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Final Regulation Agency Background Document

Agency name	Board of Health – Virginia Department of Health
Virginia Administrative Code (VAC) citation(s)	12VAC5-610
Regulation title(s)	Sewage Handling and Disposal Regulations (the Regulations)
Action title	Establish requirements for the physical construction, design, and installation of gravelless material, and requirements for the physical construction, design and installation of drip dispersal.
Date this document prepared	December 29, 2015

This information is required for executive branch review and the Virginia Registrar of Regulations, pursuant to the Virginia Administrative Process Act (APA), Executive Orders 17 (2014) and 58 (1999), and the *Virginia Register Form, Style, and Procedure Manual*.

Brief summary

Please provide a brief summary of the proposed new regulation, proposed amendments to the existing regulation, or the regulation proposed to be repealed. Alert the reader to all substantive matters or changes. If applicable, generally describe the existing regulation.

The proposed amendments to the Regulations (12VAC5-610) will permanently incorporate the requirements for gravelless material and drip dispersal established by emergency regulations. These requirements can be summarized as follows:

1. Specifications for the physical construction of gravelless material including minimum exterior width, height, effluent storage capacity, and structural capacity.
2. Requirements for a permeable interface between gravelless material and trench sidewall soil surfaces for the absorption of effluent.

3. Criteria for the allowable slope, maximum length, minimum sidewall depth, and minimum lateral separation of gravelless material absorption trenches.
4. Criteria for determining the minimum absorption area required when utilizing gravelless material.
5. Criteria for substitution of gravelless material in place of gravel for gravity percolation lines and low pressure distribution systems.
6. Specifications for the physical construction of drip dispersal system components.
7. Minimum requirements for the design of drip dispersal systems.
8. Minimum installation requirements for drip dispersal systems.

The final regulation has several minor revisions compared to the emergency regulations for gravelless material and drip dispersal. The revisions address public comments and comments from two technical advisory committees (the Chamber and Bundled Expanded Polystyrene Technical Advisory Committee, and the Drip Dispersal Technical Advisory Committee) and are intended to clarify requirements outlined in the emergency regulations.

Acronyms and Definitions

Please define all acronyms used in the Agency Background Document. Also, please define any technical terms that are used in the document that are not also defined in the "Definition" section of the regulations.

Acronyms

AOSS – Alternative Onsite Sewage System
CBEP TAC – the Chamber and Bundled Expanded Polystyrene Technical Advisory Committee
DD TAC – the Drip Dispersal Technical Advisory Committee
DEQ – Virginia Department of Environmental Quality
GMP – Virginia Department of Health Guidance, Memorandum, and Policies
OEHS – Virginia Department of Health’s Office of Environmental Health Services
OSE – Licensed Onsite Soil Evaluator
PE – Licensed Professional Engineer
VDH – Virginia Department of Health

Definitions

Drip dispersal means an onsite sewage system that applies wastewater in an even and controlled manner over an absorption area. Drip dispersal components may include treatment components, a flow equalization pump tank, a filtration system, a flow measurement method, supply and return piping, small diameter pipe with emitters, air/vacuum release valves, redistribution controls, and electromechanical components or controls.

Gravelless material means a proprietary product specifically manufactured to disperse effluent within the absorption trench of an onsite sewage system without the use of gravel. Gravelless material may include chamber, bundled expanded polystyrene, and multi-pipe systems.

Statement of final agency action

Please provide a statement of the final action taken by the agency including: 1) the date the action was taken; 2) the name of the agency taking the action; and 3) the title of the regulation.

On March 17, 2016, the Board of Health approved final amendments to the Sewage Handling and Disposal Regulations (12VAC5-610) regarding gravelless material and drip dispersal.

Legal basis

Please identify the state and/or federal legal authority to promulgate this proposed regulation, including: 1) the most relevant citations to the Code of Virginia or General Assembly chapter number(s), if applicable; and 2) promulgating entity, i.e., agency, board, or person. Your citation should include a specific provision authorizing the promulgating entity to regulate this specific subject or program, as well as a reference to the agency/board/person's overall regulatory authority.

Section 32.1-164.9 of the Code of Virginia mandates the Board to promulgate regulations for physical construction, design, and installation of chamber and bundled expanded polystyrene systems. Additionally, the Board is authorized pursuant to § 32.1-12 of the Code of Virginia to promulgate and enforce regulations. Section 32.1-164 of the Code of Virginia authorizes the Board to promulgate regulations governing the collection, conveyance, transportation, treatment, and disposal of sewage by onsite sewage systems to protect public health, surface water, and ground water.

Purpose

Please explain the need for the new or amended regulation. Describe the rationale or justification of the proposed regulatory action. Describe the specific reasons the regulation is essential to protect the health, safety or welfare of citizens. Discuss the goals of the proposal and the problems the proposal is intended to solve.

The need for the final amendments is to implement § 32.1-164.9 of the Code of Virginia and incorporate requirements for gravelless material and drip dispersal into the Regulations. The emergency regulations currently include construction, design, and installation requirements for gravelless material and drip dispersal systems. However, the emergency regulations will expire on March 14, 2016. Since 1995, VDH has recognized through Guidance Memoranda and Policy (GMP) that gravelless material and drip dispersal are acceptable means of dispersing effluent. The final amendments establish the physical construction, design, and installation standards for gravelless material and drip dispersal necessary to protect public health, safety and welfare of citizens. The goal of the final amendments is to permanently add the construction, design, and installation standards for gravelless material and drip dispersal found in the emergency regulations into the Regulations.

Substance

Please briefly identify and explain the new substantive provisions, the substantive changes to existing sections, or both.

