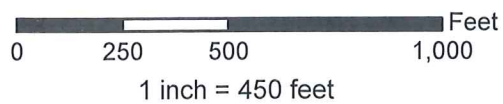
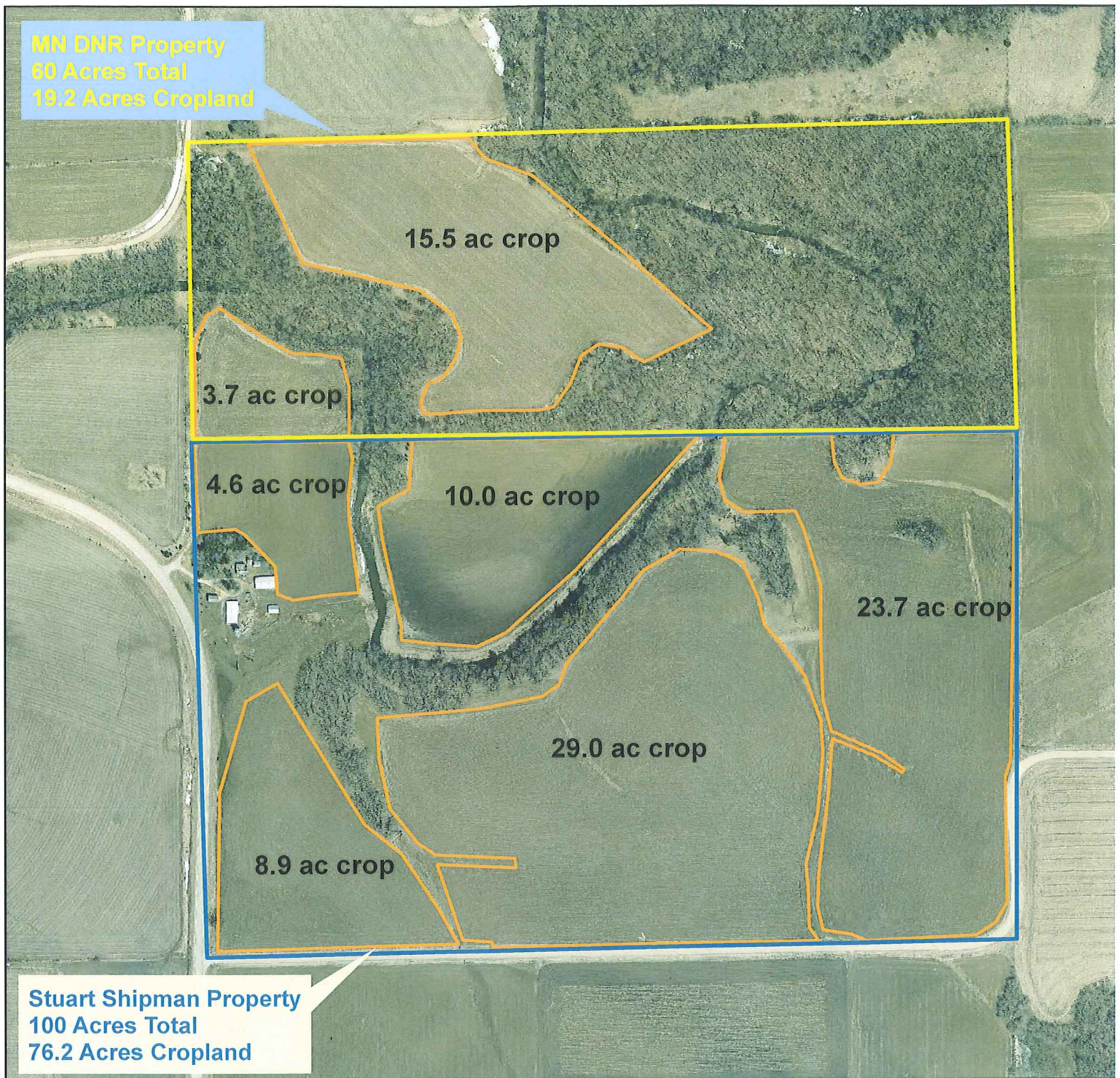


## 2017 State Envirothon Scenario Ownership and Field Map







MINNESOTA DEPARTMENT OF NATURAL RESOURCES  
Wildlife Management Area

August 18, 2016

Dear Cooperator:

Through the years, the Minnesota Department of Natural Resources (DNR) has worked with farmers like you to plant crops on Wildlife Management Areas (WMAs). Crops provide food for wildlife and enhance hunting opportunities, and can also prepare fields for habitat restoration. As a result of an ongoing evaluation of our management practices and in light of recent research, we are reviewing farming practices on WMAs statewide and are making some changes. We believe these changes will improve habitat and better sustain wildlife on WMAs. We are letting you know so you can plan for these changes, some of which begin in 2017.

