.

System Sand Source Verification

The system sand placed between, beside and below and the ATL must be purchased from an Infiltrator-approved source, with list available at www.infiltratorwater.com. Acceptable system sand shall be material conforming with ASTM C33, North Carolina Department of Transportation No. 2S, or South Carolina Department of Transportation FA-10 and purchased at an Infiltrator-approved system sand supplier. No other system sand specifications may be used. The name and location of the Infiltrator-approved system sand supplier and material specification must be identified on the warranty form in order for the warranty to be valid.

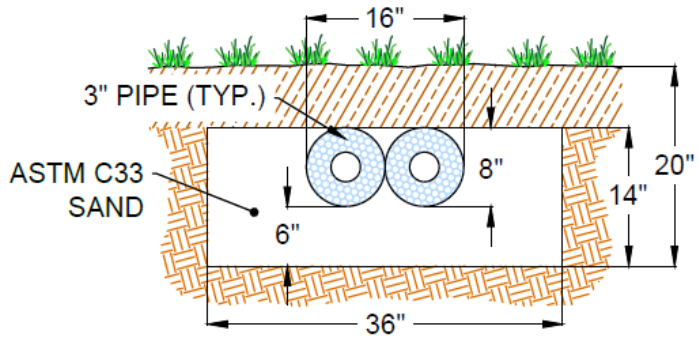
Installer Licensure and Authorization

In addition to meeting state licensure requirements, ATL systems may only be installed by a person that is certified in writing by Infiltrator or its authorized representative as specially trained and qualified to install ATL units as a PPBPS system under 15A NCAC 18A .1956(3)(a)(ii).

