EAU GALLE PROJECT
MASTER PLAN

APPENDIX D

WETLAND DELINEATION

SPRING VALLEY, WISCONSIN

August 2019

US Army Corps of Engineers ®
St. Paul District

St. Paul District
Regulatory Branch

August 2018

MEMORANDUM

SUBJECT: *Wetland Delineation for Eau Galle Recreation Area*
St. Croix and Pierce Counties, Wisconsin

1. Introduction.

The U.S. Army Corps of Engineers, St. Paul District Regulatory Branch conducted a wetland delineation of the Eau Galle Recreation Area on behalf of the MVP Operations, Recreation and Natural Resources (RNR) Branch (Mississippi River and Eau Galle Section) for the 2018 update to the Eau Galle Master Plan. The purpose of this memorandum is to document the methods used and conclusions made regarding the extent of wetlands present at the Eau Galle project.

The area of investigation (AOI) for the Eau Galle Project (Project) encompasses approximately 648.3 acres, and is located in parts of Sections 5 and 6 of Township 27 N., Range 15 W., and Sections 31 and 32 of Township 28 N., Range 15 W., immediately north of the village of Spring Valley, St. Croix and Pierce Counties, Wisconsin.

2. Methods and Materials.

The wetland delineation was conducted using a combination of on-site and off-site methods detailed below.

On-site procedures were conducted in accordance with the 1987 *Corps of Engineers Wetlands Delineation Manual* (*Corps Manual*) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)* (U.S. Army Corps of Engineers 2010). The Corps team conducted the on-site data collection on June 14 and 29, and July 5, 6 and 18, 2018. Off-site wetland determination methods using aerial photography and elevation data, coupled with the field verification, were employed to determine the extent of wetlands.

The following resources were utilized for the wetland delineation:

- Google Earth true color aerial photography available as of 2018;
- Wisconsin Wetlands Inventory (WWI) mapping;
- USDA Web Soil Survey digital soil mapping;
- St. Croix County LiDAR data
- Trimble Geoexplorer XT GPS unit to record the locations of data points and wetland/upland boundaries during field investigation
- ArcMap 10.3.1 GIS program to digitize and display the results of the investigation.

In addition, the following methods were used:

a. Placing Observations of Hydrology in the Context of Antecedent Precipitation. *Hydrology Tools for Wetland Determination* (Woodward *et al*. 1997) and *Assessing and Using Meteorological Data to Evaluate Wetland Hydrology* (Sprecher and Warne 2000) recommend evaluation of precipitation for the 3 months prior to the date of field review. Direct observations of hydrology indicators made during the site visit were then placed in the context of antecedent precipitation.

3. Landscape and Soils.

The Eau Galle Project is located in the transition between the Western Prairie and Western Coulees and Ridges ecological landscape types, as defined by the Wisconsin DNR. The Western Prairie landscape type is to the North and West of the Project area and the Western Coulees and Ridges landscape type is immediately to the South of the Project area. The Western Prairie ecological landscape was entirely glaciated. Major landforms are rolling till plain, with end moraine and small areas of outwash. The Western Coulee and Ridges ecological landscape is characterized by its highly eroded, un-glaciated topography with steep sided valleys and ridges, high gradient headwaters streams, and large rivers with extensive, complex floodplains and terraces. Coolwater streams like the Eau Galle River are common in this ecological landscape.

The Project's landscape and valleys were formed from and following the last glaciation. Glacial meltwaters carved the valley approximately 50 feet deeper than its present level, and since glacial times the valley has filled with a mixture of alluvial and colluvial deposits. The valley fill consists of a thin cap of clays and silty clays overlying granular soils. The soils in the project area have been mapped by the Natural Resources Conservation Service (NRCS) (Langton 1978; NRCS 2015). Loess-based loamy soils that formed in a forested environment are dominant within the uplands. Slopes range from flat river channel filled with recent alluvium to upland landforms with varying degrees from moderate to steep. Some areas have thin to absent loess cover above glacial till and bedrock and glacial till outcrops are indicated to be located on steeper slopes.

Refer to the Appendix B for the Project soils information available from NRCS, all of which is available to the public in detail directly from the Web Soil Survey. Hydric soil mapping units and components of mapping units are mainly associated with the fluvial systems, or in depressions and drainageways on the dense glacial upland soils.

4. Wisconsin Wetland Inventory Mapping.

The Wisconsin Wetland Inventory (WWI) mapped approximately 87.0 acres of wetlands within the Project area, as shown in Appendix C.

