Item 8E.
BCWMC 11-20-13

Minnesota Wetland Conservation Act
Notice of Application

Local Government Unit (LGU)	Address
City of Plymouth	**3400 Plymouth Blvd.** **Plymouth, MN 55447**

1. PROJECT INFORMATION

Applicant Name	Project Name	Date of Application	Application Number
Earl Fischer	**617 Cottonwood Lane**	**10/22/13**	

Type of Application (check all that apply):

☒ Wetland Boundary or Type ☐ No-Loss ☐ Exemption ☐ Sequencing
☐ Replacement Plan ☐ Banking Plan

Summary and description of proposed project (attach additional sheets as necessary):

Svoboda Ecological Resources (SER) completed at wetland delineation on 8/02/13 for this site located in the NE 1/4 Section 35, T118N, R22W. The parcel is approximately 1.76 acres and is dominated by mesic and upland woodlands and has a small isolated wetland. Wetland 1 is a PEMCd wetland dominated by Reed Canary Grass, Silver Maple, and Buckthorn.

2. APPLICATION REVIEW AND DECISION

Signing and mailing of this completed form to the appropriate recipients in accordance with 8420.0255, Subp. 3 provides notice that an application was made to the LGU under the Wetland Conservation Act as specified above. A copy of the application is attached. Comments can be submitted to:

Name and Title of LGU Contact Person	Comments must be received by (minimum 15 business-day comment period):
Derek Asche **Water Resources Manager**	**November 21, 2013**
Address (if different than LGU) **Plymouth City Hall** **3400 Plymouth Blvd.** **Plymouth, MN 55447**	Date, time, and location of decision: **November 22, 2013** **9AM** **Plymouth City Hall**
Phone Number and E-mail Address **763-509-5526** **dasche@plymouthmn.gov**	Decision-maker for this application: ☒ Staff ☐ Governing Board or Council

Signature: Derk Asche **Date:** 10/28/13

3. LIST OF ADDRESSEES

- X HCD TEP member: **Ms. Stacey Lijewski, HCD, 701 Fourth Avenue South, Suite 700, Minneapolis, MN, 55415-1600** (sent electronically)
- X BWSR TEP member: **Ms. Lynda Peterson, BWSR, 520 Lafayette Rd. N., St. Paul, MN, 55155** (sent electronically)
- ☐ LGU TEP member (if different than LGU Contact):
- X DNR TEP member: **Melissa Doperalski, MN DNR, 1200 Warner Road, St. Paul, MN, 55106** (sent electronically)
- ☐ DNR Regional Office (if different than DNR TEP member)
  Ms. Kate Drewry, DNR Division of Ecological and Water Resources, 1200 Warner Road, St. Paul, MN, 55106 (sent electronically)
- X WD or WMO (if applicable): **BCWMC, c/o Laura Jester, Keystone Waters, LLC, 16415 Hillcrest Lane, Eden Prairie, MN, 55346** (sent electronically)
- X Applicant and Landowner (if different):
  Earl Fischer, 18025 Co Rd 6, Plymouth, MN, 55447
  A N T S LLC, 617 Cottonwood Lane, Plymouth, MN, 55441
- X Members of the public who requested notice:
  Frank Svoboda, 25580 Nelsine Drive, Shorewood, MN, 55331 (sent electronically)
- X Corps of Engineers Project Manager: **Melissa Jenny, Army Corps of Engineers, 180 5th Street East, Suite 700, St. Paul, MN, 55101-1678** (sent electronically)
- ☐ BWSR Wetland Bank Coordinator (wetland bank plan decisions only)

4. MAILING INFORMATION

- For a list of BWSR TEP representatives: www.bwsr.state.mn.us/contact/WCA_areas.pdf
- For a list of DNR TEP representatives: www.bwsr.state.mn.us/wetlands/wca/DNR_TEP_contacts.pdf
- Department of Natural Resources Regional Offices:

NW Region:	NE Region:	Central Region:	Southern Region:
Reg. Env. Assess. Ecol.	Reg. Env. Assess. Ecol.	Reg. Env. Assess. Ecol.	Reg. Env. Assess. Ecol.
Div. Ecol. Resources	Div. Ecol. Resources	Div. Ecol. Resources	Div. Ecol. Resources
2115 Birchmont Beach Rd. NE	1201 E. Hwy. 2	1200 Warner Road	261 Hwy. 15 South
Bemidji, MN 56601	Grand Rapids, MN 55744	St. Paul, MN 55106	New Ulm, MN 56073

For a map of DNR Administrative Regions, see: http://files.dnr.state.mn.us/aboutdnr/dnr_regions.pdf

- For a list of Corps of Project Managers: www.mvp.usace.army.mil/regulatory/default.asp?pageid=687 or send to:

US Army Corps of Engineers
St. Paul District, ATTN: OP-R
180 Fifth St. East, Suite 700
St. Paul, MN 55101-1678

- For Wetland Bank Plan applications, also send a copy of the application to:

Minnesota Board of Water and Soil Resources
Wetland Bank Coordinator
520 Lafayette Road North
St. Paul, MN 55155

5. ATTACHMENTS

In addition to the application, list any other attachments:

- ☒ **Wetland Delineation Report dated August 14, 2013 by SER**
- ☐
- ☐
- ☐
- ☐

Minnesota Wetland Conservation Act
Application for Approval of Wetland Type and Boundary

1. Project/Site Information

Project/Site Name: 617 Cottonwood Lane Local Government Unit: Plymouth

Location (address and/or T, R, Sec.): A portion of the NE ¼ of Section 35, T118N R22W

2. Applicant Information

Applicant Name: Earl Fischer Address: 18025 Co Rd 6

City, State, Zip: Plymouth, MN 55447

E-mail: patrick@bayshoresells.com Phone: 952-250-5770

3. Agent/Consultant Information

Company Name (if applicable): Svoboda Ecological Resources Contact Person: Frank Svoboda

Address: 25580 Nelsine Drive City, State, Zip: Shorewood,MN,55331

E-mail: franks@gpsinnovations.com Phone: 952-471-1100

4. Description of Request

Check all that apply: ☒ Wetland Boundary (must attach wetland delineation report)
☒ Wetland Type (Eggers & Reed and/or Circular 39 type)

5. Signature

By signature below, the applicant requests a determination from the Local Government Unit under Minnesota Rules 8420.0225 on the submitted wetland boundary and type information in this application. The applicant also affirms that they are the owner of the subject property or have permission from the landowner to pursue this determination.