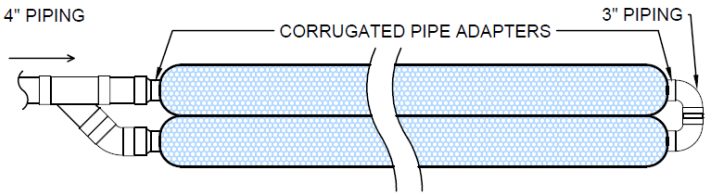
Figure 1. System Configurations

Infiltrator ATL Prefabricated Permeable Block Panel System Configurations

Horizontal

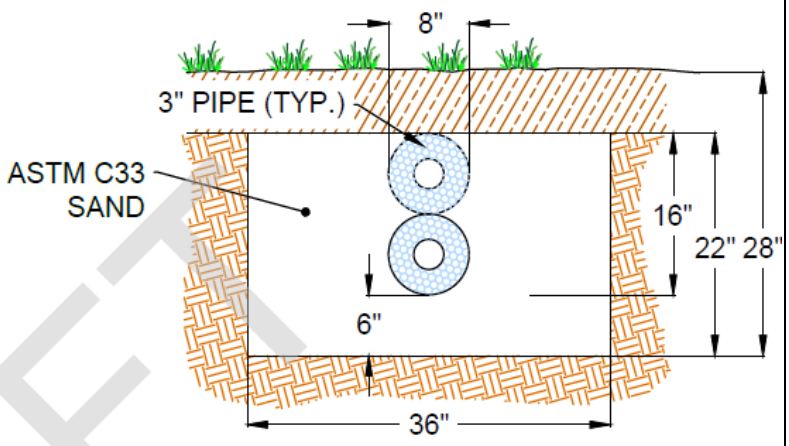


TRENCH SECTION

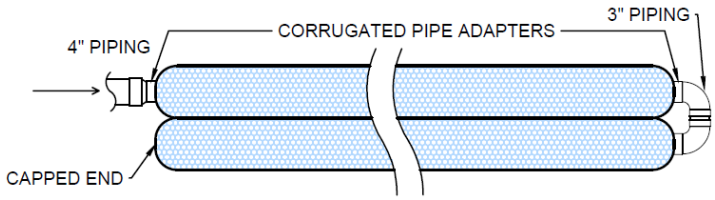


PLAN VIEW

Vertical



TRENCH SECTION



SECTION VIEW

Table 1. System Specifications

System Construction Parameter	ATL PPBPS Configuration	
	Horizontal	Vertical
Overall system height (in)	8	16
ATL rows per trench	2	2
Configuration	Side-by-side	Stacked
Overall dimensions (in)	8H x 16W	16H x 8W
Trench width (in)	36	36
Equivalency factor (sf/lf)	3	3
Minimum soil cover (in)	4 to 6	4 to 6
Minimum trench spacing (ft)	8	8
Minimum trench depth below finished grade (in)	20	28
System sand specification	ASTM C33, Grade A, NCDOT No. 2S, or SCDOT FA-10 obtained from an Infiltrator-approved source	ASTM C33, Grade A, NCDOT No. 2S, or SCDOT FA-10 obtained from an Infiltrator-approved source
Inlet end piping connection	Split flow to both ATL pipes	Flow to top ATL pipe only
Distal end piping connection	Looped - horizontally	Looped - vertically

