Virginia Department of Health
Sewage Handling and Disposal Advisory Committee (SHADAC) Meeting
May 20, 2021 Summary

Location: Virtual meeting using Webex

List of Attendees:

SHADAC Members

Lance Gregory – Virginia Department of Health
Alan Brewer – Virginia Association of Counties
Curtis Moore – Virginia Onsite Wastewater Recycling Association
Matt Tolley – Virginia Association of Professional Soil Scientist
Mike Lynn – Home Builders Association of Virginia
Scott Currie - Manufacturer
Valerie Rourke – Virginia Department of Environmental Quality

VDH Staff and Members of the Public

Tom Ashton	Steve Thomas	Reed Johnson	Dave Tiller
Doug Canody	Anne Powell	Brent Williams	Anna Killius
Joshua Anderson	Trapper Davis	Anthony Creech	Dave Tiller
Bob Marshall	Marcia Degen		

There was one member of the public that did not identify themselves, and showed up as 132 722 1009.

Section 12VAC5-610-50 of the Sewage Handling and Disposal Regulations states that the SHADAC shall establish its rules of order. On November 7, 2008, the SHADAC adopted rules which require at least eight voting members of the committee to be present for a quorum. Less than eight voting members of the SHADAC were present. Therefore, the meeting could not officially be called to order to conduct the business of the SHADAC. The committee continued through the proposed agenda; however, the committee members could not make motions or provide specific recommendations on behalf of the SHADAC.

Chairman Lynn asked whether there was any movement on allowing certified professional geologist to permit private wells. Mr. Gregory noted there were no bills during the 2021 General Assembly to include professional geologist with regards to submission of private well designs.

Dr. Degen discussed the proposed fast-track amendments to the Sewage Handling and Disposal Regulations and comments received from the SHADAC and members of the public on the proposed amendments. Based on comments received, VDH:

- Added a definition for infiltrative surface.

- Modified section 880 on control panels to require a 30-42 inch height from the ground surface.
- Clarified the language for pumps integral to treatment to separate out pumps that act as conveyance pumps but might also be part of the treatment unit.
- Recommend striking the language added regarding time dosing, since we didn't have strong consensus.
- Recommend striking the language added in section 950 for placement of an absorption area below a restriction as there is no consensus.
- Corrected an issue in 950.K, systems were not exempt from lateral separation in policy.
- Addressed a comment regarding rise of run requirement that could affect system on slopes greater than 25%.
- Added language to have the reserve pad areas be located upslope of active pads.
- Addressed comments regarding the placement of pads on contour.
- Modified the proposal regarding gravel pads. Minimum install of 12 inches unless in texture group I or II, when you can install at 8 inches, and gravelless would follow the manufacture recommendations.

Attendees provide the following comments and feedback on the proposed amendments:

- Owners complaint that the control panel is the only thing sticking up in the yard.
- Primary need for minimum height on the control panel is access; maybe just set a minimum height.
- May need to carve out recirculation pumps from the pumps integral to treatment section.
- A conveyance pump is conveying to the soil absorption areas, and that is where the floats and check valves come in. A recirculation pump sends a little bit downstream, but don't think that is the same a pumping to a distribution box.
- Possible that one day soon we will have one pump doing both conveyance and movement within the treatment system.
- Are pads ever designed with pressure dosing across the pad, or just gravity; need to clarify intent in the proposal.

VDH ask that member provided comments on the updated proposal by June 3, 2021.

Dr. Degen then discussed a proposed job aid for identification of permeability limiting features. Chairman Lynn noted that a large group of VDH and private sector stakeholders had put considerable effort into developing the document. Dr. Degen provided a presentation giving an overview of the document. The main purpose was to define permeability limiting features, and clarify when a mounding calculation is required. The presentation covered:

- A proposed definition of a permeability limiting feature.
- How a permeability limiting feature is described.
- Comments received from Dr. Galbraith.
- When a mounding calculation would be required.
- When Ksats should be run.
- Hydraulic linear loading considerations.

Dr. Degen noted that job aid states that any permeability differential between the installation zone and the permeability limiting feature (PLF) would trigger mounding calculation unless the design uses the most limiting rate within 18 inches of the install depth. Other options that were considered were:

- When there is a texture group differential of more than 1, a water mounding evaluation is required. For example, a texture group 1 over a texture group 2 would not require a water mounding evaluation.   A texture group 1 over a texture group 3, however, would require a water mounding evaluation, such as a sandy loam horizon over a silty clay loam.
- When the mpi rate differential is greater than 46 mpi between the installation horizon and the PLF, a water mounding evaluation is required.
- No water mounding evaluation is needed when the design is based on the most restrictive horizon within 18 inches of the ground surface for above grade installation or within 18 inches of the infiltrative surface for below grade installations (trench bottom, drip tubing, etc.) If the PLF is estimated at greater than 120 mpi, however, then a Ksat test should be conducted to verify the rate

Comments and feedback from the SHADAC included:

- How do we account for lateral movement?
- Are there other options to Ksats?
- Does the job aid presume that you have already run Ksats, or is it an estimated slower rate? Dr. Degen said it could be estimated.
- Suggest adding "estimated" soil rate; or "estimated or measured".
- So, this would have a pass/fail check list? We are talking about AOSS sites with less than 24 inches to a limiting feature, with seasonal wetness. I'm concerned someone is going to be denying an 18 inch installation.

Mr. Gregory then shared a presentation on proposed updates to the Hardship Guidelines. He noted that beginning July 1, 2021, the income eligibility will drop to 200 percent of the federal poverty guidelines. He noted that there were over 15,000 total application over the previous annual review period, with 93.3% of all onsite sewage system designs being completed by the private sector; up from 84% the previous year. Based on the initial assessment of annual data using the equation in the Hardship Guidelines, the following counties would transition onsite sewage design services: Appomattox, Lunenburg, Nelson, Pittsylvania, Rappahannock, and Washington Counties. Local health department staff are conducting data clean up, so several additional localities may be able to transition. For Safe, Adequate, and Proper (SAPs) evaluations, VDH did have better data, but it shows that the vast majority of SAPs are still being conducted by VDH; 77.5% of all SAP evaluations in the database. VDH is still working to modify the database to accurately track private well designs.

Lastly, Mr. Gregory shared a presentation with the SHADAC a summary of regulatory program changes developed by a 2017 SHADAC subcommittee. The purpose of this discuss was to serve as a starting point of discussion on revising the Sewage Handling and Disposal Regulations. Comments and feedback from the SHADAC members included:

- Opening up innovation to help communities in need where a regulatory compliant option is a non-starter based on price. Think a risk based analysis with bonding could make it sustainable and could remove financial barriers.
- It’s very difficult to find a bond that is always there. They are usual duration.
- Agree it’s not maybe a bond. Maybe insurance. Think you design to a performance standard and have assurance to improve the system if it doesn’t perform.
- From a 10,000 foot view, before you re-write you need an end goal. We either have to agree on how long this regulations is going to work, 20 year, 50 years. Responsible management entity models. If you have financial assurance its better than a install and forget it until it fails. Is our goal that every system will last the life of the house?
- Risk based is a good application. Think it would be good to establish levels of risk, otherwise it’s all just a general concept. Think you have to define what is high risk and what is low risk. Once you know what those risk levels are, you can design to that. There are a lot of options. How do you implement a risk based strategy? Need building blocks within that concept.
- Wonder if this needs to be a one size fits all regulation. What do people think about having a prescriptive regulation that covers most systems, but if you are outside of that then and can provide other standards (bonding) then you have a different standard.
- Advocate for routine repeatable solutions. Still processing things at VDH like they are bare applications, without as much field work.
- To some degree a risk based approach is already practiced by OSE/PE’s, they sometime do variations. They aren’t necessarily following the prescriptive requirements, but they are meeting the performance requirements. There is still a place for prescriptive requirements for simple situations. While it is very flexible, it is not very clear cut of how things are uniformly regulated to use a risk based approach. It gets more complicated as systems get bigger.
- Starting with the end in mind. We are spending 90% of our effort on the design and not focusing on maintenance.
- Think there was a section that talked about resources. We should be focusing VDH resources on failing system. Hope that VDH will consider that there be a discussion about resources with any changes to the regulations.
- Someone needs to ask, is VDH adequately resources to administer their programs. We are certainly falling short on operation and maintenance.
- I would really like to know, how far is the department willing to go. Would encourage coming back with the Departments feelings. Develop a list of things that would be difficult to take out of the regulations.
- Some of the administration stuff, do you need to do them. Which things give you the least value.
- Present a detailed list of what is required by Code in regards to our regulations.

Adjourn

Virginia Department of Health
Sewage Handling and Disposal Advisory Committee (SHADAC) Meeting
Agenda

Date: May 20, 2021
Time: 10 am to 2 pm
Location: Webinar using Webex (use instructions below to join)

You can access the meeting on your computer, phone, or mobile device with the meeting link below.

Join from the meeting link:

https://vdhoep.webex.com/vdhoep/j.php?MTID=mc7cd201612e21671e5156527fea79626

Join by meeting number:
Meeting number (access code): 132 722 1009
Meeting password: yEptnq2DH82

Tap to join from a mobile device (attendees only)
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Agenda

Administrative (15 minutes)
1. Welcome and instruction on using Webex system. (5 minutes)
2. Approve agenda. (5 minutes)
3. Review summary from March 24, 2021 meeting. (5 minutes)

Public Comment Period (10 minutes)

Standing Agenda Items (5 minutes)
1. Issues related to internal VDH policies and processes. (5 minutes)
    - Open discussion (5 minutes)

Break (5 minutes)

Old Business (60 minutes)
1. Proposed Fast-track Amendments to the Sewage Handling and Disposal Regulations (60 minutes)

New Business (30 minutes)
1. Proposed Job Aid for Identification of a Permeability Limiting Feature (30 minutes)

Break (5 Minutes)

New Business Continued (45 minutes)
2. Update to Hardship Guidelines (45 minutes)

Break (5 minutes)

New Business Continued (60 minutes)
3. Overall Revisions to the Sewage Handling and Disposal Regulations (60 minutes)

Adjourn

12VAC5-610 New Definitions Proposed:

"Infiltrative surface" means the designated interface where effluent moves from distribution piping, media, and fill to natural soil.

"Treatment level 2 effluent" or "TL-2 effluent" means secondary effluent as defined in 12VAC5-610-120 that has been treated to produce BOD_5 and TSS concentrations equal to or less than 30 mg/l each.

"Treatment level 3 effluent" or "TL-3 effluent" means effluent that has been treated to produce BOD_5 and TSS concentrations equal to or less than 10 mg/l each.

"Treatment unit" or "treatment system" means a method, technique, equipment, or process other than a septic tank or septic tanks used to treat sewage to produce effluent of a specified quality before the effluent is dispersed to a soil treatment area.

"Working volume" means the volume in a pump tank between the pump off level and the high water alarm level.

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Pulled for REFERENCE for the development of the term 'infiltrative surface'.

Related from 610
"Subsurface soil absorption" means a process which utilizes the soil to treat and dispose of effluent from a treatment works.

