Wetland Delineation Report

Sibley State Park Beach Area Project

Kandiyohi County, Minnesota

July 29, 2014

Prepared For:

Minnesota Department of
Natural Resources

Jared DeMaster
261 Hwy 15 S
New Ulm, MN 56073-8915

Prepared By:

Westwood

Consultant's Report

Wetland Delineation Report
Sibley State Park Beach Area Project

Kandiyohi County, Minnesota

Prepared for:

Minnesota Department of Natural Resources
Mr. Jared DeMaster
Senior Engineer
261 Hwy 15 S
New Ulm, MN 56073-8915

Prepared by:

Westwood Professional Services, Inc.
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Suite 206
St Cloud, MN 56303

Project Number: 0004072.00

July 29, 2014

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EXHIBITS

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1.0 PURPOSE

This report, the attached exhibits, and data forms constitute the wetland delineation report for the Sibley State Park Beach Area Project located within Sibley State Park, Kandiyohi County, Minnesota (heretofore referred to as the Site). Kandiyohi County is the Local Governmental Unit (LGU) that administers the Minnesota Wetland Conservation Act (WCA) for Kandiyohi County. This delineation report provides the required documentation for wetland boundary determinations in conformance with the United States Army Corps of Engineers (USACE) Wetlands Delineation Manual (Environmental Laboratory, Waterways Experiment Station 1987) and the Regional Supplement to the USACE Wetland Delineation Manual: Midwest Region (US Army Engineer Research and Development Center, 2010).

Applications for WCA Wetland Boundary/Type Determination and USACE Jurisdictional Determination are included in **Appendix A**.

2.0 SITE LOCATION AND DESCRIPTION

The Site is composed of 8.5 acres contained entirely within Sibley State Park. This 8.5 acre site is a portion of parcel 23-002-0015. This parcel is listed as owned by the State of Minnesota, Department of Natural Resources on the Kandiyohi County Parcel Website. This portion of the parcel is located in Section 2, Township 125N, Range 38 W, Kandiyohi County, Minnesota.

The Site is located south of and adjacent to Sibley Park Road NW and north of and adjacent to Lake Andrew. A campground bounds the site to the east and wooded upland bounds the site to the west. A number of improvements are located on the site, including a small shop and public restrooms, a large parking lot and an improved beach area along Lake Andrew.

At the time of the Site review, conditions were cloudy and cool. Antecedent precipitation was wet in the 3 months prior to the delineation. Table 2.1 constitutes the Precipitation Documentation Worksheet from the Minnesota Climatology Working Group.

Table 2.1: Precipitation Documentation Worksheet **Kandiyohi Lake Andrew: (T121N, R35W, S3)**
Score using 1981-2010 normal period

(values are in inches)	first prior month: **June 2014**	second prior month: **May 2014**	third prior month: **April 2014**
estimated precipitation total for this location:	10.73	5.14	4.33
there is a 30% chance this location will have less than:	3.61	2.13	1.48
there is a 30% chance this location will have more than:	6.22	3.66	3.10
type of month: dry normal wet	**wet**	**wet**	**wet**
monthly score	**3 * 3 = 9**	**2 * 3= 6**	**1 * 3 = 3**
multi-month score: 6 to 9 (dry) 10 to 14 (normal) 15 to 18 (wet)	**(18) wet**		

3.0 WETLAND DELINEATION METHODOLOGY

Prior to delineating wetland boundaries in the field, Westwood reviewed USGS topography (Exhibit 1), the National Wetlands Inventory (NWI) and the Minnesota Department of Natural Resources (MNDNR) Public Waters and Wetlands Inventory (PWI) for Kandiyohi County (**Exhibit 2**), and the Natural Resource Conservation Service (NRCS) Soil Survey Geographic database (SSURGO2) for Kandiyohi County (2010) (**Exhibit 3**).

On July 22, 2014, Westwood delineated three wetlands using a level two routine determination method set forth in the USACE Wetlands Delineation Manual (Environmental Laboratory, Waterways Experiment Station 1987) and the supplemental methods set forth in the regional supplement to the USACE Wetland Delineation Manual: Midwest Region (US Army Engineer Research and Development Center 2010). Soils, vegetation, and hydrology data were recorded on data forms and are included in **Appendix B** of this report.

Wetlands were classified according to Wetlands of the United States (U.S. Fish and Wildlife Service Circular 39; Shaw and Fredine; 1971) and Wetlands and Deepwater Habitats of the United States (FWS/OBS Publication 79/31; Cowardin et. al. 1979). Wetland plant community types were classified according to Wetland Plants and Communities of Minnesota and Wisconsin (Eggers and Reed 1997). Common names and scientific names for vegetation identified in this report and on the attached data forms generally correspond with the nomenclature used in the 2013 National Wetland Plant List (Lichvar 2013). Plant indicator status was based upon the Midwest rankings. Species dominance for vegetation measurements was based on the percent coverage visually estimated within a 30-foot radius of the sample point location for the tree and vine layers, a 15-foot radius for the shrub layer, and a five-foot radius for the herbaceous layer. Delineated wetland boundaries were marked in the field using pink pin flags and located using a Trimble GeoXH sub-meter accuracy global positioning unit (GPS) (**Exhibit 4**).

4.0 RESULTS

4.1 Mapping

The NWI data depicts one wetland area mapped along the southern Site boundary. A L1UBH wetland is mapped located along the southern site boundary extending to the south, east and west. The MNDNR PWI for Kandiyohi County indicates the nearest MNDNR Public Waters watercourses or wetlands is Lake Andrew (DNR No. 34-206P) and is mapped along the southern site boundary. No riparian wetlands were delineated along the shoreline of Lake Andrew. The MN DNR website indicates the OHWL of Lake Andrew is 1192.2 feet.

