

Conventional On-Site Septic Systems

Purpose: change septic interpretations to

- better reflect local conditions
- closely match state regulations
- address customer requests
- improve state-wide planning

Criteria (suitable for Tennessee)

- slopes less than 30 percent
- bedrock depth: karst (>90 cm)
non-karst (>75 cm)
- depth to fragipan (>60 cm)
- saturated hydraulic conductivity (KSAT)
between (4.23 and 42 $\mu\text{m/s}$)

National Interpretation Differences

- national interpretation has ponding and flooding
- slope suitability (<15 percent)
- root restriction suitability (>100 cm)
- national includes large stones as a limitation

Partner Involvement

- Tennessee Department of Environment and Conservation
- National Soil Survey Center (NSSC)
- Tennessee Department of Economic Development and Commerce (expressed a need for it to help with community development decisions)

Conventional On-Site Septic System (TN)

Rating is for dominant condition for map unit



National Septic Tank Absorption Fields

Rating is for dominant condition for map unit



Summary

- local interpretations developed based on state criteria and discussions with partners can more effectively meet local needs and objectives
- national interpretations are nationwide in scope and may not reflect specific local conditions and circumstances

TENNESSEE CONVENTIONAL ON-SITE SEPTIC SYSTEMS SCHEMATIC DESCRIPTION

CRITERIA: The interpretive rating is the most limiting of the representative value of the restrictive features; only major components were rated. In addition, only the most dominant or an average condition can be shown on the maps where several major components constitute a map unit. Small areas of minor components and other areas of major components, which are not dominant, can and will occur within any areas shown on the soil maps. Miscellaneous components and higher taxa were not rated. Ponding and flooding are not factors for the suitability of the underground wastewater disposal fields in Tennessee regulations, although they would affect the homesites suitability and would be evaluated separately for that use. The rule is general in nature and is simplified to approximate the general probability that conventional septic systems may or may not be approved for use in given areas within Tennessee under current Department of Environment and Conservation (TDEC) Regulations for conventional on-site septic systems.

This rule is not intended to give any impression to the users that the component and map unit ratings are approved by TDEC. It is intended as a general guide to TDEC regulations not to supersede any onsite investigation. An on-site investigation of mapped areas will very likely reveal inclusions of other different soils or similar soils with features at different depths than those used as representative for this database interpretation. TDEC was not listed in the summary but was consulted and had agreed with the rule for making generalized interpretations of the USDA SSURGO database. The criteria came from the RULES OF DEPARTMENT OF ENVIRONMENT AND CONSERVATION DIVISION OF GROUND WATER PROTECTION CHAPTER 1200-01-06 REGULATIONS TO GOVERN SUBSURFACE SEWAGE DISPOSAL SYSTEMS. In addition, TDEC soil scientists were consulted to help modify the rule and clarify some misconceptions in the application of the regulations, i.e. the component look up list which is intended to be used only as a guide for evaluating the criteria.

1. Slope

- a. Rule Used MLRA16_Office: Slope (0 to 30 percent)
- b. Evaluation used MLRA16_Office: Slope (0 to 30 percent)
- c. Properties used NSSC Pangaea: SLOPE PERCENT
- d. Restrictive limits:
 - i. Too Steep, 1.00
 - ii. Moderate slope limitation, 0.99
 - iii. Slight slope limitation, 0.70
 - iv. No slope limitation, 0.00

2. Depth to Fragipan

- a. Rule Used MLRA16_Office: Depth to fragipan > 60 cm
- b. Evaluation used MLRA16_Office: Depth to fragipan (60 to 180 cm)
- c. Properties used: MLRA16_Office: DEPTH TO FRAGIPAN
- d. Restrictive limits:
 - i. Shallow depth to fragipan. 1.00
 - ii. Moderate depth to fragipan, 0.99
 - iii. Fragipan lower in the soil, 0.51
 - iv. No fragipan depth limitation, 0

3. Depth to Bedrock

- a. Rule Used MLRA16_Office: Depth to Bedrock (>= 75 non karst or >= 90 karst)
- b. Evaluation used MLRA16_Office:
 - i. Shallow to Bedrock (90 to 180 cm)
 - ii. Component parent material origin = limestone
 - iii. Geomorphic landform = karst
- c. Properties used: MLRA16_Office:
 - i. Depth to bedrock RV
 - ii. Parent material origin
 - iii. Landform: anything labeled karst y/n