Table 2. ATL PPBPS Minimum Total Trench Length

Textural Group	LTAR (gpd/sf)	Minimum Total ATL PPBPS Trench Length (ft)			
		3 Bedrooms	4 Bedrooms	5 Bedrooms	6 Bedrooms
Group II Coarse Loam	0.8	DO NOT INSTALL	DO NOT INSTALL	DO NOT INSTALL	DO NOT INSTALL
	0.7	DO NOT INSTALL	DO NOT INSTALL	DO NOT INSTALL	DO NOT INSTALL
Group III Fine Loam	0.6	DO NOT INSTALL	DO NOT INSTALL	DO NOT INSTALL	DO NOT INSTALL
	0.5	DO NOT INSTALL	DO NOT INSTALL	DO NOT INSTALL	DO NOT INSTALL
	0.4	150	200	250	300
Group IV Clays	0.3	200	267	333	400
	0.2	300	400	500	600
	0.1	600	800	1,000	1,200

Notes:

1. "DO NOT INSTALL" indicates that the manufacturer's specifications do not allow the ATL to be installed at the indicated LTAR.
2. Two ATL rows are required along the entire length of trench for horizontal and vertical configurations. See Figure 1 for illustrations.
3. For more than 6 bedrooms, an additional 45 feet of ATL per bedroom is required.

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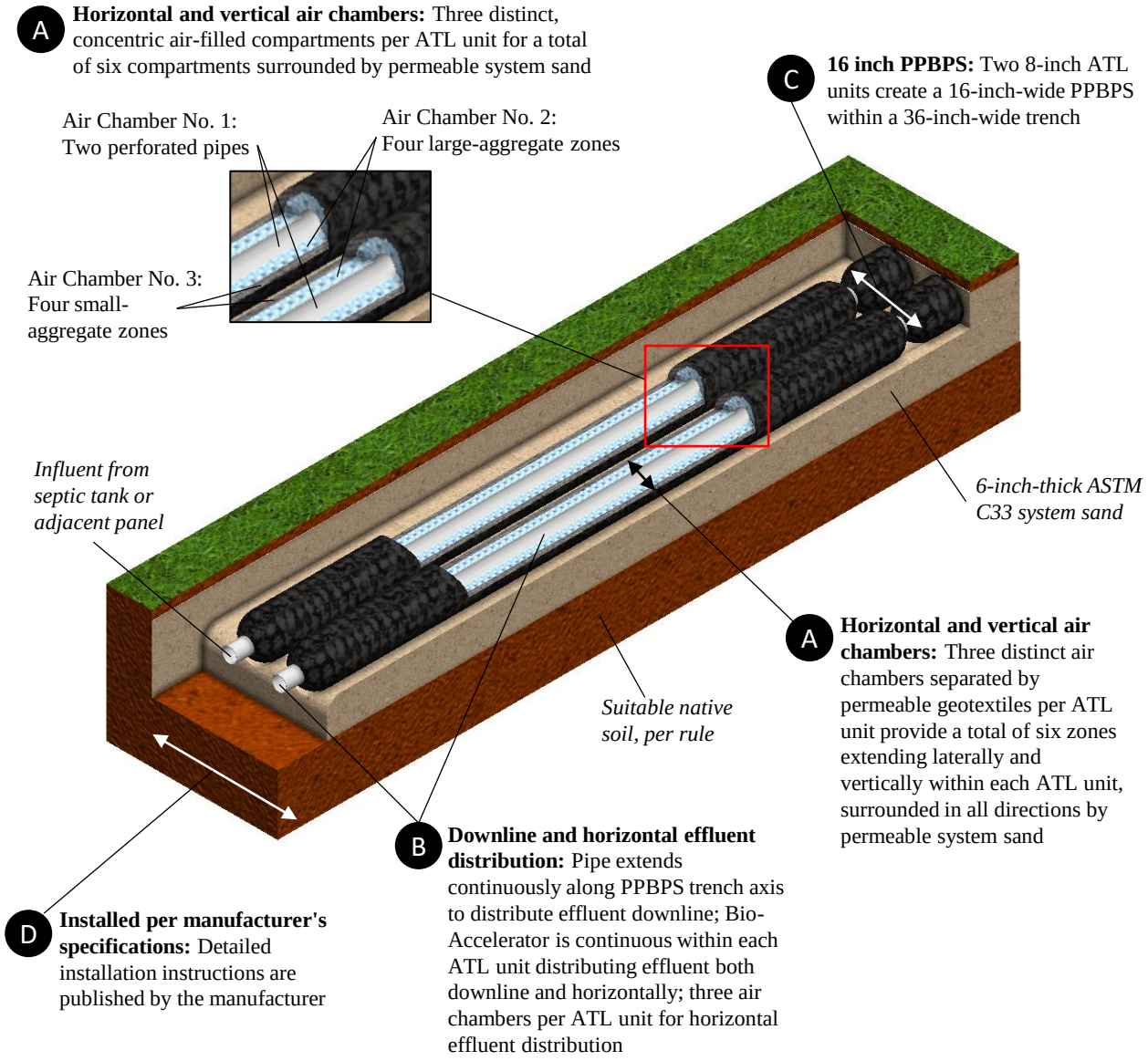
Exhibit B