The NRCS SSURGO2 for Kandiyohi County indicates that the soils listed in **Table 4.1** are mapped within the Site boundary (Exhibit 3). The detailed Soil Report for the Site is included in **Appendix C**. Based on the NRCS Minnesota state list of hydric soils, none of the mapped soils are predominantly or completely hydric soils within this Site.

Table 4.1: Soil Summary Table

Map Symbol[1]	Map Unit Name[2]	Rating[2]	Percent Hydric Soil[3]
566	Regal loam	Predominately Hydric	95
804D	Koronis-Hawick complex, 12 to 20 percent slopes	Non-hydric	0
807B	Koronis-Sunburg complex, 2 to 6 percent slopes	Predominately Non-Hydric	15
807D	Koronis-Sunburg complex, 12 to 20 percent slopes	Predominately Non-Hydric	10
W	Water	Non-hydric	0

[1] – Soils determined using GIS geospatial query clipping the NRCS Soil Survey Geographic (SSURGO2) spatial data by Project boundaries.

[2] – As indicated in the SSURGO2 database. "Hydric" means that all components listed for a given map unit are rated as being hydric. "Predominantly hydric" means components that comprise 66 to 99 percent of the map unit are rated as hydric. "Partially hydric" means components that comprise 33 to 66 percent of the map unit are rated as hydric. "Predominantly nonhydric" means components that comprise up to 33 percent of the map unit are rated as hydric. "Nonhydric" means that none of the components are rated as hydric. The assumption here is that all components of the map unit are rated as hydric or nonhydric in the underlying database. A "Not rated or not available" map unit rating is displayed when none of the components within a map unit have been rated.

[3] – As indicated in the SSURGO2 database. Where percentages are small (e.g. < 15 %) the hydric soil is likely an inclusion that is not recognized in the map unit name. The absence of a value does not necessarily indicate the absence of hydric soils, but that the relative percentages of included minor soils has not been determined.

4.2 Delineated Wetland Descriptions

Westwood delineated three wetlands on Site, Wetland WB-01 WB-02 and WB-03, for which data forms are provided in Appendix B and photographs in **Appendix D**. Delineated boundaries were identified based on the plant communities, hydrologic data, and soil properties. The

boundaries followed distinct changes in topography and plant communities between the upland and wetland sample locations.

Wetland WB-001 was a 0.20-acre (8,870 square foot), Type 2/7 (PEMB/FOA) wetland with low quality Wet (Fresh) Meadow/Hardwood Swamp plant community classification (Eggers and Reed 2007, Cowardin et al. 1979, Shaw and Fredine 1971) and was located in the central portion of the Site, connecting to wetlands WB-002 via a culvert. The wetland was positioned in a shallow depression along an excavated ditch. Dominant vegetation in the wetland sample plot consisted of lakebank sedge, spotted touch-me-not and green ash. Soils observed inside the wetland boundary met the F1 (Loamy Mucky Mineral) field indicator for hydric soils. Two primary indicators including High Water Table and Saturation along with two secondary indicators including the FAC-Neutral Test and geomorphic position were observed at the sample point. Lower elevations within the wetland were inundated at the time of the delineation. Wetland WB-001 is not mapped on the NWI, and is located in an area of mapped predominately hydric soil (566).

Dominant vegetation in the upland sample plot consisted of a mix of upland meadow species, dominated by red fescue, Kentucky bluegrass and red clover. Soils characterized in the upland location did not meet field hydric soil indicators and no field hydrology indicators were observed. The upland sample point appears to be in an area planted and maintained as an upland ball field area adjacent to the wetland.

Wetland WB-002 was a 0.25-acre (10,884 square foot), Type 2/7 (PEMB/FOA) wetland with low quality Wet (Fresh) Meadow/Hardwood Swamp plant community classification (Eggers and Reed 2007, Cowardin et al. 1979, Shaw and Fredine 1971) and was located in the northern portion of the Site, connecting to wetlands WB-001 and WB-003 via culverts. The wetland was positioned in a shallow depression along an excavated ditch. Dominant vegetation in the wetland sample plot consisted of reed canary grass and green ash. Soils observed inside the wetland boundary met the F1 (Loamy Mucky Mineral) field indicator for hydric soils. Two primary indicators including High Water Table and Saturation along with two secondary indicators including the FAC-Neutral Test and geomorphic position were observed at the sample point. Lower elevations within the wetland were inundated at the time of the delineation. Wetland WB-002 is not mapped on the NWI, and is located in an area of mapped predominately hydric soil (566).

Dominant vegetation in the upland sample plot consisted of a mix of upland weedy species dominated by annual ragweed, common milkweed, purple vetch and smooth brome. Soils characterized in the upland location did not meet field hydric soil indicators and no field hydrology indicators were observed. The upland sample point is in an area planted and maintained as a trail edge to the edge of the wetland.

Wetland WB-003 was a 0.44-acre (19,051 square foot), Type 2/7 (PEMB/FOA) wetland with low quality Wet (Fresh) Meadow/Hardwood Swamp plant community classification (Eggers and Reed 2007, Cowardin et al. 1979, Shaw and Fredine 1971) and was located in the northeastern portion of the Site, connecting to wetland WB-002 via a culvert. The wetland was positioned in a wide broad depression along an excavated ditch. Dominant vegetation in the wetland sample

plot consisted of green ash, American elm and jack-in-the-pulpit. Soils observed inside the wetland boundary met the F1 (Loamy Mucky Mineral) field indicator for hydric soils. Three secondary indicators including Drainage patterns, the FAC-Neutral Test and geomorphic position were observed at the sample point. Lower elevations within the wetland were inundated at the time of the delineation. Wetland WB-003 is not mapped on the NWI, and the sample point is located in an area of mapped predominately non-hydric soil (807B).

