

# Hydric Soils

Columbia County, Pennsylvania

| Map symbol and map unit name   | Component  | Percent of map unit | Landform                 | Hydric rating | Hydric criteria |
|--|------------|---------------------|--------------------------|---------------|-----------------|
| AaA:<br>Albrights gravelly silt loam, 0 to 3 percent slopes                            | Shelmadine | 2                   | Depressions              | Yes           | 2B3             |
| AaB2:<br>Albrights gravelly silt loam, 3 to 8 percent slopes, moderately eroded        | Shelmadine | 2                   | Depressions              | Yes           | 2B3             |
| AaC:<br>Albrights gravelly silt loam, 8 to 15 percent slopes                           | Shelmadine | 2                   | Depressions              | Yes           | 2B3             |
| AnB2:<br>Allis silt loam, neutral substratum, 3 to 8 percent slopes, moderately eroded | Allis      | 90                  | Depressions, Till plains | Yes           | 2B3             |
| ArA:<br>Alvira silt loam, 0 to 3 percent slopes  | Shelmadine | 10                  | Drainageways             | Yes           | 2B3             |
| ArB:<br>Alvira silt loam, 3 to 8 percent slopes  | Shelmadine | 8                   | Drainageways             | Yes           | 2B3             |
| AsB2:<br>Alvira shaly silt loam, 3 to 8 percent slopes, moderately eroded              | Shelmadine | 10                  | Depressions              | Yes           | 2B3             |
| AsC2:<br>Alvira shaly silt loam, 8 to 15 percent slopes, moderately eroded             | Shelmadine | 10                  | Depressions              | Yes           | 2B3             |
| At:<br>Atherton loam   | Atherton   | 65                  | Stream terraces          | Yes           | 2B3, 3          |
| Ba:<br>Barbour fine sandy loam   | Holly      | 2                   | Flood plains             | Yes           | 2B3, 3          |
| Bb:<br>Barbour gravelly loam   | Holly      | 3                   | Flood plains             | Yes           | 2B3, 3          |
| Bc:<br>Barbour silt loam   | Holly      | 5                   | Flood plains             | Yes           | 2B3, 3          |
| Bd:<br>Basher fine sandy loam  | Holly      | 5                   | Flood plains             | Yes           | 2B3, 3          |
| BrA:<br>Braceville loam, 0 to 3 percent slopes   | Atherton   | 5                   | Flood plains             | Yes           | 2B3             |
| BrB:<br>Braceville loam, 3 to 8 percent slopes   | Atherton   | 5                   | Flood plains             | Yes           | 2B3             |

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| <b>BuB:</b><br>Buchanan cobbly loam, 3 to 8 percent slopes                            | Andover       | 10                  | Depressions                           | Yes           | 2B3             |
| <b>BvB:</b><br>Buchanan very stony loam, 0 to 8 percent slopes                        | Shelmadine    | 8                   | Depressions                           | Yes           | 2B3             |
| <b>CfB2:</b><br>Canfield channery silt loam, 3 to 8 percent slopes, moderately eroded | Lickdale      | 5                   | Depressions                           | Yes           | 2B3             |
| <b>CIA:</b><br>Chippewa silt loam, 0 to 3 percent slopes                              | Chippewa      | 95                  | Depressions                           | Yes           | 2B3, 3          |
| <b>CnB:</b><br>Chippewa very stony silt loam, 0 to 8 percent slopes                   | Chippewa      | 100                 | Depressions                           | Yes           | 2B3, 3          |
| <b>Hs:</b><br>Holly silt loam   | Holly         | 80                  | Backswamps, Depressions, Flood plains | Yes           | 2B3             |
|   | Holly, ponded | 5                   | Flood plains                          | Yes           | 2B3, 3          |
| <b>Ln:</b><br>Lickdale silt loam  | Lickdale      | 100                 | Depressions                           | Yes           | 2B3             |
| <b>Lo:</b><br>Lickdale very stony silt loam   | Lickdale      | 100                 | Depressions                           | Yes           | 2B3, 3          |
| <b>MaB:</b><br>Mardin channery silt loam, 3 to 8 percent slopes                       | Chippewa      | 3                   | Depressions                           | Yes           | 2B3             |
| <b>MaC:</b><br>Mardin channery silt loam, 8 to 15 percent slopes                      | Chippewa      | 2                   | Depressions                           | Yes           | 2B3             |
| <b>Mb:</b><br>Middlebury fine sandy loam  | Holly         | 5                   | Flood plains                          | Yes           | 2B3, 3          |
| <b>Md:</b><br>Middlebury silt loam  | Holly         | 5                   | Flood plains                          | Yes           | 2B3, 3          |
| <b>MrB:</b><br>Morris channery silt loam, 3 to 8 percent slopes                       | Norwich       | 20                  | Depressions                           | Yes           | 2B3             |
| <b>MsB:</b><br>Morris very stony silt loam, 0 to 8 percent slopes                     | Norwich       | 20                  | Depressions                           | Yes           | 2B3             |