Exhibit B
15A NCAC 18A .1956(3)(a)(ii) Compliance Evaluation

Isometric Drawing of Segment of Infiltrator ATL Horizontal PPBPS Installation



Isometric Drawing of a Segment of T & J Panel Horizontal Installation

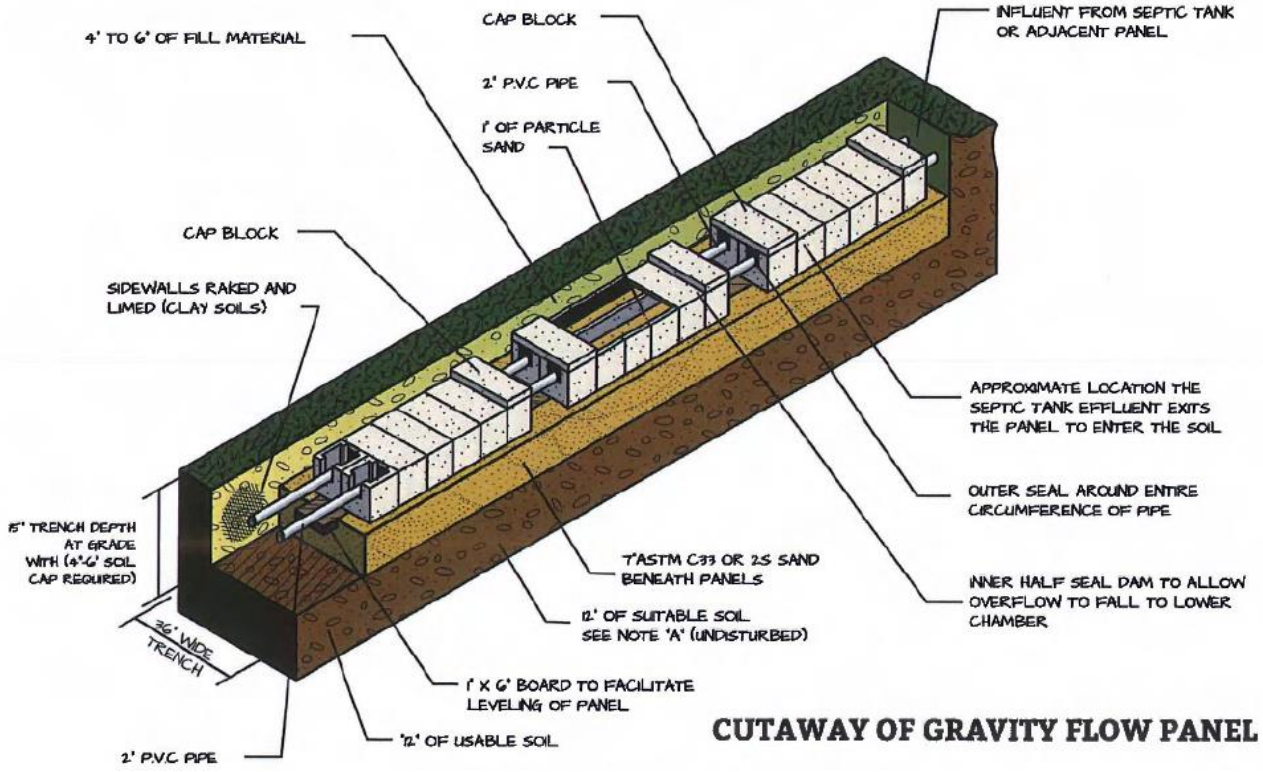


Image source:
T & J Panel Inc. v. DHHS, 16 DHR 11241, Affidavit of Brad Johnson, Exhibit B, page 18 (OAH June 12, 2017)

Exhibit C

Exhibit C

Comparative Evaluation of PPBPS Regulation

As discussed above, 15A NCAC 18A .1956(3)(a)(ii) sets forth just four compliance points for a PPBPS. To put four compliance points into perspective, DHHS regulation of other wastewater systems under Title 15A Subchapter 18A is examined.

The "modified trenches" section of 15A NCAC 18A .1956(3) includes two categories of gravelless trenches: 1) large diameter pipe systems; and 2) PPBPS. The manner in which technical requirements are set forth between these two gravelless trench systems differs substantively, with the large diameter pipe rules establishing multiple highly prescriptive requirements for how a large diameter pipe product would need to be manufactured, marked, and packaged. In contrast, the PPBPS rules describe almost no comparable prescriptive manufacturing requirements and no marking or packaging obligations. For large diameter pipe, 15A NCAC 18A .1956(3)(a)(i) describes detailed construction, certification, and numerical requirements, including:

- pipe diameter;
- pipe and filter wrap materials of construction;
- ASTM F-667 pipe certification;
- pipe perforation size, spacing, and arrangement;
- filter wrap numerical requirements for unit weight, sheet grab tensile strength, trapezoidal strength, Mullen burst strength, and Frazier air permeability;
- visible marking indicator; and
- product packaging using a material capable of blocking ultraviolet light.

While 15A NCAC 18A .1955 on conventional sewage systems does not approach the level of prescription that is present in 15A NCAC 18A .1956(3)(a)(i) for large diameter pipe, there are very detailed construction, certification, and numerical requirements established for conventional gravel and pipe trenches in 15A NCAC 18A .1955, including:

- plastic tubing diameter;
- plastic tubing materials of construction;
- ASTM F 405 tubing certification;
- tubing perforation size, spacing, and arrangement;
- acceptable North Carolina Department of Transportation rock gradation specification numbers;
- gravel depth and width;
- trench soil cover minimum depth.

Table 1 provides a summary of design parameters for five common North Carolina wastewater systems that disperse septic tank effluent. The type of approved wastewater system and rule under which the system is approved is provided across the top of the table, with design parameters shown vertically. In the table, "Regulated" indicates that the rule or DHHS-issued accepted approval (issued via G.S. 130A-343((h) and 15A NCAC 18A .1969(h)) establishes a requirement associated with the indicated design parameter. "Unregulated" indicates that the prescriptive design parameter is not subject to requirements under North Carolina statute, rule, and written policy.

Table 1 – Prescriptive design parameter regulation comparison

Manufactured Product Design and Installation Parameter	Large Diameter Pipe 15A NCAC 18A .1956(3)(a)(i)	Conventional Trench 15A NCAC 18A .1955	EZflow 1203H-GEO 15A NCAC 18A .1969(h)	Quick4 Plus Standard 15A NCAC 18A .1969(h)	PPBPS 15A NCAC 18A .1956(3)(a)(ii)
Geometric configuration	Regulated	Regulated	Regulated	Regulated	**Not regulated**
Materials of construction	Regulated	Regulated	Regulated	Regulated	**Not regulated**
Dimensions	Regulated	Regulated	Regulated	Regulated	Regulated
Component certifications	Regulated	Regulated	Regulated	Regulated	**Not regulated**
External markings	Regulated	**Not regulated**	Regulated	Regulated	**Not regulated**
Finished packaging	Regulated	**Not regulated**	**Not regulated**	**Not regulated**	**Not regulated**
Installed per mfr specs	**Not regulated**	**Not regulated**	Regulated	Regulated	Regulated

