



THIS PROJECT WAS FUNDED IN PART BY THE AGSTAR FUND FOR RURAL AMERICA.

THIS PROJECT WAS FUNDED IN PART BY THE INITIATIVE FOUNDATION, A REGIONAL FOUNDATION.

Feasibility Report For

Possible Industrial Park Site

Prepared for:
Maple Lake, Minnesota



April 2015
Stantec Project No. 193803089



Stantec Consulting Services Inc.
2335 Highway 36 West, St. Paul MN 55113

April 30, 2015

Honorable Mayor and City Council
City of Maple Lake
10 Maple Avenue South
Maple Lake, MN 55358-0757

Re: Feasibility Report
Possible Industrial Park Site

Dear Mayor and Council:

The City of Maple Lake is interested in expanding the industrial property base in the city. In an effort to assist the expansion of the industrial base, the city has completed an extensive review of possible sites for future industrial expansion and has included those areas in the city's comprehensive plan.

This report provides a feasibility analysis for a specific site that has been identified for possible industrial expansion. The site is located east of Spruce Avenue and north of the existing Jude Industrial Park property.

This report provides planning level information on the feasibility of developing the property. Information in the report includes a concept lot layout, concept street and utility layout, some available information on existing soils in the area, and a planning level opinion of probable costs.

The report does not include preliminary plat information, construction level plan details, and information on possible funding or assessments.

***This project was funded in part by the Initiative Foundation, a regional foundation.
This project was funded in part by the AgStar Fund for Rural America.***

We'd be please to meet with you to discuss the information contained in the report.

Sincerely,

STANTEC CONSULTING SERVICES, INC.

Phil Gravel

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Phil Gravel, P.E.

Date: 04/30/2015

Reg. No. 19864

CITY OF MAPLE LAKE

POSSIBLE INDUSTRIAL PARK SITE

APRIL 2015

2015 CITY OFFICIALS

Lynn Kissock	Mayor
John Northenscold Sr.	Council
Deb Geyen	Council
Bart Lauer	Council
Todd Jude	Council

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INTRODUCTION

The City of Maple Lake has a need to expand the amount of industrial property available for new users. The city recently went through an extensive effort to identify possible future industrial expansion areas. The comprehensive plan has been amended to show the future land use for the identified areas as industrial.

In late 2015 the city identified a specific property (consisting of two parcels) as having the potential for industrial development (Figure 1). The property is approximately 57 acres in size and is located north of an existing industrial park. Information on the two parcels from Wright County is shown on the following page.

The property is presently zoned Agricultural and is shown as Light Industrial on the Future Land Use Plan. The City's Economic Development Coordinator has met with the property owners and has obtained their permission to complete this report.

The purpose of the report is to begin to evaluate the feasibility of the property for industrial development and to provide the city with information to consider in making forthcoming decisions about the property.

The report includes a discussion on the topography of the site including general available information on soils, elevations, and wetlands.

The report includes a concept layout showing how the property could be divided for industrial use (Figure 3). The concept layout illustrates how the site could possibly be developed but it is only a preliminary layout. More detailed information on road alignment and lot sizes will be determined as part of a platting process.

The report includes a planning level proposed utility plan to demonstrate that municipal infrastructure could serve the site (Figure 4). The storm water management pond included on the concept plan is generally indicative of the amount of area that will need to be provided for stormwater management, but detailed pond sizing has not been completed.

Finally, the report includes a planning level opinion of probably construction costs estimate for the municipal infrastructure as presented on the concept drawings. The cost information can be used along with other cost information to evaluate options for moving the development forward. Note that obtaining additional information regarding current property value, site grading costs, and how to deal with the farmstead buildings may be beneficial.

