



Minnesota
Pollution
Control
Agency

Policy and
Planning
Division

Community
and Area Wide
Programs
Section

Existing individual sewage-treatment systems: vertical separation

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Minn. Stat. § 115.55, subd. 5a (c) and (d) and Minn. R. ch. 7080 make a special compliance provision for individual sewage-treatment systems (ISTSs) built *before* April 1, 1996, when the system is:

- located outside a shoreland area;
- located outside a wellhead protection area;
- is *not* serving a food, beverage, or lodging establishment.

The three bullets are referred to as “non-SWF.” To be in compliance, a non-SWF system built before April 1, 1996 must have at least two feet (rather than three feet) of vertical separation from the bottom of the soil treatment system to seasonally saturated soil or bedrock. In addition, the system must not be an imminent threat or failing.

Prohibited imminent threat criteria include sewage discharges to surface water or to the ground surface, sewage backups and any other situation with the potential to immediately and adversely affect or threaten public health or safety.

Failing criteria include seepage pit, cesspool, drywell, leaching pit, other pit, or a tank that obviously leaks below the designed operating depth.

To be complying, existing systems must also meet the requirements of a monitoring and mitigation plan (for “other” and “performance” systems – 7080.0178 and 7080.0179) and the local

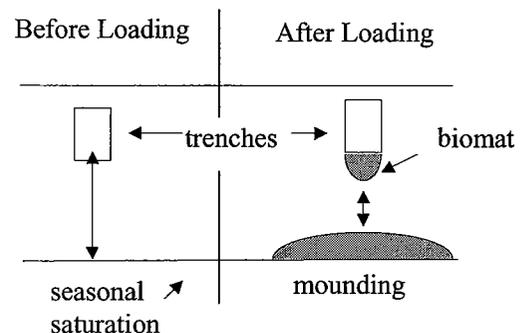
operating permit (for “performance” systems).

Can a local ordinance be more restrictive?

The statute *does not* allow local units of government to adopt and enforce a more restrictive (e.g., more than two-foot) vertical separation for non-SWF systems built before April 1, 1996.

How do you measure the vertical separation distance?

Answering this question requires basic knowledge of how ISTSs operate. When soil systems are loaded with sewage, the groundwater beneath the system rises and reduces the designed vertical separation. In addition, infringement into the vertical separation zone occurs directly below the system as a biological layer (biomat) is created. These conditions are depicted in the figure below.

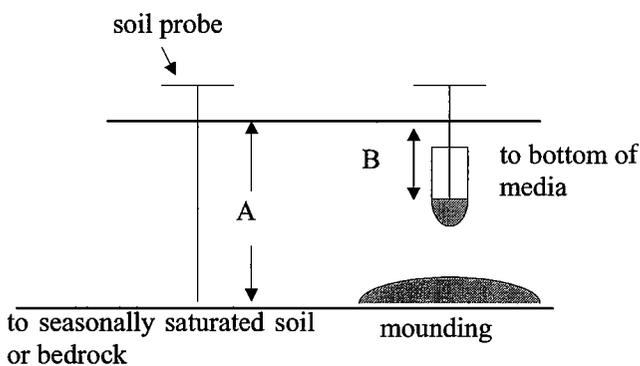




Chapter 7080 states that the separation distance measurement must be taken outside the area of influence (groundwater mound) in an area of similar soil. Therefore, the measurement must be taken:

- at a distance from the system in which the groundwater has not mounded, and
- on the same contour and landscape position of similar soil.

When a compliance inspection is conducted, the MPCA instructs inspectors to take soil borings outside this area of influence to verify whether the vertical separation is present before the system was loaded with sewage. This is depicted below:



The inspector finds the depth to the soil's redoximorphic features, measurement "A," and then finds the bottom of the soil treatment system, measurement "B." The calculation for vertical separation follows:

$$A - B = 2 \text{ feet or more for compliance}$$

The MPCA also encourages inspectors to conduct more than one boring to get the best possible representation of the site. The MPCA relies on the inspector's best professional judgment to determine whether the system meets the two-foot vertical separation requirement by using redoximorphic features.

What are redoximorphic features?

"Redoximorphic" means features formed in saturated soil by the process of reduction, translocation and oxidation of iron and manganese compounds

(commonly known as "mottling"). Redoximorphic features are verified by landscape or vegetative indicators.

The use of redoximorphic features for existing systems (there are more features for designing new systems) is described in part 7080.0110, subp. 4, D (5):

- (a) *in subsoils redoximorphic features include:*
 - i. *distinct iron accumulations, or distinct iron depletions;*
 - ii. *soil colors having a chroma of two or less;*
- or*
- iii. *soil colors having a hue of 5Y and a chroma of three or less;*
- (b) *in lower topsoils, immediately followed by saturated subsoils, redoximorphic features include:*
 - ii. *redoximorphic accumulations or depletions;*
- (c) *in upper topsoils immediately followed by saturated lower topsoil, redoximorphic features include:*
 - ii. *accumulation of high levels of organic material;*
 - iii. *dominance of hydrophilic vegetation.*

How do I get more information?

For more information, visit the Web site at <http://www.pca.state.mn.us>, leave a message on the ISTS Information Line at (651) 282-6246, or call your district representative toll free at (800) 657-3864.