Of the seven manufactured product design and installation parameters presented in Table 1, three systems are regulated for six parameters, one system is regulated for four parameters, and PPBPS is regulated for two parameters, specifically, dimensions and installation per manufacturer's specifications. Unlike other septic tank effluent dispersal products, PPBPS are unregulated for geometric configuration, materials of construction, component certifications, external markings, and finished packaging. Of the three systems in Table 1 that are specifically described in Title 15A Subchapter 18A, large diameter pipe and conventional trenches are regulated for geometry, material of construction, dimensions, and component certifications, while PPBPS is only regulated for dimensions.

The comparative evaluation in Table 1 clearly demonstrates that the degree to which DHHS regulates effluent dispersal systems is variable from system to system. Some wastewater systems are subject to higher levels of regulation, while others, like PPBPS, are subject to less, leaving product design elements such as geometric configuration, materials of construction, and component certifications to be determined by the manufacturer. If the regulation of geometric configuration, materials of construction, and component certifications were important for a PPBPS, then it would be expected that the Commission for Health Services would have included details commensurate with large diameter pipe or conventional systems in the rules that were promulgated in the late 1980s. This was not the case, making the design and configuration of PPBPS unique within the North Carolina wastewater regulatory framework.

Additional Technical Considerations

As discussed previously, 15A NCAC 18A .1956(3)(a)(ii) does not establish requirements for the design, manufacture, and credentialing of a PPBPS. While not required, the ATL has been certified to NSF/ANSI 40 Class I wastewater treatment standards. The ATL was tested at an NSF International-accredited testing facility and underwent the full test procedure prescribed under the NSF/ANSI 40 standard. NSF/ANSI 40 Class I wastewater treatment criteria are recognized in 15A NCAC 18A .1970 Table VII. Testing included influent and effluent biochemical oxygen demand, total suspended solids, pH, temperature, and dissolved oxygen 5 days per week for 26 weeks. Effluent $CBOD_5$ concentrations ranged from <3 to 27 mg/L over the course of the evaluation, with an average concentration of 9 mg/L and a median concentration of 8 mg/L, as compared to the 15A NCAC 18A .1970 Table VII requirement of 25 mg/l. The effluent TSS concentration ranged from <2 to 25 mg/L during the evaluation, with an

average concentration of 11 mg/L and a median concentration of 10 mg/L, as compared to the 15A NCAC 18A .1970 Table VII requirement of 30 mg/l. The ATL treatment values are well below the NSF/ANSI 40 treatment standards.
The tested ATL diameter was 12 inches, while the diameter that would be used as a PPBPS would be 8 inches. NSF International conducted an engineering review to examine scaling the 12-inch diameter product to 8 inches and found that the 8-inch-diameter product would meet NSF/ANSI 40 Class I effluent treatment standards. DHHS has employed scaling for advanced wastewater pretreatment systems regulated under 15A NCAC 18A .1970 for well over 20 years. Manufacturers of advanced wastewater pretreatment systems typically test a system using a daily flow of 500 gallons per day and scale the equipment componentry up or down for lower or higher flows, as needed. DHHS innovative wastewater system approval reflect such scaling practices. The process used to scale the ATL is no different than DHHS' historical use of scaling.

Infiltrator took scaling a step further for the ATL system by voluntarily comparing the effluent flow characteristics during the NSF/ANSI 40 testing to the flow characteristics for a PPBPS system in North Carolina under the state's daily design flow criteria. The analysis was conducted to verify that the length of ATL PPBPS trench would provide at least as much internal surface area as was provided during the NSF/ANSI 40 testing, for which performance is known and demonstrated to be highly effective. This analysis is not required under Title 15A Subchapter 18A or any other North Carolina regulatory requirement. The analysis was previously presented to the DHHS staff as a voluntary demonstration of the ATL being a worthy PPBPS product.