Franklin J. Svoboda 10/22/13

Applicant or Authorized Agent Signature Date

Important Notes:

- The applicant may be required to submit multiple copies of the report/information to the LGU. The LGU may require the applicant to submit copies directly to Technical Evaluation Panel Members. ***Check with your LGU regarding their submittal requirements***.
- The LGU decision must be made in compliance with Minnesota Statutes, section 15.99.

For LGU use only

Date Received: 10/22/13 Derek Chute

Print Form

U S Army Corps
of Engineers
St. Paul District

Request for Corps of Engineers Wetland Delineation Review

Please enter the following general information about the property under review:

Name of property owner	
Earl Fischer	
Property Address (No. & Street, City, State, Zip Code)	
617 Cottonwood Lane, Plymouth 55447	
Lat. °	**Long.** ° **(decimal degrees)**
County Hennepin	
Location: NE **1/4 Section** 35	**Township** 118N **Range** 22W
Size of review area 1.78	**acre(s)**

By submission of this wetland delineation report I am requesting that the U.S. Army Corps of Engineers. St. Paul District provide me with the following (check only one box):

☐ Wetland Delineation Concurrence. Concurrence with awetland delineation is a written notification from the Corps concurring, not concurring, or commenting on the wetland boundaries delineated on a property. Under this request, the Corps will not address the jurisdictional status of the wetlands on the property, only the boundaries of the resources within the review area.

☑ Preliminary Jurisdictional Determination. Preliminary Jurisdictional Determination. A preliminary jurisdictional determination is a nonbinding written indication that there may be waters of the United States, including wetlands, on a parcel or indications of the approximate location(s) of waters of the United States or wetlands on a parcel. For purposes of computation of impacts and compensatory mitigation requirements a permit decision made on the basis of a preliminary jurisdictional determination will treat all waters and wetlands in the review area as if they are jurisdictional waters of the U.S. Preliminary jurisdictional determinations are advisory in nature and may not be appealed.

☐ Approved Jurisdictional Determination. An approved jurisdictional determination is an official Corps determination that jurisdictional waters of the United States or navigable waters of the United States, or both, are either present or absent on the property. An approved jurisdictional determination precisely identifies the limits of those waters on the project site determined to be jurisdictional under the Clean Water Act or Rivers and Harbors Act. Approved jurisdictional determinations can be relied upon by the affected party for a period of five years. An approved jurisdictional determination may be appealed through the Corps' administrative appeal process.

In order for the Corps to process your request, the wetland delineation must be prepared in accordance with the 1987 Corps of Engineers Wetland Delineation Manual, any approved Regional Supplements to the 1987 Manual, and the Guidelines for Submitting Wetland Delineations in Minnesota and Wisconsin (http://www.mvp.usace.army.mil/regulatory/).

Requestor Franklin J Svoboda Date 10/22/13

Name (typed) Franklin J Svoboda



617 Cottonwood Ln

Plymouth, MN

Prepared by Svoboda Ecological Resources for:
Bayshore Developement

Wetland Classification, Identification, and Delineation

Project No. 2013-009-03
August 14, 2013

SVOBODA ECOLOGICAL RESOURCES

Providing the Sharper Edge in Natural Resources & Environmental Consulting

25580 Nelsine Drive, Suite 100 • Shorewood, MN 55331
(952) 471-1100 • (952) 471-0007 (Fax)

617 Cottonwood Ln
Plymouth, Hennepin County, MN

Wetland Classification, Identification, and Delineation Report

Prepared for:
Bayshore Development

By:
Svoboda Ecological Resources
Project Number 2013-009-03
10/15/2013

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TECHNICAL DOCUMENTS:

Photo Log
Field Data Sheets
Plant Indicator Status
Soil Series Data
Wetland Definition

ABSTRACT

Svoboda Ecological Resources (SER) visited the above referenced property on 8/02/13 to examine the site for the presence of areas meeting wetland criteria. The study parcel is located in the city of Plymouth, MN in Hennepin County (Figure 1). One wetland boundary was delineated at this site. One sample transect was established along the boundary of the wetland area and in order to characterize the soil, vegetation, and existing hydrology within the wetland-to-upland transition zone.

INTRODUCTION

The subject parcel is approximately 1.76 acres and is dominated by mesic and upland woodlands and has a small isolated wetland. The topography of the site is rolling with a house and outbuilding on the top of the hill and a drainage swale that traverses the parcel from northwest to southeast. The surrounding land use is primarily moderately spaced single family homes to the east and south with more industrial use to the west and north. The identified wetland was classified according to the Cowardin et al., the Circular 39 and the Eggers and Reed classification systems and marked with pink "Wetland Delineation" pin flags and orange flagging tape. The Technical Documents section of this report contains field data sheets, plant indicator status information, soil survey information, and wetland definition information.

METHODS

The methods used to delineate the subject parcel are as described in the 1987 US Army Corps of Engineers Wetlands Delineation Manual and the 2010 Midwest Regional Supplement Manual. In the 1987 Manual, the methods used were described under the "routine" methods for sites less than 5 acres. This methodology is followed in order to assess whether the three parameters of a wetland are met for areas on the subject parcel. The three parameters required under normal circumstances in order to delineate a wetland are described in the Technical Documents section.

The Midwest Regional Supplement Wetland Delineation Manual is also being utilized to increase the accuracy of our wetland boundaries. This addendum to the original 87 Manual was created to address the many regional differences that affect wetlands and the delineation methods used throughout the country. The following explanations are passages from that document.