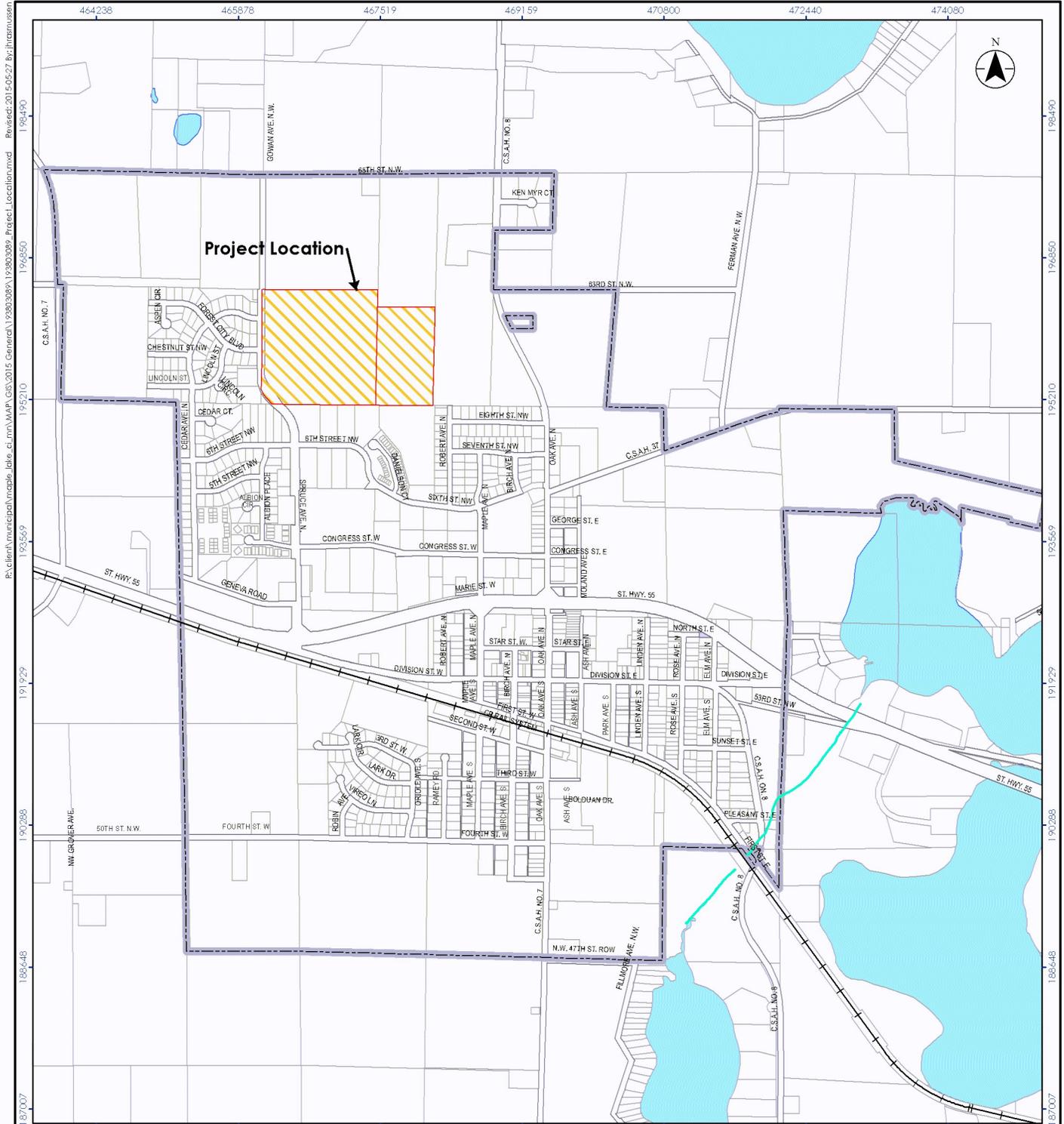
Parcel Information from Wright County Beacon site



Parcel ID	110500313300	Alternate ID	n/a	Owner Address	n/a
Sec/Twp/Rng	31-121-26	Class	101 - AGRICULTURAL		
Property Address	820 SPRUCE AVE N MAPLE LAKE	Acreage	40.310		
District	n/a				
Brief Tax Description	Sect-31 Twp-121 Range-026 UNPLATTED LAND MAPLE LK1 40.31 AC SW1/4 OF SW1/4 EX TR DES ON DOC721405(313301)				



Parcel ID	110500313400	Alternate ID	n/a	Owner Address	n/a
Sec/Twp/Rng	31-121-26	Class	101 - AGRICULTURAL		
Property Address		Acreage	17.360		
District	n/a				
Brief Tax Description	Sect-31 Twp-121 Range-026 UNPLATTED LAND MAPLE LK1 17.36 AC S 1138 FT OF W 1-2 OF E 1-2 SW				



R:\client\municipal\incaps_1\193803089\193803089_General\193803089\193803089_Planet_Localland.mxd Revised: 2015-06-27 By: jharrismuse

187007 189648 190288 191929 193569 195210 196850 198490

464238 465878 467519 469159 470800 472440 474080

- Project Location
- Railroad
- Right of Way
- Parcels
- Streams
- Surface Water
- City Boundary

Project Location: City of Maple Lake, Wright County, MN
 Prepared by JHR on 2015-04
 Technical Review by PG on 2015-04

Client/Project:
City of Maple Lake
Possible Industrial Park Site
193803089

Figure No.
1

Title
Project Location Map

Notes
 1. Coordinate System: MN Wright Lambert Conformal Conic
 2. Base features: Wright County MN, City of Maple Lake, Stantec, MNDNR

Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.