Additional Regulatory Considerations

Since 2018, placement of ATL units in a side-by-side, in-contact geometry has been recognized by the New York State Department of Health (NYSDOH) as a method of constructing a gravelless geotextile sand filter trench under New York Appendix 75-A *Wastewater Treatment Standards - Residential Onsite Systems*. For the system configuration recognized by the NYSDOH, three 12-inch-diameter ATL bundles are placed on a 6-inch-high system sand layer and backfilled with system sand within a 4-foot-wide trench. Figure A-1 is an excerpt from Infiltrator's NYSDOH-accepted product installation manual[1] showing the side-by-side ATL configuration. As discussed previously, Infiltrator's proposed North Carolina ATL PPBPS sizing was developed based on the testing configuration used for NSF/ANSI 40 certification. Therefore, the North Carolina 8-inch-diameter ATL with NSF/ANSI 40-based product sizing would be installed within a trench of length and width defined by and conforming to 15A NCAC 18A.1956(3)(A)(ii). The purpose in including the NYSDOH-accepted configuration is to show that the side-by-side ATL configuration has been in use in another regulatory jurisdiction. Trench lengths and the internal proprietary components are always unique to the jurisdiction-specific regulatory framework.

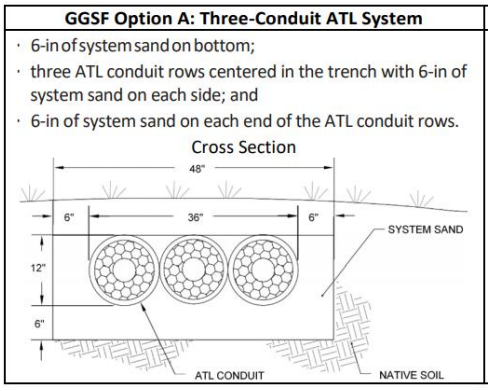


Figure A-1 – New York side-by-side ATL trench

Infiltrator has broad knowledge of the North American onsite wastewater treatment system market, particularly with respect to proprietary products used for the construction of effluent dispersal trenches. The company's market knowledge indicates that the vertical PPBPS configuration is unique to North Carolina, as it does not appear that this system configuration, when intended to provide combined treatment and dispersal of septic tank effluent through the use of proprietary media and a specified sand

[1] https://www.infiltratorwater.com/Customer-Content/www/CMS/files/location-manuals/NY_ATL_AES_Manual_March_2020_Final.pdf

gradation, is used in any state or province other than North Carolina. For this reason, two stacked ATL units are not used in other jurisdictions because no other North American regulatory jurisdiction allows such a system. While the use of a tall or stacked product configuration for the purpose of providing combined treatment and dispersal is unique to North Carolina, the stacking of bundled expanded polystyrene (bundled EPS) is commonplace outside of North Carolina for dispersal of septic tank effluent. ATL PPBPS is within the "family" of bundled EPS products, which also includes EZflow and Flowtech, two products that are allowed by DHHS under accepted and innovative approvals, respectively. The broad acceptance and use of stacked bundled EPS can be used to gain an understanding that vertically stacked ATL configurations are technically feasible, easily constructed, maintain their geometry over time, and are capable of acceptable long-term functionality.

Most bundled EPS product usage in North Carolina employs a "horizontal" geometry, meaning that bundles are placed side-by-side, like the proposed 2-bundle-wide ATL horizontal 8-inch PPBPS configuration. The North Carolina innovative EZflow approval allows a "triangular" configuration, designated EZflow 1003T-GEO, as illustrated in Figure A-2. In this configuration, bundles are stacked in an offset orientation, with the center, upper bundle offset from the lower side bundles. The trench backfill and sidewalls stabilize and constrain all three bundles. Other Southeastern states that allow "triangular" configurations for dispersal of septic tank effluent include Alabama, Georgia, South Carolina, and Virginia.