> "This Regional Supplement is part of a nationwide effort to address regional wetland characteristics and improve the accuracy and efficiency of wetland-delineation procedures. Regional differences in climate, geology, soils, hydrology plant and animal communities, and other factors are important to the identification and functioning of wetlands. These differences cannot be considered adequately in a single national manual. The development of this supplement follows National Academy of Sciences recommendations to increase the regional sensitivity of wetland-delineation methods (National Research Council 1995). The intent of this supplement is to bring the Corps Manual up to date with current knowledge and practice in the region and not to change wetland boundaries." "...This Regional Supplement is designed for use with the

> current version of the Corps Manual (Environmental Laboratory 1987) and all subsequent versions. Where differences in the two documents occur, this Regional Supplement takes precedence over the Corps Manual for applications in the Midwest Region."

National Wetland Inventory (NWI) maps (Figure 2), Web Soil Survey of Hennepin County map (Figure 3), Minnesota Public Waters Inventory maps (Figure 4), and 2012 aerial photographs were reviewed prior to the site visit to identify areas that may be wetlands. Areas illustrating evidence of wetland conditions were examined in greater detail during the field survey. Vegetation, soils and hydrology were examined (as outlined in the 1987 Manual) and used to characterize wetland types and determine wetland boundaries. Sample transects were established in representative wetland-to-upland transition zones in order to characterize the vegetation, soils, and hydrology of the site. Transects consist of a representative upland sample point, a representative transition sample point and representative wetland sample point. Information obtained at the sample points can be found on the field data sheets located in the Technical Documents section.

Wetland boundaries were marked at the site by pink "Wetland Delineation" pin flags and orange flagging tape. The wetland boundary is considered to be the topographically highest extent of the wetland basin; areas below the staked boundary met the three required wetland criteria while areas above were lacking in one or more of these criteria. Wetlands were classified in accordance with methods described by Cowardin et al. (1979) and used in the NWI (e.g. PEMB, PSS1C, etc.), completed by the U.S. Fish and Wildlife Service. The Circular 39 and Eggers and Reed classification systems are also given. The indicator status of plants, as described in the Technical Documents section, was determined using the National List of Plant Species That Occur in Wetlands – Region 3 (Sabine 1999).

RESULTS

The National Wetland Inventory indicates the presence of one wetland in the survey area, categorized as PEMCd. (Figure 2).

The Web Soil Survey of Hennepin County (Figure 3) identifies three soil map units present on the subject property, two of which are the same soil family, just different slope categories. They are as follows: Hamel, overwash Hamel complex and Lester loam, morainic. The first soil type is partially hydric. The remaining soils are predominantly nonhydric. Soil series descriptions are provided in the Technical Documents section.

The Minnesota Department of Natural Resources, State Protected Waters Map (Public Water Inventory) indicates no public waters within the study area (Figure 4).

Site Visit

SER ecologists examined the subject property for areas meeting jurisdictional wetland criteria during the site visit. The area meeting the jurisdictional criteria of a wetland was flagged, and boundaries were determined and delineated. The approximate wetland boundary is outlined in yellow (Figure 5).

The wetland on this parcel is classified as a PEMCd wetland. The wetland vegetation in the intermittently inundated wetland was dominated by reed canary grass (*Phalaris arundinacea* FACW) in the herb layer with silver maple (*Acer saccharinum* FACW) and buckthorn (*Frangula alnus* FACW) dominating the immediately surrounding wooded canopy. The transition to upland can be marked vegetatively, primarily as the reed canary grass disappears. The transition to the woodland canopy is marked by an almost complete loss of the herbaceous layer. The further upslope the more upland species, such as virginia creeper (*Parthenocissus quinquefolia* FACU), become prevalent.

Sample point SP1-1 Wet was taken from the center of the intermittently inundated wetland location. The soils at sample point SP1-1 Wet consisted of a mucky clay at the surface that became a loamy clay below 6 inches of depth. Hydric indicator A10 (2 cm Muck) was present. The soils at sample point SP1-1 Trans, collected north of the wetland area, consisted of an initial 8 inches of mucky clay. Soil below that was a silty clay with several layers in which some concentrations and depletions were present. Hydric indicator A10 (2 cm Muck) was present.

Sample point SP1-1 Up was also taken from the north side of the intermittently inundated wetland. The soils at sample point SP1-1 Up consisted of 18 inches of a disturbed but uniform sandy loam. There was broken glass mixed into the soil down to 18 inches. Below that soils were more complex with concentrations mixed with the matrix sandy loam. No hydric indicators were present.

Wetland hydrology was present at sample point SP1-1 Wet in secondary indicators D2 (Geomorphic Position) and D5 (FAC-Neutral Test). At sample points SP1-1 Trans and SP1-1 Up no hydrology indicators were present. While the herbaceous layer was almost completely absent around SP1-1 Trans, we did not feel comfortable attributing this as B8 (Sparsely Vegetated Concave Surface) as the tree layer was very thick and almost no sunlight was reaching the woods floor so the lack of an herbaceous layer could have been due to that.

Detailed soils, vegetation, and hydrology data for the delineated jurisdictional wetlands are provided in the data sheets of the Technical Documents section.

DISCUSSION

This area was previously delineated in 2005, reviewed by Shane Missaghi, representing the City of Plymouth and the boundary as originally delineated was reduced (see attached documents). Originally, drainage from Cottonwood Lane would pass through a drainage swale west of the residence and then enter the subject wetland area. This drainage pattern has now been intercepted and diverted through a storm sewer that was installed in the east-west section of Cottonwood Lane (Source, Earl Fischer) thereby reducing much of the inflow to the basin.

SER completed all on-site delineations based on the three required technical criteria as outlined by the 1987 Manual: the presence of hydric soils, a predominance of hydrophytic vegetation, and indicators of wetland hydrology in each basin. The site visit portion of the wetland delineation was completed on 8/02/13.