EXISTING SITE CONDITIONS

Based on the available information used for the preparation of this report, the site appears to be developable. The site does not appear to be much different than portions of existing developed property to the west of Spruce Avenue.

Some of the positive aspects to the site include the proximity of Spruce Avenue and existing municipal utilities. Note that Spruce Avenue on the west side of the site has been improved to an urban connector street design. Sewer and water stubs have been provided to the site.

Some of the negative aspects of the site include soil issues, anticipated wetland areas, and drainage concerns.

Topography

The site is presently used as farmland and includes a residential farmstead. The farm field includes drain tiles including a large tile that extends diagonally from the southeast corner of the site to the northwest corner of the site. The topography is gently rolling with a change in elevation of approximately 15-feet (approximately 1025 to 1010). Contour elevations from the site available from USGS maps are presented on Figure 2.

Wetlands

National Wetland Inventory maps indicate the presence of wetlands on the site. The approximate wetland areas on the site are shown on the city's Land Use plans. Specifically, the southeast corner of the site and a small area just west of the farmstead are shown on the national wetland inventory as wetlands.

The actual limits of wetland on the site will need to be determined by a formal wetland delineation process. A formal wetland delineation process will include field work to confirm the wetland locations including documenting soils, vegetation, and hydrology. The delineation information will be reviewed by Federal, State and local agencies to establish the wetland limits. The existence of field tiles and the past farming use of the property may influence the delineated wetlands limits on the site.

Soils

As is common in the Maple Lake area, the soil conditions of the site present development challenges. Soil information available from the USDA was obtained as part of this report. No geotechnical field borings were completed. A portion of available USDA information on existing soil conditions is included as Appendix C of this report.

The site appears to include loams and clayey loams. The USDA Soil Survey information indicates that much of the site appears to meet the criteria for hydric soils. Hydric soils are soils that indicate saturation conditions. On the map below, the areas shown as red or orange are the areas to most likely contain hydric soils.

The amount of hydric soils and organics soils on a site has a direct impact on the developable area of the site and the amount of soil correction (excavation and replacement) required to support building pads, parking lots, and roads.



For this report, an assumed street section including 2-feet of sand and 1-foot of gravel has been included to account for anticipated soil conditions. If unsuitable soils are encountered below the top 3.5-feet, extra soil correction will be required for the street construction.

No lot pad soils correction work or cost is included in this report. It is assumed that lot pad correction work would be completed on lot-by-lot basis at the time buildings are constructed. Similarly, no mass site grading is included with the cost included in this report. The report assumes that grading will be completed for the main east-west road and the stormwater pond at the northwest corner of the property but not on the lots or the possible loop street.

CONCEPT PLAN

A concept layout plan has been developed for the site (Figure 3). The layout assumes some standard industrial lot configuration dimensions and is based on the following site considerations:

- The existing intersection locations on Spruce Avenue.
- Anticipated wetland conditions in the southeast corner of the site.
- The need for an east-west connector road (Forest City Boulevard) as shown in the comprehensive plan.

The concept plan can be used as a tool for marketing the property and for future planning efforts. Comments and feedback on the concept plan should be solicited from interested parties. It is anticipated that the proposed lot lines and road alignments of the concept plan will be revised as the project proceeds through the preliminary plat phase.

Lots

The lot lines shown on the concept plan could be adjusted to accommodate variable building site sizes. The sizes proposed a similar in size to existing industrial lots on 6th Street NW. The proposed lot on the southwest corner of the site would require a driveway access off of Spruce Avenue.

Acreage Summary

The concept plan includes land for public right-of-way, storm water ponding, wetlands, and developable lots. Based on the concept plan, the site could yield approximately 38.6 net developable acres. Note that the net developable acres estimated herein is an approximation based on available information. The actual final developable acreage will be determined during the plat preparation process when more detailed information including wetland delineation and lot dimensions are available.

