DEQ
Montana Department
of Environmental Quality

Memo

TO: DEQ Staff, Contracted Counties, County Sanitarians and Interested Parties

FROM: Rachel Clark, Public Water and Subdivisions Section Supervisor RC

DATE: January 7, 2020

SUBJECT: Separation to a limiting layer

The Department has received several recent questions regarding how to measure the separation distance from an absorption system to a limiting layer. Since 2002, the standards have required measurement from the bottom of the infiltrative surface (below placed drain rock or sand) to the limiting layer.

History

The Department has had regulations since the 1970s governing the minimum vertical distance between an absorption system and groundwater or another limiting layer. Although the minimum required distance has consistently been 4 feet, the place of measurement has not. In the 1990s, the standard specified four feet of soil from the natural ground surface to the limiting layer. In 2002, the rule and standards were changed from "natural ground surface" to "infiltrative surface" as follows:

> *ARM 17.36.320(2) A minimum separation of at least 4 feet of natural soil must exist between the infiltrative surface or the liner of a lined system and a limiting layer, except that at least 6 feet of natural soil must exist on a steep slope (15% to 25%).*
>
> *"Infiltrative surface" means the soil interface that receives the effluent wastewater below the drain rock or sand.*
>
> *"Limiting layer" means bedrock, an impervious layer, or seasonally high ground water.*
>
> *"Natural soil" means soil that has developed through natural processes and to which no fill material has been added.*

The 2002 rule amendment thus required that the vertical distance be measured from the infiltrative surface at the bottom of the drain rock or sand fill to the limiting layer. This requirement also was included in several standards in the 2013 revisions to Circular DEQ-4. For instance, DEQ-4, Standard 6.2.1 along with Illustration 6.2-1 and Standard 6.7.4.1 along with Illustration 6.7-1 both clearly indicate the measurement point begins at the soil interface below the drain rock or sand fill.

In addition, the following Response to Comments from the 2013 rule package indicates the Board of Environmental Review and the Department's intent.

COMMENT NO. 71: Does the second paragraph of section 2.2.5 conflict with the design nature of elevated sand mounds? Isn't the infiltrative surface the bottom of the sand bed, not native soil? Is minor leveling allowed for mounds?

RESPONSE: The board and department agree that the second paragraph of section 2.2.5 may conflict with the design of an elevated sand mound and the circular has been amended in response to this comment. After site modification, the soil that has been cut or filled is not considered to be native or natural. In the case of an elevated sound mound, soil that has undergone minor leveling may be considered part of the infiltrative surface. Plowing or keying an uneven surface for an elevated sand mound is allowed if four feet of unmodified or natural soil from the bottom of the key or plowed area to a limiting layer is maintained. Section 2.2.5 has been changed to clarify that soil that has undergone minor leveling is not considered natural soil.

COMMENT NO. 199: Subsection 6.7.4.1 should clarify if the key can infringe upon the four feet of natural soil separation. The potential to key into the four-foot separation and meet the separation regulation must be understood.

RESPONSE: A minimum of four feet of natural soil between the bottom of the key or scarified area to a limiting area must be maintained for all elevated sand mounds. The board and department agree that the requirement should be clarified and the circular has been amended in response to this comment. Subsection 6.7.4.1 has been amended to state "[a] minimum of 4 feet of natural soil from the bottom of the plowed surface, scarified surface, or key to the limiting layer must be maintained."

Application:

For all subsurface absorption and lined systems, including elevated sand mounds submitted for review after the 2002 rule changes, a minimum of four feet of separation is required between the bottom of the placed sand or drain rock and a limiting layer. While this rule has been in place since 2002, the Department will not seek to invalidate prior approvals where the depth to a limiting layer was calculated incorrectly unless the Department receives a complaint or other evidence that there is a threat to public health or the environment or if there are proposed changes the absorption system.

Waivers and deviations:

This rule and associated definitions are not waivable except for public wastewater treatment systems, as provided for in ARM 17.38.101(4)(j). An applicant is welcome, however, to submit a waiver or deviation request to modify the depth of placed material below an absorption system. For example, a non-public system with groundwater at 51" can request a waiver to only have a 3" key depth below an elevated sand mound, thereby leaving 48" between the bottom of the key depth and a limiting layer.