Dominant vegetation in the upland sample plot consisted of Green ash and American Basswood in the overstory, and gooseberry and Virginia creeper in the understory. Soils characterized in the upland location did not meet field hydric soil indicators and no field hydrology indicators were observed. The upland sample point is on a wooded sideslope adjacent to the wooded portion of the wetland.

5.0 CONCLUSIONS

Westwood delineated three wetlands on the Sibley State Park Beach Area Project on behalf of The Minnesota Department of Natural Resources. Please contact Westwood if you have questions regarding this report. No grading, excavation, draining, blocking or diverting water from this site should begin without appropriate permits from regulatory agencies. Severe penalties may be incurred if violation of wetland protection law occurs. **On behalf of the Minnesota Department of Natural Resources, Westwood requests that Kandiyohi County, as the LGU, and the USACE process the enclosed Boundary Confirmation applications (Appendix A).**

Regulatory contact information:

Federal Agency:		
U.S Army Corps of Engineers St. Paul District Jessie Diaz 180 5th St. East, Ste. 700 St. Paul, MN 55101	Phone: (651) 290-5324	Jessie.C.Diaz@usace.army.mil
Local Governmental Unit:		
Kandiyohi County SWCD Jeff Bredberg 400 SW Benson Ave Willmar, MN 56201	Phone: (320) 231-6200	jeff_b@co.kandiyohi.mn.us

6.0 LITERATURE CITED

Cowardin, L.M. , V.M. Carter , F.C. Golet , and E.T. LaRoe . 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service, Biological Services Program, Washington, DC, USA. FWS/OBS-79/31. 103pp.

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Eggers, S.D. and D.M. Reed. 2010. Wetland Plants and Communities of Minnesota and Wisconsin 3rd Addition. U.S. Army Corps of Engineers, St. Paul District. http://cdm16021.contentdm.oclc.org/cdm/ref/collection/p266001coll1/id/2360.

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United States Department of Agriculture, Natural Resources Conservation Service, 2010. Field Indicators of Hydric Soils in the United States, Verson 7.0. C.M. Vasilas, G.W. Hurt, and C.V. Noble (eds.). USDA NRCS, in cooperation with the National Technical Committee for Hydric Soils.

7.0 CERTIFICATION

I certify that, to the best of my knowledge and belief, the wetland delineation completed for this Site is consistent with current wetland delineation practices and guidelines. I have the specific qualifications, education, training, and experience to complete wetland delineations and determinations in accordance with federal and state requirements.

Sincerely,

WESTWOOD PROFESSIONAL SERVICES

Matthew Vollbrecht
Environmental Scientist
MN Certified Wetland Delineator No.1101
Professional Wetland Scientist No. 2115

Exhibits

Sibley State Park Beach Area Property

City of Long Beach, Kandyiohi County, Minnesota

Data Source(s): USDA DRG (LMIC WMS Website, accessed 2014)

Sibley State Park Beach Area

Kandiyohi County, Minnesota

Westwood Professional Services, Inc.
7699 Anagram Drive
Eden Prairie, MN 55344

PHONE 952-937-5150
FAX 952-937-5822
TOLL FREE 1-888-937-5150

www.westwoodps.com

Westwood

±

Feet
1,000

Legend

Proposed Wetland Delineation Area

Site Location

EXHIBIT 1

Map Document: Q:\0064072.00\GIS\4072Site01A.mxd 7/21/2014 12:11:09 PM

Data Source(s): USFWS NWI (1991), MN DNR PWI (2002) Bing Aerial (ERSI WMS Website, accessed 2014)

Sibley State Park Beach Area

Kandiyohi County, Minnesota

Water Resources Mapping

EXHIBIT 2

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±

150 Feet

Legend

- Proposed Wetland Delineation Area
- Mapped DNR Public Water
- NWI Mapped Wetland

Map Document: Q:\0004072.00\GIS\4072Site01A.mxd 7/21/2014 12:03:54 PM

Data Source(s): USDA FSA SURRGO Soils (2002) Bing Aerial (ERSI WMS Website, accessed 2014)

