

ALL SOILS “All soils” refers to soils with any USDA soil texture. All mineral layers above any of the A Indicators, **except** for Indicator A16, have a dominant chroma ≤2, or the layer(s) with a dominant chroma >2 is less than 15 cm (6 inches) thick.

A1. Histosol Classifies as a Histosol (except Folist).

A2. Histic Epipedon. A histic epipedon underlain by mineral soil material with chroma ≤2.

A3. Black Histic. A layer of peat, mucky peat, or muck ≥ 20 cm (8 inches) thick that starts within the upper 15 cm (6 inches) of the soil surface; has hue of 10YR or yellower, value ≤3 and chroma ≤1; and is underlain by mineral soil material with chroma of ≤2.

A4. Hydrogen Sulfide. A hydrogen sulfide odor within 30 cm (12 inches) of the soil surface.

A5. Stratified Layers. Several stratified layers starting within the upper 15 cm (6 inches) of the soil surface. One or more of the layers has value of ≤3 and chroma ≤1, and/or it is muck, mucky peat, or peat or has a mucky modified mineral texture. The remaining layers have chroma ≤2. In sandy layer with value ≤3 and (see *Organic Masking Requirement*).

A11. Depleted Below Dark Surface. A layer with a depleted or gleyed matrix that has 60 or more% chroma ≤2, starting within 30 cm (12 inches) of the soil surface, and having a minimum thickness of either:
a. 15 cm (6 inches), or
b. 5 cm (2 inches) if the 5 cm consists of fragmental soil material.

Loamy or clayey layer(s) above the depleted or gleyed matrix must have value ≤3 and chroma ≤2. Any sandy material above the depleted or gleyed matrix must have value ≤3 and chroma ≤1, and (see *Organic Masking Requirement*).

A12. Thick Dark Surface. A layer at least 15 cm (6 inches) thick with a depleted or gleyed matrix that has 60% or more chroma ≤2 and starting below 30 cm (12 inches) of the surface. The layer(s) above the depleted or gleyed matrix must have value ≤2.5 and

chroma ≤1 to a depth of at least 30 cm (12 inches) and value ≤3 and chroma ≤1 in any remaining layers above the depleted or gleyed matrix. In any sandy material above the depleted or gleyed matrix see *Organic Masking Requirement*.

SANDY SOILS -- *Sandy soils have a USDA texture of loamy fine sand and coarser. All mineral layers above any of the S Indicators, except for Indicator S6, have a dominant chroma ≤2, or the layer(s) with a dominant chroma >2 is less than 15 cm (6 inches) thick.*

S1. Sandy Mucky Mineral. A layer of mucky modified sandy soil material 5 cm (2 inches) or more thick starting within 15 cm (6 inches) of the soil surface.

S4. Sandy Gleyed Matrix. A gleyed matrix that occupies 60% or more of a layer starting within 15 cm (6 inches) of the soil surface.

S5. Sandy Redox. A layer starting within 15 cm (6 inches) of the soil surface that is ≥10 cm (4 inches) thick and has a matrix with 60% or more chroma ≤2 with 2% or more distinct or prominent redox concentrations occurring as soft masses and/or pore linings.

S6. Stripped Matrix. A layer starting within 15 cm (6 inches) of the soil surface in which iron-manganese oxides and/or organic matter have been stripped from the matrix and the primary base color of the soil material has been exposed. The stripped areas and translocated oxides and/or organic matter form a faintly contrasting pattern of two or more colors with diffuse boundaries. The stripped zones are 10% or more of the volume and are rounded.

S7. Dark Surface. A layer 10 cm (4 inches) or more thick starting within the upper 15 cm (6 inches) of the soil surface and with a matrix value ≤3 and chroma ≤1, and (see *Organic Masking Requirement*).

S8. Polyvalue Below Surface. A layer with value ≤3 and chroma ≤1 or less, starting within 15 cm (6 inches) of the soil surface, and (see *Organic Masking Requirement*). Directly below this layer, 5% or more of the soil has value ≤3 and chroma ≤1, and the remainder of the soil volume has value ≥4 and chroma

≤1 to a depth of 30 cm (12 inches) or to the spodic horizon, whichever is less.

S9. Thin Dark Surface. A layer 5 cm (2 inches) or more thick within the upper 15 cm (6 inches) of the soil, with value ≤3 or less and chroma ≤1, and ((see *Organic Masking Requirement*). This layer is underlain by a layer(s) with a value ≤4 and chroma ≤1 to a depth of 12 in. (30 cm) or to the spodic horizon, whichever is less.

LOAMY & CLAYEY SOILS -- *These soils have USDA textures of loamy very fine sand and finer. All mineral layers above any of the F Indicators, except for Indicators F8, F12, & F19 have a dominant chroma ≤2, or the layer(s) with a dominant chroma >2 is less than 15 cm (6 inches) thick.*

F2. Loamy Gleyed Matrix. A gleyed matrix that occupies 60% or more of a layer starting within 30 cm (12 inches) of the soil surface.