A prior wetland delineation was completed and approved with changes by the City of Plymouth in 2005. A copy of the prior delineation along with the modified boundary as determined by the onsite TEP review is attached.

SER personnel examined the subject property for areas meeting jurisdictional wetland criteria during the site visit and delineated the edges of the intermittently inundated depression as being jurisdictional wetland. (Figure 5). Detailed soils, vegetation and hydrology data are provided in the data sheets of the Technical Documents section. A set of figures is provided in the Figures section.

RECOMMENDATIONS

Activities that impact or could potentially impact wetlands are regulated at several levels of government. In Minnesota, the two primary jurisdictions are covered at the state and federal levels by the provisions of the following legislative actions.

1* State jurisdiction by the Wetland Conservation Act of 1991 (WCA) administered by the WCA Local Governmental Unit (LGU).

2* Federal jurisdiction by the Clean Water Act of 1972 and subsequent amendments. Wetland protection is implemented by the Corps of Engineers (Corps) with permit certification issued by the Environmental Protection Agency.

While the wetland boundaries that SER has delineated are not official until approved by a WCA approved local government unit (LGU), SER advises the property owner/developer to refrain from any filling, draining, or excavating, or any impact to the area SER has delineated as wetland. No grading or filling in wetland basins should commence until all necessary permits have been obtained. Violation of wetland regulations may result in substantial civil and criminal penalties. Local ordinances may regulate wetland modifications such as brush and tree removal and burning in addition to grading and filling. Depending on the location of the property, buffers around the wetland may also be protected. Any activities in the proximity of the wetland should be cleared with appropriate WCA regulatory agencies. It is also advisable to have the wetland boundary surveyed by a licensed land surveyor. Since the pin flags used along the boundary can be vandalized or inadvertently knocked over, a GPS survey of the flags will assure the permanence of the boundary. The client should also be aware that approved wetland boundaries are typically valid for only three years from the date of approval.

To avoid project delays associated with wetland regulations, it is essential that you acquire necessary permits from all jurisdictional agencies before initiating activities. A WCA Sequencing form, a WCA and Army Corps of Engineers Replacement Plan Application form, and a DNR permit application are among the materials that you may be required to submit if impacts are proposed for the delineated wetlands. By initiating the permit process as soon as possible, potential costly delays to the project may be avoided.

CERTIFICATION

David Remucal completed the above-described delineation on 8/02/2013. This delineation was performed according to the procedures described by the US Army Corps of Engineers in the 1987 Wetlands Delineation Manual and the 2007 Midwest Region Supplement Wetland Delineation Manual. The delineation meets the standards and a criterion described in these manuals and conforms to the applicable standards and regulations in force at the time the delineation was completed.

Report and graphics were prepared by David Remucal (Wetland Ecologist) on this day 8/9/2013. The delineation report was reviewed by Frank Svoboda, President of Svoboda Ecological Resources.

Client: Bayshore Development
Project Name: 617 Cottonwood Ln
Project No.: 2013-009
Location: Plymouth MN

Environmental Scientist/Certified Wetland Delineator

David Remucal

Wetland Ecologist

Franklin J. Svoboda

President, Svoboda Ecological Resources

10/15/13
Date

DATA SOURCES

Minnesota Department of Natural Resources, Public Waters Inventory Basin Delineations, Published 7/31/2008 and retrieved from http://deli.dnr.state.mn.us

United States Fish and Wildlife Service National Wetland Inventory Map. Retrieved from http://www.fws.gov/wetlands/Data/Mapper.html on 5/28/12.

2010 Aerial Color Photos. Publicly Distributed by MN Geo WMS Service.

Topographic maps obtained via the National Geographic Society's USA Topo service through ESRI.

Web Soil Survey for Hennepin County, MN. Retrieved from http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm

LITERATURE REFERENCED

Cowardin, L.M., V. Carter, F.C. Golet, and R.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service, FWS/OBS-79/31. 103pp.

Eggers, Steve D. and Donald M. Reed. 2011. *Wetland Plants and Plant Communities of Minnesota and Wisconsin 3rd edition.* US Army Corps of Engineers, St. Paul District. 478 pp, unclassified.

Environmental Laboratory. 1987. *1987 U.S. Army Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1, US Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