5. Site Visits.

Data collection and field delineation of the wetland resources took place on June 14 and 29 and July 5, 6 and 18, 2018; field work is documented on data sheets available from the St. Paul District, Regulatory Branch upon request. Weather during each of the field reviews was clear and hot, with temperatures in the upper 80s to low 90s. Precipitation during the three months antecedent to the site visits was normal to drier than normal.

6. Results and Discussion.

Wetland resources were identified and delineated for the Project as shown in Appendix A. Within the AOI of the Project, sixteen wetlands (Table 1) were identified above the ordinary high water of the reservoir, within the valleys of the tributaries and within other lowland areas.

The delineation was based on evidence of the changes in vegetation, soils and topography between the wetland and upland areas. Along much of the reservoir, the immediately adjacent land has steep slopes with little to no wetlands along the landward edge. Upstream from the reservoir along the tributaries, steep slopes within the Project give way to an abrupt wetland boundary or to wetland/non-wetland mosaic floodplain in the lowlands. Dominant vegetation observed includes black willow (*Salix nigra*, OBL) and other willow species (*Salix spp.*), hairy-fruited sedge (*Carex trichocarpa*, OBL) and a diversity of other sedges (*Carex sp*.), forbs and grasses. Cattail species (*Typha spp*, OBL), common buckthorn (*Rhamnus cathartica,* FAC) and reed canary grass (*Phalaris arundinacea*, FACW) are the predominant invasive species present.

TABLE 1
Eau Galle Recreation Area Wetland Resources

Wetland Name	Type	Approximate Size in AOI (ac)
Wetland 1	Seasonally flooded basin, forested, and Fresh (Wet) Meadow	0.8
Wetland 2	Shallow to deep marsh	1.5
Wetland 3	Fresh (Wet) meadow	0.7
Wetland 4	Fresh (Wet) meadow	0.03
Wetland 5	Shallow marsh/shrub carr	0.8
Wetland 6	Fresh (Wet) meadow	0.4
Wetland 7	Shallow marsh	0.8
Wetland 8	Shallow to deep marsh	8.7
Wetland 9	Shallow marsh	4.3
Wetland 10	Shallow marsh/floodplain forest mosaic	16.3
Wetland 11	Fresh (Wet) meadow, sedge meadow, shrub carr	20.9
Wetland 12	Fresh (Wet) meadow	3.4
Wetland 13	Seasonally flooded basin, forested	0.1
Wetland 14	Sedge meadow	0.1
Wetland 15	Sedge meadow	0.05
Wetland 16	Fresh (Wet) meadow/shrub carr	1.5
Wetland 17	Fresh (Wet) meadow	2.4

Wetland types cited herein are based on the descriptions and key in Eggers and Reed (2015). Table 2 below compares these plant communities with the classification systems Cowardin *et al*. (1979) and that used by the WWI.

TABLE 2
Comparison of Wetland Classification Systems

Eggers and Reed (2015)	Cowardin et al. (1979)	WWI
Seasonally Flooded Basin	Palustrine; flat; emergent; persistent and nonpersistent	Flats/unvegetated wet soil; and persistent and nonpersistent, emergent/wet meadow
Floodplain Forest	Palustrine; forested; broad-leaved deciduous	Broad-leaved deciduous, forested
Fresh (Wet) Meadow	Palustrine; emergent; broad- and narrow-leaved persistent	Broad- and narrow-leaved persistent, emergent/wet meadow
Sedge Meadow	Palustrine; emergent; narrow-leaved persistent	Narrow-leaved persistent, emergent/wet meadow
Shallow Marsh	Palustrine; emergent; persistent and nonpersistent	Persistent and nonpersistent, emergent
Deep Marsh	Palustrine or lacustrine, littoral; aquatic bed; submergent, floating and floating-leaved; and emergent; persistent and nonpersistent	Aquatic bed, submergent , and floating; and persistent and nonpersistent, emergent
Shrub Carr	Palustrine; scrub/shrub; broad-leaved deciduous	Broad-leaved deciduous, scrub/shrub

7. Conclusion.

Based on the procedures described above, a preponderance of evidence demonstrates the extent of wetland areas within the Eau Galle Recreation Area project, as described herein and shown in Appendix A.

Corps of Engineers, St. Paul District Regulatory Branch Team for Eau Galle delineation:

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LITERATURE CITED

Cowardin, L., V. Carter, F. Golet and E. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. 103 pp.