A summary of approximate areas for the site based on the concept plan is as follows:

<u>Use</u>	<u>Area</u>	
Right-of-Way	5.9 Acres	
Stormwater Pond	1.7 Acres	
Wetland	11.47 Acres	
Lots	<u>38.6 Acres</u>	
TOTAL	57.67 Acres	

INFRASTRUCTURE IMPROVEMENTS

The proposed municipal infrastructure improvements are shown on Figure 4.

The proposed improvements consist of adding city streets and utilities to serve the development. This report does not include a detailed discussion on the availability or cost of private utility improvements (i.e. natural gas, telephone, electric, etc.).

Streets

The concept plan includes an east-west connector street (Forest City Boulevard). This road is part of a through road between County Road 7 and County Road 8 in accordance with the city's comprehensive plan.

The concept plan also includes a loop street between proposed Forest City Boulevard and existing Spruce Avenue. The alignment and length of this street could be modified depending on the desired final lot layout for the property. For example, if one buyer wanted to purchase a large parcel, the entire street may not be required. Another option might be to extend the road to the north edge of the property to provide a connection point with that property for future industrial development. For the purposes of this report, it is assumed that the final alignment of the loop street will be subject to further consideration during the plat preparation stage(s).

Streets are proposed to be 36-feet wide to accommodate industrial traffic. The street section is proposed to be an industrial section similar to that of Spruce Avenue.

Sanitary Sewer

Sanitary sewer service for the site will come from an existing sewer lift station on Spruce Avenue. The city's 2004 comprehensive sewer and water plan calls for the sewer size to be a 15-inch diameter pipe in order to provide sufficient capacity for future sewer service to the east.

It is proposed to maintain available depth of the sewer by constructing at minimum grade from the existing sewer stubs on Spruce Avenue. Maintaining maximum depth will facilitate an expanded future service area to the east of the site.

The proposed sanitary sewer pipe will be PVC pipe in accordance with city standards.

The cost estimates contained herein do not include sewer within the "loop street" as it is uncertain whether or not that street will ever need to be constructed as shown on the concept plan.

Water Main

Water service will come from existing mains on Spruce Avenue. The city's 2004 comprehensive sewer and water plan calls for the main size to be a 12-inch diameter pipe.

Water main is not shown on the concept utility plan to avoid having too many lines on the drawing. The general alignment of the water main will follow the sanitary sewer alignment. Hydrants will be spaced as necessary to provide coverage per past city practice.

The proposed water main pipe will be PVC pipe in accordance with city standards.

Storm Sewer

Stormwater management for the site will include addressing onsite run-off and providing capacity and an overland drainage route for runoff from south of the site. It is assumed that additional stormwater storage and treatment ponding will be required on each lot on a site by site basis.

The concept utility plan includes a preliminary storm sewer alignment. The proposed storm sewer will provide some capacity to convey runoff from the wetland complex at the southeast corner of the site, capacity for the street runoff, and capacity for predevelopment runoff from the lots.

The concept plan includes a stormwater management pond on the northwest corner of the site. The proposed pond size is based on anticipated site conditions and is intended to manage runoff from the street as well as limited runoff from the lots. Final sizing of the pond and storm sewer will be completed during the plat preparation phase.

Private Infrastructure

Development of the site will require construction of "private utilities" including natural gas, electric, telephone and cable. Private utility companies generally install basic services within the street rights of way at the time of development. It is anticipated that the basic services are installed at no cost to the city. If desired, street light installation will include a charge by the electric company.

PRELIMINARY COST INFORMATION

Planning level preliminary cost estimates have been prepared for the proposed municipal improvement as shown on the concept plan. Since it is unclear whether or not the proposed "loop street" would need to be fully or partially constructed, costs for that street and the associated utilities are not included in the estimates herein.

The preliminary cost information contained herein can be used in conjunction with additional site information when making planning level decisions about the site.

A detailed opinion of probable costs is included in Appendix A. A summary of the estimated costs is presented below.

<u>Item</u>	<u>Estimated Cost</u>
Street (east-west street only)	\$ 574,700
Sanitary Sewer (east-west street only)	\$ 185,900
Water Main (east-west street only)	\$ 126,500
Storm Sewer (east-west street only)	\$ 272,500
Lot Services (lots on east-west street only)	\$ 31,000
Total	\$1,190,600

For discussion purposes, it may be beneficial to look at the estimated costs in "per net developable acre" terms. If the net area that can be developed as lots is approximately 38.6 acres, and the estimated construction cost to build the east-west street and associated municipal utilities is \$1,190,600, then the per developable acre costs for those improvements is \$30,845. That amount equates to a per square foot cost of about \$0.71 per net developable square foot.