References to infiltrative surface from 610
700.A.3. Soil smearing. Excavating equipment utilized to construct the absorption system shall be so designed as not to compress or smear the sidewalks or bottom of the system. Excessive smearing of the usable absorption trench sidewalls or bottom during construction may result in irreversible damage to the soil infiltrative surface and may be grounds for rejection of the site and/or system.

592.C. Absorption area. The absorption area is the soil medium beginning at the interface between the soil and the gravel, sand, or other point of effluent application, which is utilized for dispersal of the effluent. The absorption area includes the infiltrative surface in the absorption trench, or the point of effluent application, and the soil between and around the effluent distribution system. Setback distance to various structures and topographic features and an absorption area are contained in Table 4.2.

950.A. The absorption area is the undisturbed soil medium utilized for absorption of the effluent. The absorption area includes the infiltrative surface in the absorption trench and the soil between and around the trenches when trenches are used.

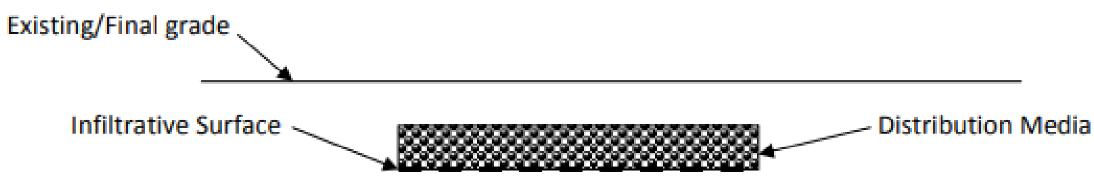
594.A. An in-ground system is a system which utilizes a natural, undisturbed soil horizon to treat and disperse effluent where the infiltrative surface is placed 18 inches or more beneath the original surface of the ground. In-ground systems include, but are not limited to, conventional septic tank drainfield systems, chamber systems, alternative aggregate systems, enhanced flow systems, and pressure dosed systems.

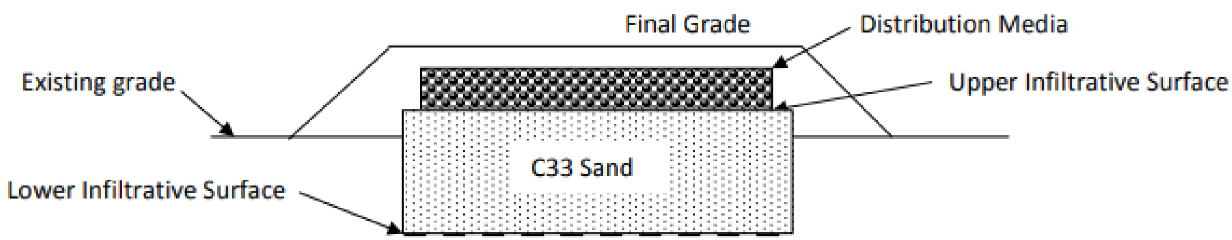
597.A. Fill systems are systems where the infiltrative surface and some portion of the treatment medium is comprised of fill material and not a naturally occurring undisturbed soil. Fill systems may be located in-ground, shallow-placed, or above ground. Fill systems addressed in these regulations are the Wisconsin Mound system, the noncarbonaceous mountain colluvium system, and the sand-on-sand system.

Related from 613
"Soil treatment area" means the physical location in the naturally occurring soil medium where final treatment and dispersal of effluent occurs.

"Subsurface drainfield" means a system installed within the soil and designed to accommodate treated sewage from a treatment works.

From Colorado:
“Infiltrative surface” means designated interface where effluent moves from distribution media or a distribution device into soil.





Mounded Sand Filter

[No changes from 03 2021 version]

12VAC5-610-250. Procedures for Obtaining a Construction Permit for a Sewage Disposal System.

1. Construction permits are issued by the commissioner but all requests for a sewage disposal construction permit shall be directed initially to the district or local health department. . Formal plans and specifications are waived for designs with design flows less than or equal to 1000 gallons per day that are exempt from the license requirements for professional engineers under §§ 54.1-402A.11.

A. Type I. A Type I sewage disposal system is an individual sewage disposal system incorporating a septic tank and subsurface soil absorption (septic tank-subsurface drainfield) serving a single residence. The submission of an application is all that is normally necessary to initiate procedure for obtaining a permit under this subsection. If after a site investigation, it is determined that pumping, enhanced flow distribution (see 12VAC5-610-930 A) or low pressure distribution (see 12VAC5-610-940) is necessary, the system shall be considered a Type II system.

B. Type II. A Type II sewage disposal system is a sewage disposal system incorporating a septic tank and subsurface soil absorption system which serves a commercial or other establishment, more than a single family dwelling unit, or where pumping, enhanced flow distribution (see 12VAC5-610-930 A) or low pressure distribution (see 12VAC5-610-940) is necessary. The procedure for obtaining a permit includes the following steps:

1. The submission of an application;
2. A preliminary conference as necessary; and
3. The submission of informal plans, specifications, design criteria, and other data, as may be required by the district or local health department. Depending on the size and complexity of the system, the submission of formal plans and specifications may be required.

C. Type III. A Type III sewage disposal system includes sewage disposal systems other than a septic tank subsurface soil absorption system, and subsurface soil absorption systems, regardless of design, with design flows greater than 1,000 gpd. The procedure for obtaining a permit under this subsection includes the following steps:

1. The submission of an application;
2. A preliminary conference; and
3. The submission of formal plans, specifications and design criteria. Other supporting data may be required on a case-by-case basis.

When high strength wastes are proposed for subsurface disposal, the treatment methodology shall complywith the requirements found in 12VAC5-580-10 et seq. of the Sewage Regulations.

12VAC5-610-880. Pumping.

880 is split into General and then 2 new pump categories. The <2 fps was eliminated from the general category and is only found in 'conveyance pumps' for final treated TL2 or TL3 treated effluent.

A. Force mains. General.

1. Velocity. At pumping capacity, a minimum self-scouring velocity of two feet per second shall be maintained. A velocity of eight feet per second should not be exceeded.

2. Air relief valve. Air relief valves shall be placed at high points in the force main, as necessary, to relieve air locking.

3. Bedding. All force mains shall be bedded to supply uniform support along their length.

4. Protection against freezing. Force mains shall be placed deep enough to prevent freezing.

5. Location. Force mains shall not pass closer than 50 feet to any drinking water source unless pressure tested in place at pump shut-off head. Under no circumstances shall a force main come within 10 feet of a nonpublic drinking water source.

6. Materials of construction. All pipe used for force mains shall be of the pressure type with pressure type joints.

7. Anchors. Force mains shall be sufficiently anchored within the pump station and throughout the line length. The number of bends shall be as few as possible. Thrust blocks, restrained joints and/or tie rods shall be provided where restraint is needed.

8. Backfilling and tamping. Force main trenches shall be backfilled and tamped as soon as possible after the installation of the force main has been approved. Material for backfilling shall be free of large stones and debris.

B. Pumping station and pumps. General.

1. Sizing. Pumping station wet wells shall provide at least one quarter (1/4) day storage above the high level alarm set point. Actual volume between high and low level limits is determined on a case-by-case basis depending on the objective of pumping: (i) when low pressure dosing is utilized see 12VAC5-610-940 A for sizing requirements; (ii) when pumping to a gravity distribution box the wet well shall be sized to provide a working volume between 1/4 the daily flow and the daily flow; (iii) when pumping for the purpose of enhancing flow distribution (see 12VAC5-610-930 A) the working volume of the wet wall shall be 0.6 of the volume of the percolation piping.

2. Materials. Materials for construction of pumping stations are the same as for septic tanks (see 12VAC5-610-810). All materials and equipment utilized in pumping stations shall be unaffected by the corrosive action of sewage.

3. Access. An access manhole terminating above the ground surface shall be provided. The manhole shall have a minimum width dimension of 24 inches and shall be provided with a shoe box type cover adequately secured.

4. Construction. Pumping stations constructed of precast or poured in place concrete shall conform with the construction requirements contained in 12VAC5-610-815 E. When precast concrete pipe is utilized for a pumping station, the pipe shall be placed on and bonded to a concrete pad at least six inches thick and having a width at least one foot greater than the diameter of the pipe. All pumping stations shall be watertight. All conduits entering or leaving the pumping stations shall be provided with a water stop. The influent pipe shall enter the pumping station at an elevation at least one inch higher than the maximum water level in the wet well (total usable volume).

5. Installation. Placement of pumping stations shall conform to the requirements for placement of septic tanks contained in 12VAC5-610-815 F.

6. Pumps. All pumps utilized shall be of the open face centrifugal, vertical turbine, or suction lift type designed to pump sewage. Pumps utilized for the sole purpose of pumping effluent to a higher elevation shall have a capacity approximately 2.5 times the average daily flow in gallons per minute but not less than five gallons per minute at the system head. Pumps utilized for the purpose of enhancing flow distribution (See 12VAC5-610-930 A) shall have a minimum capacity of 36 gallons per minute at system head per 1200 linear feet of percolation piping. Pumps discharging to a low pressure distribution system shall be sized in accordance with 12VAC5-610-940 A. Dual alternating pumps are required on systems 1800 linear feet or greater in accordance with 12VAC5-610-930 B. Pumps shall be so placed that under normal start conditions it shall be subjected to a positive suction head. When multiple pumps are used, each pump shall have its own separate suction line. Suitable shutoff valves shall be provided on the discharge line and suction line (if provided) for normal pump isolation. A check valve shall be placed in the discharge line between the pump and shutoff valve. When the pump discharge is at a lower elevation than the high liquid level in the pump station, an antisiphon device shall be provided on the pump discharge. Pumps shall be piped so that they can be removed for servicing without having to dewater the wet well.

7. Controls. Each pumping station shall be provided with controls for automatically starting and stopping the pumps ~~based on water level~~. When float type controls are utilized, they shall be placed so as to be unaffected by the flow entering the wet well. Provisions shall be made for automatically alternating the pumps. The electrical motor control center and master disconnect switch shall be placed in a secure location above grade and remote from the pump station. Each motor control center shall be provided with a manual override switch. The control panel shall be located to allow for access and shall be set 30 to 42 inches from the ground surface.

Commented [DM(1]: From SHADAC meeting 03 2021

8. Alarms. A high water alarm with remote sensing and electrical circuitry separate from the motor control center circuitry shall be provided. The alarm shall be audiovisual and shall alarm in an area where it may be easily monitored. When multiple pumps are utilized, an

additional audiovisual alarm shall be provided to alarm when a pump motor fails to start on demand.

9. Ventilation. Positive ventilation shall be provided at pumping stations when personnel are required to enter the station for routine maintenance.

a. Wet wells. Ventilation may be either continuous or intermittent. Ventilation, if continuous, shall provide at least 12 complete air changes per hour; if intermittent, at least 30 complete air changes per hour. Such ventilation shall be accomplished by mechanical means.

b. Dry wells. Ventilation may be either continuous or intermittent. Ventilation, if continuous, shall provide at least six complete air changes per hour; if intermittent, at least 30 complete air changes per hour. Such ventilation shall be accomplished by mechanical means.