The proposed regulation establishes minimum physical construction, design, and installation requirements for gravelless material and drip dispersal. The proposed regulation permanently incorporates sections 30, 920, 930(F), 940(D), 950, Table 5.4, and 955 of the emergency regulations, with a few minor revisions.

Issues

Please identify the issues associated with the proposed regulatory action, including: 1) the primary advantages and disadvantages to the public, such as individual private citizens or businesses, of implementing the new or amended provisions; 2) the primary advantages and disadvantages to the agency or the Commonwealth; and 3) other pertinent matters of interest to the regulated community, government officials, and the public. If there are no disadvantages to the public or the Commonwealth, please indicate.

The primary advantage to the public of the final amendments is that it provides a clear standard for the use of gravelless material and drip dispersal; products that have been allowed through a series of GMPs for more than 20 years. The final amendments also provide manufacturers of new gravelless materials with a clear understanding of the physical construction requirements for gravelless materials in Virginia, along with a clear process for seeking approval of new technologies. The primary advantages to VDH are similar to those for the public; clear regulations and a clear process for approving new technologies. Additionally, the final amendments implement the requirements of § 32.1-164.9 of the Code of Virginia. The final amendments benefit the regulated community by providing a clear set of regulations for gravelless material and drip dispersal designs submitted pursuant to § 32.1-163.5 of the Code of Virginia.

The final amendments pose no disadvantages to the public or the Commonwealth. However, two issues have generated a considerable amount of interest and concern: 1) a perception that gravelless material systems sized in accordance with the proposed regulation will fail prematurely; and 2) VDH employees do not possess the same latitude as private sector designers to specify which materials are used in their designs.

A number of commenters during the Notice of Intended Regulatory Action stage voiced concern that gravelless material sized in accordance with the final amendments will result in premature system failure. The CBEP TAC discussed at length the issue of gravelless material sizing. Under previous GMPs, gravelless material could be used at up to a 50% reduction in sizing when compared to gravel trench systems. The CBEP TAC came to a general agreement that the reduction should be limited to 25% in Class I, II, and III soils, and 15% in class IV soils.

OEHS has performed two reviews to evaluate claims that the use of gravelless material will increase premature failure rates. The first review looked at indemnification fund cases where gravelless materials were used. In those cases, improper evaluation of soil permeability rates and depth to water table were found to be the primary causes of failure. The second review looked at malfunction assessments entered into the Virginia Environmental Information System database between January 1, 2015, and October 12, 2015, where the malfunctioning system was less than 15 years old. The causes of failure were similar among both gravel trench systems and gravelless material systems. More information on this review is included in the November 23, 2015, CBEP TAC meeting summary. The summary can be found at www.townhall.virginia.gov/L/GetFile.cfm?File=C:\TownHall\docroot\meeting\58\23698\Minutes_VDH_23698_v1.pdf.

Gravelless materials have been approved for use through GMPs for more than 20 years, with smaller minimum sizing requirements than those in the final amendments. Additionally, reviews conducted by OEHS did not find clear evidence that gravelless material sizing allowed under previous GMPs resulted in increased rates of premature failure. However, VDH agrees that the performance of all materials approved for use in onsite sewage systems should be tracked to inform future VDH policies and regulations. VDH has identified several improvements for malfunction assessment reporting that will enhance the ability to evaluate the performance of onsite sewage system components.

Commenters during the Notice of Intended Regulatory Action stage also voiced concern that VDH employees are not given the same latitude as private sector designers to specify which materials are used in their designs. Specifically, commenters raised concerns that VDH employees must accept the substitution of gravelless material for gravel trenches when done in accordance with the minimum requirements of the final amendments for gravelless materials. However, this requirement for VDH employees is not new and is not limited to gravelless materials.

VDH employees must approve onsite sewage system installations that adhere to the Regulations and GMPs. For the last 20 years VDH employees have approved the use of gravelless materials installed in accordance with GMPs. The final amendments simply move those GMPs into the Regulations. Other onsite sewage system components, such as distribution boxes and header lines, have multiple material options. VDH employees must approve these components as well, provided each meets the Regulations and GMPs.

Requirements more restrictive than federal

Please identify and describe any requirement of the proposal which is more restrictive than applicable federal requirements. Include a rationale for the need for the more restrictive requirements. If there are no applicable federal requirements or no requirements that exceed applicable federal requirements, include a statement to that effect.

There are no applicable federal requirements.

Localities particularly affected

Please identify any locality particularly affected by the proposed regulation. Locality particularly affected means any locality which bears any identified disproportionate material impact which would not be experienced by other localities.

There are no known localities that would be particularly affected by the final amendments. The Regulations apply to all localities.

Family impact

Please assess the impact of this regulatory action on the institution of the family and family stability including to what extent the regulatory action will: 1) strengthen or erode the authority and rights of parents in the education, nurturing, and supervision of their children; 2) encourage or discourage economic self-sufficiency, self-pride, and the assumption of responsibility for oneself, one’s spouse, and one’s children and/or elderly parents; 3) strengthen or erode the marital commitment; and 4) increase or decrease disposable family income.

The final amendments will have no family impact.