We have established some broad preliminary guidelines for farming on WMAs that follow improved soil and watershed health. These include:

1. Reducing or eliminating chemical inputs;
  - a. Eliminate use of insecticides (including neonicotinoid-treated seed) and fungicides beginning in 2017, including those used in seed and soil treatments. With the approval of the regional wildlife manager, on a case by case basis, rescue spraying of insecticides to save a maturing crop from being lost may be allowed.
  - b. Minimize use of herbicides; and
  - c. Minimize overall use of fertilizers, tied to soil tests; with no fall application of nitrogen after 2016
2. Moving toward more multi-species seed mixes and utilizing cover crops in order to minimize soil and nutrient loss; and
3. Moving toward minimal tillage farming

We are developing guidelines to determine when and where farming for specific wildlife benefits should continue on each WMA. We have no intention of eliminating farming on WMAs, but plan to phase it out where it does not benefit wildlife.

We want to work with you and other stakeholders to determine how best to implement these changes, including timelines for the various changes. Some of our cooperators have already initiated these practices and are pleased with the results. Some changes, as described above, will be adopted in 2017. Other changes will be phased in over the next five years.

We recognize the long collaborative history of farming on WMAs, and we respect the strong connection that farmers have to the land they farm. Our office will be contacting you in the near future related to the guidelines, beyond those stated above to begin in 2017. We recommend you please start now to locate untreated seed for 2017. The goal is to enhance habitat for wildlife and improve soil and watershed health while also being thoughtful to the needs of our farming partners. We look forward to working with you.

Sincerely,

Area Wildlife Supervisor



# RESOURCE CONCERNS INVENTORY AND ESTIMATE OF ENVIRONMENTAL IMPACTS

Producer: Stuart Shipman

Tract: 101

Date: 11/15/16

Indicate the resource concern(s) identified during the planning process with an "X" in the proper landuse column across from identified concern.	CROPLAND	FORESTLAND	PASTURE HAYLAND	RANGELAND	WILDLIFE	FARMSTEAD	Indicate how resource concern will be addressed in the plan (ie. practice code; narrative).
<b>A. SOIL</b>							
1. EROSION							
a. Sheet and rill	X						
b. Wind							
c. Concentrated flow	X						
d. Classic gullies		X	X				
e. Stream bank					X		
f. Irrigation induced							
g. Soil mass movement							
h. Road banks, etc.							
2. CONDITION							
a. Tilt and organic matter depletion	X						
b. Compaction or subsidence							
c. Contaminants, chem, organic, fertilizer, pesticides	X						
3. DEPOSITION							
a. Onsite damage, safety							
b. Offsite damage, safety							
<b>B. WATER</b>							
1. QUANTITY							
a. Excess: seeps, runoff/flooding, subsurface							
b. Inadequate outlets							
c. Inefficient Water Use: irrigated, nonirrigated							
d. Reduced capacity of conveyances – deposition							
e. Reduced storage of water bodies due to sediment			X				
2. QUALITY							
a. Groundwater contaminants, pesticides							
b. Groundwater contaminants, nutrients & organics	X						
c. Groundwater contaminants, salinity/heavy metals							
d. Groundwater contaminants, pathogens/petroleum							
e. Surface contaminants: pesticides							
f. Surface contaminants: nutrients / organics					X		
g. Surface contaminants: turbidity / dissolved oxygen					X		
h. Surface contaminants: salinity / heavy metals							
i. Surface contaminants: temperature, pathogens							
j. Aquatic habitat suitable							
<b>C. Air</b>							
1. QUALITY							
a. Excessive CO2, N2O, Ozone, CH4, NH3							
b. Chemical Drift	X						
c. Objectionable Odors							
d. Reduced Visibility							
e. Undesirable Air Movement							
f. Adverse Air Temperature							
<b>D. Plants</b>							
1. SUITABILITY							
a. Not adapted or Suited							
2. CONDITION							
a. productivity, health and vigor							
b. T&E plant species proposed or listed on ESA							
c. Declining or Species of concern on site							
d. Noxious and invasive plants present		X	X				
e. Forage Quality and Palatability							
f. Wildfire Hazard							
<b>E. ANIMALS</b>							
1. Fish and Wildlife							
a. Inadequate Food, cover, shelter, water, space							
b. Habitat Fragmentation, Population imbalance					X		
2. Domestic Animals							
a. Inadequate food, forage, shelter, water							
b. Stress and Mortality							



## RUSLE2 Worksheet Printout Summary

Summary printout of RUSLE2 calculation for one operation

**Client/Owner name:** Stuart Shipman

**Tract #:** 101

**Location:** USA\Minnesota\Winona County

Printout date: November 15, 2016

Prepared by (name): SWCD Technician

USDA Service Center/Location: Winona County

*Soil: 401C*

Summary of RUSLE2 output for each management alternative:

<i>Description</i>	<i>Cons. plan. soil loss, t/ac/yr</i>	<i>Soil conditioning index (SCI)</i>	<i>STIR value</i>
<b>Cg – F NH3, disk tandem, S FCult; Sb - NT</b>	<b>8</b>	<b>-0.0090</b>	<b>36.8</b>

Recommendations / Comments:

*Cons. Plan soil loss (t/ac/yr) above may exceed  
the soil's T factor by 2. Also known as  
2xT. This is the acceptable rate  
of soil loss on a crop operation.*





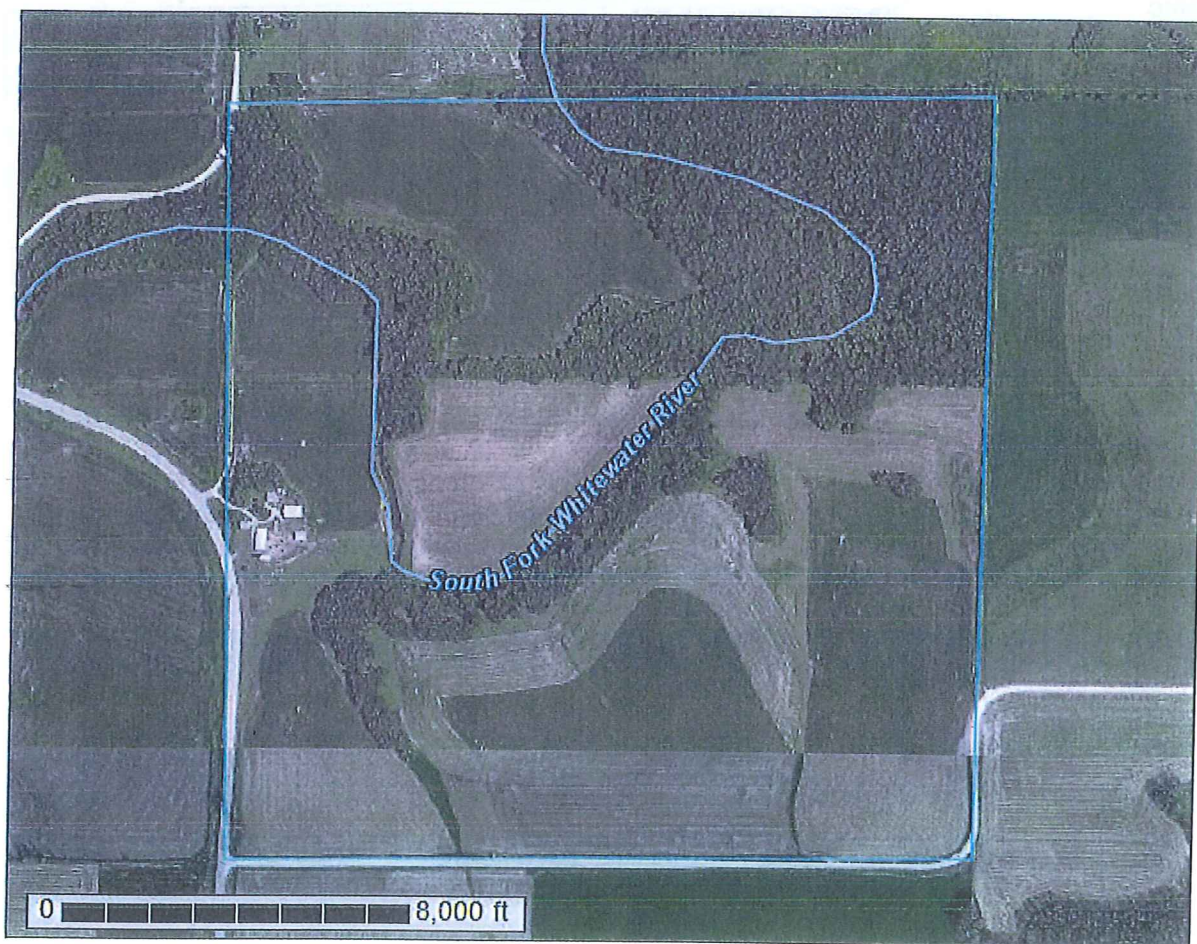
United States  
Department of  
Agriculture