Eggers, S. and D. Reed. 2015. *Wetland Plants and Plant Communities of Minnesota and Wisconsin, Version 3.2.* U.S. Army Corps of Engineers, St. Paul District, St. Paul, MN.

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U.S. Army Corps of Engineers. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0*, ed., J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-10-16. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

USDA, Web Soil Survey: http://websoilsurvey.nrcs.usda.gov/

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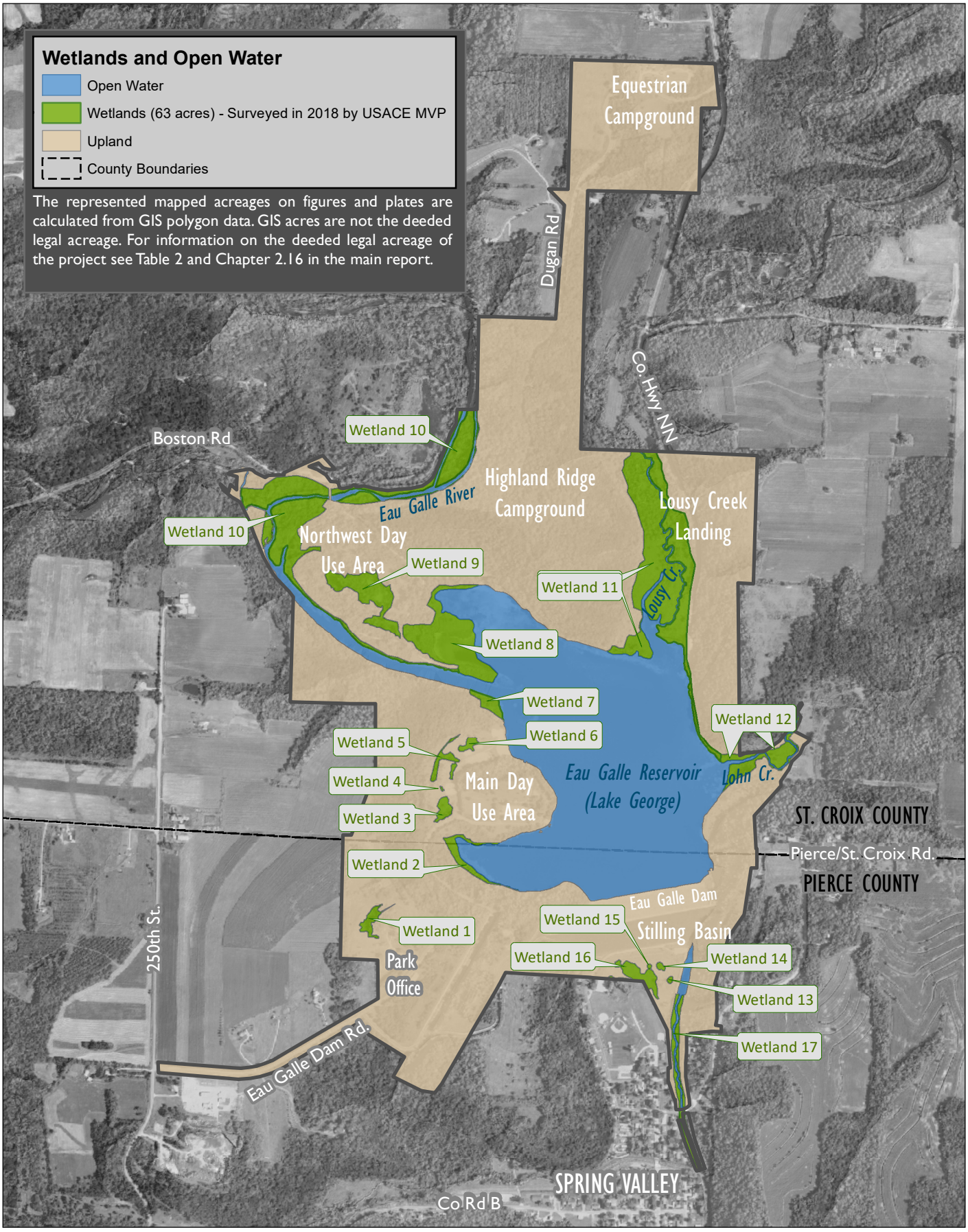
Appendix A

Eau Galle Project Wetland Delineation

Wetlands and Open Water



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EAU GALLE PROJECT - WETLANDS AND OPEN WATER

0 650 1,300 1,950 2,600 Feet

Base Image - 2017 - NAIP Wisconsin Greyscale, LIDAR St. Croix and Pierce Counties