Changes made since the proposed stage

*Please list all changes that made to the text of the proposed regulation and the rationale for the changes; explain the new requirements and what they mean rather than merely quoting the proposed text of the regulation. *Please put an asterisk next to any substantive changes.*

Section number	Requirement at proposed stage	What has changed	Rationale for change
930.F.4	Requires installation of gravelless material to comply with the requirements of the Regulations.	<p>“Installation of gravelless material shall comply with this chapter <u>and the approved installation manual</u> unless the department grants a deviation pursuant to 12VAC5-610-660 or the division has granted a deviation identified in the installation manual.”</p> <p>Requires installation of gravelless material to also comply with the requirements of the manufacturer’s installation manual, as approved by VDH.</p>	This change is proposed to address a comment from the CBEP TAC that the proposed regulation did not make it clear that an installer must follow the manufacturer’s approved installation manual, in addition to the minimum requirements of the proposed regulation.
930.F.8	Requires the system designer to identify on the inspection report any	“Gravelless material may be substituted for gravel in accordance with this chapter, provided that the	This change addresses a public comment asking VDH to identify the

	<p>substitution of gravelless material for gravel trenches.</p>	<p>certifying licensed professional engineer or onsite soil evaluator approves the substitution. The certifying licensed professional engineer or onsite soil evaluator shall <u>identify document the substitution and related design changes</u> on the inspection report submitted in accordance with 12VAC5-610-330. A new construction permit pursuant to 12VAC5-610-310 is not required for the substitution.”</p> <p>Requires the system designer to also document any additional modifications to the system made as a result of substituting gravelless material for gravel trenches (e.g. modification of pump drawdown specifications).</p>	<p>responsible party for alteration of pump designs as a result of a substitution of gravelless material for gravel trenches. The proposed change requires the certifying designers to document any changes to the pump or other system components resulting from a substitution as part of their inspection report approving or denying the installation.</p>
<p>955.B.3</p>	<p>This section currently sets installation depth requirements for drip systems dispersing septic tank effluent, and minimum cover requirements for drip systems dispersing secondary effluent.</p>	<p>“Except as provided by 12VAC5-613, drip systems dispersing septic tank effluent shall comply with the requirements of 12VAC5-610-594. <u>4.</u> Drip systems dispersing secondary effluent or better require a minimum of six inches of cover over the tubing. Cover may be achieved by a combination of installation depth and Group II or Group III soil cover or other approved material over the drip field”</p> <p>Removes the minimum cover requirement for drip systems dispersing secondary effluent or better from 955.B.3 and moves it to a new section, 955.B.4.</p>	<p>This change was recommended by the DD TAC in response to a public comment regarding 955.B.3. The change is intended to provide a clear distinction between requirements for drip systems dispersing septic tank effluent and those dispersing secondary or better effluent.</p>
<p>955.B.4</p>	<p>“4. The discharge rate of any two emitters shall not vary by more than 10% in order to ensure that the effluent is uniformly distributed over the entire drip field or zone.”</p>	<p>“<u>45.</u> The discharge rate of any two emitters shall not vary by more than 10% in order to ensure that the effluent is uniformly distributed over the entire drip field or zone.”</p> <p>Changes the section number to address the separation of language in section B.3 that creates a new section B.4.</p>	<p>This change simply incorporates a numbering changes based on revisions to 955.B.3.</p>

955.B.5	<p>“5. The emitters shall be evenly spaced along the length of the drip tubing at not less than six inches or more than 24 inches apart.”</p>	<p>“56. The emitters shall be evenly spaced along the length of the drip tubing at not less than six inches or more than 24 inches apart.”</p> <p>Changes the section number to address the separation of language in section B.3. that creates a new section B.4.</p>	<p>This change simply incorporates a numbering changes based on revisions to 955.B.3.</p>
955.B.6	<p>“6. The system design shall protect the drip emitters and system from the effects of siphoning or backflow through the emitters.”</p>	<p>“67. The system design shall protect the drip emitters and system from the effects of siphoning or backflow through the emitters.”</p> <p>Changes the section number to address the separation of language in section B.3 that creates a new section B.4.</p>	<p>This change simply incorporates a numbering changes based on revisions to 955.B.3.</p>
955.C.3	<p>Establishes minimum landscape linear loading rate requirements for drip dispersal systems.</p>	<p>“3. Landscape linear loading rates shall be considered for sloping absorption areas. For sites where effluent flow is primarily horizontal, linear loading rates shall be less than four gallons per day per linear foot. For sites where the flow is primarily vertical, the linear loading rate shall be less than 10 gallons per day per linear foot.”</p> <p>Removes landscape linear loading rate requirements from the proposed regulation.</p>	<p>This change addresses two public comments requesting that this section be removed. Several solutions were evaluated by the DD TAC. Removing this section from the proposed regulation received the highest level of support.</p> <p>Drip dispersal systems are AOSS subject to the performance requirements contained in the Regulations for Alternative Onsite Sewage Systems (12VAC5-613, the AOSS Regulations). The AOSS Regulations already establish necessary requirements to assure that water mounding will not adversely affect the functioning of the soil treatment area or create ponding on the surface for all AOSS.</p>
955.C.4	<p>“4. Air/vacuum release valves shall be located at</p>	<p>“43. Air/vacuum release valves shall be located at the high point of</p>	<p>This change simply incorporates a numbering</p>

	the high point of the supply and return manifolds to each zone.”	the supply and return manifolds to each zone.” Changes the section number to address the removal of the section regarding landscape linear loading rates.	changes based on removal of 955.C.3.
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Public comment

Please summarize all comments received during the public comment period following the publication of the proposed stage, and provide the agency response. If no comment was received, please so indicate. Please distinguish between comments received on Town Hall versus those made in a public hearing or submitted directly to the agency or board.