**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 **Winona County, Minnesota**



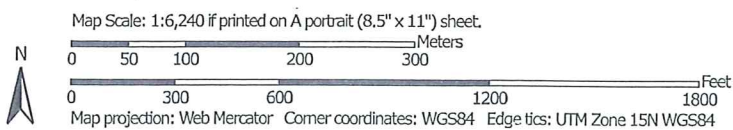
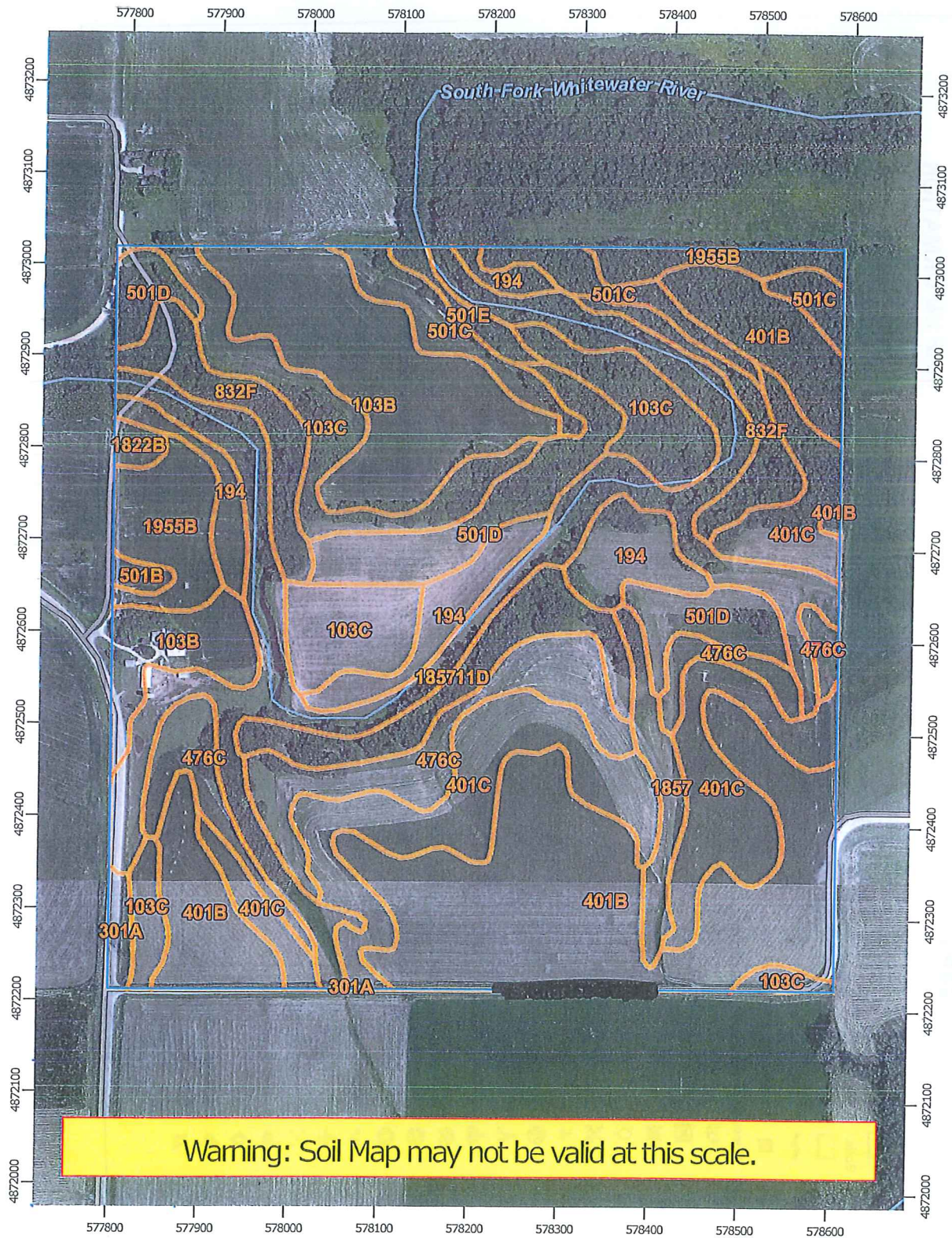
November 15, 2016

# Map Unit Legend

Winona County, Minnesota (MN169)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
11D	Sogn silt loam, rocky, 6 to 30 percent slopes	5.2	3.3%
103B	Seaton silt loam, ridge phase, 2 to 6 percent slopes	15.4	9.7%
103C	Seaton silt loam, 6 to 12 percent slopes	14.8	9.3%
194	Huntsville silt loam	8.1	5.1%
301A	Lindstrom silt loam, 1 to 3 percent slopes	0.7	0.4%
401B	Mt. Carroll silt loam, 2 to 6 percent slopes, moderately eroded	30.2	19.0%
401C	Mt. Carroll silt loam, 6 to 12 percent slopes, moderately eroded	20.5	12.9%
476C	Frankville silt loam, 6 to 12 percent slopes	11.2	7.1%
501B	NewGlarus silt loam, 3 to 6 percent slopes	0.5	0.3%
501C	NewGlarus silt loam, 6 to 12 percent slopes	5.6	3.5%
501D	NewGlarus silt loam, 12 to 20 percent slopes	9.5	6.0%
501E	NewGlarus silt loam, rocky, 12 to 30 percent slopes	1.0	0.6%
832F	Lacrescent-Rock outcrop complex, 30 to 45 percent slopes	6.8	4.3%
1822B	Abasco variant sand, 1 to 6 percent slopes	0.6	0.4%
1857	Eitzen silt loam, channeled	22.8	14.4%
1955B	Waukeo loam, bedrock substratum, 2 to 6 percent slopes	5.8	3.7%
Totals for Area of Interest		158.7	100.0%