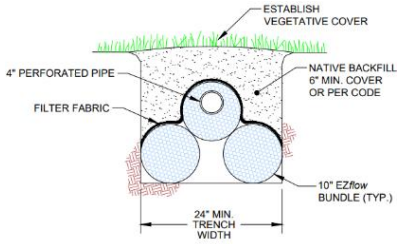


Figure A-2 – EZflow 1003T

Bundled EPS "vertical" configurations, where bundles are stacked along a single vertical axis (Figure A-3), are used extensively in the western United States. Vertically stack bundled EPS configurations are allowed under the *2021 Uniform Plumbing Code (2021 UPC)*, *2019 California Plumbing Code (2021 CPC)*, and IAPMO IGC 276-2019 – *Bundled Expanded Polystyrene (EPS) Synthetic Aggregate Systems*. New Mexico has allowed vertical configurations since at least 2007. The Arizona Department of Environmental Quality approved the use of vertical EZflow systems in 2017. California counties make extensive use of vertically stacked EZflow configurations under the *2019 CPC*. This includes one of the nation's largest septic system permit issuers, San Bernardino County, which allows stacked 18-inch bundled EPS. Example vertically oriented EZflow configurations are presented in Table 2, along with the corresponding regulatory status in the above-referenced codes, standard, and states.

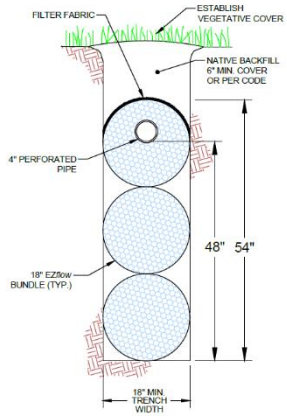


Figure A-3 – EZflow 1803V

Table 2 – Regulatory status of vertically stacked bundled EPS products

Vertically Stacked Configuration	Bundle Diameter	Number of Stacked Bundles	Regulatory Allowance						
			2021 UPC	2019 CPC	IAPMO IGC 276	Arizona	California	Nevada	New Mexico
EZflow 1202V	12 in	2	✓	✓	✓	✓	✓	✓	✓
EZflow 1203V	12 in	3	✓	✓	✓	✓	✓	✓	✓
EZflow 1204V	12 in	4	✓	✓	✓	✓	✓	✓	✓
EZflow 1802V	18 in	2	✓	✓	✓	✓	✓		
EZflow 1803V	18 in	3	✓	✓	✓	✓	✓		
EZflow 1804V	18 in	4	✓	✓	✓	✓	✓		
EZflow 1805V	18 in	5	✓	✓	✓	✓	✓		

Sizing and Installation Information

The manufacturer's specifications for the Infiltrator ATL are provided in Exhibit A. This document illustrates the configuration of the system and horizontal and vertical air chambers, how the system promotes downline and horizontal distribution of effluent, how the system components are to be placed to achieve the 16-inch dimensional requirement, and how the system sand is installed to ensure proper treatment and product dimension stability. The manufacturer's specifications also define trench sizing, step-by-step installation methodology, and trench backfill materials, each of which is discussed below.

- Trench sizing – Sizing of the ATL PPBPS trench length would be established to meet all 15A NCAC 18A .1956(3)(a)(ii) minimum trench length requirements. As part of the scaling used to determine the minimum size of ATL PPBPS relative to ATL NSF/ANSI 40 certification testing, Infiltrator compared the effluent flow characteristics during the NSF/ANSI 40 testing to the flow characteristics for a PPBPS system in North Carolina under the state's 120 gallons per day per bedroom daily design flow criteria (see additional discussion below). The analysis was conducted to verify that the length of ATL PPBPS trench would provide at least as much internal surface area as was available during NSF/ANSI 40 certification testing, for which performance is known and demonstrated to be effective. While the scaling analysis is not required under Title 15A Subchapter 18A or any other North Carolina regulatory requirement, it was Infiltrator's means of ensuring that the sizing of an ATL PPBPS trench provides a wastewater flow regime that falls within the known, proven parameters of the NSF/ANSI 40 certification testing protocol, where the product was shown to produce Class I treated effluent. Note that this scaling evaluation is highly conservative because the measured 450-gallon-per-day flow during NSF/ANSI 40 certification testing, equating to 150 gallons per day per bedroom, is much greater than actual per capita domestic water use in North Carolina. While North Carolina's daily design flow is 120 gallons per day per bedroom, at a per capita use of 65 to 70 gallons

per day, the actual flow per bedroom is considerably less than 120 gallons per day. These water use values were provided in multiple past discussions with Steven Berkowitz, P.E. of the DHHS and are further supported by large-scale national domestic wastewater usage studies conducted by the Water Environment Research Foundation (*Residential End Uses of Water, Version 2*, 2016).