Commenter	Comment	Agency response
Nan Gray	Why not say 20,000 pound crush strength for gravelless material instead of H-10 or H-20 loading?	The H-10 and H-20 standards provided in the proposed regulation are derived from International Association of Plumbing and Mechanical Officials (IAPMO) and American Association of State Highway and Transportation Officials (AASHTO) vehicle loading specifications. The CBEP TAC discussed these standards and determined that H-10 and H-20 standards are more appropriate than establishing a specific weight for crush strength.
Nan Gray	Why is the minimum absorption area sizing for gravelless material less than the minimum absorption area sizing for gravel trenches?	This issue was discussed in great detail during the CBEP TAC meetings, and the proposed minimum area sizing is the result of those discussions. Gravelless material has been approved for use in Virginia for more than 20 years; in some cases at an even greater reduction in area sizing than is provided in the proposed regulation. Section 448 of the Regulations directs VDH to include in the Regulations systems and components approved through policy.
Nan Gray	What is the justification for the proposed installation and cover depth requirements for drip dispersal?	<p>The proposed requirements for installation and cover depth of drip systems dispersing septic tank effluent is based on existing requirements for all in-ground system dispersing septic tank effluent contained in section 594 of the Regulations.</p> <p>The cover requirement for drip systems dispersing secondary effluent is based on the minimum cover necessary to protect the drip tubing from damage and to prevent surfacing of effluent.</p> <p>The DD TAC recommended separating the requirements for septic tank effluent versus secondary effluent contained in section 955.B.3 to</p>

		avoid confusion on the issue of cover and installation depth. This recommendation is reflected in the proposed regulation.
Tom Ashton	Section 955.B.6 is redundant and not necessary for drip dispersal as these elements are captured in other proposed sections dealing with air relief valves and prevention of gravity redistribution. Recommend section 955.B.6 be removed.	Section 955.B.6 was added to the proposed regulation to address concerns raised by a DD TAC member that the language in the emergency regulations was not sufficient to ensure that all drip system are designed to prevent drain back.
Tom Ashton	Language in 955.C.3 may be in conflict with section 12VAC5-613-80 of the Regulations for Alternative Onsite Sewage Systems. The proposed minimum landscape linear loading rates are based on above ground mound systems, not drip dispersal. Additional factors are involved in appropriately sizing a drip dispersal system. Section 955.C.3 should be removed.	The section regarding landscape linear loading rates has been removed from the proposed regulation. Drip dispersal systems are AOSS. In addition to the proposed regulation, all drip dispersal systems are subject to the performance requirements contained in the AOSS Regulations. The AOSS Regulations already establish necessary requirements to assure that water mounding will not adversely affect the functioning of the soil treatment area or create ponding on the surface for all AOSS.
Jeff Walker	Could VDH offer guidance on who is responsible for alteration of the pump design to reflect the change in area and/or number of trenches when gravelless material is substituted for gravel trenches?	To address this comment the CBEP TAC suggested modifying the proposed language in section 930.F.8 to state: “...the certifying licensed professional engineer or onsite soil evaluator shall <u>identify document the substitution and related design changes</u> on the inspection report...” The inclusion of “related design changes” assures that the designer must also approve and document any alterations to other system components (e.g. pump design) as a result of the substitution of gravelless material for gravel trenches.
Jeff Walker	VDH OSE designs do not clarify whether the selection of materials is made by a contractor, homeowner, or the designer. How does VDH intend to amend policy requiring design of onsite systems to conform with the engineering responsibilities of the licensed designer? Once a permit is issued, does the substitution of one generally approved product for another generally approved product require endorsement by the designer, and	Proposed section 930.F.8 states: “Gravelless material may be substituted for gravel in accordance with this chapter, provided that the certifying licensed professional engineer or onsite soil evaluator approves the substitution.” This section places the decision to grant final approval of the gravelless material with the designer, regardless of whether the selection of material is made by the contractor, homeowner, or designer.

	how does the public know who is responsible for the change?	
Jeff Walker	How will VDH assure that a property owner has been advised of increased area loading rates, and risk of reduced system performance when gravelless material is installed at the minimum sizing in the proposed regulation?	Gravelless materials have been approved for use in Virginia for more than 20 years. The proposed regulation is based on those existing GMPs and comments from the CBEP TAC. Systems installed in accordance with the proposed regulation are not expected to reduce system performance.
Jeff Walker	When will VDH share information regarding gravelless system performance statistics and malfunction assessments?	Malfunction assessment data was shared at the November 23, 2015, CBEP TAC meeting. An overview of that data can be found at www.townhall.virginia.gov/L/GetFile.cfm?File=C:\TownHall\docroot\meeting\58\23698\Minutes_VDH_23698_v1.pdf .
Bob Marshall	Recommend a revision to section 880.B.6 to allow utilization of submersible turbine pumps. Section 880.B.6 is narrowly worded.	The recommended revision is outside the scope of this regulatory action. However, the CBEP TAC and the DD TAC felt this was a good comment that VDH should consider during periodic review of the Regulations.
Harold Mathews	Septic effluent tends to clog drip dispersal emitters and filters. Owners are reluctant to pay for the necessary service to keep system functioning properly. Recommend removing septic tank effluent drip dispersal as an option in the proposed regulation.	The inclusion of septic tank effluent drip dispersal was discussed in great detail during the DD TAC meetings. The primary concern raised deals with the proper maintenance of the drip dispersal system. Drip dispersal systems are subject to the AOSS Regulations, which require that all AOSS receive at least an annual inspection. Operation, maintenance, and inspection schedules for some AOSS may exceed this minimum requirement to ensure proper performance.
Harold Mathews	Recommend adding a requirement that all header lines must be a minimum of 8 inches above the drainfield trench bottom.	The recommended revision is outside the scope of this regulatory action. However, the CBEP TAC and the DD TAC felt this was a good comment that VDH should consider during periodic review of the Regulations.
Harold Mathews	Recommend adding a requirement that all control panel boxes must be mounted a minimum of 30 inches above the ground surface.	The recommended revision is outside the scope of this regulatory action. However, the CBEP TAC and the DD TAC felt this was a good comment that VDH should consider during periodic review of the Regulations.
Bob Mayer	Section 955.C.3, regarding landscape linear loading rates, should be removed. The section does not adequately cover the issue of linear loading, and may be misleading.	The section regarding landscape linear loading rates has been removed from the proposed regulation. Drip dispersal systems are AOSS. In addition to the proposed regulation, all drip dispersal systems are subject to the performance requirements contained in the AOSS Regulations. The AOSS Regulations already establish necessary requirements to assure that water mounding will not adversely affect the functioning of the soil

		treatment area or create ponding on the surface for all AOSS.
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All changes made in this regulatory action