C. Pumps Integral to Treatment Systems. Pumps integral to treatment system are pumps that move wastewater within the treatment unit. 12VAC5-610-880.A and B do not apply to these integral pumps that are internal to a treatment unit. Conveyance pumps that are located in units with multiple compartments are not considered integral to the treatment unit.

D. Conveyance pumps and pump stations that move TL-2 or TL-3 final effluent to a soil dispersal system shall comply with the following.

1. 12VAC5-610-880.A. shall apply except that the minimum velocity in the force main may be reduced to 1 foot per second.

2. Pump station wet wells shall provide at least one quarter (1/4) day storage above the high level alarm set point.

The following comment was received. Should this be added?

> The requirement for a ¼ day storage above the high level alarm set point in a pumping station wet well doesn't take into consideration treatment technologies that achieve storage upstream from the wet well, e.g. recirculating packed bed systems. The regulations should accommodate the abilty of these systems to meet the ¼ day storage within the treatment train and in the up-stream septic tank for systems that do not have forward flow in the event of a power outage or pump failure.

~~3. When timed dosing is required by this chapter, the working volume shall be a minimum of ¾ of the daily design flow volume.~~

4. 12-VAC5-610-880.B 2, 3, 4, 5, 7, 8 and 9 shall apply.

5. All pumps utilized shall be of the open face centrifugal, vertical turbine, or suction lift type designed to pump sewage. Dual alternating pumps are required on systems 1800 linear

Commented [DM(2]: Often treatment units are sold with integral pump tanks for final dispersal. Those final dispersal/conveyance pumps are not integral to the treatment process and therefore are not eligible to be considered under this section.

Commented [DM(3]: Based on comments received this is too controversial so is dropped from further consideration.

feet or greater in accordance with 12VAC5-610-930 B. Pumps shall be so placed that under normal start conditions it shall be subjected to a positive suction head. When multiple pumps are used, each pump shall have its own separate suction line. Suitable shutoff valves shall be provided on the discharge line and suction line (if provided) for normal pump isolation. A check valve shall be placed in the discharge line between the pump and shutoff valve. When the pump discharge is at a lower elevation than the high liquid level in the pump station, an anti-siphon device shall be provided on the pump discharge. Pumps shall be piped so that they can be removed for servicing without having to dewater the wet well.

12VAC5-610-950. Absorption area design.

A. The absorption area is the undisturbed soil medium utilized for absorption of the effluent. The absorption area includes the infiltrative surface in the absorption trench and the soil between and around the trenches when trenches are used.

B. Suitability of soil horizon. The absorption trench bottom shall be placed in the soil horizon or horizons with an average estimated or measured percolation rate less than 120 minutes per inch. Soil horizons are to be identified in accordance with 12VAC5-610-480. The soil horizon must meet the following minimum conditions:

1. It shall have an estimated or measured percolation rate equal to or less than 120 minutes per inch;

2. The soil horizon or horizons shall be of sufficient thickness so that at least 12 inches of absorption trench sidewall is exposed to act as an infiltrative surface; and

3. If no single horizon meets the conditions in subdivision 2 of this subsection, a combination of adjacent horizons may be utilized to provide the required 12-inch sidewall infiltrative surface. However, no horizon utilized shall have an estimated or measured percolation rate greater than 120 minutes/inch.

C. Placement of absorption trenches below a soil restriction~~s~~ that is not a perched water table or free standing water . Placement of the soil absorption trench bottom below such a soil restriction~~s~~ as defined in 12VAC5-610-490 D, ~~whether or not there is evidence of a perched water table as indicated by free standing water or gray mottlings or coloration~~, requires a special design based on the following criteria:

1. The soil horizon into which the absorption trench bottom is placed shall be a Texture Group I, II or III soil or have an estimated or measured percolation rate of less than 91 minutes per inch.

2. The soil horizons shall be a minimum of three feet thick for septic tank effluent and shall exhibit no characteristics that indicate wetness on restriction of water movement. The absorption trench bottom shall be placed so that at least two feet of the soil horizon separates the trench bottom from the water table or rock. At least one foot of the absorption trench side wall shall penetrate the soil horizon. The design loading rate shall be based on the most limiting percolation rate in the 36 inch profile below the restriction.

3. The soil horizons below the soil ~~that is not a perched water table or free standing water~~shall be a minimum of 30 inches thick for TL2 effluent with disinfection and shall exhibit no characteristics that indicate wetness or restriction of water movement. The absorption trench bottom shall be placed so that at least 18 inches of the soil horizon separates the trench bottom from any indication of wetness or restriction. At least one foot of the absorption trench side wall shall penetrate the soil horizon. The design loading rate

Commented [DM(1]: Should these changes be pursued under this FAST TRACK Reg action?

Commented [DM(2]: This is based on discussions at the last meeting. DEQ commented that they concurred that installing below a perched or free standing water table should not be allowed for STE, TL2 or TL3.

Commented [DM(3]: Would allowing to go below a perched water table conflict with the definition of direct dispersal? Should we limit to restrictions without a perched or free water table for any type of effluent or just TL2 and TL3? Seems that if you limit it for treated effluent, you should definitely limit it for STE.

FYI "Direct dispersal of effluent to ground water" means less than six inches of vertical separation between ground water and the point of effluent application or the bottom of an effluent-dispersal trench or other excavation. Other excavation excludes the following: minor tillage of the soil surface without soil removal; replacement of fill material with better quality fill material as determined by the department to improve the ability of the site to treat wastewater; house foundations; tank excavations; force main and header line excavations; and soil disturbances, including preexisting drainfields installed prior to July 17, 2017, that are not designed for surface or ground water drainage, and do not create a direct conduit to ground water.

shall be based on the most limiting percolation rate in the 30 inch profile below the restriction.

4. The soil horizons below the soil (that is not a perched water table or free standing water?) shall be a minimum of 24 inches thick for TL3 effluent with disinfection and shall exhibit no characteristics that indicate wetness or restriction of water movement. The absorption trench bottom shall be placed so that 12 inches of the soil horizon separates the trench bottom from any indication of wetness or restriction. At least one foot of the absorption trench side wall shall penetrate the soil horizon. The design loading rate shall be based on the most limiting percolation rate in the 24 inch profile below the restriction.

3. A lateral ground water movement interceptor (LGMI) shall be placed upslope of the absorption area. The LGMI shall be placed perpendicular to the general slope of the land. The invert of the LGMI shall extend into, but not through, the restriction and shall extend for a distance of 10 feet on either both sides of the absorption area (See 12VAC5-610-700 D 3).

4. Pits shall be constructed to facilitate soil evaluations as necessary.

D. Sizing of absorption trench area for septic tank effluent.

1. Required area. The total absorption trench bottom area required shall be based on the average estimated or measured percolation rate for the soil horizon or horizons into which the absorption trench is to be placed. If more than one soil horizon is utilized to meet the sidewall infiltrative surface required in subsection B of this section, the absorption trench bottom area shall be based on the average estimated or measured percolation rate of the "slowest" horizon. The trench bottom area required in square feet per 100 gallons ($Ft^2/100$ Gals) of sewage applied for various soil percolation rates is tabulated in Table 5.4. The area requirements are based on the equation:

$$\log y = 2.00 + 0.008 (x)$$

where $y = Ft^2/100$ Gals

x = Percolation rate in minutes/inch

Notwithstanding the above, the minimum absorption area for single family residential dwellings shall be 400 square feet.

2. Area reduction. See Table 5.4 for area reduction when gravelless material or low pressure distribution is utilized. A reduction in area shall not be permitted when flow diversion is utilized with low pressure distribution. When gravelless material is utilized, the design width of the trench shall be used to calculate minimum area requirements for absorption trenches.

E. Minimum cross section dimensions for absorption trenches.

Commented [DM(4]: This additional language is intended to avoid a conflict with 12VAC5-613-80.12 (need for mounding calculations)

Commented [DM(5]: Based on comment received.

1. Depth. The minimum trench sidewall depth as measured from the surface of the mineral soil shall be 12 inches when placed in a landscape with a slope less than 10%. The installation depth shall be measured on the downhill side of the absorption trench. When the installation depth is less than 18 inches, the depth shall be measured from the lowest elevation in the microtopography. All systems shall be provided with at least 12 inches of cover to prevent frost penetration and provide physical protection to the absorption trench; however, this requirement for additional cover shall not apply to systems installed on slopes of 30% or greater. Where additional soil cover must be provided to meet this minimum, it must be added prior to construction of the absorption field, and it must be crowned to provide positive drainage away from the absorption field. The minimum trench depth shall be increased by at least five inches for every 10% increase in slope. Sidewall depth is measured from the ground surface on the downhill side of the trench.

2. Width. All absorption trenches utilized with gravity distribution shall have a width of from 18 inches to 36 inches. All absorption trenches utilized with low pressure distribution shall have a width of eight inches to 24 inches.

F. Lateral separation of absorption trenches. The absorption trenches shall be separated by a center to center distance no less than three times the width of the trench for slopes up to 10%. However, where trench bottoms are two feet or more above rock, pans and impervious strata, the absorption trenches shall be separated by a center to center distance no less than three times the width of the trench for slopes up to 20%. The minimum horizontal separation distance shall be increased by one foot for every 10% increase in slope. In no case shall the center to center distance be less than 30 inches.

G. Slope of absorption trench bottoms.

1. Gravity distribution. The bottom of each absorption trench shall have a uniform slope not less than two inches or more than four inches per 100 feet.

2. Low pressure distribution. The bottom of each absorption trench shall be uniformly level to prevent ponding of effluent.

H. Placement of absorption trenches in the landscape.

1. The absorption trenches shall be placed on contour.

2. When the ground surface in the area over the absorption trenches is at a higher elevation than any plumbing fixture or fixtures, sewage from the plumbing fixture or fixtures shall be pumped.

I. Lateral ground water movement interceptors. Where subsurface, laterally moving water is expected to adversely affect an absorption system, a lateral ground water movement interceptor (LGMI) shall be placed upslope of the absorption area. The LGMI shall be placed perpendicular to the general slope of the land. The invert of the LGMI shall extend into, but not through, the restriction and shall extend for a distance of 10 feet on either side of the absorption area.

Table 5.4.
Area Requirements for Absorption Trenches Receiving Septic Tank Effluent.

Percolation Rate (Minutes/Inch)	Area Required (Ft^2/100 Gals)			Area Required (Ft^2/Bedroom)		
	Gravity	Gravity Gravelless	Low Pressure Distribution	Gravity	Gravity Gravelless	Low Pressure Distribution
5	110	83	110	165	124	165
10	120	90	120	180	135	180
15	132	99	132	198	149	198
20	146	110	146	218	164	218
25	158	119	158	237	178	237
30	174	131	164	260	195	255
35	191	143	170	286	215	260
40	209	157	176	314	236	264
45	229	172	185	344	258	279
50	251	188	193	376	282	293
55	275	206	206	412	309	309
60	302	227	217	452	339	325
65	331	248	228	496	372	342
70	363	272	240	544	408	359
75	398	299	251	596	447	375
80	437	328	262	656	492	394
85	479	359	273	718	539	409

90	525	394	284	786	590	424
95	575	489	288	862	733	431
100	631	536	316	946	804	473
105	692	588	346	1038	882	519
110	759	645	379	1138	967	569
115	832	707	416	1248	1061	624
120	912	775	456	1368	1163	684

J. Controlled blasting. When rock or rock outcroppings are encountered during construction of absorption trenches the rock may be removed by blasting in a sequential manner from the top to remove the rock. Percolation piping and sewer lines shall be placed so that at least one foot of compacted clay soil lies beneath and on each side of the pipe where the pipe passes through the area blasted. The area blasted shall not be considered as part of the required absorption area.