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Appendix B

Eau Galle Project Wetland Delineation

USDA NRCS Soil Survey Report/Hydric Soils

Soil Map—Pierce County, Wisconsin, and St. Croix County, Wisconsin
(Eau Galle Rec Area - General)

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at scales ranging from 1:12,000 to 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Pierce County, Wisconsin
Survey Area Data: Version 17, Oct 6, 2017

Soil Survey Area: St. Croix County, Wisconsin
Survey Area Data: Version 13, Oct 6, 2017

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 4, 2010—Jun 6, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
116C2	Churchtown silt loam, 6 to 12 percent slopes, moderately eroded	1.0	0.1%
116D2	Churchtown silt loam, 12 to 20 percent slopes, moderately eroded	2.5	0.2%
125C2	Pepin silt loam, 6 to 12 percent slopes, moderately eroded	1.5	0.1%
125D2	Pepin silt loam, 12 to 20 percent slopes, moderately eroded	3.3	0.3%
144C2	Newglarus silt loam, deep, 6 to 12 percent slopes, moderately eroded	2.7	0.2%
144D2	Newglarus silt loam, deep, 12 to 20 percent slopes, moderately eroded	8.3	0.6%
144E2	Newglarus silt loam, deep, 20 to 30 percent slopes, moderately eroded	0.0	0.0%
161D2	Fivepoints silt loam, 12 to 20 percent slopes, moderately eroded	0.5	0.0%
646A	Dunnbot fine sandy loam, 0 to 3 percent slopes, occasionally flooded	21.8	1.7%
814D2	Renova silt loam, dissected, 12 to 20 percent slopes, moderately eroded	0.1	0.0%
816B2	Vlasaty silt loam, dissected, 2 to 6 percent slopes, moderately eroded	12.2	1.0%
816C2	Vlasaty silt loam, dissected, 6 to 12 percent slopes, moderately eroded	8.4	0.7%
818B	Sargeant silt loam, 1 to 6 percent slopes	0.1	0.0%
823C2	Whalan silt loam, 6 to 12 percent slopes, moderately eroded	0.5	0.0%
1125F	Dorerton, very stony-Elbaville complex, 30 to 60 percent slopes	34.4	2.7%
2002	Udorthents, earthen dams	19.1	1.5%
W	Water	27.4	2.1%
Subtotals for Soil Survey Area		**144.0**	**11.2%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Totals for Area of Interest		**1,282.0**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
668A	Orion silt loam, till plain, 0 to 3 percent slopes, occasionally flooded	9.7	0.8%
AmD2	Amery loam, 12 to 20 percent slopes, eroded	6.5	0.5%
AoB	Antigo silt loam, 2 to 6 percent slopes	6.3	0.5%
AsB	Arland silt loam, 2 to 6 percent slopes	0.3	0.0%
AsC2	Arland silt loam, 6 to 12 percent slopes, eroded	3.2	0.2%
DaB	Dakota loam, 2 to 6 percent slopes	9.0	0.7%
Fe	Fluvaquents	222.0	17.3%
Gp	Gravel pits	17.0	1.3%
HsC	Hubbard loamy sand, loamy substratum, 6 to 12 percent slopes	3.5	0.3%
HuA	Huntsville silt loam, 0 to 3 percent slopes	15.3	1.2%
LcA	Lawler silt loam, 0 to 3 percent slopes	5.1	0.4%
OmC2	Rosholt sandy loam, 6 to 15 percent slopes	1.4	0.1%
OtB	Otterholt silt loam, 2 to 6 percent slopes	13.5	1.1%
OtC	Otterholt silt loam, 6 to 12 percent slopes	53.7	4.2%
OtD2	Otterholt silt loam, 12 to 20 percent slopes, eroded	81.5	6.4%
PmB	Plainfield loamy sand, 2 to 6 percent slopes	1.8	0.1%
RnC2	Ritchey silt loam, 6 to 12 percent slopes, eroded	11.1	0.9%
RnD2	Ritchey silt loam, 12 to 20 percent slopes, eroded	16.8	1.3%
RoE	Ritchey soils and rock outcrop, 20 to 35 percent slopes	360.2	28.1%
SaB	Santiago silt loam, 2 to 6 percent slopes	22.8	1.8%
SaC2	Santiago silt loam, 6 to 12 percent slopes, eroded	33.6	2.6%
SrA	Skyberg silt loam, 0 to 3 percent slopes	0.1	0.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ud	Udifluvents	12.3	1.0%
VaB	Vlasaty silt loam, 2 to 6 percent slopes	11.1	0.9%
W	Water	112.2	8.7%
WhB	Whalan silt loam, 2 to 6 percent slopes	18.7	1.5%
WhC2	Whalan silt loam, 6 to 12 percent slopes, eroded	65.1	5.1%
WhD2	Whalan silt loam, 12 to 25 percent slopes, eroded	24.3	1.9%
Subtotals for Soil Survey Area		**1,138.0**	**88.8%**
Totals for Area of Interest		**1,282.0**	**100.0%**