Waivers are reviewed on a project-by-project basis and decisions are made based on site-specific circumstances but several waivers like this have been approved by the Department in the past. In order to receive a waiver for this situation, the applicant must provide site-specific evidence and analysis that a lesser depth of placed material will not negatively impact public health, the environment, or the quality of state waters. In cases where the limiting layer is groundwater, the Department typically requires a pathogen analysis, as described in the Nondegradation Guidance Manual for source-specific mixing zones, to support the waiver request.

Thank you for your time and consideration and feel free to let me know if you have any additional questions regarding this issue.

Sand Mound Material Specifications:

Sand must be washed free of silts and clays.

The in-place fill material must meet one of the following specifications:

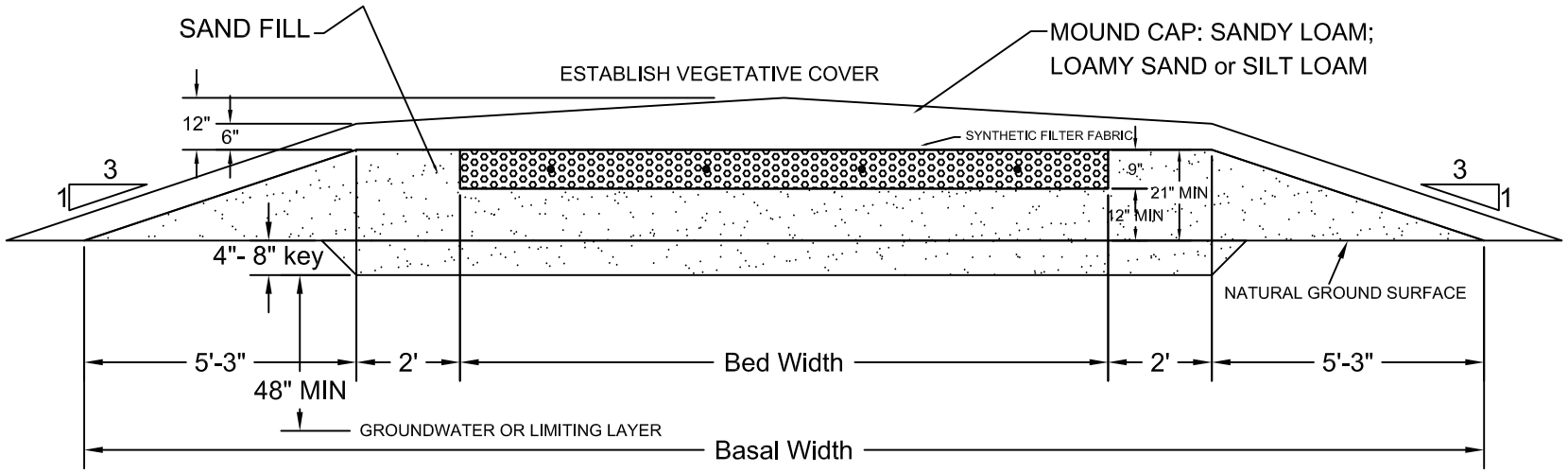
A. ASTM C-33 for fine aggregate, with a maximum of 2 percent passing the No. 100 sieve, or

B. Fit within the following particle size distribution:

Sieve	Particle Size (mm)	Percent Passing
3/8 in	9.50	100
No. 4	4.75	95 to 100
No. 8	2.36	80 to 100
No. 16	1.18	45 to 85
No. 30	0.60	20 to 60
No. 50	0.30	10 to 30
No. 100	0.15	0 to 2

C. Have an effective size (D10) of 0.15 mm to 0.30 mm with a Uniformity Coefficient (D60/D10) of 4 to 6, with a maximum of 3 percent passing the No. 100 sieve.

Drain rock must be washed and range in size from ¾ to 2-1/2 inches.



Montana Department of Environmental Quality	Scale: NTS	Elevated Sand Mound - Bed Design Section View	Dwg. No. 6.7-1