Please list all changes that are being proposed and the consequences of the proposed changes. Describe new provisions and/or all changes to existing sections. Explain the new requirements and what they mean rather than merely quoting the proposed text of the regulation

Current section number	Proposed new section number, if applicable	Current requirement	Proposed change and rationale
30	N/A	States the Regulations are supplemental to rules for sewerage systems administered by the DEQ.	<p>“This chapter is supplemental to the current Virginia Sewerage Regulations, or their successor, which were adopted jointly by the State Board of Health and the Department of Environmental Quality pursuant to § 62.1-44.19 of the Code of Virginia. This chapter addresses the handling and disposal of sewage not regulated by a Virginia Pollutant Discharge Elimination System (VPDES) Permit.</p> <p style="margin-left: 40px;">A. <u>This chapter addresses the handling and disposal of those portions of sewage flows not regulated by a Virginia Pollutant Discharge Elimination System (VPDES) Permit or a Virginia Pollutant Abatement (VPA) Permit issued in accordance with 9VAC25-31 or 9VAC25-32, respectively.</u></p> <p style="margin-left: 40px;">B. <u>Reclamation and reuse of sewage may be subject to permitting by the Department of Environmental Quality under 9VAC25-740.</u>”</p> <p>Identifies other potentially applicable regulations and clarifies areas of responsibility between VDH and DEQ.</p>
920	N/A	Establishes that distribution methods begin at the point of flow splitting (e.g. distribution box) and end at the point where effluent is dispersed to a gravel trench or sand.	<p>“The term distribution methods refers to the piping, flow splitting devices, gravel, and other appurtenances beginning at the point of flow splitting and ending at the soil-gravel or sand interface application of effluent to the soil absorption area. Two basic method are considered:</p> <p style="margin-left: 40px;">A. Gravity; and</p> <p style="margin-left: 40px;">B. Pressure.”</p> <p>The revision ensures the Regulations also address gravelless material and drip dispersal systems instead of only addressing gravel trench and sand</p>

			systems.
N/A	930.F	N/A	<p><u>“Gravelless material is a proprietary product specifically manufactured to disperse effluent within the absorption trench of an onsite sewage system without the use of gravel. Gravelless material may include chamber, bundled expanded polystyrene, and multi-pipe systems. The division shall maintain a list of all generally approved gravelless material. Gravelless material on the generally approved list may be used in accordance with Table 5.4 of 12VAC5-610-950.”</u></p> <p>This proposed new section provides a definition of gravelless material and identifies that VDH will maintain a list of approved gravelless material.</p>
N/A	930.F.1	N/A	<p><u>“Gravelless material that received general approval as of December 12, 2013, shall retain such status when used in accordance with the requirements of this chapter. After December 12, 2013, the division shall review and evaluate new applications for general approval pursuant to the requirements of this chapter.</u></p> <p><u>a. Any manufacturer of gravelless material may submit an application for general approval to the division using a form provided by the division. A complete application shall include the manufacturer's contact information, product specifications, product approvals in other states or territories, installation manual, and other information deemed necessary by the division to determine compliance with this chapter.</u></p> <p><u>b. The manufacturer of gravelless material shall identify in the application for general approval any recommendation that deviates from the requirements of this chapter. If the recommendation is approved by the division, then the manufacturer shall include the deviation in the gravelless material's installation manual.”</u></p> <p>This section allows gravelless material that received approval under previous GMPs to retain approval status. Additionally, this section provides a process for evaluating approval requests for new gravelless materials.</p>
N/A	930.F.2.a	N/A	<u>“Gravelless material shall have the following minimum characteristics for general approval:</u>

			<p>a. <u>The minimum exterior width shall be at least 90 percent of the total width of the absorption trench. The exterior width of a chamber system shall be measured at the edge or outer limit of the product's contact with the trench bottom unless the division determines a different measurement is required based on the gravelless material's design. The exterior width of bundled expanded polystyrene and multi-pipe systems shall be measured using the outside diameter of the bundled gravelless material unless the division determines a different measurement is required based on the gravelless material's design. The division shall establish the exterior width of any gravelless material that is not considered a chamber, bundled expanded polystyrene, or multi-pipe system.</u></p> <p>This section creates a minimum exterior width for gravelless material as required by §32.1-164.9 of the Code of Virginia. The requirement is based on previous GMPs and discussion among the CBEP TAC.</p>
N/A	930.F.2.b	N/A	<p><u>“Gravelless material shall have a minimum height of eight inches to provide a continuous exchange of air through a permeable interface.”</u></p> <p>This section creates a minimum height requirement for gravelless material as required by §32.1-164.9 of the Code of Virginia. The requirement is based on previous GMPs and discussion among the CBEP TAC.</p>
N/A	930.F.2.c	N/A	<p><u>“Gravelless material shall have a permeable interface that shall be located along the trench bottom and trench sidewalls within the absorption trench.”</u></p> <p>This section creates a requirement for a permeable interface between gravelless material and the trench sidewall as required by §32.1-164.9 of the Code of Virginia.</p>
N/A	930.F.2.d	N/A	<p><u>“Gravelless material shall provide a minimum storage capacity of 1.3 gallons per square foot of trench bottom area.”</u></p> <p>This section creates a minimum storage capacity requirement for gravelless material as required by § 32.1-164.9 of the Code of Virginia. The required</p>