Sibley State Park Beach Area

Kandiyohi County, Minnesota

Soils Mapping

EXHIBIT 3

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Westwood

±

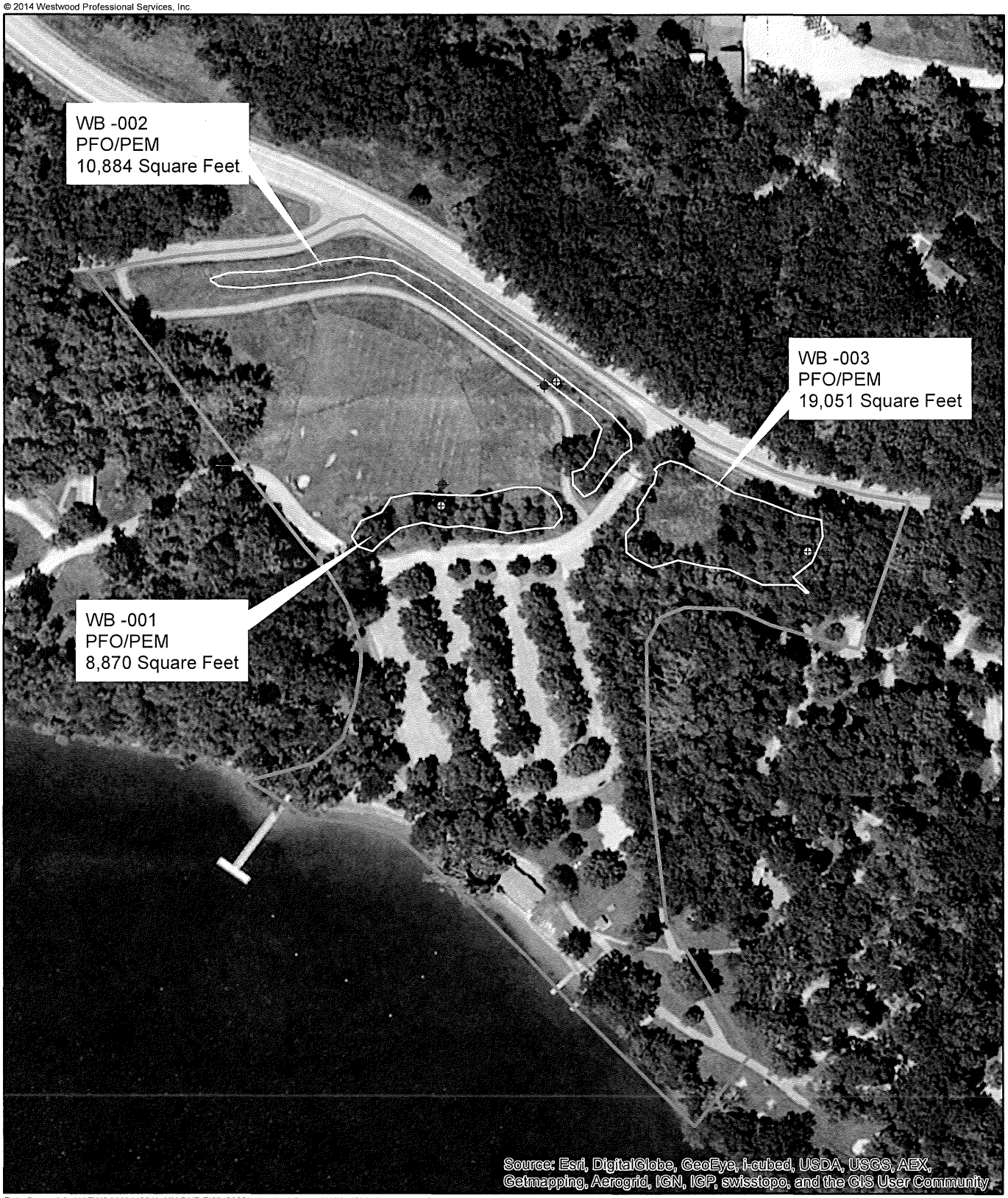
Feet
150

Legend

Proposed Wetland Delineation Area

soilmu_a_mn067

Map Document: Q:\0004072.00\GIS\4072Soil01A.mxd 7/21/2014 12:06:59 PM



Data Source(s): USFWS NWI (1991), MN DNR PWI (2002) Bing Aerial (ERSI WMS Website, accessed 2014)

Sibley State Park Beach Area

Kandiyohi County, Minnesota

Delineated Wetland Boundary Map

EXHIBIT 4

Legend

- Proposed Wetland Delineation Area
- Delineated Wetland
- Upland Sample Point
- Wetland Sample Point

N

Feet
150

Westwood

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Map Document: Q:\0004072.00\GIS\4072WTLD01A.mxd 7/23/2014 7:38:06 AM

Appendix A

WCA/USACE Applications

Sibley State Park Beach Area Property
City of Long Beach, Kandyiohi County, Minnesota

Print Form

US 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	
State of Minnesota Department of Natural Resources	
Property Address (No. & Street, City, State, Zip Code)	
A portion of Section 2, Township 125N, Range 38 W, Kandiyohi County, Minnesota	
Lat. 45.315 °	**Long.** -95.039 ° **(decimal degrees)**
County Kandiyohi	
Location: **1/4 Section** 2	**Township** 125N **Range** 38W
Size of review area 8.5	**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 Matthew Vollbrecht, electronic signature Date July 29, 2014

Name (typed) Matthew Vollbrecht, Westwood Professional Services

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

1. Project/Site Information

Project/Site Name: Sibley State Park Beach Area Local Government Unit: Kandiyohi County
Location (address and/or T, R, Sec.) A portion of Section 2, Township 125N, Range 38 W, Kandiyohi County, Minnesota

2. Applicant Information

Applicant Name: Minnesota Department of Natural Resources
Management Resources Attn. Jared DeMaster

261 Hwy 15 S, New Ulm, MN 56073-8915

3. Agent/Consultant Information

Company Name (if applicable): Westwood Professional Services
Contact Person: Matthew Vollbrecht
Address: 3701 12th Street N Suite 206, St Cloud, MN 56303
E-mail: matt.vollbrecht@westwoodps.com Phone: (320) 229-2311, Mobile (612) 280-4009

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.

Applicant or Authorized Agent Signature

July 29, 2014
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:

Appendix B

Wetland Delineation Data Forms

Sibley State Park Beach Area Property
City of Long Beach, Kandyiohi County, Minnesota

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: SIBLEY STATE PARK City/County: KANDIYOI Sampling Date: 7/22/2014 4:30:00 PM

Applicant/Owner: MN DNR State: MN Sampling Point: WB-001-WET

Investigator(s): MATTHEW VOLLBRECHT PWS#2115 Section, Township, Range: Sec 2 T212N R35W

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

Slope (%): 0 - 2% Lat: 45.316 Long: -94.040 Datum: DECIMAL DEGREE

Soil Map Unit Name: 566 NWI classification: NOT MAPPED

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No ____	**Is the Sampled Area within a Wetland?** Yes ✔ No ____
Hydric Soil Present?	Yes ✔	No ____	
Wetland Hydrology Present?	Yes ✔	No ____	

Remarks:

PFO/PEM WETLAND ALONG AN EXCAVATED DITCH

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	25	Yes	FACW
2. Ulmus americana	15	Yes	FACW
3.			
4.			
5.			
	40	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Rubus idaeus	15	Yes	FACU
2. Acer negundo	10	Yes	FAC
3. Ulmus americana	5	No	FACW
4.			
5.			
	30	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Carex lacustris	35	Yes	OBL
2. Impatiens capensis	20	Yes	FACW
3. Urtica dioica	10	No	FACW
4. Cirsium arvense	5	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	70	= Total Cover	
Woody Vine Stratum (Plot size: 10)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 83.33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	35	x 1 =	35
FACW species	75	x 2 =	150
FAC species	10	x 3 =	30
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	140 (A)		295 (B)

Prevalence Index = B/A = 2.11

Hydrophytic Vegetation Indicators:

✔ 2 - Dominance Test is >50%

✔ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No ____

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

PEM/PFO WETLAND DOMINATED BY GREEN ASH AND LAKEBANK SEDGE

SOIL

Sampling Point: WB-001-W

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[1]	Loc[2]	Texture	Remarks
0 - 26	10YR 2/1	100					MMI	
26 - 32	10YR 5/3	80	10YR 5/8	20.00	C	M	SC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (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)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___
- ✔ 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[3]:

- ___ Coast Prairie Redox (A16)
- ___
- ___ Iron-Manganese Masses (F12)
- ___
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): 0.00

Hydric Soil Present? Yes ✔ No _____

Remarks:
DARK BLACK LOAMY MUCKY MINERAL SOIL

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 ✔ Depth (inches): _____

Water Table Present? Yes ✔ No _____ Depth (inches): 11.00

Saturation Present? (includes capillary fringe) Yes ✔ No _____ Depth (inches): 10.00

Wetland Hydrology Present? Yes ✔ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
PORTIONS OF THE WETLAND WERE INUNDATED AT THE TIME OF DELINEATION

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: SIBLEY STATE PARK City/County: KANDIYOI Sampling Date: 7/22/2014 4:35:48 PM

Applicant/Owner: MN DNR State: MN Sampling Point: WB-001-UP

Investigator(s): MATTHEW VOLLBRECHT PWS#2115 Section, Township, Range: Sec 2 T212N R35W

Landform (hillslope, terrace, etc.): Side slope Local relief (concave, convex, none): LL

Slope (%): 3-7% Lat: 45.316 Long: -94.040 Datum: DECIMAL DEGREE

Soil Map Unit Name: 566 NWI classification: NOT MAPPED

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

UPLAND BALLFIELD PLANTED IN TURF GRASS UPSLOPE OF A PFO/PEM WETLAND

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5)			
1. Festuca rubra	30	Yes	FACU
2. Poa pratensis	30	Yes	FAC
3. Trifolium repens	20	Yes	FACU
4. Digitaria sanguinalis	10	No	FACU
5. Plantago rugelii	5	No	FAC
6. Taraxacum officinale	5	No	FACU
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 10)			
1.			
2.			
	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	35	x 3 =	105
FACU species	65	x 4 =	260
UPL species	0	x 5 =	0
Column Totals:	100 (A)		365 (B)

Prevalence Index = B/A = 3.65

Hydrophytic Vegetation Indicators:

___

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

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

UPLAND MOWED BALLFIELD PLANTED IN TURF GRASS

SOIL

Sampling Point: WB-001-U

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 10	10YR 2/2	100					L	
10 - 30	10YR 5/6	100					LCOS	FILL MATERIAL

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (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)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___
- ___ 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[3]:

- ___ Coast Prairie Redox (A16)
- ___
- ___ Iron-Manganese Masses (F12)
- ___
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✔

Remarks:
NO HYDRIC SOIL INDICATORS OBSERVED

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 ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
NO EVIDENCE OF WETLAND HYDROLOGY OBSERVED

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: SIBLEY STATE PARK City/County: KANDIYOI Sampling Date: 7/22/2014 4:18:37 PM

Applicant/Owner: MN DNR State: MN Sampling Point: WB-002-MCV-W

Investigator(s): MATTHEW VOLLBRECHT PWS#2115 Section, Township, Range: Sec 2 T212N R35W

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

Slope (%): 0 - 2% Lat: 45.316 Long: -94.039 Datum: DECIMAL DEGREE

Soil Map Unit Name: 566 NWI classification: NOT MAPPED

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No _____	**Is the Sampled Area within a Wetland?** Yes ✔ No _____
Hydric Soil Present?	Yes ✔	No _____	
Wetland Hydrology Present?	Yes ✔	No _____	

Remarks:

PFO/PEM WETLAND ALONG AN EXCAVATED DITCH

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	15	Yes	FACW
2.			
3.			
4.			
5.			
	15	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Phalaris arundinacea	40	Yes	FACW
2. Impatiens capensis	20	Yes	FACW
3. Rumex crispus	10	No	FAC
4. Solidago gigantea	10	No	FACW
5. Vicia americana	10	No	FACU
6.			
7.			
8.			
9.			
10.			
	90	= Total Cover	
Woody Vine Stratum (Plot size: 10)			
1. Vitis riparia	10	Yes	FACW
2.			
	10	= 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 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	95	x 2 =	190
FAC species	10	x 3 =	30
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	115 (A)		260 (B)

Prevalence Index = B/A = 2.26

Hydrophytic Vegetation Indicators:

___

✔ 2 - Dominance Test is >50%

✔ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No _____

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

PEM/PFO WETLAND DOMINATED BY GREEN ASH AND REED CANARY GRASS

SOIL

Sampling Point: WB-002-M

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 3/2	100					P	
6 - 28	10YR 7/1	80	10YR 5/8	20.00	C	M	MMI	
28 - 32	10YR 2/1	100					P	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (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)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___
- ✔ 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[3]:

- ___ Coast Prairie Redox (A16)
- ___
- ___ Iron-Manganese Masses (F12)
- ___
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): 0.00

Hydric Soil Present? Yes ✔ No _____

Remarks:
DARK BLACK LOAMY MUCKY MINERAL SOIL OVER PEAT

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 ✔ Depth (inches): _____

Water Table Present? Yes ✔ No ___ Depth (inches): 11.00

Saturation Present? (includes capillary fringe) Yes ✔ No ___ Depth (inches): 10.00

Wetland Hydrology Present? Yes ✔ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
PORTIONS OF THE WETLAND WERE INUNDATED AT THE TIME OF DELINEATION

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: SIBLEY STATE PARK City/County: KANDIYOI Sampling Date: 7/22/2014 5:00:21 PM

Applicant/Owner: MN DNR State: MN Sampling Point: WB-002-UP

Investigator(s): MATTHEW VOLLBRECHT PWS#2115 Section, Township, Range: Sec 2 T212N R35W

Landform (hillslope, terrace, etc.): Side slope Local relief (concave, convex, none): LL

Slope (%): 3 - 7% Lat: 45.316 Long: -94.040 Datum: DECIMAL DEGREE

Soil Map Unit Name: 566 NWI classification: NOT MAPPED

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

UPLAND MEADOW ALONG TRAIL UPSLOPE OF A PFO/PEM WETLAND

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Vicia americana	45	Yes	FACU
2. Poa pratensis	20	No	FAC
3. Achillea millefolium	10	No	FACU
4. Ambrosia artemisiifolia	10	No	FACU
5. Asclepias syriaca	10	No	FACU
6. Bromus inermis	10	No	FACU
7. Solidago gigantea	10	No	FACW
8.			
9.			
10.			
	115	= Total Cover	
Woody Vine Stratum (Plot size: 10)			
1.			
2.			
	0	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	20	x 3 =	60
FACU species	85	x 4 =	340
UPL species	0	x 5 =	0
Column Totals:	115 (A)		420 (B)

Prevalence Index = B/A = 3.65

Hydrophytic Vegetation Indicators:

___

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

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

UPLAND MEADOW ALONG PAVED TRAIL DOMINATED BY VETCH

SOIL

Sampling Point: WB-002-U

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0 - 10	10YR 2/2	100					L	
10 - 30	10YR 5/6	100					LCOS	FILL MATERIAL

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (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)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___
- ___ 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[3]:

- ___ Coast Prairie Redox (A16)
- ___
- ___ Iron-Manganese Masses (F12)
- ___
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✔

Remarks:
NO HYDRIC SOIL INDICATORS OBSERVED

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 ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
NO EVIDENCE OF WETLAND HYDROLOGY OBSERVED

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: SIBLEY STATE PARK City/County: KANDIYOI Sampling Date: 7/22/2014 4:28:46 PM

Applicant/Owner: MN DNR State: MN Sampling Point: WB-003-WET

Investigator(s): MATTHEW VOLLBRECHT PWS#2115 Section, Township, Range: Sec 2 T212N R35W

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

Slope (%): 0 - 2% Lat: 45.316 Long: -94.038 Datum: DECIMAL DEGREE

Soil Map Unit Name: 807B NWI classification: NOT MAPPED

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No ____	**Is the Sampled Area within a Wetland?** Yes ✔ No ____
Hydric Soil Present?	Yes ✔	No ____	
Wetland Hydrology Present?	Yes ✔	No ____	

Remarks:

PFO/PEM WETLAND ALONG AN EXCAVATED DITCH

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	75	Yes	FACW
2. Ulmus americana	20	Yes	FACW
3.			
4.			
5.			
	95	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Ribes triste	20	Yes	OBL
2. Ulmus americana	20	Yes	FACW
3. Fraxinus pennsylvanica	10	No	FACW
4. Rhamnus cathartica	10	No	FAC
5.			
	60	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Arisaema triphyllum	20	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	20	= Total Cover	
Woody Vine Stratum (Plot size: 10)			
1. Vitis riparia	15	Yes	FACW
2.			
	15	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	160	x 2 =	320
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	190 (A)		370 (B)

Prevalence Index = B/A = 1.95

Hydrophytic Vegetation Indicators:

✔ 2 - Dominance Test is >50%

✔ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✔ No ____

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

PEM/PFO WETLAND DOMINATED BY GREEN ASH AND REED CANARY GRASS

SOIL

Sampling Point: WB-003-W

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 33	10YR 2/1	100					MMI	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (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)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___
- ✔ 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[3]:

- ___ Coast Prairie Redox (A16)
- ___
- ___ Iron-Manganese Masses (F12)
- ___
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): 0.00

Hydric Soil Present? Yes ✔ No _____

Remarks:
DARK BLACK LOAMY MUCKY MINERAL SOIL

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 ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes ✔ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
PORTIONS OF THE WETLAND WERE INUNDATED AT THE TIME OF DELINEATION

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: SIBLEY STATE PARK City/County: KANDIYOI Sampling Date: 7/22/2014 5:07:12 PM

Applicant/Owner: MN DNR State: MN Sampling Point: WB-003-UP

Investigator(s): MATTHEW VOLLBRECHT PWS#2115 Section, Township, Range: Sec 2 T212N R35W

Landform (hillslope, terrace, etc.): Side slope Local relief (concave, convex, none): LL

Slope (%): 3 - 7% Lat: 45.316 Long: -94.038 Datum: DECIMAL DEGREE

Soil Map Unit Name: 807B NWI classification: NOT MAPPED

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✔ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✔	**Is the Sampled Area within a Wetland?** Yes _____ No ✔
Hydric Soil Present?	Yes _____	No ✔	
Wetland Hydrology Present?	Yes _____	No ✔	

Remarks:

UPLAND MEADOW ALONG TRAIL UPSLOPE OF A PFO/PEM WETLAND

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Fraxinus pennsylvanica	25	Yes	FACW
2. Tilia americana	25	Yes	FACU
3.			
4.			
5.			
	50	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15)			
1. Tilia americana	20	Yes	FACU
2. Ribes cynosbati	10	Yes	FAC
3.			
4.			
5.			
	30	= Total Cover	
Herb Stratum (Plot size: 5)			
1. Parthenocissus quinquefolia	15	Yes	FACU
2. Arisaema triphyllum	10	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	25	= Total Cover	
Woody Vine Stratum (Plot size: 10)			
1. Parthenocissus quinquefolia	10	Yes	FACU
2.			
	10	= 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: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 42.86 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	35	x 2 =	70
FAC species	10	x 3 =	30
FACU species	70	x 4 =	280
UPL species	0	x 5 =	0
Column Totals:	115 (A)		380 (B)

Prevalence Index = B/A = 3.3

Hydrophytic Vegetation Indicators:

___

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✔

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

SOIL

Sampling Point: WB-003-U

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 33	10YR 2/2	100					CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
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- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
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- ___ 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[3]:

- ___ Coast Prairie Redox (A16)
- ___
- ___ Iron-Manganese Masses (F12)
- ___
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✔

Remarks:
NO HYDRIC SOIL INDICATORS OBSERVED

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)
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- ___ 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 ✔ Depth (inches): _____

Water Table Present? Yes _____ No ✔ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✔ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
NO EVIDENCE OF WETLAND HYDROLOGY OBSERVED

Appendix C

Custom Soil Report

Sibley State Park Beach Area Property
City of Long Beach, Kandyiohi County, Minnesota

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Kandiyohi County, Minnesota

Sibley State park Beach Area

June 12, 2014

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

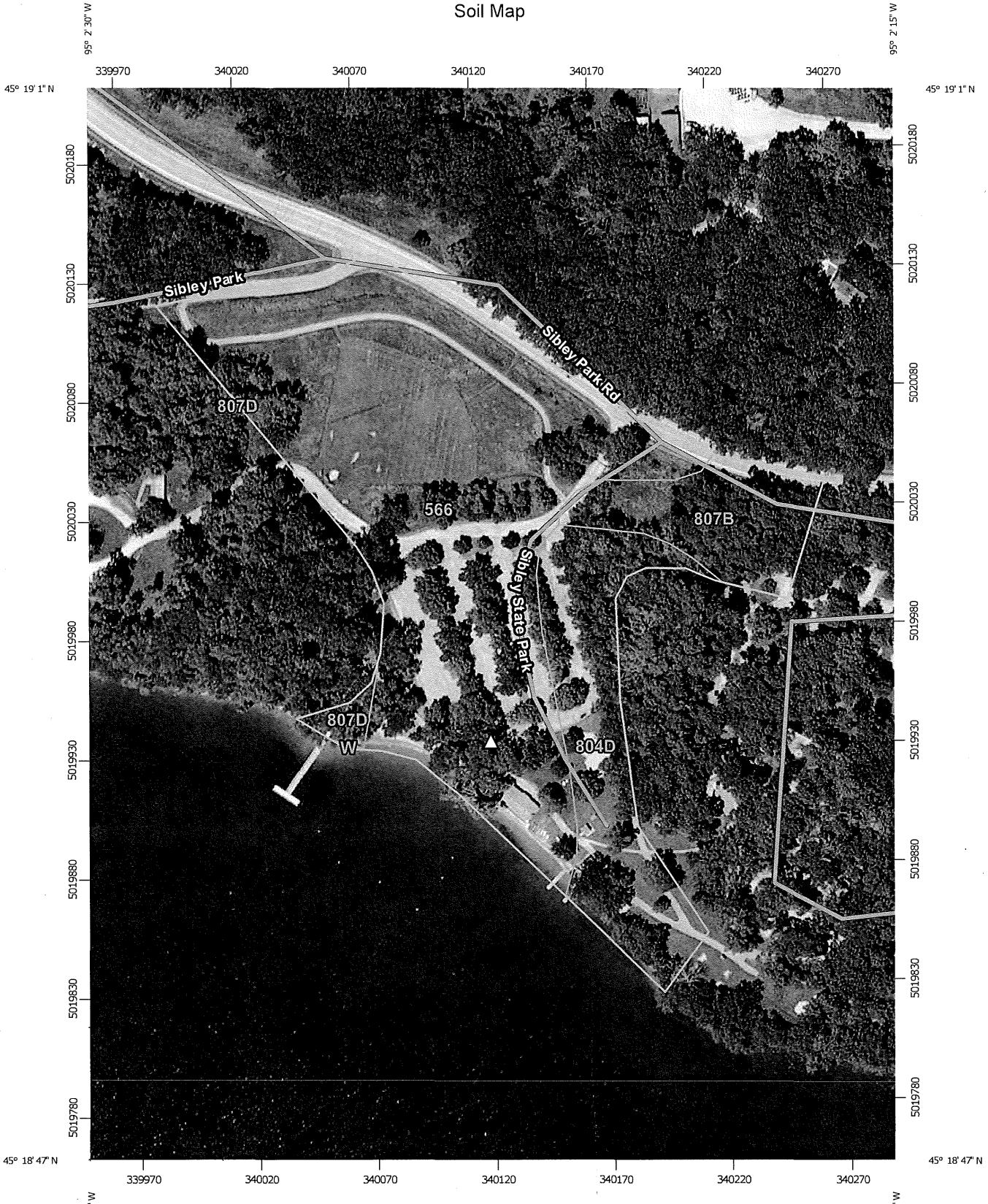
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:2,190 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 30 60 120 180