F3. Depleted Matrix. A layer that has a depleted matrix with 60% or more chroma ≤2 and that has a minimum thickness of either:
a. 5 cm (2 inches) if the 5 cm is entirely within the upper 15 cm (6 inches) of the soil, or
b. 15 cm (6 inches), starting within 25 cm (10 inches) of the soil surface.

F6. Redox Dark Surface. A layer that is at least 10 cm (4 inches) thick, is entirely within the upper 30 cm (12 inches) of the mineral soil, and has:
a. Matrix value ≤3 and chroma ≤1 and 2% or more distinct or prominent redox concentrations occurring as soft masses or pore linings, or
b. Matrix value ≤3 and chroma ≤2 and 5% or more distinct or prominent redox concentrations occurring as soft masses or pore linings.

F7. Depleted Dark Surface. Redox depletions with value ≥5 and chroma ≤2 in a layer that is at least 10 cm (4 inches) thick, is entirely within the upper 30 cm (12 inches) of the mineral soil, and has:
a. Matrix value ≤3 and chroma ≤1 and 10% or more redox depletions, or
b. Matrix value ≤3 and chroma ≤2 and 20% or more redox depletions.

F8. Redox Depressions. In closed depressions subject to ponding, 5% or more distinct or prominent redox concentrations occurring as soft masses or pore linings in a layer that is 5 cm (2 inches) or more thick and is entirely within the upper 15 cm (6 inches) of the soil.

**POTENTIAL INDICATORS
FOR PROBLEMATIC SOILS
(See Chapter5 Regional Supplement)**

“In general, wetland determinations on difficult or problematic sites must be based on the best information available to the field inspector. Interpreted in light of his or her professional experience and knowledge of the ecology of wetlands in the region” – Regional Supplement

A10. 2 cm Muck. (for use in MLRA 149B, Long Island/Cape Cod subregion). A layer of muck 2 cm. (0.75 inch) or more thick with value ≤3 and chroma ≤1 and starting within 15 cm. (6 inches) of the soil surface

A16. Coast Prairie Redox. (NOT for use in MLRA 149B, Long Island/Cape Cod subregion) a layer starting within 15 cm (6 inches) of the soil surface that is at least 10 cm. (4 inches) thick and has a matrix chroma ≤3 and 2% or more distinct or prominent redox concentrations occurring as soft masses and/pr pore linings.

S3. 5 cm Mucky Peat or Peat. (NOT for use in MLRA 149B, Long Island/Cape Cod subregion). (Primarily in *Interdunal Swales*). A layer of mucky peat or peat 5 cm (2 inches) or more thick with value ≤ and chroma ≤2, starting within 15 cm (6 inches) of the soil surface, and underlain by sandy soil material.

POTENTIAL INDICATORS
FOR PROBLEMATIC SOILS
(continued)

F12. Iron-Manganese Masses. (NOT for use in MLRA 149B, Long Island/Cape Cod subregion). On floodplains, a layer 4 in. (10 cm) or more thick with 40% or more chroma ≤ 2 and 2% or more distinct or prominent redox concentrations occurring as soft iron/manganese masses with diffuse boundaries. The layer occurs entirely within 12 in. (30 cm) of the soil surface. Iron-manganese masses have value and chroma ≤ 3 . Most commonly, they are black. The thickness requirement is waived if the layer is the mineral surface layer.

F19. Piedmont Floodplain Soils. (for use in MLRA 149B, Long Island/Cape Cod subregion). On active floodplains, a mineral layer at least 6 in. (15 cm) thick starting within 10 in. (25 cm) of the soil surface with a matrix (60% or more of the volume) chroma < 4 and 20% or more distinct or prominent redox concentrations occurring as soft masses or pore linings.

F21. Red Parent Material. A layer derived from red parent materials (see glossary) that is at least 10 cm (4 inches) thick, starting within 25 cm (10 inches) of the soil surface with a hue of 7.5YR or redder. The matrix has a value and chroma > 2 and less ≤ 4 . The layer must contain 10% or more depletions and/or distinct or prominent redox concentrations occurring as soft masses or pore linings. Redox depletions should differ in color by having:

- a. Value one or more higher and chroma one or more lower than the matrix, or
- b. Value ≥ 4 and chroma ≤ 2 .

TA6. Mesic Spodic. A layer 5 cm (2 inches) or more thick starting within 15 cm (6 inches) of the mineral soil surface that has value ≤ 3 and chroma ≤ 2 that is underlain by either:

- a. a layer(s) 8cm (3 inches) or more thick occurring within 30 cm (12 inches) of the mineral soil surface that has value and chroma ≤ 3 that shows evidence of spodic development; or
- b. a layer(s) 5 cm (2 inches) or more thick occurring within 30 cm (12 inches) of the mineral soil surface that has value > 4 and chroma ≤ 2 that is directly

underlain by a layer(s) 8cm (3 inches) or more thick with value ≤ 3 and chroma ≤ 3 that shows evidence of spodic development.