Hydric Soil List - All Components

This table lists the map unit components and their hydric status 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, 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, 2). 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. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
   B. Show evidence that the soil meets the definition of a hydric soil;
3. Soils that are frequently ponded for long or very long duration during the growing season.
   A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
   B. Show evidence that the soil meets the definition of a hydric soil;
4. Map unit components that are frequently flooded for long duration or very long duration during the growing season that:
   A. Based on the range of characteristics for the soil series, will at least in part meet one or more Field Indicators of Hydric Soils in the United States, or
   B. Show evidence that the soil meets the definition of a hydric soil;

Hydric Condition: Food Security Act information regarding the ability to grow a commodity crop without removing woody vegetation or manipulating hydrology.

References:

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

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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.

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Vasilas, L.M., G.W. Hurt, and C.V. Noble, editors. Version 7.0, 2010. Field indicators of hydric soils in the United States.

Report—Hydric Soil List - All Components

Hydric Soil List - All Components–WI093-Pierce County, Wisconsin					
Map symbol and map unit name	**Component/Local Phase**	**Comp. pct.**	**Landform**	**Hydric status**	**Hydric criteria met (code)**
116C2: Churchtown silt loam, 6 to 12 percent slopes, moderately eroded	Churchtown	95-100	Valley sides	No	—
	Greenridge	0-3	Valley sides	No	—
	Chaseburg-Occassionally flooded	0-2	Valley sides	No	—
116D2: Churchtown silt loam, 12 to 20 percent slopes, moderately eroded	Churchtown	90-100	Valley sides	No	—
	La Farge	0-5	Valley sides	No	—
	Beavercreek	0-2	Valley sides	No	—
	Brownchurch	0-3	Valley sides	No	—
125C2: Pepin silt loam, 6 to 12 percent slopes, moderately eroded	Pepin	85-95	Ridges	No	—
	Newglarus-Deep	4-8	Ridges	No	—
	Seaton-Ridge	1-7	Ridges	No	—
125D2: Pepin silt loam, 12 to 20 percent slopes, moderately eroded	Pepin	85-95	Ridges	No	—
	Newglarus-Deep	4-10	Ridges	No	—
	Seaton-Ridge	1-5	Ridges	No	—
144C2: Newglarus silt loam, deep, 6 to 12 percent slopes, moderately eroded	Newglarus-Deep	57-87	Ridges	No	—
	Fivepoints	5-15	Ridges	No	—
	Reedsburg-Deep	4-12	Ridges	No	—
	Pepin	3-9	Ridges	No	—
	Lamoille	1-7	Valley sides	No	—
144D2: Newglarus silt loam, deep, 12 to 20 percent slopes, moderately eroded	Newglarus-Deep	62-91	Ridges	No	—
	Fivepoints	5-15	Ridges	No	—
	Pepin	3-13	Ridges	No	—
	Lamoille	1-10	Valley sides	No	—
144E2: Newglarus silt loam, deep, 20 to 30 percent slopes, moderately eroded	Newglarus-Deep	60-90	Ridges	No	—
	Fivepoints	5-15	Ridges	No	—