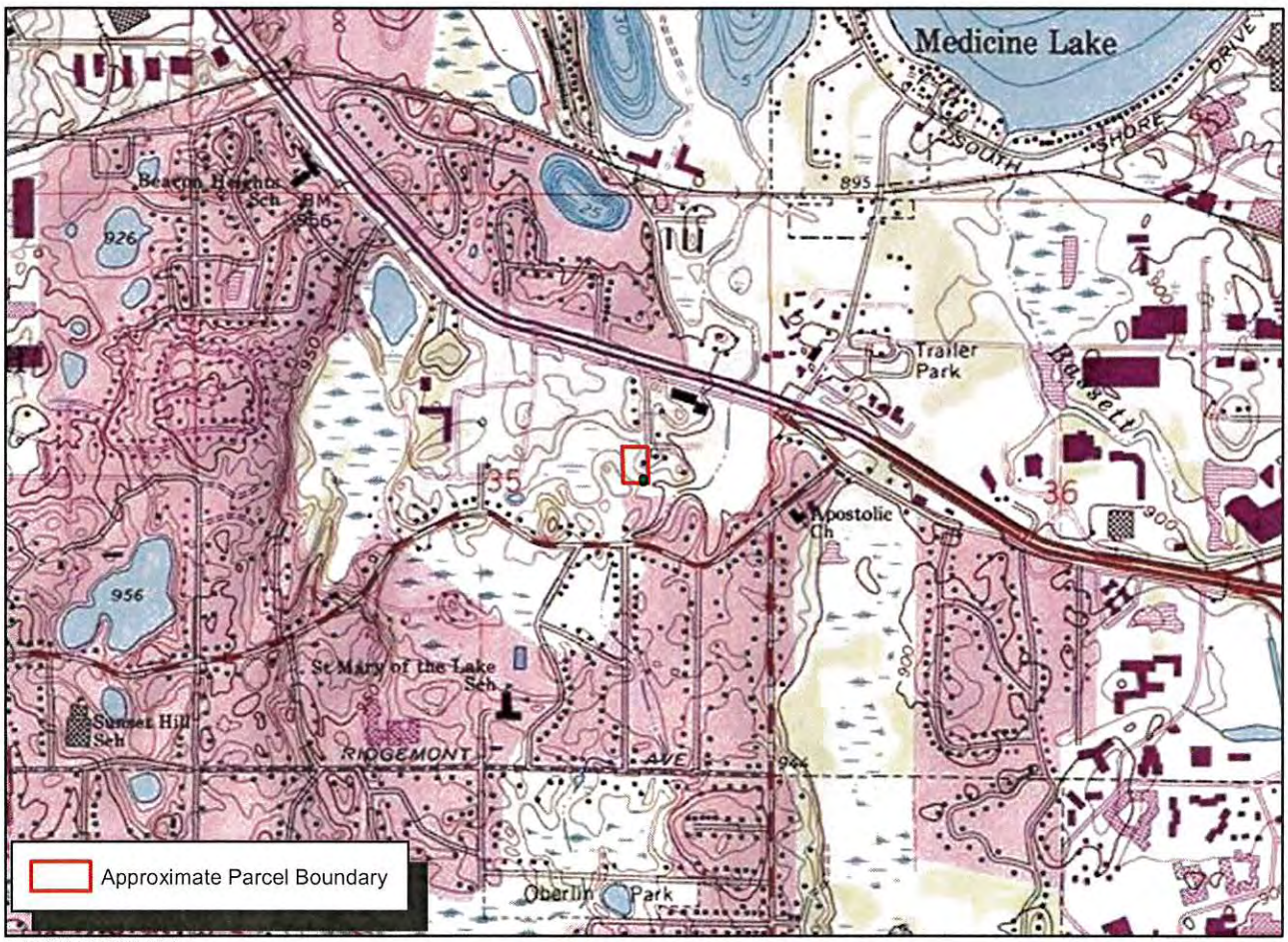
Gleason, H.A. and A.C. Cronquist. 1991. *Manual of Vascular Plants of Northeastern United States and Adjacent Canada*. New York Botanical Garden, Bronx. 910pp.

Lichvar, R. W. 2013 *National Wetland Plant List.* 2013 wetland ratings. Phytoneuron 2013-49: 1 – 241 (See also [http://rsgisias.crrel.usace.army.mil/NWPL/].

Shaw, S.P., and C.G. Fredine. 1956. *Wetlands of the United States*. U.S. Fish and Wildlife Service, Circular 39. 67pp.

U.S. Army Corps of Engineers. August 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0).* ERDC/EL TR-10-16. Vicksburg, MS: US Army Engineer Research and Development Center.