Section K establishes that all trenches must be constructed using standard methods and materials. The shallowest sidewall on a gravel trench is 12 inches. The shallowest sidewall on a gravelless product in 8 inches. It reiterates that timed dosing is required when trenches are less than 12 inches deep. There is an allowance for approved manufacturer products to deviate from the sidewall and the dosing. To date these have been sand lined treatment products that are being used for dispersal.

K. Trenches receiving TL-2 or better quality effluent are exempt from the increase in trench depth with slope and the cover requirements as found in 12VAC5-610-950.E.1 ~~and 12VAC5-610-950.F.~~ The following additional requirements shall apply.

1. Soil dispersal loading rates shall not exceed the values in Table 5.5.

2. The minimum vertical standoff to a limiting feature shall be maintained under the entire infiltrative surface in accordance with 12VAC5-613
.

3. The minimum cover over the absorption area is 6 inches~~. If the cover is mounded above grade, the finished sideslope cannot exceed 1:4 (rise:run);~~ On sloping sites, cover shall be tied back into the existing slope to facilitate stabilization of the slope and maintenance of the site. Soil cover material shall support vegetative growth.

Commented [DM(6]: This was an error. GMP 147 never exempted the increase in lateral separation with slope.

Commented [DM(7]: Comment from SHADAC – why are we more restrictive for TL2/TL3 than for STE with having the separation apply across whole trench?

Answer: This is a requirement that was in GMP 147. Given the reductions in vertical separation, it is critical that minimum separations be maintained in order to adequately treat the wastewater.

Commented [DM(8]: Received comment that this effectively limits trench installations to a 25% slope. Modified language to address.

~~4. The minimum installation depth is not required to be increased for slope.~~

5. The minimum installation depth is equal to the sidewall of the dispersal system construction as defined in 12VAC5-930.F, 12VAC5-610-950.E.1, and 12VAC5-610-940 (gravelless). On sloping sites, the minimum installation depth is measured on the downhill side.

6. When trenches are installed at less than 12 inches from the ground surface, timed dosing shall be used to disperse the effluent.

7. For slopes up to 15 percent slope, there are not any soil texture group limitations for shallow placed trenches receiving TL-2 or TL-3 effluent. For slopes over 15 percent, trench systems installed in Texture Group III and IV soils, are limited to a 12 inch or greater installation depth.

Commented [DM(9]: Picks up GMP 147 pg 10, letter D.

8. Designs supported by Division approved manufacturer's design manuals may deviate from 12VAC5-610-950.K5 and K6.

9. Not withstanding the above, the minimum absorption area for a single family residential dwelling receiving TL-2 or better quality effluent shall be 400 square feet.

Commented [DM(10]: Preferred by VDH staff to maintain a minimum for SFH and did not see value in having two separate standards for STE and TL2/TL3

Table 5.5 Soil Absorption Area Loading Rates for Systems Receiving TL-2 or TL-3 Effluent

	TL-2 Effluent				TL-3 Effluent			
Percolation Rate (mpi)	Pressure Trench* Loading (gpd/ft^2)	Gravity Trench* Loading (gpd/ft^2)	Drip** Loading) (gpd/ft^2)	Pad/Mound Loading** (gpd/ft^2)	Pressure Trench* Loading (gpd/ft^2)	Gravity Trench* Loading (gpd/ft^2)	Drip** Loading (gpd/ft^2)	Pad/Mound Loading** (gpd/ft^2)
5	1.8	1.80	0.60	1.20	3.0	3.00	1.00	1.66
10	1.67	1.67	0.56	1.11	2.67	2.67	0.89	1.66
15	1.53	1.53	0.51	1.02	2.33	2.33	0.78	1.66
20	1.4	1.40	0.47	0.93	2.0	2.00	0.67	1.66
25	1.30	1.30	0.43	0.86	1.75	1.75	0.58	1.33
30	1.2	1.13	0.40	0.80	1.5	1.41	0.50	1.11
35	1.10	0.98	0.37	0.73	1.38	1.22	0.46	0.95
40	1.00	0.84	0.33	0.66	1.25	1.05	0.42	0.83
45	0.90	0.73	0.30	0.60	1.13	0.91	0.38	0.74
50	0.8	0.62	0.27	0.53	1.0	0.77	0.33	0.67
55	0.76	0.57	0.25	0.50	0.94	0.71	0.31	0.61

60	0.71	0.51	0.24	0.47	0.89	0.64	0.30	0.55
65	0.67	0.46	0.22	0.44	0.83	0.57	0.28	0.51
70	0.62	0.41	0.21	0.41	0.78	0.51	0.26	0.48
75	0.58	0.36	0.19	0.38	0.72	0.46	0.24	0.44
80	0.53	0.32	0.18	0.35	0.67	0.40	0.22	0.42
85	0.49	0.28	0.16	0.33	0.61	0.35	0.20	0.39
90	0.44	0.24	0.15	0.30	0.56	0.30	0.19	0.37
95	0.4	0.20	0.13	0.27	0.5	0.25	0.17	0.35
100	0.37	0.19	0.12	0.25	0.46	0.23	0.15	0.33
105	0.34	0.17	0.11	0.23	0.43	0.21	0.14	0.32
110	0.31	0.16	0.10	0.21	0.39	0.19	0.13	0.30
115	0.28	0.14	0.09	0.19	0.35	0.18	0.12	0.29
120	0.25	0.13	0.08	0.17	0.32	0.16	0.11	0.28

*Loading rates to trenches, whether gravity or pressure dosed, are based on the gallons per day of wastewater applied to the bottom of the trench.

**Loading rates to drip systems, pads, and mounds are based on the infiltrative surface area provided and are on an aerial basis.

12VAC5-610-960. Elevated sand mound.

A. An elevated sand mound is a soil absorption system that incorporates low pressure distribution and sand filtration to produce treated sewage prior to absorption in the natural underlying soil. The elevated sand mound utilizes less gross soil area than most other soil absorption systems. Elevated sand mounds differ from pads in that they follow the natural contour of the site, are always an above ground system, may receive septic tank effluent and always require pressure distribution.

B. Mound systems are considered Type III systems (see 12VAC5-610-250 C).

C. Mound systems receiving septic tank effluent shall be designed and constructed in accordance with the Wisconsin Mound Soil Absorption System Siting, Design and Construction Manual prepared by the Small Scale Waste Management Project, School of Natural Resources, College of Agricultural and Life Sciences, University of Wisconsin-Madison dated January 19902000 or its successor. Drip dispersal or low pressure distribution shall be used.

D. The manual referred to in subsection C of this section shall be used for the designated construction of elevated sand mounds. The following criteria are required for all elevated sand mound systems in addition to the requirements found in the manual.

1. The construction permit shall require permanent water saving devices; however, there shall be no corresponding reduction in the basal area. The construction permit shall be recorded and indexed in the grantor index under the holder's name in the land records of the clerk of the circuit court having jurisdiction over the site of the sewage disposal system pursuant to 12VAC5-610-250 J.

2. The proposed mound site shall be fenced, roped or otherwise secured, and marked, to prevent damage by vehicular traffic. Activities on the mound site shall be severely limited in order to protect it to the greatest extent possible.

3. Formal plans and specifications, prepared by a licensed professional engineer in accordance with 12VAC5-610-250 G, shall be required and must be approved by the health department prior to any site-disturbing activities.

4. The local health department shall be notified at least 48 hours before any work begins on the site, including delivery of materials. The mound must be constructed during dry weather and soil conditions. The contractor shall schedule a conference with the local health department to review the plans and specifications prior to beginning any phase of construction, including delivery of materials.

5. Wooded sites shall not be used unless it is shown by the applicant that the wooded site is the only site available, and if the applicant can demonstrate that the site can be properly prepared (plowed). If a wooded site is used, trees shall be removed by cutting them off at ground level, leaving the stumps in place. The cut trees shall be removed using methods that

Commented [DM(1]: Had a comment to move 960A and 966 A into definitions.

The guidance we've received from the Registrar is that if you use a term throughout the regulations, the definition should be in the "definition" section. But if you only use a term once, or in one section, then that section should serve as the definition for the term.

do not require driving equipment over the mound site and that do not result in the removal of any soil from the site. Larger basal areas may be required on wooded sites.

6. When the depth to a restriction, shrink-swell soils or a water table is less than 24 inches, pretreatment sufficient to produce a ~~secondary~~ TL-2 or better quality effluent may be used to reduce these distances as shown in Table X~~4.4.~~

7. The minimum absorption area for single family residential dwellings shall be 400 square feet.

E. Elevated sand mounds receiving TL-2 or better quality effluent shall adhere to the following additional design criteria;

1. The basal area (interface of fill sand and original soil surface) loading rate shall not exceed the values found in Table 5.5 for pads/mounds.

2. The minimum sand depth under the dispersal system is 6 inches.

3. The minimum soil cover over the absorption area is 6 inches. The finished sideslopes cannot exceed 1:4 (rise:run); Soil cover material shall support vegetative growth.

4. Vertical separation to limiting features as found in 12VAC5-613 shall be maintained under the entire infiltrative surface of the basal area.

5. Designs supported by Division approved manufacturer's design manuals may deviate from pressure dosing but require dosing to a gravity distribution system at a minimum.

12VAC5-610-966. Pads. [NEW section from 03 2021]

A. A pad is an absorption area wider than 3 feet but not longer than 100 feet with a level infiltrative surface. The minimum standoff to a limiting feature in accordance with 12VAC5-613 is to be met under the entire infiltrative surface (bottom of pad).

B. The minimum effluent quality dispersed to a pad is TL2 and pad bottom loading rates shall not exceed the values for pads noted in Table 5.5.

~~C. A system may contain one or more pads, but the combined area of all pads in a system may not exceed 1,200 square feet.~~

D. Pads and trenches may be used together in a single system when each zone follows the design criteria found in this chapter and are separated by a minimum of 6 feet between the sidewall of the pad and the trench.

E. Pads shall be limited to sites with slopes 10% or less.

F. All pads must be dosed. Pad systems over 1,000 gallons per day must be pressure dosed.

G. When pads are installed at less than 12 inches from the ground surface, timed dosing shall be used to disperse the effluent.

H. Pads must be installed on contour with the longest dimension of the pad along the contour. Every effort should be made to minimize the linear loading rate.