- d. Restrictive limits:
 - i. Shallow depth to bedrock, 1.00
 - ii. Moderate depth to bedrock, 0.99
 - iii. Bedrock lower in the soil, 0.52
 - iv. No bedrock depth limitation, 0

4. Filter Field

- a. Rule Used: NSSC_Pangaea: Filter Field 60 - 150cm (24-60")
- b. Evaluation used NSSC_Pangaea: Filter Field 60 to 150cm (24 to 60")
- c. Properties used NSSC_Pangaea: KSAT HIGHEST MINIMUM ABOVE RESTRICTIVE LAYER 24 to 60
- d. Restrictive limits: KSAT >42 Crisp
 - i. Filtering capacity, 1.00
 - ii. No filtering capacity limitation, 0.00

5. Percolation

- a. Rule Used MLRA16_Office: Percolation - Fine Particle Size and KSAT <4.23
- b. Evaluation used MLRA16_Office:
 - i. Particle Size Class (fine, very fine)
 - ii. Taxonomic mineralogy "smectitic"
 - iii. Percolation (< 4.23) 50 to 120 cm
- c. Properties used
 - i. MLRA 16: Taxonomic particle size class
 - ii. Pangaea: TAXONOMIC MINERALOGY CLASS
 - iii. MLRA 16: KSAT MINIMUM ABOVE RESTRICTIVE LAYER 50-120
- d. Restrictive limits: KSAT >42 Crisp
 - i. Percolation, 1.00
 - ii. Ksat not restrictive, 0.00

6. Depth to Water Table

- a. Rule Used MLRA16_Office: Drainage class or depth to water table
- b. Evaluation used MLRA16_Office:
 - i. Depth to water table (60 - 180 cm)
 - ii. Drainage class = "poorly"
 - iii. Drainage class = "very poorly"
 - iv. Drainage class = "somewhat poorly"
- c. Properties used:
 - i. Pangaea: HIGH WATER TABLE DEPTH MINIMUM
 - ii. Pangaea: GRL-DRAINAGE CLASS
 - iii. MLRA 16: Drainage class
- d. Restrictive limits:
 - i. Depth to saturated zone, 1.00
 - ii. No wetness depth limitation, 0.00

7. Depressional

- a. Rule Used MLRA16_Office: Component phase or landform = depression
- b. Evaluation used MLRA16_Office:
 - i. Geomorphic feature (depressions & sinkholes)
 - ii. Drainage Class = VP to MW
 - iii. Local phase = depressional
- c. Properties used MLRA16_Office:
 - i. GEOMORPHIC FEATURE NAME OF LANDFORM
 - ii. Pangaea: COMPONENT LOCAL PHASE
 - iii. MLRA 16: Drainage class
- d. Restrictive limits:
 - i. Depth to saturated zone, 1.00
 - ii. No depressional area, 0.00

8. Unstable Fill

- a. Rule Used MLRA16_Office: Unstable fill - not rated
- b. Evaluation used :
 - i. Pangaea: Reclaimed Land
 - ii. MLRA 16: Component name NOT MATCHES any Entisols
 - iii. MLRA 16: Component name NOT MATCHES MIS Area
- c. Properties used:
 - i. Pangaea: COMPONENT LOCAL PHASE
 - ii. MLRA 16: Component name not matches Arents or Orthents
 - iii. Component not miscellaneous
- d. Restrictive limits:
 - i. Component local phase equals reclaimed land

REFERENCES:

- 1) U.S. Department of Health, Education and Welfare, Public Health Service. (1969). *Manual of Septic Tanks. PHS Publication No. 526*, p. 8.
- 2) Bouma, J. (1974). *New Concepts in Soil Survey Interpretations for Onsite Disposal of Septic Tank Effluent*.
- 3) Tennessee Department of Environment and Conservation, Ground Water Protection Division. (December 2009, Revised). REGULATIONS TO GOVERN SUBSURFACE SEWAGE DISPOSAL SYSTEMS. *RULES OF DEPARTMENT OF ENVIRONMENT AND CONSERVATION DIVISION OF GROUND WATER PROTECTION, CHAPTER 1200-01-06*. Retrieved from <http://tn.gov/sos/rules/1200/1200-01/1200-01-06.20091208.pdf/>