Additional costs for items such as land acquisition, soils correction, building removal, etc. also need to be taken into account when discussing a final per net developable square foot cost estimate.

Summary and Recommendations

The purpose of this report is to provide information to the city to be used, in conjunction with other information, to evaluate the possibility of developing the selected site as industrial property. From an engineering standpoint, the site appears to be developable. There is a good in place road on the east edge of the property and existing municipal utilities are available for the site.

This report provides planning level information on the feasibility of developing the property. Information in the report includes a concept lot layout, concept street and utility layout, some available information on existing soils in the area, and a planning level opinion of probable costs.

Based on the information presented herein and on our understanding of the goals of the city, we offer the following recommendations for the Maple Lake City Council:

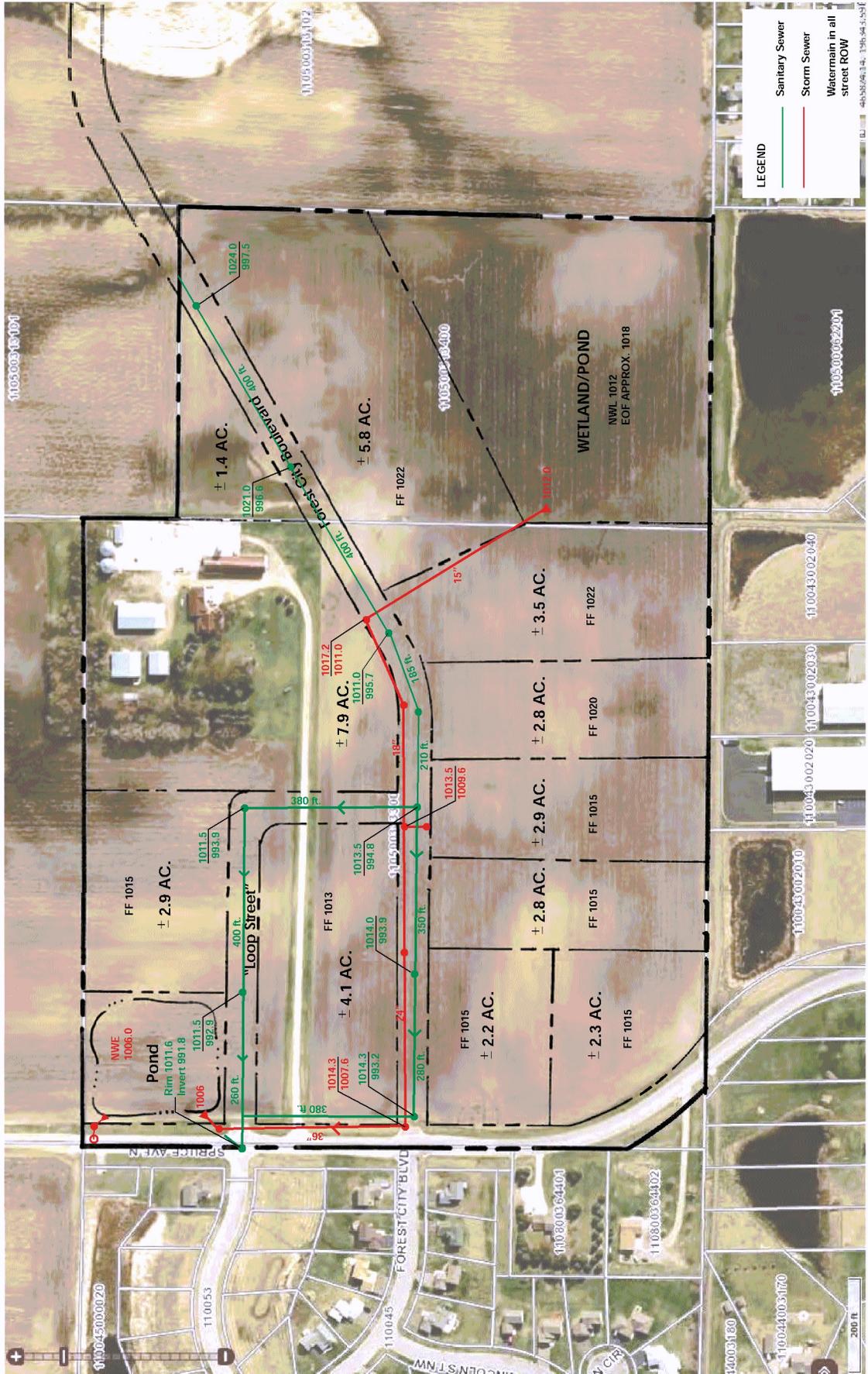
1. This report should be accepted and used a concept plan for development of the site.
2. The information in this report should be presented to the Planning Commission, Development Group, and other interested parties do gather input and feedback.
3. As is financially practical, the city should obtain additional information about the site including geotechnical information, a site survey, title work, and a wetland delineation.
4. The city should discuss options regarding property valuation and property acquisition.