I. When multiple pads are used on a site, the pads must be separated by the width of the pad across contour.

J. The minimum absorption area for single family residential dwellings shall be 400 square feet.

J. The minimum installation depth is equal to the sidewall of the dispersal system construction. Gravel pads shall have a minimum installation depth of 12 inches. Pads using gravelless materials shall have a minimum installation depth equal to the height of the gravelless material being used. On sloping sites, the minimum installation depth is measured on the downhill side. Designs supported by a Division approved manufacturer's design manual may deviate in accordance with the approved manual.

K. No portion of the pad bottom or the sidewall may be installed in fill material.

L. The minimum cover over the absorption area is 6 inches. If the cover is mounded above grade, the finished sideslope cannot exceed 1:4 (rise:run); Soil cover material shall support vegetative growth.

12VAC5-610-966. Pads. [ALTERNATE NEW section 05 2021]

A. A pad is an absorption area wider than 3 feet but not longer than 100 feet with a level infiltrative surface where the bottom of the pad meets the original soil. The minimum standoff to a limiting feature in accordance with 12VAC5-613 is to be met under the entire infiltrative surface.

B. The minimum effluent quality dispersed to a pad is TL2 and pad bottom loading rates shall not exceed the values for pads noted in Table 5.5.

~~C.~~ Pads are generally installed on contour with the longest dimension of the pad following the contour. Minor deviations from surface contours are acceptable as long as the bottom of the pad is level (at the same elevation across the bottom of the pad), and intersects a similar soil horizon across its surface. ~~On sloping sites every effort should be made to minimize the hydraulic linear loading rate which is the design flow divided by the length of the pad along the contour.~~

D. Pads and trenches may be used together in a single system when each zone follows the design criteria found in this chapter and are separated by a minimum of 6 feet between the sidewall of the pad and the trench. When multiple pads are used on a site, the pads must be separated by the width of the pad along the contour. Reserve pad areas must be upslope of an active pad area.

E. Pads shall be limited to sites with slopes 10% or less.

F. Dosing. All pads must be dosed. Pad systems over 1,000 gallons per day must be pressure dosed. When pads are installed at less than 12 inches from the ground surface, timed dosing shall be used to disperse the effluent. Dose volume shall be less than or equal to 20% of the design wastewater flow [OR maximum of 6 doses per day..

G. The minimum absorption area for single family residential dwellings shall be 400 square feet.

J. Pad Constructon.

a. Gravel pads shall have a minimum installation depth of 12 inches, unless in Texture Group I or II soils where the installation depth can be reduced to 8 inches. On sloping sites, the minimum installation depth is measured on the downhill side. The construction of the pad's gravity percolation line and gravel bedding shall follow 12VAC5-610-930E with the exception that the bottom of the pad is level and not sloping. Piping shall have a maximum center to center spacing of 9 feet.

b. Gravel pads utilizing low pressure distribution shall follow 12VAC5-940 for construction and dosing cycle (volume). Gravel pads using low pressure distribution shall have a minimum installation depth of 12 inches, unless in Texture Group I or II soils where the installation depth can be reduced to 8 inches. On sloping sites, the minimum installation depth is measured on the downhill side. Piping shall have a maximum center to center spacing of 9 feet.

c. Pads utilizing gravelless material as found in 12VAC5-610-930F shall follow 12VAC5-630F and the manufacturer's instructions on minimum depth of installation, but in no case shall a pad be installed at less than 8 inches from the original soil surface. Gravelless material shall have a

Commented [DM(1]: Modified to address concerns over being 'off contour' due to minor surface topographical deviations.

Commented [DM(2]: Received a comment that dosing should be addressed for pads. Options:
(1) From2001 Mound Component Manual for private onsite WWTS – 20% of design flow or less
(2) Alternatively Alabama using a maximum of 6 doses per day.

Commented [DM(3]: This modification allows a gravel pad (gravity or LPD0 to be installed as shallow as 8 inches in TG1 or II soils.

maximum center to center spacing of 9 feet. On sloping sites, the minimum installation depth is measured on the downhill side.

d. Designs supported by a Division approved manufacturer's design manual may deviate in accordance with the approved manual.

H. The minimum cover over the absorption area is 6 inches. If the cover is mounded above grade, the finished sideslope cannot exceed 1:4 (rise:run). Soil cover material shall support vegetative growth.

Fast Track Regulation Process to move GMP 147 into the SHDR

From SHADAC meeting 3/24 2021

from Kim to everyone: 11:08 AM

That working volume at 3/4 of daily design flow seems high. The woking volume for a 4 bedroom would be 450 gallons. I usually do 4 times my dose amount. So a 50 gallon dose has a working volume of 200 gallons.

from Lynn Breeden to everyone: 11:13 AM

Don't we need to be careful on the time dosing side where you need to take pump line length into account so you clear the pump line each dose?

from Mike Lynn to everyone: 11:21 AM

Does the operator have the authority to change the time dosing to something that is not called out in the design or the O&M manual? Are we concerned about regrowth on low flow systems if we dont get it out of the pump tank wuick enough?

from Mike Lynn to everyone: 11:22 AM

Why are we so concerend with the size of the pump tank when there are thousands of grinders installed every year with simplex pumps in an 80 gallon vessel?

from Lynn Breeden to everyone: 11:34 AM

I recal in the Soil data books the 80 inch depth for soil limitation..

from John Ewing to everyone: 11:34 AM

Venting pump systems may need addressing as well.

from Lynn Breeden to everyone: 11:41 AM

you are right. that is in the regulations..

from Lynn Breeden to everyone: 11:42 AM

6 inches under pipe, then 7 to cover pipe with 2 inches over pipe right?

from Mike Lynn to everyone: 11:44 AM

LPD has lower requirement under the pipe, i dont know why, Fairfax local reg requires more gravel under the pipe.

from Reed Johnson to everyone: 11:51 AM

when using high head pumps on long lines, the pipe fill is almost instantaneous. This is especially true when conveying highly treated effluent. the reason is your conveyance line can be 1" and your laterals can be one inch if properly designed with 3-5ft of distal head. in the case working volume really means nothing.

from Lynn Breeden to everyone: 11:54 AM

Curtis, so here they are saying you need TL-2 for a pad but Septic tank effluent is OK for the Wisconsin Mound. In certain situations it seems..

from John Ewing to everyone: 11:59 AM

Does the 6ft stand-off apply to two separate pads or just between a trench and a pad?

from Mike Lynn to everyone: 12:04 PM

pad separation is equal to the width of the pad, I assume that means install pad to reserve pad if required?

from Kim to everyone: 12:04 PM

I'm confused about item J. "The minimum installation depth for gravel pads is 12". Why can't gravel pads have an 8" install depth for example? A minimum 12" install depth for gravel pads in my area is going to wipe out a very high percentage of our Pads.

Pump panel should be 30 to 42 inches above grade

Reed - and pumps that move water to the drainfield too, Should be considered here. Consider that storage can be upfront and not necessarily on end of process. GMP 112 - 30 inch basin to DF

Tom - ? on dosing and minimum dose volume. RMF provide multiple small doses and may not meet the Regs.

Reed - other white paper Converse says small doses are better with highly treated effluent

Joel Pinnix - can/should there be a max depth for install of STE

John Schofield - could vent to get oxygen transfer to deeper depth

DEQ - concurs with adding this language to STE, TL2 and TL3; (950C)
- Concern over using this in wetlands
- Inconsistencies between SHDR and AOSS over absorption/infitrative/soil treatment area/dispersal field -add definition for absorption area that includes soil treatment/ dispersal field terms.

Clarify text regarding LGMI's that it should extend a distance of 10 feet on both, not either, side of the absorption area.

With regard to maintaining vertical separation to a limiting feature under the whole absorption area: or STE we do not have this requirement - why should we be more restrictive with treated effluent.

For pads: DEQ need to define on contour (following or along) , across contour (perpendicular to slope) maybe use elevation

Curtis - can only set upper or lower line on contour - suggests lowest elevation to be on contour

Mike - with puraflo pads - could always square it up. does it matter if its - may go through a natural change in slope

Email Comments:

Thu, Mar 25, 9:49 AM

LRH Soil Consultants, Inc <lrhsoil@gmail.com>
to me, Lance

Good morning Marcia,

I know you and I briefly touched on my concern with proposed reg 12VAC5-610-966. Pads. item J, yesterday in the meeting but I would like to further discuss it and item K.

Pads and trenches are not the same and shouldn't be treated the same. Trench design and loading rates are based on Trench bottom **and** side wall infiltration. Pads are based solely on bottom infiltration. This is shown as fact by item "B. The minimum effluent quality dispersed to a pad is TL-2
and pad **bottom** loading rates shall not exceed the values for pad noted in Table 5.5".
As long as the gravel Pad bottom is in natural soil the sidewalls being natural soil or top soil fill should be of no concern as long as the stone is sufficiently covered (minimum 6") all around the stone including sides.

I probably design around 40 Pads a year with at least 50% of them with install depths less than 12". In our flat, high water table, Coastal plains soils this is a necessity. Even with TL-3 level treatment I try to design with a 12" separation to water table. In our area shallower is better and that brings about shallow install depths.
I'm personally not a fan of gravelless technology in Pads. I have to wonder if any person invested in the use of gravelless technology on the Board helped come up with this new design criteria.

I'm completely in objection to items J. and K. using sidewalls in the design criteria and the minimum gravel install depth of 12". Pads, by design, are flat, bottom infiltration means of dispersal and only the pad Bottom infiltration surface should be relevant.

Thank you for your time and I hope to see this change in the next draft version of the Fast Track Regs. I can also be reached at the phone # listed below for further discussion.

SHDR Fast-Track Amendments – Adam Feris

4/15/21

Section 880:

C. Pumps Integral to Treatment Systems. This section is intended to include what were previously described as “transfer pumps,” correct?

Section 950:

Comment/question regarding installation below perched water table and direct dispersal:

Discussion: I don’t believe that installation below a perched water table would conflict with the definition of direct dispersal. I think part of the issue may be the term “ground water.” Recent rainwater infiltration that is evident in well-drained soil is groundwater, but that's obviously not the intent of the direct dispersal definition. In my opinion, a perched water table could be treated the same way.

Michael Lynn Mon, Apr 26, 4:14 PM
to me

Yes definitely

Get [Outlook for iOS]

From: Degen, Marcia <marcia.degen@vdh.virginia.gov>
Sent: Monday, April 26, 2021 4:10:58 PM
To: Michael Lynn <mlynn@ses-company.com>
Subject: Re: Variances

Yes and let's keep this in mind as we rewrite regs. Should we put something in the fast track to have a separation between reserve and primary pads if the primary is not downslope of the reserve?

Marcia J. Degen, Ph.D., P.E.

Wed, Mar 24, 12:37 PM

Scott Currie <scott.currie@anuainternational.com>
to me

The main note I have is determining the amount of pipe in a pad. A lot of these designs have a d-box and then just some random amount of pipe spaced out randomly. There needs to be a standard that EHS can look to, to approve these designs. (i.e a three foot wide trench gets a piece of pipe so do we require a pipe for every three foot of pad width. How much pad bottom is accounted for for each run of pipe?)