FIGURES



T118N R22W S35

Overview

Figure 1

Overlaid on Topographic Map

N

0 1,350 2,700 5,400 Feet

2013-009
617 Cottonwood Ln
Plymouth, MN



T118N R22W S35

National Wetland Inventory

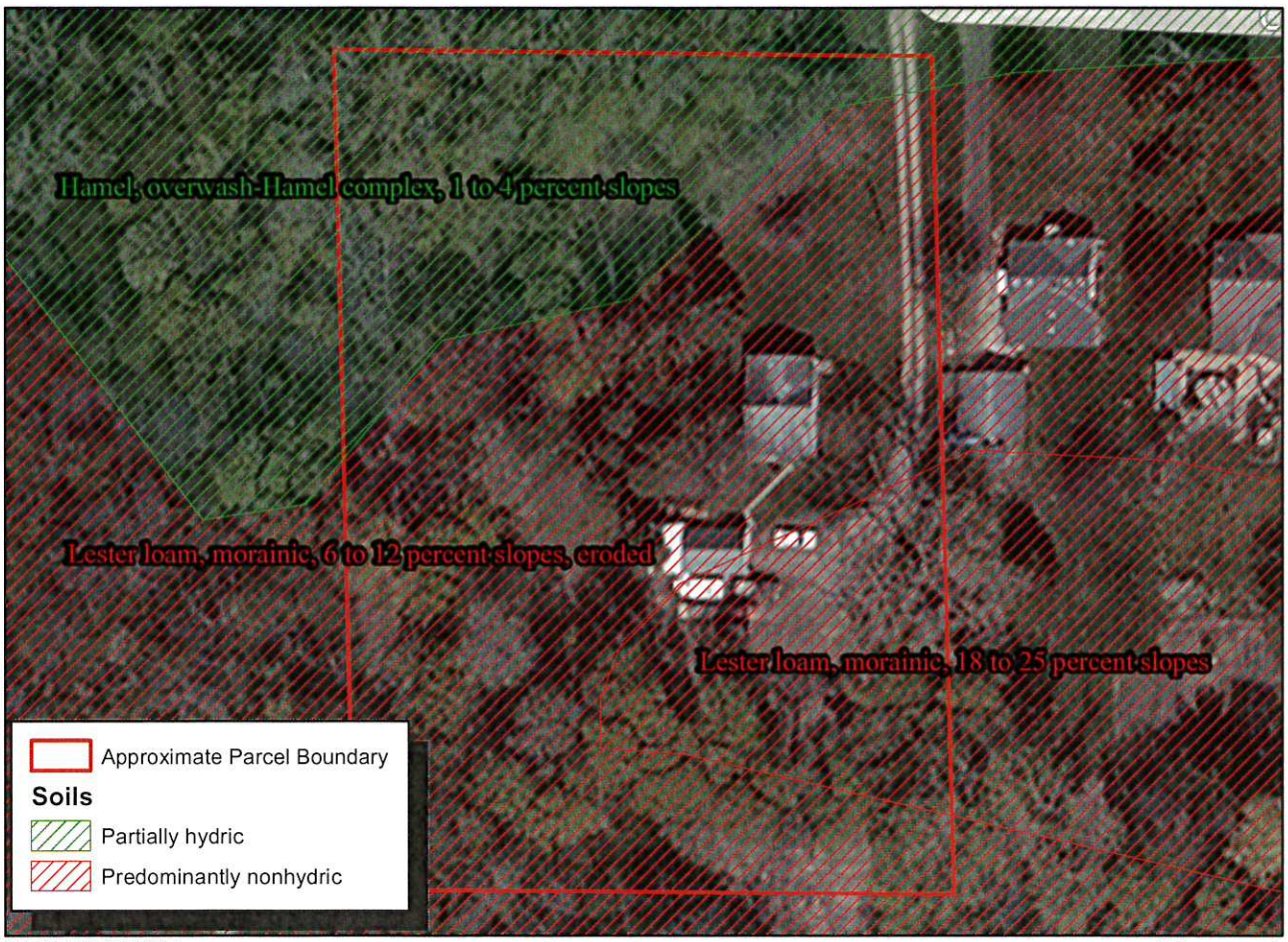
Figure 2

Overlaid on 2012 Aerial Photo

N

0 60 120 240 Feet

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617 Cottonwood Ln
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T118N R22W S35

Soil Survey

Figure 3

Overlaid on 2012 Aerial Photo

N

0 60 120 240 Feet

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Plymouth, MN



T118N R22W S35

Public Waters Inventory

Figure 4

Overlaid on 2012 Aerial Photo

N

0 60 120 240 Feet

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T118N R22W S35

Approximate Wetland Boundary

Figure 5

Overlaid on 2012 Aerial Photo

N

0 60 120 240 Feet

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617 Cottonwood Ln
Plymouth, MN

THE TECHNICAL DOCUMENTATION SECTION

Field Data Sheets

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: 617 Cottonwood Lane | City/County: Plymouth | Sampling Date: 8/02/13

Applicant/Owner: Bayshore Development | State: MN | Sampling Point: SP1-1 Up

Investigator(s): FJS, DR | Section, Township, Range: T118N R22W S35

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): none

Slope (%): 1-2% | Lat: | Long: | Datum: NAD 83

Soil Map Unit Name: Lester loam | NWI Classification: None

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed?

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? Are "normal circumstances" present? Yes

(If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y		
Hydric soil present?	N	**Is the sampled area within a wetland?**	N
Indicators of wetland hydrology present?	N	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION -- Use scientific names of plants.VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species	Indicator Staus
1 *Fraxinus pennsylvanica*	30	Y	FACW
2 *Acer negundo*	30	Y	FAC
3 *Frangula alnus*	30	Y	FACW
4 *Acer saccharinum*	10	N	FACW
5			
	100	= Total Cover	
Sapling/Shrub stratum (Plot size: 15')			
1 *Frangula alnus*	60	Y	FACW
2			
3			
4			
5			
	60	= Total Cover	
Herb stratum (Plot size: 5')			
1 *Circaea canadensis*	5	Y	FACU
2 *Fragaria virginiana*	5	Y	FACU
3 *Alliaria petiolata*	2	N	FAC
4 *Phalaris arundinacea*	1	N	FACW
5 *Ageratina altissima*	1	N	FACU
6 *Galium aparine*	1	N	FACU
7			
8			
9			
10			
	15	= Total Cover	
Woody vine stratum (Plot size: 30')			
1			
2			
	0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across all Strata: 6 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 66.67% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0	
FACW species	131	x 2 =	262	
FAC species	32	x 3 =	96	
FACU species	12	x 4 =	48	
UPL species	0	x 5 =	0	
Column totals	175	(A)	406	(B)

Prevalence Index = B/A = 2.32

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: SP1-1 Up

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
18	10YR 3/1						Sandy loam	Very uniform, broken glass to 18"
21	10YR 3/1	60	10YR 6/4	40	C	M	Sandy loam	
30	10YR 3/1	98	10YR 5/8	2	C	PL	Sandy loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

Upper 18 inches likely highly disturbed, broken glass pieces were found mixed in the soil to 18 inches in depth.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches):	___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: 617 Cottonwood Lane | City/County: Plymouth | Sampling Date: 8/2/13

Applicant/Owner: Bayshore Development | State: MN | Sampling Point: SP1-1Trans

Investigator(s): FJS, DR | Section, Township, Range: T118N R22W S35

Landform (hillslope, terrace, etc.): Hillslope | Local relief (concave, convex, none): Concave

Slope (%): 1-2% | Lat: | Long: | Datum: NAD 83

Soil Map Unit Name: Lester loam | NWI Classification: PEMCd

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed?

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? Are "normal circumstances" present? Yes

(If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	N
Hydric soil present?	Y	If yes, optional wetland site ID:	
Indicators of wetland hydrology present?	N		

Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION -- Use scientific names of plants.VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species	Indicator Staus
1 *Frangula alnus*	60	Y	FACW
2 *Acer negundo*	40	Y	FAC
3 *Acer saccharinum*	20	N	FACW
4 *Fraxinus pennsylvanica*	10	N	FACW
5			
	130	= Total Cover	
Sapling/Shrub stratum (Plot size: 15')			
1 *Frangula alnus*	25	Y	FACW
2			
3			
4			
5			
	25	= Total Cover	
Herb stratum (Plot size: 5')			
1 *Circaea canadensis*	2		FACU
2 *Fragaria virginiana*	2	Y	FACU
3 *Galium aparine*	0.1	N	FACU
4			
5			
6			
7			
8			
9			
10			
	4.1	= Total Cover	
Woody vine stratum (Plot size: 30')			
1			
2			
	0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across all Strata: 4 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 75.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	115	x 2 =	230
FAC species	40	x 3 =	120
FACU species	4.1	x 4 =	16.4
UPL species	0	x 5 =	0
Column totals	159.1 (A)		366.4 (B)