Hydric Soil List - All Components–WI093-Pierce County, Wisconsin					
Map symbol and map unit name	**Component/Local Phase**	**Comp. pct.**	**Landform**	**Hydric status**	**Hydric criteria met (code)**
	Pepin	3-10	Ridges	No	—
	Elbaville	2-10	Ridges	No	—
	Lamoille	0-5	Valley sides	No	—
161D2: Fivepoints silt loam, 12 to 20 percent slopes, moderately eroded	Fivepoints	85-95	Hills	No	—
	NewGlarus	2-10	Hills	No	—
	Elbaville	1-5	Hills	No	—
	Lamoille	1-5	Hills	No	—
646A: Dunnbot fine sandy loam, 0 to 3 percent slopes, occasionally flooded	Dunnbot-Fine sandy loam	85-90	Flats on flood plains,natural levees on flood plains	No	—
	Algansee	2-5	Flats on flood plains	Yes	4
	Rusktown	2-5	Valley trains	No	—
	Scotah	2-5	Flats on flood plains,natural levees on flood plains	No	—
	Kalmarville	1-5	Depressions on flood plains,overflow stream channels on flood plains	Yes	2,3,4
814D2: Renova silt loam, dissected, 12 to 20 percent slopes, moderately eroded	Renova	85-100	Till plains	No	—
	Vlasaty	0-10	—	No	—
	Wykoff	0-5	—	No	—
	Whalan-Upland	0-5	—	No	—
816B2: Vlasaty silt loam, dissected, 2 to 6 percent slopes, moderately eroded	Vlasaty-Dissected	85-100	Till plains	No	—
	Hersey	0-5	—	No	—
	Sargeant	0-5	—	No	—
	Wykoff	0-5	—	No	—
	Whalan	0-5	—	No	—
816C2: Vlasaty silt loam, dissected, 6 to 12 percent slopes, moderately eroded	Vlasaty	85-100	Till plains	No	—
	Sargeant	0-5	—	No	—
	Hersey	0-5	—	No	—
	Whalan	0-5	—	No	—
	Wykoff	0-5	—	No	—

Hydric Soil List - All Components–WI093-Pierce County, Wisconsin					
Map symbol and map unit name	**Component/Local Phase**	**Comp. pct.**	**Landform**	**Hydric status**	**Hydric criteria met (code)**
818B: Sargeant silt loam, 1 to 6 percent slopes	Sargeant	85-100	Till plains	No	—
	Sargeant-Stony	0-5	—	No	—
	Clyde	0-5	Drainageways on till plains	Yes	2
	Vlasaty	0-5	—	No	—
	Vasa	0-5	—	No	—
823C2: Whalan silt loam, 6 to 12 percent slopes, moderately eroded	Whalan	85-95	Till plains on hills	No	—
	Vlasaty	0-5	—	No	—
	Wykoff	0-5	—	No	—
	Fivepoints	0-5	—	No	—
	Derinda	0-5	—	No	—
1125F: Dorerton, very stony-Elbaville complex, 30 to 60 percent slopes	Dorerton-Very stony	55-65	Valley sides	No	—
	Elbaville	20-30	Valley sides	No	—
	Churchtown	3-10	Valley sides	No	—
	Dorerton-Nonstony	1-5	Valley sides	No	—
	Rockbluff	1-5	Valley sides	No	—
	Brodale	0-5	Valley sides	No	—
2002: Udorthents, earthen dams	Udorthents-Earthen dams	100	—	No	—
W: Water	Water	100	—	No	—

Hydric Soil List - All Components–WI109-St. Croix County, Wisconsin					
Map symbol and map unit name	**Component/Local Phase**	**Comp. pct.**	**Landform**	**Hydric status**	**Hydric criteria met (code)**
668A: Orion silt loam, till plain, 0 to 3 percent slopes, occasionally flooded	Orion-Occassionally flooded	85-100	Drainageways	No	—
	Ettrick-Frequently flooded	0-5	Depressions on drainageways	Yes	2
	Vasa-Rarely flooded	0-5	Drainageways	No	—
	Arenzville-Occassionally flooded	0-5	Drainageways	No	—
AmD2: Amery loam, 12 to 20 percent slopes, eroded	Amery-Deep to dense layer	100	End moraines,ground moraines	No	—
AoB: Antigo silt loam, 2 to 6 percent slopes	Antigo	70-100	Terraces,flats,hillslopes	No	—
	Rosholt	0-10	Terraces,flats,hillslopes	No	—
	Billyboy	0-10	Terraces,flats,hillslopes	No	—
	Sconsin	0-10	Terraces,flats,hillslopes	No	—
	Brill	0-5	Terraces,flats,hillslopes	No	—
	Ossmer	0-5	Terraces,flats,hillslopes	No	—
AsB: Arland silt loam, 2 to 6 percent slopes	Arland	100	Ground moraines	No	—
AsC2: Arland silt loam, 6 to 12 percent slopes, eroded	Arland	100	Ground moraines	No	—
DaB: Dakota loam, 2 to 6 percent slopes	Dakota	100	Outwash plains,stream terraces	No	—
Fe: Fluvaquents	Fluvaquents	100	Flood plains	No	—
	Seelyeville		Depressions	Yes	1,3,4
	Rib		Depressions	Yes	2,3
	Fluvaquents-Wet		Depressions	Yes	2,3,4
	Saprists		Depressions	Yes	1,2,3,4
	Aquents		Depressions	Yes	1,2,3,4
Gp: Gravel pits	Pits-Gravel	99	—	Unranked	—
	Aquents	1	Depressions	Yes	2,3
HsC: Hubbard loamy sand, loamy substratum, 6 to 12 percent slopes	Hubbard-Loamy substratum	100	Pitted outwash plains,stream terraces	No	—
HuA: Huntsville silt loam, 0 to 3 percent slopes	Huntsville	100	Flood plains,drainageways on outwash plains	No	—
	Fluvaquents-Wet		Drainageways	Yes	2,3,4