I like the minimum depth stuff. Personally I think anything shallower than 13" for gravel (6" below, 4" pipe & 3" above pipe) and 8" for gravelless should be engineered. I have seen a lot of shallow trenches treated or untreated as soon as they get above grade and use fill things get out of hand.
Another item to address is the dosing in a pad (enhanced flow 60% of the volume pipe, Reed's micro dosing(LOL), or some other standard) This needs to be set in order to actually remove pad from the practice of engineering.

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15 April 2021

Marcia J Degen, Ph.D., P.E.
Environmental Technical Services Manager
Division of Water and Wastewater Services
c/o VDH – Environmental Health
Civic Mall 2nd Floor
1502 Williamson Road, SE.
Roanoke, VA 24012

Dear Marcia,

I would like to respectfully offer comments to the proposed additions to 12VAC5-610 Onsite regulations:

D. Conveyance pumps and pump stations that move TL-2 or TL-3 final effluent to a soil dispersal system shall comply with the following.

1. 12VAC5-610-880.A. shall apply except that the minimum velocity in the force main may be reduced to 1 foot per second.

2. Pump station wet wells shall provide at least one quarter (1/4) day storage above the high level alarm set point.

3. When timed dosing is required by this chapter, the working volume shall be a minimum of 3⁄4 of the daily design flow volume.

The working volume in some treatment systems that dose to drip is in the treatment unit itself. That is where the ¾ of the design flow requirement is met. So there should be no restriction on the size of the pump basin, as long as it can meet the required minimum dose size and scouring velocity.

Here are some comments on other sections of the regulations:

12VAC5-610-880. Pumping.

B. Pumping station and pumps. General.

1. Sizing. Pumping station wet wells shall provide at least one quarter (1/4) day storage above the high level alarm set point.

The requirement for a ¼ day storage above the high level alarm set point in a pumping station wet well doesn't take into consideration treatment technologies that achieve storage upstream from the wet well, e.g. recirculating packed bed systems. The regulations should accommodate the abilty of these systems to meet the ¼ day storage within the treatment train and in the up-stream septic tank for systems that do not have forward flow in the event of a power outage or pump failure.

12VAC5-610-955. Drip Dispersal.

E. 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.

The 18 hours of storage is not necessary for all treatment systems. Some systems meter the amount of effluent that can reach the discharge tank by controlling how often and how much effluent is sent to the discharge tank, in contrast to systems that cannot prevent forward flow. Treatment systems that are designed to prevent forward flow do not need the 18 hours of storage, since any power outages or pump failures will prevent any forward flow into the discharge chamber.

F. 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.

What is the intent of the minimum dose volume? Vertical turbine pumps can pressurize a drip field in seconds, so there is no risk that the field will be loaded unevenly.

In addition, there should be some clarification on the definition of timed dose vs demand dosing. Some treatment train technologies meter the effluent that can move into the discharge chamber. This limits the dose size moving forward to the dispersal system. On-demand discharge from the pump chamber to the dispersal (drip) is metered, and thus functionally timed dosed, because the rate of discharge is controlled by a timer.

Additional Comments:

When time dosing is required, it should be clear in the regulations that the timer settings should be based on actual flow, not design or peak flow. Setting timers for peak-flow conditions, when there is less actual flow from the home, can result in unnecessarily large doses, resulting in ineffective time dosing over a 24-hour period.

Enhanced flow distribution should not be allowed. If the conditions on the site aren't suitable for standard gravity flow, and a pump is required, then a pressure dose system with orifices should be required.

Treatment systems rely on mechanical/electrical devices such as air blowers, motors, pumps, disinfection units, etc., to treat sewage to levels that meet performance standards established in regulations. Unless the treatment system features appropriate sensors and mechanisms to halt the flow of wastewater through the system in the event of a power failure or critical system malfunction, untreated or partially-treated sewage will flow through the system and be discharged to the subsurface disposal area. Untreated or partially-treated sewage released to the soil disposal area presents an environmental and/or public health risk, and may lead to failure of the disposal area.

Thank you.

Best regards,

Joseph Soulia
Sr. Government Relations Rep
(541) 537-0772

Commonwealth of Virginia

Degen, Marcia <marcia.degen@vdh.virginia.gov>

Absorption Area Design fast Track Revisions (SHADAC Minutes 3/24/21)

1 message

Jeff Walker <walker@swva.net> Sat, May 15, 2021 at 8:59 AM
To: "Gregory, Lance" <lance.gregory@vdh.virginia.gov>
Cc: Mike Lynn <mike@ses-company.com>, "Degen, Marcia (VDH)" <Marcia.Degen@vdh.virginia.gov>, Joel Pinnix <joelpinnix@obsidianengineering.com>, norm.oliver@vdh.virginia.gov

Mr. Gregory, in review of drafted regulations I wish to raise concerns best summarized as a question over cost and benefit. Is the Governor aware the Fast Track regulations and policy under development will further burden rural residents, while failing to enhance environmental quality? These proposals have not been analyzed to weigh increased expense, or outright prohibitions on rural development against undocumented benefits.

As written, southwest Virginian will be harmed, our citizens prevented from constructing home on sites with rolling hills, and suitable soils which currently meet the regulations for construction of onsite sewage systems. If the Agency were to enforce existing regulation and precedent these property rights would not be threatened, yet as we have become aware staff seem unable, or unwilling to consistently oversee development under the current regulations. It is negligent to implement further changes in regulations absent ability of your staff to enforce, or apply scientific rationale toward consideration of achievable goals for Environmental Health programs. This is especially so in light of changes in technology and applied understanding of natural systems. It is unfortunate to read at this late stage language which is so controversial, and drafted absent publicly accessible documented input from professionals, representatives of rural landowners or concerned citizens outside of the bureaucratic echo chamber.

I remain concerned VDH exceeds authority in drafting these regulations. During a period wherein use of onsite septic has fallen from 40,000 permits/year (FY2008) to about 4,000 (FY2020) we should be concerned over regulations which further limit licensed professionals discretion in solving onsite treatment and dispersal availability and cost. As examples I would like reconsideration of proposed regulations which will prohibit construction on property across much of Southwest Virginia.

Dispersal of treated effluent where minimum depth of install is permitted @ 12” and depth of cover was at licensed designer’s discretion. GMP 147 waived additional cover on sites > 30%. Evidence of surface breakout on sites properly characterized is absent even with very shallow cover over dispersal media (e.g. 2-4" measured at downhill trench margin. Construction of trenches on sites exceeding 4:1 (25%) slope would be prohibited under the proposed language, and yet existing SHDR permits use of land up to 50% without terracing. Citing proposed language released yesterday from the SHADAC minutes:

12VAC5-610-950. Absorption area design.:

K. Trenches receiving TL-2 or better quality effluent are exempt form 12VAC5-610-950.E.1 and 12VAC5-610-950.F. The following additional requirements shall apply. 1. Soil dispersal loading rates shall not exceed the values in Table 5.5. 2. The minimum vertical standoff to a limiting feature shall be maintained under the entire infiltrative surface. 3. The minimum cover over the absorption area is 6 inches. If the cover is mounded above grade, the finished sideslope cannot exceed 1:4 (rise:run); Soil cover material shall support vegetative growth. 4. The minimum installation depth is not required to be increased for slope.

The general public might understand the impact of this language on their interests. And yet I request you provide calculations or established precedent to establish the minimum cover of 6". Please explain whether there a demonstrable threat to health or safety which has been documented?

I also wish to see calculations toward sidewall regulations; it seems absurd to regulate a 12" sidewall when all indications show a flooded trench is already subject increased threat of malfunction and failure. Since we understand the best soils are nearest the surface, and regulation forcing increased depth of install should be questioned. Sidewall absorption is not the design objective, rather suitable loading of the trench-bottom, and compliance with maintaining the underlying standoff to rock, seasonal water table or restrictions should be the focus of all reliable construction. Therefore I will oppose any regulation forcing designers to increase depth of installation, when all experience demonstrates that shallow systems are the most reliable.

At minimum I urge reconsideration, or simply strike all new & burdensome prescriptive language from the proposal. I encourage VDH open the discussion of revisions to the licensed community and public through normal drafting process.

As the cost of construction increases citizens will be locked out of new rural housing. VDH's focus developing unsupported restrictions on use, raises costs of site evaluation and design. The stakeholders at SHADAC benefit from these increases, and yet file none of the required disclosures expected by other boards and committees. The public is not well served by self-dealing process, hidden from view.

Individuals continue to observe the Department of Health's policies toward nutrient reduction is arbitrary & capricious, absent substantial environmental benefit. The Commonwealth has taken a misdirected path claiming a 50% nitrogen restriction, while forcing compliance on fewer than 10% of new systems, hiding evidence of impact from conventional and legacy systems which are unregulated. Clearly Virginia is not meeting Chesapeake Bay, or regional watershed protection objectives. Instead VDH allied with certain localities which seem to insist on using regulation, policy, and VDH staff to block new development alluding to a poorly considered application of the health code, rather than authorities given to them by the General Assembly.

I look forward to engaging this process further at your invitation,

Jeff T. Walker, BSc. AOSE, AOSSI, LPSS

Blue Ridge Site & Soil; LLC

Floyd, VA 24091

540 239 9131

12VAC5-613-80.12
Working in Soils with Permeability Limiting Features

Purpose of Job Aid

The purpose of this job aid is to explain how to identify a permeability limiting feature (PLF) and when that permeability limiting feature triggers a water mounding evaluation as required by subsection 12VAC5-613-80.12.a.of the Regulations for Alternative Onsite Sewage Systems (AOSS Regulations) for applications for construction permits, certification letters, and subdivision approvals.

12VAC6-613-80.12. states:

> *Whenever the depth to a permeability limiting feature on the naturally occurring site is less than 18 inches as measured from the ground surface, whenever the treatment works does not provide at least 18 inches of vertical separation to a permeability limiting feature, or whenever the design is for a large AOSS, then the following shall apply:*
>
> a. *The designer shall demonstrate that (i) the site is not flooded during the wet season, (ii) there is a hydraulic gradient sufficient to move the applied effluent off the site, and (iii) water mounding will not adversely affect the functioning of the soil treatment area or create ponding on the surface;*
>
> b. *For large AOSSs, the department may require the owner to monitor the degree of saturation beneath the soil treatment area to verify that water mounding is not affecting the vertical separation; and*
>
> c. *For any system in which artificial drainage is proposed as a method to meet the requirements of this chapter, the designer shall provide calculations or other documentation sufficient to demonstrate the effectiveness of the proposed drainage*.

This section of the *AOSS Regulations* defines the conditions that require a designer to evaluate water mounding under the soil dispersal field. If any of the following statements are true, then a designer is required to evaluate if mounding will occur and result in an impact to the vertical separation to a limiting feature or create ponding on the surface.

- A permeability limiting feature is within 18 inches of the original ground surface for an above or at grade system; OR
- A permeability limiting feature is found within 18 inches of the infiltrative surface for a below grade system; OR
- The design is for a large AOSS.