			<p>storage capacity is equivalent to the storage capacity below the pipe in a gravel trench system. The requirement is based on previous GMPs and discussion among the CBEP TAC.</p>
N/A	930.F.2.e	N/A	<p><u>“Gravelless material shall pose no greater risk to surface water and groundwater quality than gravel in absorption trenches. Gravelless material shall be constructed to maintain structural integrity such that it does not decay or corrode when exposed to effluent.”</u></p> <p>This section creates a minimum structural capacity requirement for gravelless material as required by § 32.1-164.9 of the Code of Virginia. The requirement assures that gravelless material will pose no greater risk to public health and the environment than materials using in gravel trenches.</p>
N/A	930.F.2.f	N/A	<p><u>“Gravelless material shall have a minimum load rating of H-10 or H-20 from the American Association of State Highway and Transportation Officials or equivalent when installed in accordance with the manufacturer's specifications and minimum specified depth of cover in non-traffic or traffic areas, respectively.”</u></p> <p>This section creates a minimum structural capacity requirement for gravelless material as required by § 32.1-164.9 of the Code of Virginia. The H-10 and H-20 standards provided in the proposed regulation are derived from IAPMO and AASHTO vehicle loading specifications.</p>
N/A	930.F.3	N/A	<p><u>“For designs using gravelless material, the absorption trenches shall receive an equal volume of effluent per square foot of trench. Trench bottom area shall be equal to or greater than the minimum area requirements contained in Table 5.4 of 12VAC5-610-950. Trench sidewall shall not be included when determining minimum area requirements. When open-bottom gravelless material is utilized, it shall provide a splash plate at the inlet of the trench or other suitable method approved by the manufacturer to reduce effluent velocity.”</u></p> <p>This section requires that effluent be dispersed evenly throughout a gravelless system and that the trench bottom be protected from erosion. These requirements are based on current requirements in the Regulations and comments from the CBEP TAC.</p>

N/A	930.F.4	N/A	<p><u>“Installation of gravelless material shall comply with this chapter and the approved installation manual unless the department grants a deviation pursuant to 12VAC5-610-660 or the division has granted a deviation identified in the installation manual.”</u></p> <p>Requires gravelless material to be designed and installed in compliance the Regulations and the manufacturer’s installation manual that has received approval from VDH. This section allows gravelless material installations to deviate from the Regulations if approved by the division as part of the product’s general approval or if granted an exception pursuant to 12VAC5-610-660. This section implements § 32.1-164.9 of the Code of Virginia.</p>
N/A	930.F.5	N/A	<p><u>“Gravelless material shall contain a pressure percolation line along the entire length of the trench when low pressure distribution is utilized pursuant to 12VAC5-610-940 D.”</u></p> <p>This section, along with 940.D, sets minimum requirements for low pressure distribution systems that use gravelless material to bed the pressure percolation lines. These minimums are based on requirements in previous GMPs and recommendations from the CBEP TAC. This section is also intended to meet requirements of § 32.1-164.9 of the Code of Virginia.</p>
N/A	930.F.6	N/A	<p><u>“6. When pumping effluent to overcome gravity, any open-bottom gravelless material shall provide a high-flow splash plate at the inlet of the trench or other suitable method approved by the manufacturer to reduce effluent velocity.”</u></p> <p>Section 930(F)(6) and 930(F)(7) set minimum requirements for pump-to-gravity, open-bottom gravelless material. These requirements ensure that effluent velocity is reduced prior to entering the absorption. Dosing volume requirements are based on 12VAC5-610-890.C.</p>
N/A	930.F.7	N/A	<p><u>“7. When enhanced flow distribution is used, open-bottom gravelless material shall contain a percolation pipe that extends a minimum of 10 feet from the trench's intersection with the header line. The percolation pipe shall be installed in accordance with the manufacturer's approved installation manual. The dosing volume shall be a minimum 39 gallons per 100 linear feet of absorption trench.”</u></p>

			Section 930(F)(6) and 930(F)(7) set minimum requirements for pump-to-gravity, open-bottom gravelless material. These requirements ensure that effluent velocity is reduced prior to entering the absorption. Dosing volume requirements are based on 12VAC5-610-890.C.
N/A	930.F.8	N/A	<p><u>“Gravelless material may be substituted for gravel in accordance with this chapter, provided that the certifying licensed professional engineer or onsite soil evaluator approves the substitution. The certifying licensed professional engineer or onsite soil evaluator shall document the substitution and related design changes on the inspection report submitted in accordance with 12VAC5-610-330. A new construction permit pursuant to 12VAC5-610-310 is not required for the substitution.”</u></p> <p>This section sets criteria for the substitution of gravelless material in lieu of gravel when gravelless material is not specified as part of the system design. Substitution of gravelless material does not require a new permit and requires approval by the certifying PE or OSE. This section implements § 32.1-164.9 of the Code of Virginia.</p>
940.C.7.c	N/A	This section sets the minimum separation between low pressure distribution lines and seasonal water table, but includes in inaccurate reference to the definition of “seasonal water table”.	<p>“However, under no circumstance shall the invert of the pressure percolation lines be placed closer than 16-1/2 inches to the seasonal water table as defined in 12VAC5-610-950 A-3 <u>12VAC5-610-470 D.</u>”</p> <p>This revision removes the inaccurate reference to the definition of “seasonal water table” contained in the Regulations.</p>
N/A	940.D	N/A	<p><u>“Gravelless material with general approval may be used for low pressure distribution in accordance with the manufacturer's approved installation manual, Table 5.4 of 12VAC5-610-950, and the applicable requirements of this chapter.”</u></p> <p>This section, along with 930.F.5, sets minimum requirements for low pressure distribution systems that use gravelless material to bed the pressure percolation lines. This section implements § 32.1-164.9 of the Code of Virginia.</p>
950.A	N/A	This section establishes that an absorption area starts at the beginning of a	<p><u>“The absorption area is the undisturbed soil medium beginning at the soil gravel or sand interface which is utilized for absorption of the effluent. The absorption area includes the infiltrative surface in</u></p>