Prevalence Index = B/A = 2.30

Hydrophytic Vegetation Indicators:

___ Rapid test for hydrophytic vegetation

X Dominance test is >50%

X Prevalence index is ≤3.0*

___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)

___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: SP1-1Trans

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
8	10YR 2/1						Mucky clay	
12	10YR 2/1	96	10YR 6/4	4	C	PL	Silty clay	
18	10YR 5/2	50	10YR 2/1	25		M	Silty clay	
			10YR 7/2	25	D	M		
22	10YR 2/1	95	10YR 3/3	5		PL	Silty clay	
30	10YR 3/3	60	10YR 2/1	40		M	Silty clay	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches):	___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: 617 Cottonwood Lane City/County: Plymouth Sampling Date: 8/2/13

Applicant/Owner: Bayshore Development State: MN Sampling Point: SP1-1 Wet

Investigator(s): FJS, DR Section, Township, Range: T118N R22W S35

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0 Lat: Long: Datum: NAD 83

Soil Map Unit Name: Lester loam NWI Classification: PEMCd

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed?

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? Are "normal circumstances" present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y		
Hydric soil present?	Y	**Is the sampled area within a wetland?**	Y
Indicators of wetland hydrology present?	Y	If yes, optional wetland site ID:	

Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION -- Use scientific names of plants.VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species	Indicator Staus
1 *Acer saccharinum*	25	Y	FACW
2 *Frangula alnus*	20	Y	FACW
3			
4			
5			
	45	= Total Cover	
Sapling/Shrub stratum (Plot size: 15')			
1			
2			
3			
4			
5			
	0	= Total Cover	
Herb stratum (Plot size: 5')			
1 *Phalaris arundinacea*	75	Y	FACW
2 *Impatiens capensis*	20	Y	FACW
3 *Solidago canadensis*	5	N	FACU
4			
5			
6			
7			
8			
9			
10			
	100	= Total Cover	
Woody vine stratum (Plot size: 30')			
1			
2			
	0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across all Strata: 4 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0	
FACW species	140	x 2 =	280	
FAC species	0	x 3 =	0	
FACU species	5	x 4 =	20	
UPL species	0	x 5 =	0	
Column totals	145	(A)	300	(B)

Prevalence Index = B/A = 2.07

Hydrophytic Vegetation Indicators:

___ Rapid test for hydrophytic vegetation

X Dominance test is >50%

X Prevalence index is ≤3.0*

___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)

___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: SP1-1 Wet

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type*	Loc**	Texture	Remarks
4	10YR 2/1						Mucky clay	
6	10YR 2/1	97	10YR 5/6	3	C	PL	Mucky loamy clay	
30	10YR 2/1	67	10YR 3/6	3	C	PL	Loamy clay	
			7.5YR 2.5/3	30		M		

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches): ___
Water table present?	Yes	___	No	X	Depth (inches): ___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches): ___

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

THE TECHNICAL DOCUMENTATION SECTION

Plant Indicator Status

INDICATOR CATEGORIES*

Obligate Wetland (OBL) – Occur almost always ***(estimated probability >99%)*** under natural conditions in wetlands.

Facultative Wetland (FACW) – Usually occur in wetlands ***(estimated probability 67% - 99%)***, but occasionally found in non-wetlands.

Facultative (FAC) – Equally likely to occur in wetlands or non-wetlands ***(estimated probability 34% - 66%)***.

Facultative Upland (FACU) – Usually occur in non-wetlands ***(estimated probability 67% - 99%)***, but occasionally found in wetlands ***(estimated probability 1% - 33%)***.

Obligate Upland (UPL) – Occur in wetlands in another region, but occur almost always ***(estimated probability >99%)*** under natural conditions in non-wetlands in the region specified. If a species does not occur in wetlands in any region, it is not on the National List.

*Reed, P.B. 1988. National list of plant species that occur in wetlands: Minnesota. National Wetlands Inventory, U.S. Fish and Wildlife Service, St. Petersburg, Florida.

THE TECHNICAL DOCUMENTATION SECTION

Soil Series Descriptions

Acquired from Natural Resource Conservation Service Website, Official Soil Series Descriptions

LESTER SERIES

The Lester series consists of very deep, well drained soils that formed in calcareous loamy glacial till on till plains and moraines. These soils have moderate permeability. Their slopes range from 5 to 70 percent. Mean annual precipitation is about 28 inches. Mean annual temperature is about 47 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, superactive, mesic Mollic Hapludalfs

TYPICAL PEDON: Lester loam with a convex slope of about 9 percent on a ground moraine in a cultivated field. (Colors are for moist soil unless otherwise noted.)

Ap--0 to 7 inches; very dark grayish brown (10YR 3/2) loam, grayish brown (10YR 5/2) dry; moderate fine subangular blocky structure; friable; many fine roots; about 3 percent gravel; slightly acid; abrupt smooth boundary. (6 to 10 inches thick)

Bt1--7 to 21 inches; brown (10YR 4/3) clay loam; moderate medium subangular blocky structure; firm; many very fine roots; common very dark grayish brown (10YR 3/2) clay films on faces of peds and few very dark gray (10YR 3/1) organic coats on faces of peds; about 2 percent gravel; slightly acid; clear smooth boundary.

Bt2--21 to 38 inches; dark yellowish brown (10YR 4/4) clay loam; moderate medium subangular blocky structure; friable; common fine roots; common dark grayish brown (10YR 4/2) clay films on faces of peds and few very dark brown (10YR 2/2) organic coats on faces of peds; about 3 percent gravel; slightly acid; gradual smooth boundary. (Combined Bt horizon is 10 to 40 inches.)

Bk1--38 to 50 inches; yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; friable; few fine roots; common very pale brown (10YR 8/2) carbonate threads; about 2 percent gravel; violently effervescent; slightly alkaline; clear wavy boundary.