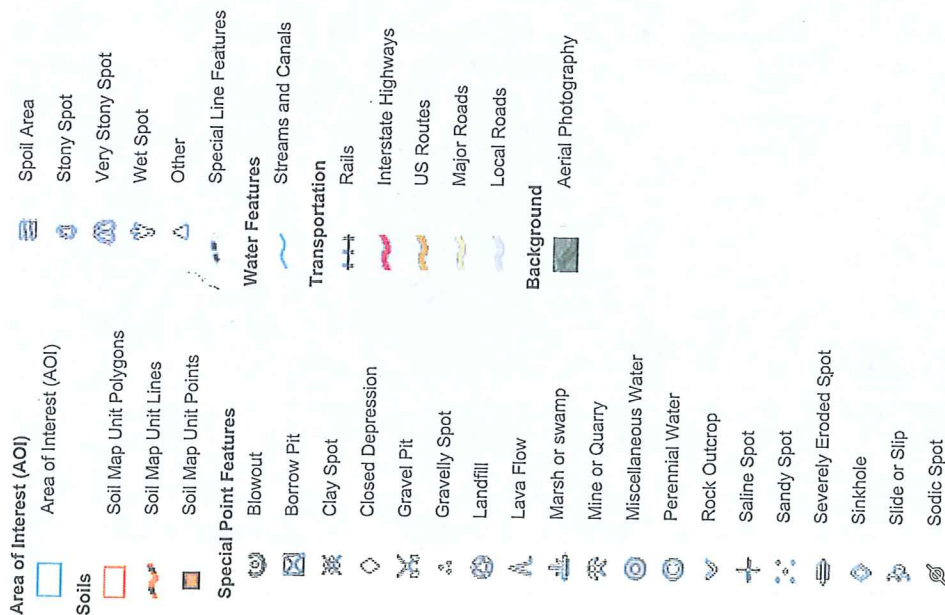


Custom Soil Resource Report  
Soil Map (2017 Envirothon Scenario Attachment)





## MAP LEGEND



## 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: Winona County, Minnesota  
Survey Area Data: Version 10, Sep 18, 2015

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

Date(s) aerial images were photographed: Nov 2, 2010—Jul 20, 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 Description (Brief, Generated)

Winona County, Minnesota

[Minor map unit components are excluded from this report]

**Map unit:** 11D - Sogn silt loam, rocky, 6 to 30 percent slopes

**Component:** Sogn, rocky (95%)

*The Sogn, rocky component makes up 95 percent of the map unit. Slopes are 6 to 30 percent. This component is on hills. The parent material consists of residuum. Depth to a root restrictive layer, bedrock, lithic, is 4 to 20 inches. The natural drainage class is somewhat excessively drained. Available water to a depth of 60 inches is very low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria.*

**Map unit:** 103B - Seaton silt loam, ridge phase, 2 to 6 percent slopes

**Component:** Seaton, ridge phase (95%)

*The Seaton, ridge phase component makes up 95 percent of the map unit. Slopes are 2 to 6 percent. This component is on loess mantled interfluvial on uplands. The parent material consists of loess. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.*

**Map unit:** 103C - Seaton silt loam, 6 to 12 percent slopes

**Component:** Seaton (95%)

*The Seaton component makes up 95 percent of the map unit. Slopes are 6 to 12 percent. This component is on hills. The parent material consists of loess. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 18 percent.*

**Map unit:** 194 - Huntsville silt loam

**Component:** Huntsville, occasionally flooded (95%)

*The Huntsville, occasionally flooded component makes up 95 percent of the map unit. Slopes are 0 to 2 percent. This component is on flood plains. The parent material consists of silty alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very high. Shrink-swell potential is moderate. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 30 inches during April, May. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 1. This soil does not meet hydric criteria.*

## Map Unit Description (Brief, Generated)

Winona County, Minnesota

**Map unit:** 301A - Lindstrom silt loam, 1 to 3 percent slopes

**Component:** Lindstrom (95%)

*The Lindstrom component makes up 95 percent of the map unit. Slopes are 1 to 3 percent. This component is on hills. The parent material consists of loess and/or silty alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 1. This soil does not meet hydric criteria.*