The end result of the scaling analysis is Table 3, which appears in the ATL installation instructions for North Carolina as Table 2 and is presented in Exhibit A. In certain instances, Infiltrator has determined that the length of trench required per 15A NCAC 18A .1956(3)(a)(ii) is less than the minimum length of trench that would be required to fall within the NSF/ANSI 40 certification testing flow regime. In these instances, the Infiltrator minimum trench length exceeds the 15A NCAC 18A .1956(3)(a)(ii) minimum trench length. All such occurrences are clearly indicated in the table with a "DO NOT INSTALL", indicating that the installation is not permissible under the manufacturer's specifications.

Table 3 – ATL PPBPS minimum trench length, per manufacturer's specifications

Textural Group	LTAR (gpd/sf)	Minimum Total ATL PPBPS Trench Length (ft)			
		3 Bedrooms	4 Bedrooms	5 Bedrooms	6 Bedrooms
Group II Coarse Loam	0.8	DO NOT INSTALL	DO NOT INSTALL	DO NOT INSTALL	DO NOT INSTALL
	0.7	DO NOT INSTALL	DO NOT INSTALL	DO NOT INSTALL	DO NOT INSTALL
Group III Fine Loam	0.6	DO NOT INSTALL	DO NOT INSTALL	DO NOT INSTALL	DO NOT INSTALL
	0.5	DO NOT INSTALL	DO NOT INSTALL	DO NOT INSTALL	DO NOT INSTALL
	0.4	150	200	250	300
Group IV Clays	0.3	200	267	333	400
	0.2	300	400	500	600
	0.1	600	800	1,000	1,200

Notes:

1. "DO NOT INSTALL" indicates that the ATL system cannot be installed for the indicated LTAR.
2. Two ATL rows are required along the entire length of trench for horizontal and vertical configurations.
3. For more than 6 bedrooms, an additional 45 feet of ATL per bedroom is required.

- Step-by-step installation methodology – The manufacturer's specifications include detailed instructions describing how the ATL PPBPS trench shall be constructed, including the placement and stabilization of the ATL bundle components used to form

the block panel structure. Fabrication of the 8-inch horizontal and 16-inch vertical system configurations is addressed separately below.

- *8-inch horizontal system* – The installation instructions require the placement of two rows of ATL side-by-side directly on the 6-inch-deep system sand, joining segments end- to-end with an internal pipe coupler. Sand is placed around the ATL to the top of panel, with soil cover depth over the top of the panel at least 4 to 6 inches. Using this method, the system sand surrounding the ATL provides lateral and horizontal stabilization to the system components, constraining them to the required horizontal configuration and maintaining the width required under 15A NCAC 18A .1956(3)(a)(ii).

- *16-inch vertical system* – The installation instructions provide two methods of vertical system construction, referred to as: 1) staking or framing; or 2) sequenced backfilling. For the staking/frame method, either stakes are driven at an 8-inch spacing along the length of the panel alignment, with the ATL placed between stakes, or a frame is placed such that the ATL panel position is maintained as system sand is placed around the panel. System sand is subsequently placed to the top of the panel and the stakes or frame is removed. For sequenced backfilling, the lower ATL row is placed directly on the surface of the 6-inch system sand layer, with system sand placed to the top of the lower ATL row. The upper ATL row is placed directly on top of the lower, backfilled ATL row, with system sand filling the final 8 inches to the top of the panel and final cover is placed above that elevation. Using this method, the system sand surrounding the ATL provides lateral and horizontal stabilization to the system components, constraining them to the required vertical configuration and maintaining the height required under 15A NCAC 18A .1956(3)(a)(ii).

- Trench backfill materials - "System sand" is the term used to describe the material placed between, beside and below the ATL bundles. This material serves multiple purposes, including stabilizing, supporting, and constraining the ATL components and promoting downline and horizontal distribution of effluent once it exfiltrates from the ATL units. As described in Exhibit A, the manufacturer's specifications for installation strictly limit materials used to backfill the ATL to sand gradations known to promote three-dimensional movement of effluent through capillary action. The ATL installation instructions allow system sand conforming with ASTM C33, North Carolina Department of Transportation No. 2S, or South Carolina Department of Transportation FA-10 specifications. These materials must be purchased at an Infiltrator-approved sand supplier. The manufacturer's specifications do not allow other system sand specifications to be used.