Concept Plan
City of Maple Lake - Possible Industrial Park (Mavencamp Site)
 Maple Lake, MN

April 2015 Figure 3

V:\71938\active\193800887\Graphics\Mavencamp Property Development Figures.mxd
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Concept Utilities
City of Maple Lake - Possible Industrial Park (Mapencamp Site)
 Maple Lake, MN
 April 2015
 Figure 4

Appendix A

Opinion of Probable Construction Cost

**APPENDIX A - Opinion of Probable Costs
Maple Lake Possible Industrial Park
April 2015**

Industrial Street (36-foot wide)	Unit Price	Quantity	Total Price
Length of Street (Approx. 1,900 LF)			
Mobilization (LS)	\$9,000.00	1	\$9,000.00
Traffic Control (LS)	\$1,758.00	1	\$1,758.00
Temporary Rock Construction Entrance (LS)	\$500.00	1	\$500.00
Common Excavation (cy)	\$6.50	2755	\$17,907.50
Subgrade Preparation (sy)	\$1.00	8125	\$8,125.00
Subgrade Excavation (cy) - (assume 12" on 10%)	\$6.50	270	\$1,755.00
Geotextile Fabric (SY)	\$2.00	7840	\$15,680.00
Granular borrow (cy) - (assumes 24-inches)	\$14.00	5350	\$74,900.00
Class 5 gravel base (TN) - (assumes 12-inches)	\$12.00	5300	\$63,600.00
3.5" non-wearing course (TN)	\$74.00	1520	\$112,480.00
Tack (Gal)	\$2.50	300	\$750.00
1.5" wearing course (TN)	\$78.00	650	\$50,700.00
Concrete curb and gutter (LF)	\$12.00	3800	\$45,600.00
Remove and replace curb and gutter (LF) - assume 10%	\$23.00	720	\$16,560.00
4" Perforated Polyethylene pipe (LF)	\$5.00	3800	\$19,000.00
Core hole for drain tile connection (EA)	\$100.00	8	\$800.00
Street sweeper w/ operator (HR)	\$85.00	7	\$595.00
Skidsteer (Bobcat) w/ operator (HR)	\$55.00	7	\$385.00
Saw and Seal (LF) - every 40'	\$3.00	1425	\$4,275.00
Sod (sy) - 2 rolls behind curb	\$2.50	1700	\$4,250.00
Seed (ac) - boulevard	\$700.00	1.2	\$805.00
Sign Panels (sf) - assume 2	\$35.00	23.8	\$833.00
Street name sign (EA) - assume 1	\$250.00	1.0	\$250.00
Adjust MH (EA)	\$250.00	12	\$3,000.00
Adjust GV (EA)	\$200.00	4	\$800.00
Estimated Construction Cost - Street			\$454,309
+10% contingencies			\$45,431
+15% Admin. and Eng.			\$74,961
Total Estimated Project Cost - Street			\$574,700
Estimated Cost/LF of street			\$302.47

Concrete Walk [no sidewalk proposed]	Unit Price	Quantity	Total Price
Length of concrete sidewalk (LF)			
6" thick concrete sidewalk (sf) includes exc. and base	\$3.20	0	\$0.00
Truncated dome ped ramps (EA)	\$585.00	0	\$0.00
Remove and replace sidewalk (sf) - assume 10%	\$6.00	0	\$0.00
Estimated Construction Cost - Sidewalk			\$0.00
+15% administration			\$0.00
Total Estimated Project Cost - Sidewalk			\$0.00