**Map unit:** 401B - Mt. Carroll silt loam, 2 to 6 percent slopes, moderately eroded

**Component:** Mt. Carroll, moderately eroded (90%)

*The Mt. Carroll, moderately eroded component makes up 90 percent of the map unit. Slopes are 2 to 6 percent. This component is on ridges on uplands. The parent material consists of loess. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.*

**Map unit:** 401C - Mt. Carroll silt loam, 6 to 12 percent slopes, moderately eroded

**Component:** Mt. Carroll, moderately eroded (90%)

*The Mt. Carroll, moderately eroded component makes up 90 percent of the map unit. Slopes are 6 to 12 percent. This component is on ridges on uplands. The parent material consists of loess. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria.*

**Map unit:** 476C - Frankville silt loam, 6 to 12 percent slopes

**Component:** Frankville (95%)

*The Frankville component makes up 95 percent of the map unit. Slopes are 6 to 12 percent. This component is on hills. The parent material consists of loess over clayey residuum. Depth to a root restrictive layer, bedrock, lithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria.*



## Map Unit Description (Brief, Generated)

Winona County, Minnesota

**Map unit:** 501B - NewGlarus silt loam, 3 to 6 percent slopes

**Component:** NewGlarus (95%)

*The NewGlarus component makes up 95 percent of the map unit. Slopes are 3 to 6 percent. This component is on hills. The parent material consists of loess over residuum. Depth to a root restrictive layer, bedrock, paralithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.*

**Map unit:** 501C - NewGlarus silt loam, 6 to 12 percent slopes

**Component:** NewGlarus (95%)

*The NewGlarus component makes up 95 percent of the map unit. Slopes are 6 to 12 percent. This component is on hills. The parent material consists of loess over residuum. Depth to a root restrictive layer, bedrock, paralithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria.*

**Map unit:** 501D - NewGlarus silt loam, 12 to 20 percent slopes

**Component:** NewGlarus (95%)

*The NewGlarus component makes up 95 percent of the map unit. Slopes are 12 to 20 percent. This component is on hills. The parent material consists of loess over residuum. Depth to a root restrictive layer, bedrock, paralithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4e. This soil does not meet hydric criteria.*

**Map unit:** 501E - NewGlarus silt loam, rocky, 12 to 30 percent slopes

**Component:** NewGlarus, rocky (95%)

*The NewGlarus, rocky component makes up 95 percent of the map unit. Slopes are 12 to 30 percent. This component is on hills. The parent material consists of loess over residuum. Depth to a root restrictive layer, bedrock, paralithic, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is low. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria.*

## Map Unit Description (Brief, Generated)

Winona County, Minnesota

**Map unit:** 832F - Lacrescent-Rock outcrop complex, 30 to 45 percent slopes

**Component:** Lacrescent (65%)

*The Lacrescent component makes up 65 percent of the map unit. Slopes are 30 to 45 percent. This component is on hills. The parent material consists of colluvium and/or loess. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 7e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 3 percent.*

**Component:** Rock outcrop (25%)

*The Rock outcrop component are areas of bedrock at or above the soil surface.*

**Map unit:** 1822B - Abscota variant sand, 1 to 6 percent slopes

**Component:** Abscota, variant, occasionally flooded (95%)

*The Abscota, variant, occasionally flooded component makes up 95 percent of the map unit. Slopes are 1 to 6 percent. This component is on flood plains. The parent material consists of alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 30 inches during April, May. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria.*

**Map unit:** 1857 - Eitzen silt loam, channeled

**Component:** Eitzen, channeled, occasionally flooded (95%)

*The Eitzen, channeled, occasionally flooded component makes up 95 percent of the map unit. Slopes are 1 to 3 percent. This component is on flood plains. The parent material consists of silty alluvium. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very high. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 30 inches during April, May. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 5w. This soil does not meet hydric criteria.*



## Map Unit Description (Brief, Generated)

Winona County, Minnesota

**Map unit:** 1955B - Waukee loam, bedrock substratum, 2 to 6 percent slopes

**Component:** Waukee, bedrock substratum (95%)

*The Waukee, bedrock substratum component makes up 95 percent of the map unit. Slopes are 2 to 6 percent. This component is on terraces. The parent material consists of loamy alluvium over sandy outwash. Depth to a root restrictive layer, bedrock, paralithic, is 40 to 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.*

## **Sensitive Soils for Nutrient Management (MN)**

### **(2017 Envirothon Scenario Attachment)**

This interpretation generates a soil sensitivity rating for nutrient management planning in Minnesota. Nutrient management plans are developed using the sensitive soil ratings classes. NRCS Conservation Practice Standard Nutrient Management (590) discusses nutrient management practices that should be used when sensitive soils are encountered. Careful planning is needed if manure or commercial fertilizers are applied. The physical properties and limitations of these soils can result in the leaching of nutrients downward beyond the root zone or the movement of nutrients toward surface waters.

