

Hydric Soils

Carlton County, Minnesota

[This report lists only those map unit components that are rated as hydric. Dashes (---) in any column indicate that the data were not included in the database. Definitions of hydric criteria codes are included at the end of the report]

Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
21:					
Ahmeek loam, 0 to 2 percent slopes	Parent	2	Depressions	Yes	2B3, 3
	Twig	2	Depressions	Yes	2B3, 3
21C:					
Ahmeek loam, 2 to 12 percent slopes	Parent	2	Depressions	Yes	2B3, 3
	Twig	2	Depressions	Yes	2B3, 3
43:					
Automba fine sandy loam, 0 to 2 percent slopes	Wet soils	3	Depressions	Yes	2B3, 3
43B:					
Automba fine sandy loam, 2 to 6 percent slopes	Very poorly drained soils	3	Depressions	Yes	2B3, 3
147:					
Spooner silt loam	Spooner	90	Flats, Lake plains	Yes	2B3
	Very fine sand to very fine sandy loam throughout	5	Flats	Yes	2B2
	Very poorly drained soils	5	Depressions	Yes	2B3, 3
186:					
Nemadji fine sand	Newson	5	Depressions	Yes	2B2, 3
188:					
Omega loamy sand, 0 to 2 percent slopes	Newson	3	Depressions	Yes	2B2, 3
188C:					
Omega loamy sand, 2 to 12 percent slopes	Newson	4	Depressions	Yes	2B2, 3
204:					
Warba fine sandy loam	Alstad variant	5	Depressions	Yes	2B3, 3
254:					
Hibbing silt loam, 0 to 2 percent slopes	Blackhoof	5	Depressions	Yes	2B3, 3
	Mahtowa	5	Depressions	Yes	2B3, 3
254C:					
Hibbing silt loam, 2 to 12 percent slopes	Blackhoof	3	Depressions	Yes	2B3, 3
	Mahtowa	3	Depressions	Yes	2B3, 3

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268: Cromwell sandy loam, 0 to 2 percent slopes	Newson	3	Depressions	Yes	2B2, 3
268B: Cromwell sandy loam, 2 to 6 percent slopes	Newson	3	---	Yes	2B2, 3
274: Newson mucky loamy sand	Newson	90	Depressions, Outwash plains	Yes	2B2, 3
	Sandy loam surface	10	Depressions	Yes	2B3, 3
292: Alstad fine sandy loam	Very poorly drained soils	5	Depressions	Yes	2B3, 3
303: Ontonagon silty clay, 0 to 2 percent slopes	Bergland	10	Depressions	Yes	2B3, 3
303C: Ontonagon silty clay, 2 to 12 percent slopes	Wet alluvial soils	10	Drainageways	Yes	2B3
303E: Ontonagon silty clay, 12 to 25 percent slopes	Wet alluvial soils	10	Drainageways	Yes	2B3
305: Bergland clay	Bergland	90	Depressions, Moraines	Yes	2B3, 3
337: Warman mucky loam	Warman	90	Depressions, Outwash plains	Yes	2B3, 3
355: Cloquet fine sandy loam, 0 to 2 percent slopes	Warman	3	Depressions	Yes	2B3, 3
355C: Cloquet fine sandy loam, 2 to 12 percent slopes	Warman	3	Depressions	Yes	2B3, 3
367: Campia silt loam, 0 to 2 percent slopes	Spooner	3	Flats	Yes	2B3
502: Dusler silt loam	Blackhoof	4	Depressions	Yes	2B3, 3
	Mahtowa	3	Depressions	Yes	2B3, 3