Sanitary Sewer	Unit Price	Quantity	Total Price
Length of Sewer (Approx 2250 LF, does not include loop street)			
15 or 12 inch PVC (20-25 feet deep)	\$55.00	2250	\$123,750.00
Manhole	\$2,400.00	8	\$19,200.00
Televising	\$1.50	2250	\$3,375.00
Improved Pipe Foundation	\$2.45	258	\$632.10
Estimated Construction Cost - Sanitary Sewer			\$146,957
+10% contingencies			\$14,696
+15% Admin. and Eng.			\$24,248
Total Estimated Project Cost - Sanitary Sewer			\$185,900.73
Estimated Cost/LF of sanitary sewer			\$82.62
		Round to:	\$185,900

Water main	Unit Price	Quantity	Total Price
Length of WM (LF)		1000	
12-inch PVC	\$36.00	1900	\$68,400.00
12-inch valve	\$2,500.00	3	\$7,500.00
6-inch water main	\$26.00	80	\$2,080.00
6-inch valve	\$1,700.00	6	\$10,200.00
Hydrant	\$3,000.00	6.0	\$18,000.00
Fittings	\$4.50	1860.0	\$8,370.00
Improved pipe bedding	\$2.40	187.5	\$450.00
Estimated Construction Cost - Water Main			\$115,000.00
+10% contingencies			\$11,500.00
+15% Admin. and Eng.			\$18,975.00
Total Estimated Project Cost - Water Main			\$126,500.00
Estimated Cost/LF of water main			\$66.58

Storm Sewer	Unit Price	Quantity	Total Price
Initial Storm Sewer (does not include loop street)			
Storm Pond	\$70,000.00	1	\$70,000.00
RCP (15-inch)	\$34.00	522	\$17,748.00
RCP (18-inch)	\$38.00	450	\$17,100.00
RCP (24-inch)	\$46.00	630	\$28,980.00
RCP (36-inch)	\$75.00	490	\$36,750.00
2x3 Catchbasin	\$1,500.00	7	\$10,500.00
Manhole	\$3,500.00	8	\$28,000.00
Apron	\$1,200.00	3	\$3,600.00
riprap	\$96.00	20	\$1,920.00
protect inlet	\$4.00	204	\$816.00
Estimated Construction Cost - Storm Sewer			\$215,414.00
+10% contingencies			\$21,541
+15% Admin. and Eng.			\$35,543
Total Estimated Project Cost - Storm Sewer			\$272,499
		Round to:	\$272,500