The ratings are based on physical properties of the soils and on soil features. Soils that are sensitive to nutrient applications include soils on flood plains, coarse textured soils, soils that are shallow to bedrock, soils that have a high water table, soils that are ponded, and sloping soils.

The ratings are both verbal and numerical. Soils are assigned to rating classes based on their degree of risk. A "sensitive" rating (1.00) indicates that a soil is sensitive to runoff or leaching of nutrients if manure or commercial fertilizer is applied. A "not sensitive" (0.00) rating indicates that the soil is not sensitive to runoff or leaching.

The components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as the one shown for the map unit. The percent composition of each component in a particular map unit is given to help the user better understand the extent to which the rating applies to the map unit.

Other components with different ratings may occur in each map unit. The ratings for all components, regardless the aggregated rating of the map unit, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.



**Tables—Sensitive Soils for Nutrient Management (MN) (2017  
Envirothon Scenario Attachment)**

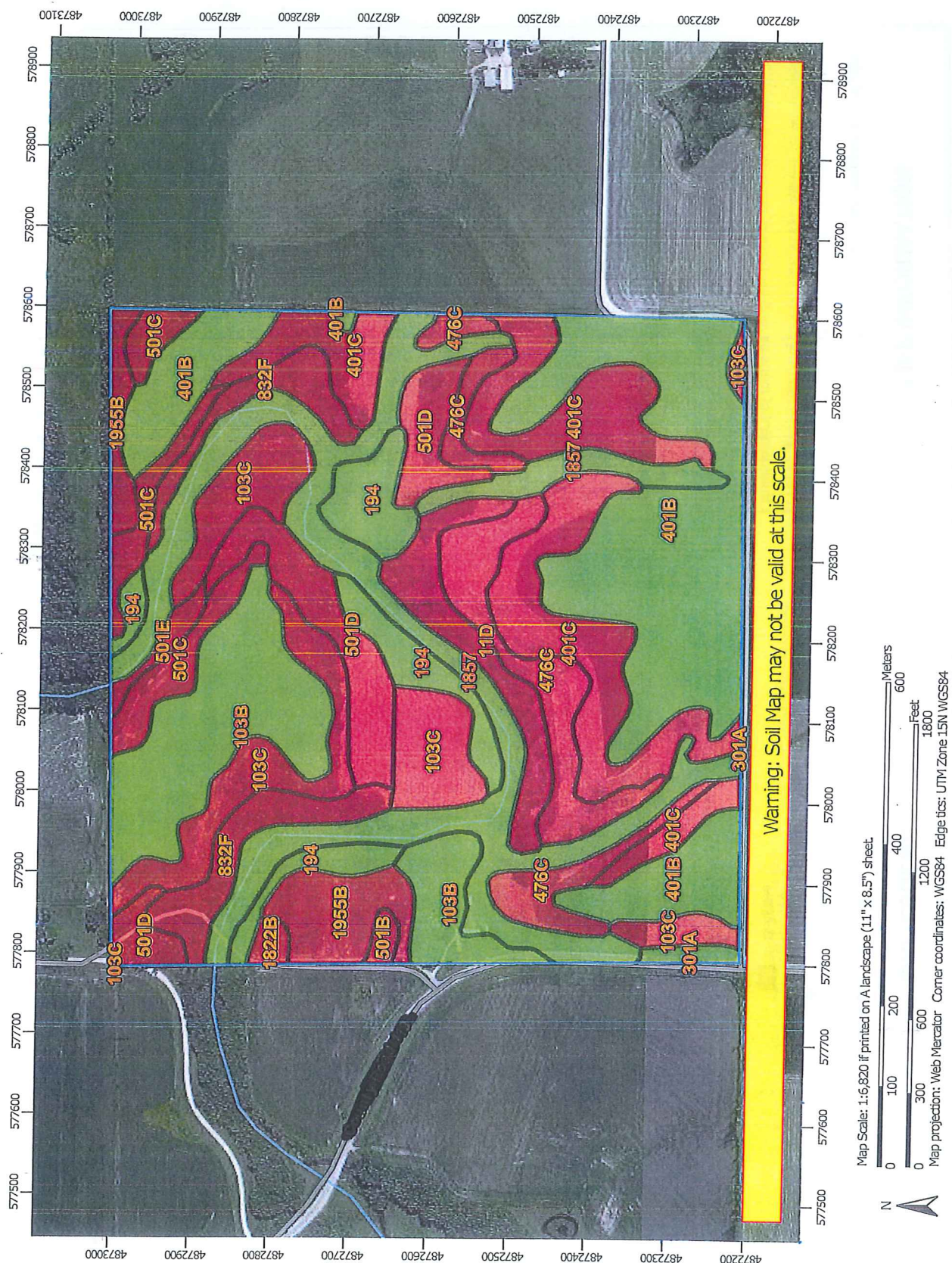
Sensitive Soils for Nutrient Management (MN)— Summary by Map Unit — Winona County, Minnesota (MN169)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
11D	Sogn silt loam, rocky, 6 to 30 percent slopes	Sensitive	Sogn, rocky (95%)	Bedrock (1.00) Slope (1.00)	5.2	3.3%
103B	Seaton silt loam, ridge phase, 2 to 6 percent slopes	Not sensitive	Seaton, ridge phase (95%)		15.4	9.7%
			Pepin (2%)			
			Mickle (1%)			
			Mt. Carroll (1%)			
			Blackhammer, very deep phase (1%)			
103C	Seaton silt loam, 6 to 12 percent slopes	Sensitive	Seaton (95%)	Slope (1.00)	14.8	9.3%
194	Huntsville silt loam	Not sensitive	Huntsville, occasionally flooded (95%)		8.1	5.1%
301A	Lindstrom silt loam, 1 to 3 percent slopes	Not sensitive	Lindstrom (95%)		0.7	0.4%
401B	Mt. Carroll silt loam, 2 to 6 percent slopes, moderately eroded	Not sensitive	Mt. Carroll, moderately eroded (90%)		30.2	19.0%
			Brinkman, moderately eroded (5%)			
			Pepin, moderately eroded (5%)			
401C	Mt. Carroll silt loam, 6 to 12 percent slopes, moderately eroded	Sensitive	Mt. Carroll, moderately eroded (90%)	Slope (1.00)	20.5	12.9%
			Pepin, moderately eroded (5%)	Slope (1.00)		
			Seaton, moderately eroded (5%)	Slope (1.00)		
476C	Frankville silt loam, 6 to 12 percent slopes	Sensitive	Frankville (95%)	Slope (1.00) Bedrock (1.00)	11.2	7.1%
501B	NewGlarus silt loam, 3 to 6 percent slopes	Sensitive	NewGlarus (95%)	Bedrock (1.00)	0.5	0.3%