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504:					
Duluth very fine sandy loam, 0 to 2 percent slopes	Blackhoof	3	Depressions	Yes	2B3, 3
	Mahtowa	3	Depressions	Yes	2B3, 3
504C:					
Duluth very fine sandy loam, 2 to 12 percent slopes	Blackhoof	4	Depressions	Yes	2B3, 3
	Mahtowa	3	Depressions	Yes	2B3, 3
530:					
Greenwood mucky peat	Greenwood	90	Bogs	Yes	1
	Besman	3	Bogs	Yes	1, 3
	Dawson	3	Bogs	Yes	1, 3
	Loxley	2	Bogs	Yes	1, 3
531:					
Beseman muck	Beseman	90	Bogs	Yes	1, 3
	Dawson	5	Bogs	Yes	1, 3
	Loxley	5	Bogs	Yes	1, 3
533:					
Loxley muck	Loxley	90	Bogs	Yes	1, 3
	Beseman	4	Bogs	Yes	1, 3
	Dawson	3	Bogs	Yes	1, 3
	Greenwood	3	Bogs	Yes	1, 3
534:					
Mooselake mucky peat	Mooselake	90	Swamps	Yes	1, 3
	Beseman	5	Bogs	Yes	1, 3
535:					
Merwin mucky peat	Merwin	90	Bogs	Yes	1, 3
	Beseman	5	Bogs	Yes	1, 3
	Greenwood	5	Bogs	Yes	1, 3

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536:					
Dawson muck	Dawson	90	Bogs	Yes	1, 3
	Loxley	4	Bogs	Yes	1, 3
	Thin organic layers over mineral	3	Bogs	Yes	1, 3
537:					
Lobo peat	Lobo	90	Bogs	Yes	1
	Greenwood	5	Bogs	Yes	1, 3
	Waskish	5	Bogs	Yes	1
538:					
Waskish peat	Waskish	90	Bogs	Yes	1
	Greenwood	5	Bogs	Yes	1, 3
	Lobo	5	Bogs	Yes	1
549:					
Greenwood peat	Greenwood	90	Bogs	Yes	1
	Beseman	3	Bogs	Yes	1, 3
	Lobo	3	Bogs	Yes	1
	Dawson	2	Bogs	Yes	1, 3
	Loxley	2	Bogs	Yes	1, 3
975:					
Ahmeek-Omega complex, 0 to 2 percent slopes	Wet areas	5	Depressions	Yes	2B3, 3
975C:					
Ahmeek-Omega complex, 2 to 12 percent slopes	Wet areas	5	Depressions	Yes	2B3, 3
975E:					
Ahmeek-Omega complex, 12 to 25 percent slopes	Wet areas	5	Depressions	Yes	2B3, 3
976C:					
Campia-Ontonagon complex, 2 to 12 percent slopes	Poorly drained soils	15	Drainageways	Yes	2B3

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980: Blackhoof and Mahtowa soils	Blackhoof	45	Depressions, Moraines	Yes	2B3, 3
	Mahtowa	45	Depressions, Moraines	Yes	2B3, 3
	Beseman	10	Depressions	Yes	1, 3
990: Twig and Parent soils	Parent	45	Depressions, Moraines	Yes	2B3, 3
	Twig	45	Depressions, Moraines	Yes	2B3, 3
	Beseman	5	Depressions	Yes	1, 3
1005: Fluvaquents	Fluvaquents	90	Flood plains	Yes	2B3, 4
1020: Udorthents	Fluvaquents	10	Drainageways	Yes	2B3
1073: Borofolists	Thin muck soils over bedrock	5	Swales	Yes	2B3
1074: Borosapristis	Borosapristis	90	Depressions, Moraines	Yes	1, 3
	Terric organic soils	5	Depressions	Yes	1, 3
V292: Alstad variant loam	Alstad, variant	90	Depressions, Moraines	Yes	2B3, 3
	Histic surface layer	5	Depressions	Yes	2B3, 3
V337: Warman fine sandy loam	Warman mucky loam	4	Depressions	Yes	2B3, 3

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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 others, 2002).

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, 2003) 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 others, 2002).

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 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.

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 Wildlife Service FWS/OBS-79/31.
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- 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.
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- 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.