If any of these 3 conditions is true, then a water mounding evaluation is required using a mathematical model. When fill is added to a site to increase vertical separation to a limiting feature, the addition of the fill does not eliminate the need for a water mounding evaluation. In other words, if the fill results in the infiltrative surface being greater than 18 inches above the permeability limiting feature, the mounding evaluation is still required if the permeability limiting feature is less than 18 inches below the original ground surface.

.

What are Permeability Limiting Features?

The term 'permeability limiting feature' (PLF) is used to describe a soil feature that impedes water movement and may affect the design, but no regulatory definition exists for PLF. The *Sewage Handling and Disposal Regulations (SHDR)* includes the definition for 'impervious strata' as "soil or soil materials with an estimated or measured percolation rate in excess of 120 minutes per inch." The SHDR also defines "a soil restriction" as "a feature in the soil that impedes the percolation of water". Soil restrictions include pans, plinthic horizons, and stoniness. However, neither the *Regulations for Alternative Onsite Sewage Systems (AOSS Regulations)* or the *Sewage Handling and Disposal Regulations (SHDR)*, defines a 'permeability limiting feature."

To address this oversight, the proposed revised AOSS Regulations define PLF as:

"Permeability limiting feature" means a soil feature within the project boundary of the soil treatment area that may impede the ease of vertical water flow from the point of effluent application in an overlying horizon to the extent such that the feature may affect the design, function, or performance of the soil treatment component of the AOSS.

PLFs include, but are not limited to:

- restrictive features such as fragic, plinthic, or densic layers, rock or residuum, and soils with mixed, vermiculitic, or smectitic mineralogy;
- abrupt textural changes or lithologic discontinuities;
- boundary conditions including varying permeability rates between the installation horizon and an underlying horizon within 18 inches of the soil infiltrative surface (below grade system) or the ground surface (above grade system); and
- soils with horizons or layers with estimated percolation rates greater than 120 minutes per inch (mpi).

A designer should look to the cause of the limitation when considering a PLF. A water table is not a PLF, but what causes the water table may be. If the feature results in a perched or seasonal water table, it indicates problems with water movement and if the separation from the permeability limiting feature, (but not necessarily the water table), is less than 18 inches to the infiltrative surface surface for a below grade system, or within 18 inches of the original ground surface for an above or at grade system, water mounding modeling with calculations are required to show that water will move away from the site and not create a water mound under the system that would encroach on the vertical separation required under Table 2 (12VAC5-613.80.13) in the *AOSS Regulations.*

Consider a site with a 30 mpi surface soil horizon above a slower rate B horizon which starts at 18 inches. The designer may propose a design based on the 30 mpi rate and install the system at 12 inches. The rate differential between the installation horizon and underlying horizon, linear loading rate, distribution method, and actual daily flow, can impact the system functionality. When there is a rate differential between the design rate and the slowest horizon within 18 inches, the impact should be addressed under 12VAC5 613-80.12. (See Figure 1)

For above grade systems, remember that the depth to the PLF is measured from the original soil surface. Consider an above grade drip system with drip tubing installed on top of 8 inches of added sand below the tubing and above the original soil surface. There is a PLF 12 inches below the ground surface. Even though the addition of the sand creates greater than 18 inches between the drip tubing and the PLF (12 inches original soil plus 8 inches of sand = 20 inches), a water mounding evaluation is required because there is a PLF within 18 inches of the original ground surface.

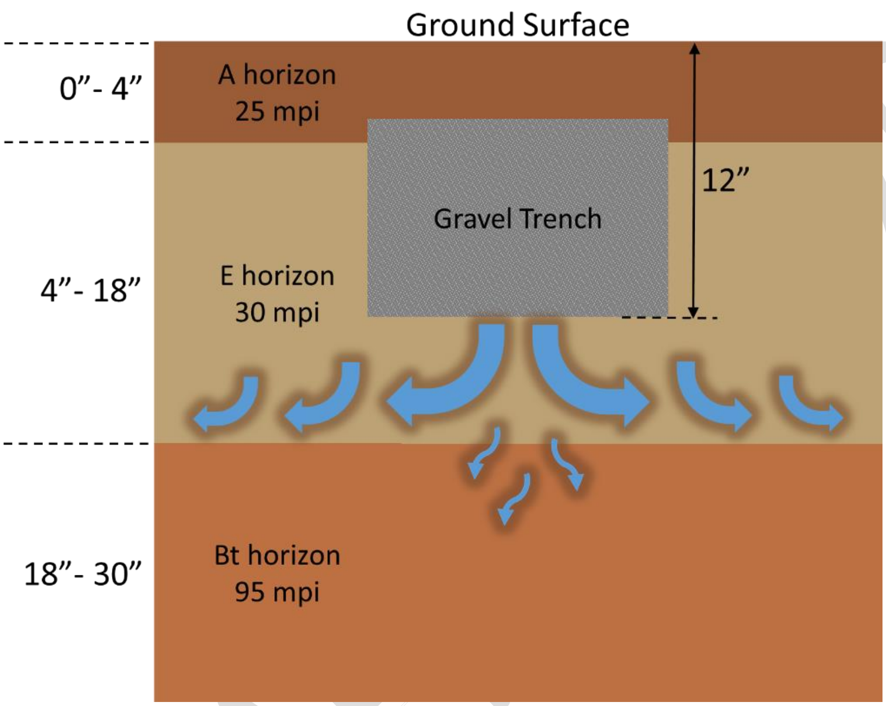


Figure 1. Downward flow of effluent from the dispersal point is limited where adjacent horizons have contrasting texture, structure, consistence, or permeability, such as a Texture Group II horizon over a Texture Group IV horizon.

*For **Small** AOSS, When is water mounding evaluation required under 12VAC5-613-80.12.a.?*

An evaluation of the site as described in 12VAC5-613-80.12a is required if the relative location of the PLF meets the criteria specified in Section 80.12 for a small AOSS:

- A permeability limiting feature is found within 18 inches of the original ground surface for an above or at grade system OR
- A permeability limiting feature is found within 18 inches of the infiltrative surface for a below grade system.

The highlighted section belows says if there is ANY differential between the installation zone and the PLF, then mounding calcs are required. IF the design is based on the most limiting rate within 18 inches of the install depth (or surface for above grade systems, then no mounding calcs required.

The committee tried to create a definitive break point such as 30 rate differential, more than 1 texture group difference, etc. but it was all subjective. This all or nothing approach was seen as the only way to provide consistency. This would require designers to report estimated rates though for more than just the install horizon.

- For small AOSSs, any time there is a soil within 18 inches of the surface or of the infiltrative surface that has a slower rate than at the dispersal system installation point, mounding calculations are required.
- If the design is based on the most limiting rate within 18 inches of the ground surface for an above grade system or within 18 inches of the infiltrative surface for a below grade system, then the design already accounts for the slower rate soil and no mounding evaluation is required.

Earlier version that attempted to define when to require mounding calcs:

- When there is a texture group differential of more than 1, a water mounding evaluation is required. For example, a texture group 1 over a texture group 2 would not require a water mounding evaluation. A texture group 1 over a texture group 3, however, would require a water mounding evaluation, such as a sandy loam horizon over a silty clay loam. (Refer to Figures 1 and 2)
- When the mpi rate differential is greater than 46 mpi between the installation horizon and the PLF, a water mounding evaluation is required. (Refer to Figure 2)
- No water mounding evaluation is needed when the design is based on the most restrictive horizon within 18 inches of the ground surface for above grade installation or within 18 inches of the infiltrative surface for below grade installations (trench bottom, drip tubing, etc.) If the PLF is estimated at greater than 120 mpi, however, then a Ksat test should be conducted to verify the rate

For Small AOSS: When to Conduct Saturated Hydraulic Conductivity Tests (Ksats) to Support a Water Mounding Analysis or Design Based on the Most Restrictive Horizons

In order to conduct a water mounding evaluation, the designer must know the saturated hydraulic conductivity (Ksat) of the installation (infiltration) zone (K1) and of the PLF (K2). A soil professional can estimate the K1 and K2 with reasonable accuracy when the horizons have a perc rate of less than a 120 mpi rate. The *SHDR* considered soils with greater than 120 mpi 'impervious' and prohibit their use. While the *AOSS Regulations* do not prohibit the use of soils with greater than a 120 mpi rate, there is little experience with using such soils in Virginia. Reliably estimating a percolation rate from a field textural and morphological characterization is difficult in such slow rate soils. Further characterization is necessary to ascertain the suitability of such soils for onsite systems. VDH has seen an increase in the use of shrink-swell soils since the adoption of the *AOSS Regulations*. Shrink-swell soils are often mischaracterized resulting in an unrealistic over-estimation of soil permeability. As a result, field Ksat testing is appropriate for some small AOSS sites. Ksat testing is always required for large AOSS pursuant to the AOSS Regulations (12VAC5-613-40.G.3), but the SHDR allows VDH to also require testing for quantification of soil permeability whenever estimated rates are in question (12VAC5-610.490.C.2) and 12VAC5-610.490.D.).

> This next section is intended to provide consistency on when Ksat testing will be required for construction, cert letters, and subdivision approvals.

For small AOSS sites, Ksat testing (to determine appropriate K2 values for modeling of water mounding) shall be conducted when any of the following characteristics are present in a PLF found within 18 inches of the soil surface for an above grade system or within 18 inches of the effluent application point for a below ground system.

- The PLF is a Texture Group IV and the K1 (in the install area) is Texture Group I, IIa, or IIb soil.
- Particle size classes of fine or very fine and mixed, vermiculitic, or smectitic mineralogy is indicated by the USDA NRCS Soil Survey soil mapping.
- Field consistence is firm, moderately sticky and/or moderately plastic, or greater.
- The soil has densic or fragic properties.
- The percolation rate based on a field textural and morphological evaluation is estimated at slower than 120 mpi.
- When any of the soil horizons above Cr or rock are texture group III or IV. Performing Ksats in rock or Cr horizons is impractical and the results are highly variable due to the Cr being rock controlled.
- The design HLLR is equal to or greater than 5 gpd/lf. (See HLLR discussion on page 5.)

Additional Considerations When Running Ksats with an Impervious PLF

All Ksat tests are to be performed following the Virginia Cooperative Extension Publication "Measuring Saturated Conductivity in Soil". (https://www.pubs.ext.vt.edu/CSES/CSES-141/CSES-141.html) Other tests may be considered on a case by case basis. Ksat tests should only be performed after the practitioner has fully familiarized themselves of the limitations of the test and of the particular testing apparatus used.

Recognition that Ksat testing is influenced by temperature and the depth of the water in the hole in relation to the radius of the borehole, results may vary based on the mathematical equations used when modeling. It is crucial the practitioner recognize and utilize the best practices in the referenced publication, while recognizing the limitations of the Ksat test methods.

One of the key parameters for running Ksats is the height of the water column in relation to the diameter of the borehole. When a Ksat test is to be run at a shallow depth and/or in a shallow horizon, it is very difficult to maintain the proper test setup. It is also necessary to modify the test to adjust for certain site conditions.