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| Mu:<br>Mucky peat  | Mucky peat | 90                  | Depressions                           | Yes           | 1, 3            |
| Pa:<br>Papakating silty clay loam  | Papakating | 95                  | Flood plains                          | Yes           | 2B3, 3, 4       |
| PkA:<br>Pekin silt loam, cobbly variant, 0 to 3 percent slopes                     | Atherton   | 5                   | Stream terraces                       | Yes           | 2B3, 3          |
| PkB2:<br>Pekin silt loam, cobbly variant, 3 to 8 percent slopes, moderately eroded | Atherton   | 5                   | Stream terraces                       | Yes           | 2B3, 3          |
| RaA:<br>Ravenna channery silt loam, 0 to 3 percent slopes                          | Lickdale   | 5                   | Depressions                           | Yes           | 2B3             |
| RaB:<br>Ravenna channery silt loam, 3 to 8 percent slopes                          | Lickdale   | 5                   | Depressions                           | Yes           | 2B3             |
| Rw:<br>Riverwash   | Holly      | 10                  | Backswamps, Depressions, Flood plains | Yes           | 2B3, 3          |
| SdA:<br>Shelmadine silt loam, 0 to 3 percent slopes                                | Shelmadine | 80                  | Drainageways                          | Yes           | 2B3             |
| SdB2:<br>Shelmadine silt loam, 3 to 8 percent slopes, moderately eroded            | Shelmadine | 80                  | Drainageways                          | Yes           | 2B3             |
| Sh:<br>Shelmadine very stony silt loam   | Shelmadine | 80                  | Depressions                           | Yes           | 2B3             |
| Tf:<br>Tioga fine sandy loam   | Holly      | 5                   | Backswamps, Depressions, Flood plains | Yes           | 2B3             |
| Tg:<br>Tioga gravelly loam   | Holly      | 2                   | Backswamps, Depressions, Flood plains | Yes           | 2B3             |
| Ts:<br>Tioga silt loam   | Holly      | 5                   | Backswamps, Depressions, Flood plains | Yes           | 2B3             |

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| Tt:<br>Tioga silt loam, high bottom  | Holly      | 2                   | Backswamps, Depressions, Flood plains | Yes           | 2B3             |
| VoB:<br>Volusia channery silt loam, 0 to 8 percent slopes                        | Chippewa   | 20                  | Depressions                           | Yes           | 2B3             |
| WbA:<br>Watson silt loam, 0 to 3 percent slopes                                  | Shelmadine | 5                   | Drainageways                          | Yes           | 2B3             |
| WbB2:<br>Watson silt loam, 3 to 8 percent slopes, moderately eroded              | Shelmadine | 5                   | Drainageways                          | Yes           | 2B3             |
| WbC2:<br>Watson silt loam, 8 to 15 percent slopes, moderately eroded             | Shelmadine | 2                   | Drainageways                          | Yes           | 2B3             |
| WfB2:<br>Wellsboro channery silt loam, 3 to 8 percent slopes, moderately eroded  | Norwich    | 3                   | Valley sides                          | Yes           | 2B3             |
| WfC2:<br>Wellsboro channery silt loam, 8 to 15 percent slopes, moderately eroded | Norwich    | 2                   | Valley sides                          | Yes           | 2B3             |
| WhB:<br>Wellsboro very stony silt loam, 0 to 8 percent slopes                    | Norwich    | 3                   | Depressions                           | Yes           | 2B3             |
| WhD:<br>Wellsboro very stony silt loam, 8 to 25 percent slopes                   | Norwich    | 1                   | Depressions                           | Yes           | 2B3             |
| WnA:<br>Wiltshire silt loam, 0 to 3 percent slopes                               | Allis      | 5                   | Depressions, Till plains              | Yes           | 2B3             |
| WnB2:<br>Wiltshire silt loam, 3 to 8 percent slopes, moderately eroded           | Allis      | 5                   | Depressions, Till plains              | Yes           | 2B3             |
| WnC2:<br>Wiltshire silt loam, 8 to 15 percent slopes, moderately eroded          | Allis      | 5                   | Depressions, Till plains              | Yes           | 2B3             |
| Zp:<br>Zipp silt loam  | Zipp       | 90                  | Depressions                           | Yes           | 2B3             |

Explanation of hydric criteria codes:

1. All Histels except for Folistels, and Histosols except for Folistels.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:

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- A. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or
- B. are poorly drained or very poorly drained and have either:
  - 1.) a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
  - 2.) a water table at a depth of 0.5 foot or less during the growing season if permeability is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
  - 3.) a water table at a depth of 1.0 foot or less during the growing season if permeability is less than 6.0 in/hr in any layer within a depth of 20 inches.
- 3. Soils that are frequently ponded for long or very long duration during the growing season.
- 4. Soils that are frequently flooded for long or very long duration during the growing season.

This table lists the map unit components that are rated as hydric soils in the survey area. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and Vasilas, 2006).

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for all of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units that are dominantly made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units dominantly made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

The criteria for hydric soils are represented by codes in the table (for example, 2B3). Definitions for the codes are as follows:

- 1. All Histels except for Folistels, and Histosols except for Folists.
- 2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
  - A. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or
  - B. are poorly drained or very poorly drained and have either:
    - 1) a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
    - 2) a water table at a depth of 0.5 foot or less during the growing season if saturated hydraulic conductivity (Ksat) is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
    - 3) a water table at a depth of 1.0 foot or less during the growing season if saturated hydraulic conductivity (Ksat) is less than 6.0 in/hr in any layer within a depth of 20 inches.
- 3. Soils that are frequently ponded for long or very long duration during the growing season.
- 4. Soils that are frequently flooded for long or very long duration during the growing season.

### References:

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and

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Wildlife Service FWS/OBS-79/31.

Federal Register. September 18, 2002. Hydric soils of the United States.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.