Hydric Soil List - All Components–WI109-St. Croix County, Wisconsin					
Map symbol and map unit name	**Component/Local Phase**	**Comp. pct.**	**Landform**	**Hydric status**	**Hydric criteria met (code)**
LcA: Lawler silt loam, 0 to 3 percent slopes	Lawler	100	Depressions on outwash plains,depressions on stream terraces,drainageways on outwash plains,drainageways on stream terraces	No	—
	Saprists		Depressions	Yes	1,2,3
	Fluvaquents-Wet		Drainageways	Yes	2,3,4
	Aquents		Depressions	Yes	1,2,3
OmC2: Rosholt sandy loam, 6 to 15 percent slopes	Rosholt	75-100	Terraces,hillslopes	No	—
	Chetek	0-15	Terraces,hillslopes	No	—
	Cress	0-5	Terraces,hillslopes	No	—
	Antigo	0-5	Terraces,hillslopes	No	—
	Scott Lake	0-5	Terraces,flats,hillslopes	No	—
OtB: Otterholt silt loam, 2 to 6 percent slopes	Otterholt	100	Hills	No	—
OtC: Otterholt silt loam, 6 to 12 percent slopes	Otterholt	100	Hills	No	—
OtD2: Otterholt silt loam, 12 to 20 percent slopes, eroded	Otterholt	100	Hills	No	—
PmB: Plainfield loamy sand, 2 to 6 percent slopes	Plainfield	100	Outwash plains,stream terraces	No	—
RnC2: Ritchey silt loam, 6 to 12 percent slopes, eroded	Ritchey	100	Hills	No	—
RnD2: Ritchey silt loam, 12 to 20 percent slopes, eroded	Ritchey	100	Hills	No	—
RoE: Ritchey soils and rock outcrop, 20 to 35 percent slopes	Ritchey	50	Hills	No	—
	Rock outcrop	50	Hills	No	—
SaB: Santiago silt loam, 2 to 6 percent slopes	Santiago	100	Ground moraines	No	—
SaC2: Santiago silt loam, 6 to 12 percent slopes, eroded	Santiago	100	Ground moraines	No	—
SrA: Skyberg silt loam, 0 to 3 percent slopes	Skyberg	100	Drainageways on ground moraines	No	—
	Auburndale		Depressions	Yes	2,3
Ud: Udifluvents	Udifluvents-Sandy substratum	100	Flood plains	No	—
	Aquents		Depressions	Yes	1,2,3,4

Hydric Soil List - All Components–WI109-St. Croix County, Wisconsin					
Map symbol and map unit name	**Component/Local Phase**	**Comp. pct.**	**Landform**	**Hydric status**	**Hydric criteria met (code)**
	Saprists		Depressions	Yes	1,2,3,4
	Seelyeville		Depressions	Yes	1,3,4
	Fluvaquents-Wet		Drainageways	Yes	2,3,4
VaB: Vlasaty silt loam, 2 to 6 percent slopes	Vlasaty	100	Ground moraines	No	—
W: Water	Water	100	—	Unranked	—
WhB: Whalan silt loam, 2 to 6 percent slopes	Whalan	100	Hills	No	—
WhC2: Whalan silt loam, 6 to 12 percent slopes, eroded	Whalan	100	Hills	No	—
WhD2: Whalan silt loam, 12 to 25 percent slopes, eroded	Whalan	100	Hills	No	—