Bk2--50 to 60 inches; yellowish brown (10YR 5/4) loam; weak medium subangular blocky structure; friable; common fine distinct yellowish brown (10YR 5/6) relict Fe concentrations; common very pale brown (10YR 8/2) carbonate threads; about 2 percent gravel; violently effervescent; slightly alkaline; clear wavy boundary.

C--60 to 80 inches; yellowish brown (10YR 5/4) loam; ; massive; friable; common medium distinct yellowish brown (10YR 5/6) relict Fe concentrations and few fine distinct light brownish gray (10YR 6/2) relict Fe depletions; about 1 percent gravel; strongly effervescent; slightly alkaline.

TYPE LOCATION: Wright County, Minnesota; about 3 miles west of Otsego, 1460 feet south and 200 feet west of the northeast corner of Sec. 15, T.121 N., R.24 W.; USGS Big Lake quadrangle; lat. 45 degrees 17 minutes 29 seconds N.; long. 93 degrees 41 minutes 3 seconds W., NAD27

RANGE IN CHARACTERISTICS: Depth to free carbonates ranges from 20 to 54 inches. Rock fragments of mixed lithology comprise 1 to 8 percent of the volume of the control section.

The A or Ap horizons have hue of 10YR, value of 2 or 3, and chroma of 1 or 2. The E horizon where present, has value of 3 to 5, and chroma of 1 to 3. The A and E horizons are loam or clay loam, but sandy loam, fine sandy loam, or silt loam is within the range. They range from moderately acid to neutral.

The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 or 4. It is clay loam or loam and has 24 to 35 percent clay and 30 to 45 percent sand. The B/A clay ratios range from 1.2 to 1.4. It is strongly acid to slightly acid in the upper part and moderately acid to neutral in the lower part. A Bw horizon is sometimes present below the Bt.

The Bk horizon has hue of 10YR or 2.5YR, value of 4 or 5, and chroma of 3 to 6. The Bk horizon is loam or clay loam. It is slightly alkaline or moderately alkaline. Relict redoximorphic features are present in some pedons.

The C horizon has hue of 2.5Y or 10YR, value of 4 to 6, and chroma of 3 to 6. It is loam or clay loam. It is slightly alkaline or moderately alkaline. Relict redoximorphic features are present in some pedons.

COMPETING SERIES: These are the Angus, Argyle, Baltimore, Bassett, Blooming, Caleb, Dowagiac, Dunbridge, Gara, Koronis, Lauramie, Longlois, Lydick, Mohawk, Neda, Newcomer, Oneco, Orwood, Racine, Razort, Sebbo, Taopi, Waucoma, and Winneshiek soils in the same family. Angus and Sebbo soil have saturation in the lower third of the series control section. Argyle, Baltimore, and Oneco soils have B horizons with 7.5YR or redder hue. Bassett soils are very strongly acid to moderately acid in the upper part of the Bt horizon. Blooming and Racine soils have 15 to 35 percent sand in the upper part of the particle-size control section. Caleb soils have some subhorizons that have more than 45 percent in the lower part of the control section. Dowagiac and Koronis soils have less than 24 percent clay in the lower one third of the particle-size control section. Dunbridge, Waucoma, Newcomer and Winneshiek soils have sola terminated by bedrock at depths above 60 inches. Gara soils average less than 2 percent rock fragments in the control section. Longlois, Lydic, and Neda soils have more than 8 percent rock fragments in some subhorizon of the control section. Lauramie soils have more than 45 percent sand in some subhorizon in the middle part of the control section. Mohawk soils have a higher content of silt and have dark colors in the B horizon which apparently are inherited from dark shale. Orwood soils have no rock fragments in the particle-size control section. Razort soils have less than 30 percent sand in the control section.

GEOGRAPHIC SETTING: These soils have convex slopes on moraines and till plains. Slope gradients range from 5 to 70 percent. They formed in calcareous, loamy glacial till of late Wisconsinan Age. Mean annual temperature ranges from 45 degrees to 52 degrees F. Mean annual precipitation ranges from 25 to 33 inches. Frost free days range from 125 to 165. Elevations range from 700 to 1600 feet.

GEOGRAPHICALLY ASSOCIATED SOILS: These include the Cordova, Dundas, Glencoe, Hamel, Houghton, Klossner, Le Sueur, Muskego, and Nessel soils. Poorly drained Cordova and somewhat poorly and poorly drained Dundas soils are on flats and upper drainageways with a high seasonal water table. Very poorly drained Glencoe,

Houghton, Klossner, and Muskego soils are mostly in depressions. Poorly drained Hamel soils are on foot and toe slopes. Moderately well drained Le Sueur and Nessel soils are on slightly elevated flats and gently convex slopes.

DRAINAGE AND PERMEABILITY: Well drained. Permeability is moderate. Runoff is medium to high.

USE AND VEGETATION: Mostly cropped to corn and soybeans. Some is in pasture and forest. Native vegetation is savanna.

DISTRIBUTION AND EXTENT: South-central and east-central Minnesota and northeastern Iowa. Extensive.

MLRA OFFICE RESPONSIBLE: St. Paul, Minnesota

SERIES ESTABLISHED: Dakota County, Minnesota, l945.

REMARKS: Diagnostic horizons and featured recognized in this pedon are: mollic subgroup - the zone from the surface to 7 inches (Ap horizon); argillic horizon - the zone from 7 to 38 inches (Bt horizons). Type location moved from Waseca County, Mn. to Wright County, Mn., 11/96 to better exemplify the series concept within the MLRA. Slopes of 1 to 5 percent that were previously correlated as Lester may be included with the Angus series in the future.

Photo Log

617 Cottonwood Ln

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Wetland

A typical view of the intermittently inundated wetland taken from the north facing south. SP1-1 Wet is indicated in photo center by pink flagging tape.



Wetland

View of ground cover at SP1-1 Trans. Vegetative herbaceous layer cover was sparse.



Wetland

View of sample point SP1-1 Up, facing north to south, downslope.