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

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 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
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: Kandiyohi County, Minnesota
Survey Area Data: Version 12, Dec 26, 2013

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

Date(s) aerial images were photographed: May 18, 2011—Sep 7, 2011

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

Kandiyohi County, Minnesota (MN067)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
566	Regal loam	5.9	69.2%
804D	Koronis-Hawick complex, 12 to 20 percent slopes	1.6	18.9%
807B	Koronis-Sunburg complex, 2 to 6 percent slopes	0.9	10.7%
807D	Koronis-Sunburg complex, 12 to 20 percent slopes	0.1	1.2%
W	Water	0.0	0.0%
Totals for Area of Interest		**8.5**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Kandiyohi County, Minnesota

566—Regal loam

Map Unit Composition

Regal and similar soils: 90 percent
Minor components: 10 percent

Description of Regal

Setting

Landform: Flats on outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy outwash over sandy and gravelly outwash

Typical profile

Ap,A - 0 to 14 inches: slightly alkaline, loam
Bg - 14 to 18 inches: moderately alkaline, sandy loam
2C - 18 to 60 inches: moderately alkaline, gravelly coarse sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 16 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Available water storage in profile: Low (about 4.7 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: B/D

Minor Components

Osakis

Percent of map unit: 5 percent
Landform: Outwash plains

Biscay

Percent of map unit: 5 percent
Landform: Depressions

804D—Koronis-Hawick complex, 12 to 20 percent slopes

Map Unit Setting

Elevation: 700 to 1,600 feet
Mean annual precipitation: 24 to 30 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 120 to 165 days

Map Unit Composition

Koronis and similar soils: 65 percent
Hawick and similar soils: 20 percent
Minor components: 15 percent

Description of Koronis

Setting

Landform: Hills on moraines
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy till

Typical profile

Ap - 0 to 7 inches: slightly acid, sandy loam
Bt - 7 to 29 inches: slightly acid, sandy clay loam
C - 29 to 60 inches: moderately alkaline, fine sandy loam

Properties and qualities

Slope: 12 to 20 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Available water storage in profile: High (about 9.2 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A

Description of Hawick

Setting

Landform: Hills on moraines
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Linear

Parent material: Sandy and gravelly outwash

Typical profile

Ap - 0 to 10 inches: neutral, loamy coarse sand
Bw - 10 to 22 inches: neutral, gravelly loamy coarse sand
C - 22 to 60 inches: moderately alkaline, gravelly coarse sand

Properties and qualities

Slope: 12 to 20 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: A

Minor Components

Sunburg

Percent of map unit: 10 percent
Landform: Moraines

Terril

Percent of map unit: 5 percent
Landform: Moraines

807B—Koronis-Sunburg complex, 2 to 6 percent slopes

Map Unit Setting

Elevation: 900 to 1,600 feet
Mean annual precipitation: 22 to 30 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 124 to 165 days

Map Unit Composition

Koronis and similar soils: 65 percent
Sunburg and similar soils: 20 percent
Minor components: 15 percent

Description of Koronis

Setting

Landform: Hills on moraines
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy till

Typical profile

Ap - 0 to 8 inches: slightly acid, sandy loam
Bt - 8 to 26 inches: slightly acid, sandy clay loam
C - 26 to 60 inches: moderately alkaline, fine sandy loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A

Description of Sunburg

Setting

Landform: Hills on moraines
Landform position (two-dimensional): Shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Coarse-loamy till

Typical profile

Ap - 0 to 8 inches: slightly alkaline, loam
C - 8 to 60 inches: moderately alkaline, fine sandy loam

Properties and qualities

Slope: 4 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 30 percent
Available water storage in profile: High (about 9.4 inches)

Interpretive groups

Farmland classification: All areas are prime farmland
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B

Minor Components

Delft

Percent of map unit: 10 percent
Landform: Drainageways

Glencoe

Percent of map unit: 5 percent
Landform: Depressions

807D—Koronis-Sunburg complex, 12 to 20 percent slopes

Map Unit Setting

Elevation: 900 to 1,600 feet
Mean annual precipitation: 22 to 30 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 124 to 165 days

Map Unit Composition

Koronis and similar soils: 55 percent
Sunburg and similar soils: 35 percent
Minor components: 10 percent

Description of Koronis

Setting

Landform: Hills on moraines
Landform position (two-dimensional): Backslope
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy till

Typical profile

Ap - 0 to 8 inches: slightly acid, sandy loam
Bt - 8 to 26 inches: slightly acid, sandy clay loam
C - 26 to 60 inches: moderately alkaline, fine sandy loam

Properties and qualities

Slope: 12 to 20 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 5.95 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 20 percent
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A

Description of Sunburg

Setting

Landform: Hills on moraines
Landform position (two-dimensional): Shoulder
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Coarse-loamy till

Typical profile

Ap - 0 to 8 inches: slightly alkaline, loam
C - 8 to 60 inches: moderately alkaline, fine sandy loam

Properties and qualities

Slope: 12 to 20 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 30 percent
Available water storage in profile: High (about 9.4 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B

Minor Components

Glencoe

Percent of map unit: 5 percent
Landform: Depressions

Delft

Percent of map unit: 5 percent
Landform: Drainageways

W—Water

Map Unit Composition
Water: 100 percent

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Appendix D

Wetland Delineation Photographs

Sibley State Park Beach Area Property
City of Long Beach, Kandyiohi County, Minnesota

Wetland WB-01 looking West at Sample Point

Wetland WB-01 looking south at transect point

West end Wetland WB-002 looking Northeast

Southeast end Wetland WB-002 looking North in wooded portion with ditch

Eastern Wooded portion Wetland WB-003 looking West

Western Wet Meadow portion Wetland WB-003 looking East