Data Source Information

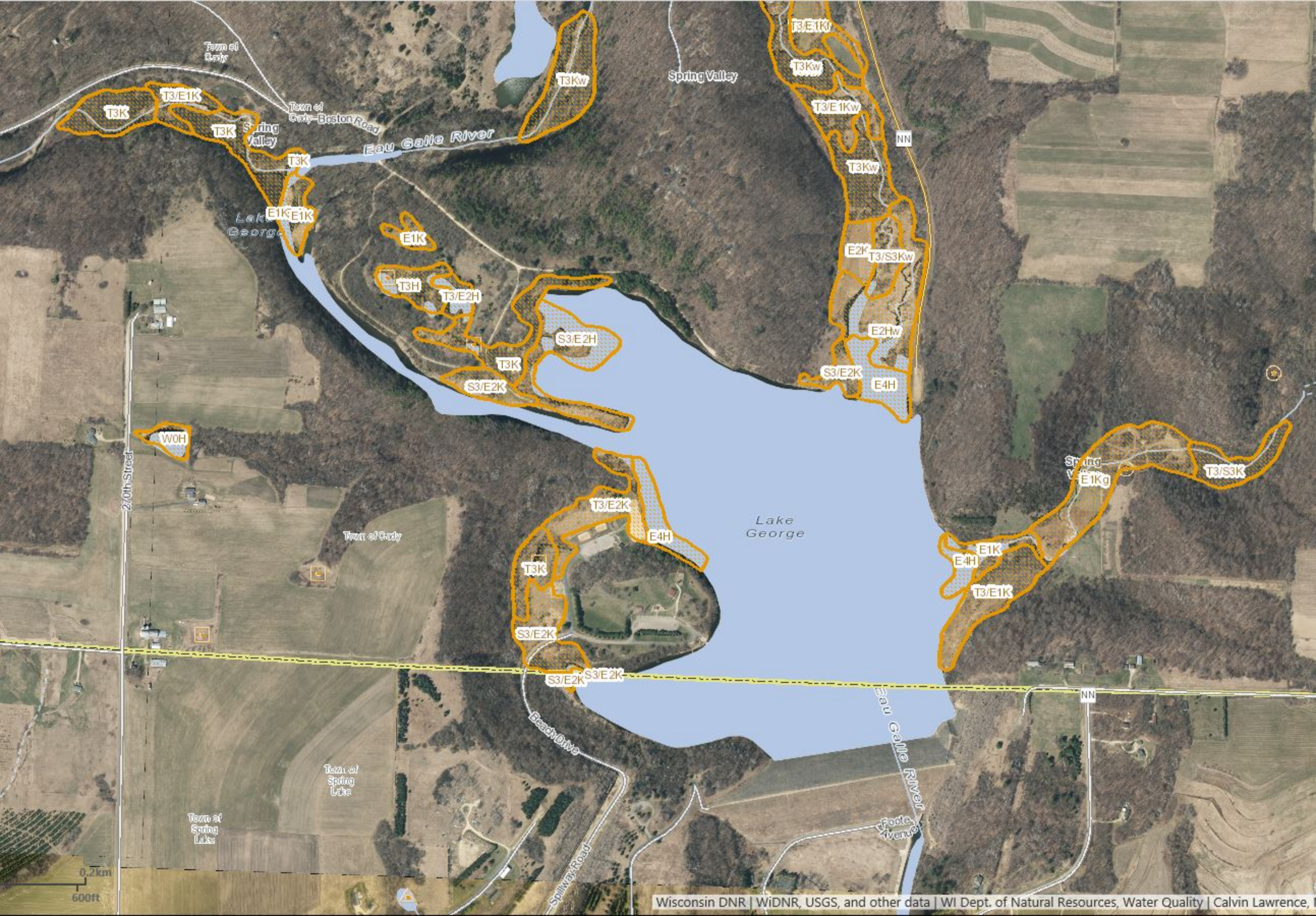
Soil Survey Area: Pierce County, Wisconsin
Survey Area Data: Version 17, Oct 6, 2017

Soil Survey Area: St. Croix County, Wisconsin
Survey Area Data: Version 13, Oct 6, 2017

Appendix C

Eau Galle Project Wetland Delineation

Wisconsin Wetland Inventory Mapping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S3/E2K
W0H
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E4H
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S3/E2K
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T3Kw
E2K
T3/S3Kw
E2Hw
S3/E2K
E4H
E1Kg
T3/S3K
E1K
E4H
T3/E1K
Spring Valley
Town of Lake George
Town of Lake George-Boston Road
Eau Galle River
Lake George
Town of Spring Lake
Town of Spring Lake
Beach Drive
Spillway Road
Eau Galle River
Foote Avenue
270th Street
NN
NN
0.2km
600ft
Wisconsin DNR | WiDNR, USGS, and other data | WI Dept. of Natural Resources, Water Quality | Calvin Lawrence,