If hard bedrock (R horizon) or soft bedrock (Cr horizon) or other impervious horizons are encountered at depths of 12 to less than 18 inches below the dispersal point (below grade system) or soil surface (above grade system), the Ksat testing depth should provide a minimum separation of two times the height of the water column height in the borehole above the R, or Cr horizon, or permeability limiting feature, if using the Glover solution for Ksat calculations. Amoozegar and Warrick have defined a calculation where offset is less than two times the height of the water column. The top of the projected water column in the testing borehole should be a minimum of 1 inch below any soil horizon boundary. The tested material, if consisting of more than one soil horizon, must be similar soil in texture, structure, and consistence.

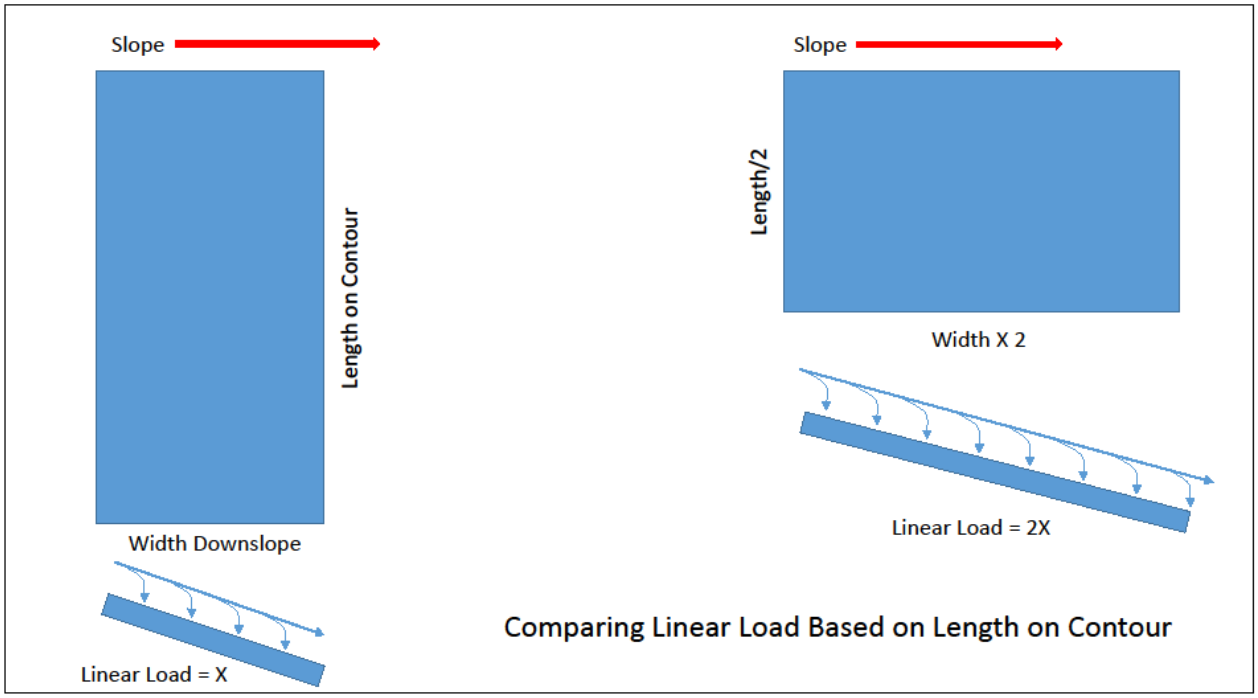
If hard or soft bedrock or other impervious horizons are encountered at depths less than 12 inches from the soil surface or the soil horizon boundary requirements above cannot be met; it is impractical to perform traditional Ksat testing. When the PLF does not have shrink swell properties, conservatively estimate the K2 mpi rate based on texture, structure, consistence and experience. Consider setting a minimal K2 loading rate by dividing the K1 loading rate 5.

When the PLF has shrink swell properties and Ksats cannot be conducted for the above reasons, the K2 value utilized in water mounding calculations should have a minimum value of 0.216 cm/day (1200 mpi) in soils with shrink-swell properties.

Hydraulic Linear Loading Rate When Designing on Sites with Shallow Depth to an Impervious Strata, Rock, or Cr

When the PLF has an mpi greater than 120 mpi, the vertical flow component of the dispersal field is compromised and the design relies more on horizontal flow. A less permeable soil less than 18 inches beneath the natural soil infiltrative surface will cause some or a significant amount of horizontal flow. In effect, a flow window is created that is bounded by the impervious strata on the bottom, the soil surface, and the length of the dispersal field across the slope. The hydraulic linear load rate (HLLR) through that 'window' is calculated by dividing the gallons applied per day by the linear feet of the dispersal system along the contour. For example, a 600 gallons per day (gpd) dispersal system that is 100 feet along the contour has a HLLR of 600 gpd/100 linear feet or 6 gallons/ linear foot. If the configuration is modified so that the length along the contour is only 50 feet, then the HLLR is 600 gpd/50 linear feet = 12 gallons/linear foot. The longer the length along the contour, the lower the HLLR. The lower the HLLR, the less likely the effluent is to surface.

In the graphic below, adapted from the 2000 Mound Design Manual by Converse and Tyler, the dispersal fields depicted contain the same area (sq. ft.) and the same sand or soil loading rates (gpd/ft^2.). The drainfield on the left is twice as long across the slope than the field on the right, but the linear loading rate for the right figure is twice that of the left figure. Read more about HLLR in the 2000 Mound Design Manual by Converse and Tyler.



For sites with shallow depths to PLFs, especially impervious PLFs, Converse and Tyler recommend a HLLR no greater than 4 gpd/linear foot in the 2000 Wisconsin Mound Design Manual, when using a design flow of 150 gpd/bedroom for a residence. With additional site/design information such as horizontal hydraulic conductivity estimates, a higher HLLR may be appropriate.

Ksat testing to determine the appropriate K2 value for use in required water mounding modeling calculations are to be performed on all sites where the hydraulic linear loading rate (HLLR) is equal to or greater than 5 gallons/linear foot/day. When separation distances between individually permitted AOSS systems are less than 25 feet, the sites should be evaluated as one system when considering HLLR. There are several digital publications at https://soils.wisc.edu/sswmp/online_publications.htm that are helpful guidance documents for onsite systems. Specifically, publications #4.42 and #4.43 discuss hydraulic linear and infiltrative loading rates and provide a table of loading rates correlated with soil texture, structure, separation distances, and slope. Loading rates cannot exceed permitted rates found in the *SHDR* or *AOSS* Regulations.

2021 Hardship Guideline Review

HB 888 Income Eligibility

Beginning July 1, 2019, (i) require means testing of applicants who petition the Department for evaluation and design services for onsite sewage systems and private wells and who are unable to demonstrate a hardship and (ii) provide evaluation and design services only to such applicants whose household income does not exceed 400 percent of the federal poverty guidelines established by the U.S. Department of Health and Human Services. The Department shall reduce such income threshold to 300 percent beginning July 1, 2020, **200 percent beginning July 1, 2021**, and 100 percent beginning July 1, 2022. Beginning July 1, 2023, the Department shall provide design and evaluation services only to an applicant who demonstrates a hardship in accordance with guidelines developed by the Department.

Updated Income Eligibility

Persons in Household	200% Federal Poverty Guidelines
1	$25,760
2	$34,840
3	$43,920
4	$53,000
5	$62,080
6	$71,160
7	$80,240
8	$89,320

Overview – Septic 5/1/2020 to 4/30/2020

- Total Applications – 14,590 (15,810 with Loudoun and Fairfax)
- New Construction – 11,040
- Minor Modification – 872
- Repair – 2134
- Voluntary Upgrade – 543

* Includes denials (545) and blank status.

Overview Septic 5/1/2020 to 4/30/2020

- 93.3% of All Designs by OSEs/PEs (84% last year)
- 6.6% of All Designs by VDH (16% last year)
- Approximately 10% by PEs, 83% by OSEs (12% and 72% last year)
- PE Designs – Avg. 10. Median 3. 8 PEs = 50% of Designs
- OSE Designs – Avg. 41. Median 21. 26 OSEs = 50% of Designs

2020 List of Localities

- Alleghany
- Appomattox
- Bland
- Buchanan
- Carroll
- Charles City
- Charlotte
- Craig
- Dickenson
- Grayson
- Highland
- Lee
- Lunenburg
- Lynchburg
- Nelson
- Pittsylvania
- Rappahannock
- Rockbridge
- Russell
- Scott
- Smyth
- Tazewell
- Washington
- Wise
- Wythe

2021 List of Localities Transitioning

- Appomattox
- Lunenburg
- Nelson
- Pittsylvania
- Rappahannock
- Washington

*86 Bare Apps from 5/1/2020 to 4/30/2021

2021 Remaining

- Alleghany
- Bland
- Buchanan
- Carroll
- Charles City
- Charlotte
- Craig
- Dickenson
- Grayson
- Highland
- Lee
- Lynchburg
- Rockbridge
- Russell
- Scott
- Smyth
- Tazewell
- Wise
- Wythe

Safe, Adequate, and Proper 5/1/2020 to 4/30/2021

- 1897 Total in EHD.
- 77.5% VDH
- 14.5% OSE
- 4.4% Installer
- 2.7% Operator
- 0.8% PE

Sewage Handling and Disposal Regulations
5/20/21 SHADAC Discussion

2017 Subcommittee Options – Paradigm Shift

- Use a risk based regulatory model that takes into account items like sensitive sites and lot size.
- Modify the program to a watershed perspective not a statewide standpoint.
- Incorporate a responsible management entity (RME) model into the regulatory scheme.
- Where there is jurisdictional overlap with other agencies, have VDH provide more information regarding human health impacts.
- Allow licensed entity's to design and install systems outside the regulations provided they are willing to bond the system.
- Require that completion statements are signed by a licensed installer.
- Require that licensed operators get hauler permits; VDH inspector has to certify that the installer is licensed.

2017 Subcommittee Options – Addressing Conflicts in Regulations

- Create a process where VDH's regulations are a higher level view of requirements, and then allow VDH to create an implementation manual to apply the regulations. VDH could then revise the implementation manual without going through the regulatory process every time.
- Combine regulations where possible.
- Conduct a comprehensive assessment of all the regulations to identify and resolve conflict.
- Review all of the policies and codify areas where there needs to be an enforceable requirement rather than guidance.
- Review local ordinances and national industry standards and incorporate good practices in the regulations.
- VDH could work with other agencies in a more prescribed manner than just having them sit on the SHADAC and other committees and have the different agencies meet at some frequency to discuss changes and overlap. The first point of discussion at the interagency meetings should be to determine where conflicts exist.

2017 Subcommittee Options – Program Administration

- Revise regulations so that they only contain requirements that VDH is willing to enforce through the courts.
- Match VDH resources areas that have the highest risk to public health. This would require an assessment of responsibilities, resources and outcomes.
  - VDH evaluates its responsibilities/tasks, the associated risk, and where resources should be directed.
- Provide stakeholders with VDH's goals and measures for the program.
- Propose a statutory or regulatory change so that licensees could have their license revoked if they falsify a document.
- Create a program for conventional onsite sewage system O&M.