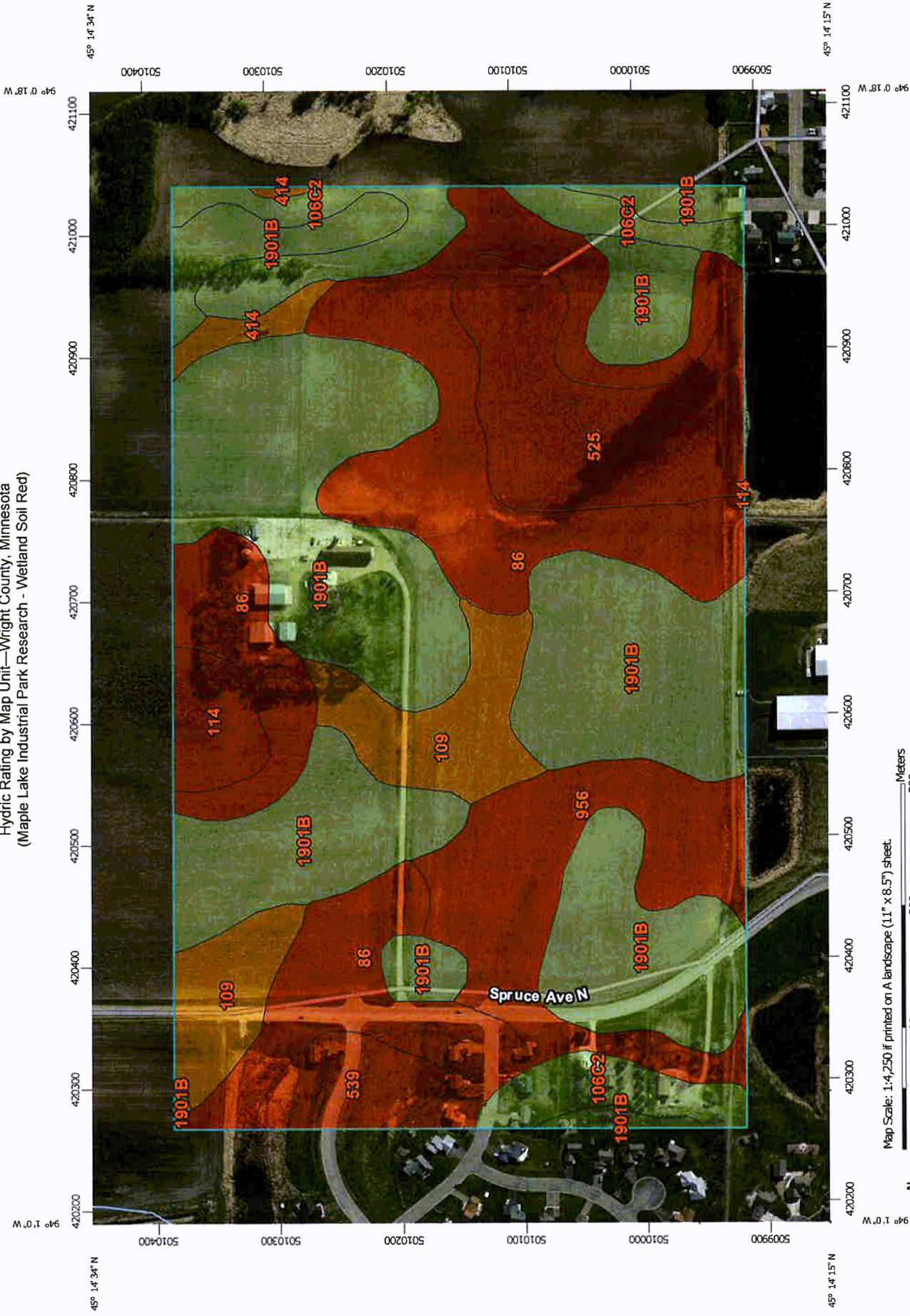
Lot Services	Unit Price	Quantity	Total Price
Number of Water and Sewer Services (EA)		1	
6-inch DIP	\$26.00	300	\$7,800.00
6-inch valve	\$1,700.00	6	\$10,200.00
15x4 wye	\$78.00	6	\$468.00
4-inch PVC	\$20.00	300	\$6,000.00
Riser	\$13.50	2	\$27.00
Estimated Construction Cost - Lot Services			\$24,495.00
+10% contingencies			\$2,449.50
+15% Admin. and Eng.			\$4,041.68
Total Estimated Project Cost - Lot Services			\$30,986.18
		Round to:	\$31,000.00

Summary:	Total Estimated Project Cost - Street	\$574,700
	Total Estimated Project Cost - Sanitary Sewer	\$185,900
	Total Estimated Project Cost - Water Main	\$126,500
	Total Estimated Project Cost - Storm Sewer	\$272,500
	Total Estimated Project Cost - Lot Services	\$31,000
		\$1,190,600

Appendix B

USDA Soils Information

Hydric Rating by Map Unit—Wright County, Minnesota
 (Maple Lake Industrial Park Research - Wetland Soil Red)



Map Scale: 1:4,250 if printed on A landscape (11" x 8.5") sheet.

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

Hydric Rating by Map Unit—Wright County, Minnesota
(Maple Lake Industrial Park Research - Wetland Soil Red)

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available

Soil Rating Lines

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available

Soil Rating Points

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available

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 1:12,000.

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: Wright County, Minnesota
Survey Area Data: Version 8, Sep 16, 2014

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

Date(s) aerial images were photographed: May 17, 2011—Apr 6, 2012

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.

Hydric Rating by Map Unit

Hydric Rating by Map Unit— Summary by Map Unit — Wright County, Minnesota (MN171)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
86	Canisteo clay loam, moderately fine substratum, 0 to 2 percent slopes	100	20.6	23.0%
106C2	Lester loam, 6 to 10 percent slopes, moderately eroded	2	6.2	7.0%
109	Cordova clay loam, 0 to 2 percent slopes	98	6.3	7.0%
114	Glencoe clay loam, depressional, 0 to 1 percent slopes	100	1.9	2.1%
414	Hamel loam, 1 to 3 percent slopes	95	0.9	1.0%
525	Muskego soils, 0 to 1 percent slopes	100	7.7	8.5%
539	Klossner muck, 0 to 1 percent slopes	100	2.3	2.6%
956	Canisteo-Glencoe, depressional, complex, 0 to 2 percent slopes	100	8.6	9.6%
1901B	Angus-Le Sueur complex, 1 to 5 percent slopes	10	35.2	39.2%
Totals for Area of Interest			89.7	100.0%

Description

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

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

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

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

References:

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

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

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

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

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

Rating Options

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower