

**LRRs N, P, T, U, and Z Hydric Soil Indicators for finding *BOUNDARIES*:** Use these indicators to find where the hydric soil ends and the upland begins. Revised 9/13//2005 by MJV. Updates can be found at: <http://www.soil.ncsu.edu/wetlands>. [*Corresponding indicator found in '87 Corps Manual*]

### Indicators for All Soils

These indicators are to be used for all soils regardless of texture.

**A5. Stratified layers.** *For use in all LRRs.* Several stratified layers starting within the upper 15 cm (6 in.) of the soil surface. One or more of the layers has value 3 or less with chroma 1 or less and/or it is muck, mucky peat, peat, or mucky modified mineral texture. The remaining layers have value 4 or more and chroma 2 or less. [*None*]

**A6. Organic bodies.** *For use in LRRs P, T, U, and Z.* Presence of 2% or more organic bodies of muck or a mucky modified mineral texture, approximately 1 to 3 cm (0.5 to 1 in.) in diameter, starting within 15 cm (6 in.) of the soil surface. [*Sandy soil-a*]

**A7. 5 cm Mucky Mineral.** *For use in LRRs P, T, U, and Z.* A mucky modified mineral surface layer 5 cm (2 in.) or more thick starting within 15 cm (6 in.) of the soil surface. [*Sandy soil-a*]

**A8. Muck Presence.** *For use in LRRs U, and Z.* A layer of muck with value 3 or less and chroma 1 or less within 15 cm (6 in.) of the soil surface. [*Sandy soil-a*]

**A9. 1 cm Muck.** *For use in LRRs P and T.* A layer of muck 1 cm (0.5 in.) thick, with value 3 or less and chroma 1 or less within 15 cm (6 in.) of the soil surface. [*Sandy soil-a*]

**A10. 2 cm Muck.** *For use in LRR N.* A layer of muck 2 cm (0.75 in.) or more thick with value 3 or less and chroma 1 or less starting within 15 cm (6 in.) of the soil surface. [*Sandy soil-a*]

### Indicators for Sandy Soils

These indicators are to be used for soil materials with a sandy USDA texture.

**S1. Sandy Mucky Mineral.** *For use in all LRR's.* A mucky modified mineral surface layer 5 cm (2 in.) or more thick starting within 15 cm (6 in.) of the soil surface. [*Sandy soil-a*]

**S5. Sandy Redox.** *For use in all LRRs.* A layer starting within 15 cm (6 in.) of the soil surface that is at least 10 cm (4in.) thick, and has a matrix with 60% or more of its volume chroma 2 or less, with 2% or more distinct or prominent redox concentrations as soft masses and/or pore linings. [*Non-Sandy soil-f(2)*]

**S6. Stripped Matrix.** *For use in all LRRs.* A layer starting within 15 cm (6 in.) of the soil surface in which iron/manganese oxides and/or organic matter have been stripped from the matrix exposing the primary base color of soil materials. The stripped areas and translocated oxides and/or organic matter form a diffuse splotchy pattern of two or more colors. The stripped zones are 10% or more of the volume; they are rounded and approximately 1 to 3 cm (0.5 to 1 in.) in diameter. [*Non-sandy-f(2)?*]

**S7. Dark Surface.** *For use in all LRRs.* A layer 10 cm (4 in.) or more thick starting within the upper 15 cm (6 in.) of the soil surface with a matrix value 3 or less and chroma 1 or less. At least 70% of the visible soil particles must be covered, coated, or similarly masked with organic material. The matrix color of the layer immediately below the dark layer must have chroma 2 or less. [*Sandy soil-a*]

### Indicators for Loamy and Clayey Soils

Indicators used for loamy very fine sand and finer textures.

**F1. Loamy Mucky Mineral.** *For use in all LRR's except P, T, U, and Z which use A7.* A mucky modified mineral surface layer 10 cm (4 in.) or more thick starting within 15 cm (6 in.) of the soil surface.. [*Sandy-a*]

**F3. Depleted [Gray] Matrix.** *For use in all LRRs.* A layer at least 15 cm (6 in.) thick with a depleted matrix that has 60% or more chroma 2 or less starting within 25 cm (10 in.) of the surface. The minimum thickness is 5 cm (2 in.) if the depleted matrix is within 15 cm (6 in.) of the soil surface. **If A or E horizons are used as part of the depleted matrix, then these horizons must always have common to many, distinct or prominent redox concentrations.** The following combinations identify a depleted matrix: [*Non-sandy f(2)*]

### F3 For B or C Horizons

1. Matrix value 5 or more and chroma 1 or less, with or without redox concentrations as soft masses and/or pore linings; or
2. Matrix value 6 or more and chroma 2 or less, with or without redox concentrations as soft masses and/or pore linings; or
3. Matrix value 4 or 5 and chroma 2, and 2 % or more distinct or prominent redox concentrations as soft masses and/or pore linings; or
4. Matrix value 4 and chroma 1, and 2 % or more distinct or prominent redox concentrations as soft masses and/or pore linings.

### F3 For A or E Horizons

5. Matrix value 5 or more and chroma 1 or less, with 2% or more redox concentrations; or
6. Matrix value 6 or more and chroma 2 or less, with 2% or more redox concentrations; or
7. Matrix value 4 or 5 and chroma 2, and 2 % or more distinct or prominent redox concentrations; or
8. Matrix value 4 and chroma 1, and 2 % or more distinct or prominent redox concentrations.

**F8. Redox Depressions.** *For use in all LRRs except U.* In closed depressions subject to ponding, 5% or more distinct or prominent pore linings in a layer 5 cm (2 in.) or more thick entirely within the upper 15 cm (6 in.) of the soil surface. [*Non-sandy f(2)*]

**F12. Iron/manganese masses.** *For use all LRRs.* On flood plains, a layer 10 cm (4 in.) or more thick with 40% or more of the volume with value 5 or more and chroma 2 or less, and 2% or more distinct or prominent redox concentrations as soft Fe/Mn masses with diffuse boundaries. The layer occurs entirely within 30 cm (12 in.) of the soil surface. Fe/Mn masses have value 3 or less and chroma 3 or less. Most commonly they are black. **Thickness waived if at surface.** [*Non-sandy-f(2)*]

**F13. Umbric [Black] Surface.** *For use in LRRs P, T and U.* In depressions and other concave landforms, a layer 15 cm (6 in.) or more thick starting within the upper 15 cm (6 in.) of the soil surface with value 3 or less and chroma 1 or less, immediately underlain by a layer 10 cm(4 in.) or more thick with chroma 2 or less. [*Non-sandy f(2)?, Sandy soils-a*]

**LRRs N, P, T, U, and Z Identification and Test Hydric Soil Indicators for CENTERS:** This second group are often used to identify hydric soils, but because they are maximum expressions of reduction, they are rarely used for finding boundaries. Revised by MJV 9/13/2005. **[Corresponding indicator found in '87 Corps Manual]**

### Indicators for All Soils

**A1. Histosol (Organic Soil).** For use in all LRRs. Classifies as a Histosol, excluding Folists. Organic soil material greater than 41 cm (16 in.) thick. May be peat (Oi), mucky peat (Oe), or muck (Oa). **[Non-sandy a]**

Note: Peat is also called fibric material, mucky peat is hemic material, and muck is sapric material.

**A2. Histic Epipedon.** For use in all LRRs. A histic epipedon. Organic soil material (in either Oa, Oe, or Oi horizons) between 20 to 41 cm (8 to 16 in.) thick. **[Non-sandy b]**

**A3. Black Histic.** For use in all LRRs. A layer of peat, mucky peat, or muck 20 to 40 cm (8 to 16 in.) or more thick starting within the upper 15 cm (6 in.) of the soil surface having hue 10YR or yellower, value 3 or less, and chroma 1 or less. **[Non-sandy b]**

**A4. Hydrogen Sulfide.** For use in all LRRs. A hydrogen sulfide odor (rotten egg smell) within 30 cm (12 in.) of the soil surface. **[Non-sandy c]**

**A11. Depleted Below Dark Surface.** For use in all LRRs. A layer at least 15 cm (6 in.) thick with a depleted matrix that has 60% or more chroma 2 or less starting within 30 cm (12 in.) of the surface. Loamy/clayey layer(s) above the depleted matrix have value 3 or less and chroma 2 or less. Sandy layers above the depleted matrix have value 3 or less, chroma 1 or less, and at least 70% of visible particles coated with organic material. **DEPLETED MATRIX REQUIRES SAME COLORS AS FOR F3 SHOWN ON REVERSE SIDE OF SHEET. [Non-sandy f(2), Sandy soil-a]**

**A12. Thick Dark Surface.** For use in all LRRs. A layer at least 15 cm (6 in.) thick with a depleted matrix that has 60% or more chroma 2 or less (or a gleyed matrix) starting below 30 cm (12 in.) from the surface. The layer(s) above the depleted or gleyed matrix have value 2.5 or less to a depth of 30 cm (12 in.), and value 3 or less and chroma 1 or less in the remainder of the dark surface layer. If the dark surface is sandy, then at least 70% of the visible soil particles must be covered with organic material. **DEPLETED MATRIX REQUIRES SAME COLORS AS FOR F3 SHOWN ON REVERSE SIDE OF SHEET. [Non-sandy f(2), Sandy soil-a]**

### Indicators for Sandy Soils

**S4. Sandy Gleyed Matrix.** For use in all LRRs. A gleyed matrix which occupies 60% or more of a layer starting within 15 cm (6 in.) of the soil surface. **[Check for Reducing soil conditions, and Non-sandy f(1)]**

Gley hues have the following hues and chromas; all need values of 4 or more:

- 10Y, 5GY, 10GY, 10G, 5BG, 10BG, 5B, 10B, or 5PB with chroma of 1; or
- 5G with chroma of 1 or 2; or
- N
- (for testing only) 5Y and chroma of 1.

Note: *Glauconitic materials excluded from Gleyed Matrix.*

**S8. Polyvalue Below Surface.** For use in LRR T. A layer with value 3 or less and chroma 1 or less starting within 15 cm (6 in.) of the soil surface underlain by a layer(s) where translocated organic matter unevenly

covers the soil material forming a diffuse splotchy pattern. At least 70% of the visible soil particles in the upper layer must be covered, coated, or masked with organic material. Immediately below this layer, the organic coating occupies 5% or more of the soil volume and has value 3 or less and chroma 1 or less. The remainder of the soil volume has value 4 or more and chroma 1 or less. **[Sandy soil-b]**

**S9. Thin Dark Surface.** For use in LRR T. A layer 5 cm (2 in.) or more thick within the upper 15 cm (6 in.) of the surface, with value 3 or less and chroma 1 or less. At least 70% of the visible soil particles in this layer must be covered, coated, or masked with organic material. This layer is underlain by a layer(s) with value 4 or less and chroma 1 or less to a depth of 30 cm (12 in.) or to the spodic horizon, whichever is less. **[Sandy soil-a]**

### Indicators for Loamy and Clayey Soils

**F2. Loamy Gleyed Matrix.** For use in all LRRs. A gleyed matrix that occupies 60% or more of a layer starting within 30 cm (12 in.) of the soil surface. **SEE GLEYED COLORS UNDER S4. [Non-sandy-f(1)]**

**F6. Redox Dark Surface.** For use in all LRRs. A layer at least 10 cm (4 in.) thick, with at least 10 cm of the layer within the upper 30 cm (12 in.) of the mineral soil, that has:

- a. matrix value 3 or less and chroma 1 or less and 2% or more distinct or prominent redox concentrations as soft masses or pore linings, or
- b. matrix value 3 or less and chroma 2 or less and 5% or more distinct or prominent redox

concentrations as soft masses or pore linings.

### **[Non-sandy f(2)]**

**F7. Depleted Dark Surface.** For use in all LRRs. Redox depletions, with value 5 or more and chroma 2 or less, in a layer at least 10 cm (4 in.) thick entirely within the upper 30 cm (12 in.) of the mineral soil that has:

- a. matrix value 3 or less and chroma 1 or less and 10% or more redox depletions, or
- b. matrix value 3 or less and chroma 2 or less and 20% or more redox depletions.

### **[Non-sandy f(2) ?]**

**F19. Piedmont Flood Plain Soils.** For use in MLRA's 149A and 148 of LRR S; for testing on flood plains subject to Piedmont deposition throughout LRRs P, S, and T. On active flood plains, a mineral layer at least 15 cm (6 in.) thick starting within 25 cm (10 in.) of the surface with 60% or more chroma less than 4, and 20% or more distinct or prominent redox concentrations as soft masses or pore linings.

### Test Indicators

**TF2. Red Parent Material.** For testing in LRRs N, P, and Z. In parent material with a hue of 7.5 YR or redder, a layer at least 10 cm (4 in.) thick with a matrix value 4 or less and chroma 4 or less and 2% or more redox depletions and/or redox concentrations as soft masses and/or pore linings. The layer is entirely within 30 cm (12 in.) of the soil surface. The minimum thickness requirement is 5 cm (2 in.) if the layer is the mineral surface layer. **[None]**