TF12. Very Shallow Dark Surface. In depressions and other concave landforms, one of the following:

- a. If bedrock occurs between depths of 15cm (6 in) and 25cm (10 in), a layer at least 15cm (6 in) thick starting within 10cm (4 in) of the soil surface and having value ≤ 3 or less and chroma ≤ 1 ; the remaining soil to bedrock must have the same colors as above or any other color that has chroma ≤ 2 .
- b. If bedrock occurs within a depth of 15cm (6 in), more than half of the soil thickness must have value ≤ 3 and chroma ≤ 1 and the remaining soil to bedrock must have the same colors as above or any other color that has chroma ≤ 2 .

COMBINING INDICATORS

It is permissible to combine certain hydric soil indicators if all requirements of the individual indicators are met **except** thickness (see Hydric Soil Technical Note 4, <http://soils.usda.gov/use/hydric/ntchs/tech_notes/index.html>. The most restrictive requirements for thickness of layers in any indicators used must be met.

CONTRAST -- DISTINCT OR PROMINENT

Any feature which has a contrast higher than the upper threshold for faint is considered to be either distinct or prominent. If an indicator requires distinct or prominent features, then those features which are at or below the upper threshold for faint do not count.

Upper Threshold for Faint		
Δ Hue	Δ Value	Δ Chroma
0	≤ 2	≤ 1
1	≤ 1	≤ 1
2	0	0
Hue	Value	Chroma
Any	≤ 3	≤ 2

User Notes in the supplement have significant additions to address some soil forming factors that may be unique to our formerly glaciated region – those notes are not presented here

HYDRIC SOILS INDICATORS
Used only in New England with *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: North Central & Northeast (Version 2.0)*
January 2012

“To use these indicators properly, a basic knowledge of soil/landscape relationships is necessary” – Regional Supplement

The Relevant Soil Surface** -- for indicators A1 (Histosol), A2 (Histic Epipedon), A3 (Black Histic), and S3 (5 cm Mucky Peat or Peat) depths are measured from the top of the organic material (peat, mucky peat, or muck); otherwise, in LRR R depths are measured from the top of the mineral surface, and in LRR S depths are measured from the top of the muck, or mineral surface, when muck is absent.
****Note** -- *this language attempts to capture the overriding concepts in NTCHS Indicators V 7.0*

IMPORTANT DEFINITIONS

Layer(s): A horizon, subhorizon, or combination of contiguous horizons or subhorizons sharing at least one property referred to in the indicators.

Depleted matrix. For loamy and clayey material, (and sandy material for the application of Indicators A11 and A12), a depleted matrix refers to the volume of a soil horizon or subhorizon in which the processes of reduction and translocation have removed or transformed iron, creating colors of low chroma and high value. A, E, and calcic horizons may have low chromas and high values and may therefore be mistaken for a depleted matrix; however, they are excluded from the concept of depleted matrix unless the soil has common or many distinct or prominent redox concentrations occurring as soft masses or pore linings. In some areas the depleted matrix may change color upon exposure to air (See Reduced matrix); this phenomenon is included in the concept of depleted matrix.

The following combinations of value and chroma identify a depleted matrix:

- 1. Matrix value ≥ 5 and chroma ≤ 1 with or without redox concentrations occurring as soft masses and/or pore linings; or
- 2. Matrix value ≥ 6 and chroma ≤ 2 with or without redox concentrations occurring as soft masses and/or pore linings; or
- 3. Matrix value of 4 or 5 and chroma of 2 and 2% or more distinct or prominent redox concentrations occurring as soft masses and/or pore linings; or
- 4. Matrix value of 4 and chroma of 1 and 2% or more distinct or prominent redox concentrations occurring as soft masses and/or pore linings.

Gleyed matrix. Soils with a gleyed matrix have the following combinations of hue, value, and chroma (the soils are not glauconitic):

- 1. 10Y, 5GY, 10GY, 10G, 5BG, 10BG, 5B, 10B, or 5PB with value ≥ 4 and chroma of 1; or
- 2. 5G with value ≥ 4 and chroma of 1 or 2; or
- 3. N with value ≥ 4 ; or in some places the gleyed matrix may change color upon exposure to air. (See Reduced matrix). This phenomenon is included in the concept of gleyed matrix.

Mucky modified mineral soil material. A USDA soil texture modifier, e.g., mucky sand. mucky modified mineral soil material that has 0% clay has between 5 and 12% organic carbon. Mucky modified mineral soil material that has 60% clay has between 12 and 18% organic carbon. Soils with an intermediate amount of clay have intermediate amounts of organic carbon. Where the organic component is peat (fibric material) or mucky peat (hemic material), mucky mineral soil material does not occur.

Reduced matrix. A soil matrix that has low chroma and high value, but in which the color changes in hue or chroma when the soil is exposed to air. See Vepraskas (1994) for a complete discussion.

Organic Masking Requirement – the relevant sandy layer has at least 70% of the visible soil particles masked with organic material, when viewed through a 10x or 15x hand lens. Observed without a hand lens, the particles appear to be close to 100% masked.