		gravel trench or sand fill.	<p>the absorption trench and the soil between and around the trenches <u>when trenches are used.</u>”</p> <p>This revision ensures inclusion of gravelless material and drip dispersal as potential starting points for absorption areas.</p>
950.D.2	N/A	This section references the area reductions allowed for low pressure distribution systems contained in the Table 5.4 sizing chart.	<p>“Area reduction. See Table 5.4 for percent area reduction when <u>gravelless material or low pressure distribution is utilized</u>. A reduction in area shall not be permitted when flow diversion is utilized with low pressure distribution. <u>When gravelless material is utilized, the design width of the trench shall be used to calculate minimum area requirements for absorption trenches.</u>”</p> <p>This section, along with Table 5.4, sets criteria for determining the minimum area requirements for gravelless material. The minimum area for gravelless material is reduced by 25% in class I, II, and III soils, and by 15% in class IV soils when compared to gravel trenches. The requirement is based on previous GMPs and discussion among the CBEP TAC.</p>
Table 5.4	N/A	This section established the minimum sizing requirements for systems using gravel trenches or low pressure distribution.	<p>Revisions to Table 5.4 include minimum sizing for gravelless material equivalent to a 25 percent reduction when compared to gravel and pipe sizing in texture group I, II, and III soils, and equivalent to a 15 percent reduction when compared to gravel and pipe sizing in texture group IV soils.</p> <p>This section, along with section 950.D.2, sets criteria for determining the minimum area requirements for gravelless material. The minimum area for gravelless material is reduced by 25% in class I, II, and III soils, and by 15% in class IV soils when compared to gravel trenches. The requirement is based on previous GMPs and discussion among the CBEP TAC.</p>
N/A	955.A	N/A	<p>“<u>Drip dispersal applies wastewater in an even and controlled manner over an absorption area. Drip dispersal system components may include treatment components, a flow equalization pump tank, a filtration system, a flow measurement method, supply and return piping, small diameter pipe with emitters, air/vacuum release valves, redistribution control, and electromechanical components or controls.</u>”</p> <p>This section provides a definition of drip dispersal.</p>

N/A	955.B	N/A	<p><u>“Drip dispersal system tubing shall be color coded and certified by the manufacturer as designed and manufactured for the dispersal of wastewater. All drip dispersal system tubing shall be equipped with emitters approved for use with wastewater. For the application of septic tank effluent, the tubing must have self cleaning emitters.”</u></p> <p>This section sets minimum physical construction criteria for drip dispersal tubing. The requirement is based on previous GMPs and discussion among the DD TAC.</p>
N/A	955.B.1	N/A	<p><u>“The minimum linear feet of tubing in the system shall be one-half of the minimum soil absorption area in square feet.”</u></p> <p>This section sets minimum design criteria for the minimum linear feet of tubing in a drip dispersal system. The requirement is based on previous GMPs and discussion among the DD TAC.</p>
N/A	955.B.2	N/A	<p><u>“All tubing shall be placed on contour.”</u></p> <p>This section requires that drip dispersal system be installed on contour, as is required for other systems contained in the Regulations. The requirement is based on discussion among the DD TAC.</p>
N/A	955.B.3	N/A	<p><u>“Except as provided by 12 VAC 5-613, drip systems dispersing septic tank effluent shall comply with the requirements of 12 VAC 5-610-594.”</u></p> <p>This section clarifies that drip systems dispersing septic tank effluent must comply with the installation depth requirements contained in section 594 of the Regulations. The requirement is based on discussion among the DD TAC.</p>
N/A	955.B.4	N/A	<p><u>“Drip systems dispersing secondary effluent or better require a minimum of six inches of cover over the tubing. Cover may be achieved by a combination of installation depth and Group II or Group III soil cover or other approved material over the drip field.”</u></p> <p>This section sets minimum cover requirements for drip systems dispersing secondary effluent. The requirement is based discussion among the DD TAC.</p>
N/A	955.B.5	N/A	<p><u>“The discharge rate of any two emitters shall not vary by more than 10 percent in order to ensure that the effluent is uniformly distributed over the entire</u></p>

			<p><u>drip field or zone.”</u></p> <p>This section sets the minimum allowable variation for drip emitter discharge rates. The requirement is based on discussion among the DD TAC.</p>
N/A	955.B.6	N/A	<p><u>“The emitters shall be evenly spaced along the length of the drip tubing at not less than six inches or more than 24 inches apart.”</u></p> <p>This section sets minimum drip emitter spacing requirements. The requirement is based on discussion among the DD TAC.</p>
N/A	955.B.7	N/A	<p><u>“The system design shall protect the drip emitters and system from the effects of siphoning, or backflow through the emitters.”</u></p> <p>This section sets criteria to protect drip dispersal systems from drain back. The requirement is based on discussion among the DD TAC.</p>
N/A	955.C.1	N/A	<p><u>“For the dispersal of septic tank effluent, the minimum soil absorption area for a drip system shall be calculated by multiplying the trench bottom area required for a low pressure distribution system in Table 5.4 of this chapter, by three.”</u></p> <p>This section sets minimum sizing criteria for drip systems dispersing septic tank effluent. The requirement is based on previous GMPs and discussion among the DD TAC.</p>
N/A	955.C.2	N/A	<p><u>“For the dispersal of secondary or better effluent, the minimum soil absorption area shall be calculated by multiplying the trench bottom area for pressure distribution systems in accordance with 12VAC5-613-80.10 by three.”</u></p> <p>This section sets minimum sizing criteria for drip systems dispersing secondary effluent. The requirement is based on previous GMPs and discussion among the DD TAC.</p>
N/A	955.C.3	N/A	<p><u>“Air/vacuum release valves shall be located at the high points of the supply and return manifolds to each zone.”</u></p> <p>This section sets minimum criteria for the location of air/vacuum release valves. The requirement is based on previous GMPs and discussion among the DD TAC.</p>
N/A	955.D	N/A	<p><u>“All drip dispersal systems shall be equipped with devices or methods to restrict effluent from draining</u></p>

			<p><u>by gravity to portions of a zone or laterals lower in elevation. Variable distribution due to gravity drainage shall be 10 percent or less within a zone.”</u></p> <p>This section set criteria to prevent gravity drainage of effluent with a drip dispersal system. The requirement is based on previous GMPs and discussion among the DD TAC.</p>
N/A	955.E	N/A	<p><u>“A minimum of six hours of emergency storage above the high water alarm in the pump chamber shall be provided. The equalization volume shall be equal to 18 hours of storage. The equalization volume shall be measured from the pump off level to the high water alarm level. An audio/visual alarm meeting the requirements of 12VAC5-610-880.B.8 shall be provided for the pump chamber.”</u></p> <p>This section sets minimum criteria pump design criteria for drip dispersal, including flow equalization, emergency storage, and audio/visual alarm requirements. The requirement is based on previous GMPs and discussion among the DD TAC.</p>
N/A	955.F	N/A	<p><u>“Each drip dispersal zone shall be time-dosed over a 24 hour period. The dose volume and interval shall be set to provide unsaturated flow conditions. Demand dosing is prohibited. Minimum dose volume per zone shall be 3.5 times the liquid capacity of the drip laterals in the zone plus the liquid capacity of the supply and return manifold lines (which drain between doses) accounting for instantaneous loading and drain back.”</u></p> <p>This section requires that all drip systems be dosed in a manner to provide unsaturated flow conditions. The requirement is based on previous GMPs and discussion among the DD TAC.</p>
N/A	955.F.1	N/A	<p><u>“At each dosing cycle, the system design shall only allow a full dose volume to be delivered.”</u></p> <p>This section assures that time dosing will be overridden when there is not a sufficient volume of effluent to provide for a full dose volume to the dispersal area. The requirement is based on previous GMPs and discussion among the DD TAC.</p>
N/A	955.F.2	N/A	<p><u>“For design flows greater than 1,000 gallons per day, a means to take each zone off line separately shall be provided. The system shall have the capability to bypass each zone that is taken out of</u></p>

			<p><u>service such that each subsequent dose is dispersed to the next available zone in sequence.”</u></p> <p>This section establishes bypass requirements that will allow for continued operation of large AOSS while maintenance is being performed. The requirement is based on discussion among the DD TAC</p>
N/A	955.G	N/A	<p><u>“Filtration shall be provided to remove suspended solids and prevent clogging of emitters. The filtration design shall meet the drip tubing manufacturer’s particle size requirements for protection of the emitters at a flow rate equal to or greater than the rate of forward flushing. Filter flush water shall be returned to the treatment system at a point where the residuals and volume of the flush water do not negatively impact the effluent quality or exceed the hydraulic design capacity of the treatment system.”</u></p> <p>This section establishes the necessary filtration and flush requirements to prevent clogging of drip emitters. The requirement is based on discussion among the DD TAC</p>
N/A	955.H	N/A	<p><u>“A means for measuring or estimating total flow dispersed to the soil absorption area and to verify field dosing and field flushing rates shall be provided.”</u></p> <p>This section ensures that total flow, field dosing, and field flushing rates can be measured. The requirement is based on discussion among the DD TAC</p>
N/A	955.I	N/A	<p><u>“The system shall provide forward field flushing to achieve scouring velocity as specified by the drip tubing manufacturer. Field flushing shall occur on a routine schedule to prevent excessive solids accumulation and clogging. Flush water shall be returned to the treatment system at a point where the residuals and volume of the flush water do not negatively impact the effluent quality or exceed the hydraulic design capacity of the treatment system.”</u></p> <p>This section sets the minimum field flushing criteria for drip dispersal necessary to prevent the accumulation of solids within the system. The requirement is based on discussion among the DD TAC.</p>

N/A	955.J	N/A	<p><u>“Electrical components shall be Underwriters Laboratory (UL) listed for the intended purpose. The designer shall provide a description with a schematic diagram of the electrical and control functions in the operation and maintenance manual. The electrical control equipment shall be mounted within a National Electrical Manufacturers Association (NEMA) 4X rated enclosure with a rigid latching door. All switches shall be clearly identified and all internal wiring shall be factory installed. All wiring shall be installed according to applicable electrical safety codes and the manufacturer’s installation schematic.”</u></p> <p>This section sets minimum design criteria for drip dispersal system control equipment. The requirement is based on discussion among the DD TAC.</p>
N/A	955.K	N/A	<p><u>“All components in a drip dispersal system shall be rated to withstand contact with wastewater and recommended for this application by the manufacturer. All components shall be protected from freezing.”</u></p> <p>This section requires all drip dispersal components to be designed in a manner to withstand contact with wastewater and be protected from freezing. The requirement is based on discussion among the DD TAC.</p>
N/A	955.L	N/A	<p><u>“The startup inspection conducted by the designer of the drip dispersal system shall verify the dosing rates, the flushing rates, and other parameters critical to the proper operation of the system. A summary of the startup inspection shall be included in the operation and maintenance manual and shall include, at a minimum, the dosing volume; the forward flow flushing rate; the pressure head of the system; and verification of proper cycling between zones.”</u></p> <p>This section establishes the minimum parameters that must be checked by the system designer during the startup inspection to assure that the system functions properly. The requirement is based on discussion among the DD TAC.</p>