Sensitive Soils for Nutrient Management (MN)— Summary by Map Unit — Winona County, Minnesota (MN169)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
501C	NewGlarus silt loam, 6 to 12 percent slopes	Sensitive	NewGlarus (95%)	Slope (1.00) Bedrock (1.00)	5.6	3.5%
501D	NewGlarus silt loam, 12 to 20 percent slopes	Sensitive	NewGlarus (95%)	Slope (1.00) Bedrock (1.00)	9.5	6.0%
501E	NewGlarus silt loam, rocky, 12 to 30 percent slopes	Sensitive	NewGlarus, rocky (95%)	Slope (1.00) Bedrock (1.00)	1.0	0.6%
832F	Lacrescent-Rock outcrop complex, 30 to 45 percent slopes	Sensitive	Lacrescent (55%)	Slope (1.00)	6.8	4.3%
1822B	Abscota variant sand, 1 to 6 percent slopes	Sensitive	Abscota, variant, occasionally flooded (95%)	Coarse texture (1.00)	0.6	0.4%
1857	Eitzen silt loam, channeled	Not sensitive	Eitzen, channeled, occasionally flooded (95%)		22.8	14.4%
1955B	Waukees loam, bedrock substratum, 2 to 6 percent slopes	Sensitive	Waukees, bedrock substratum (95%)	Coarse texture (1.00)	5.8	3.7%
Totals for Area of Interest					158.7	100.0%

Sensitive Soils for Nutrient Management (MN)— Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI
Sensitive	81.6	51.4%
Not sensitive	77.2	48.6%
Totals for Area of Interest	158.7	100.0%




















# Custom Soil Resource Report





## MAP LEGEND

- Area of Interest (AOI)  
 Area of Interest (AOI)
- Soils  
 Soil Rating Polygons  
 Sensitive  
 Not sensitive  
 Not rated or not available
- Soil Rating Lines  
 Sensitive  
 Not sensitive  
 Not rated or not available
- Soil Rating Points  
 Sensitive  
 Not sensitive  
 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 1:20,000.

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: Winona County, Minnesota  
 Survey Area Data: Version 10, Sep 18, 2015

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

Date(s) aerial images were photographed: Nov 2, 2010—Jul 20, 2011

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## **Surface Water Management, System (2017 Envirothon Scenario Attachment)**

The ratings for Surface Water Management, System are based on the soil properties that affect the capacity of the soil to convey surface water across the landscape. Factors affecting the system installation and performance are considered. Water conveyances include graded ditches, grassed waterways, terraces, and diversions. The ratings are for soils in their natural condition and do not consider present land use. The properties that affect the surface system performance include depth to bedrock, saturated hydraulic conductivity, depth to cemented pan, slope, flooding, ponding, large stone content, sodicity, surface water erosion, and gypsum content.

The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. "Not limited" indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. "Somewhat limited" indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. "Very limited" indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures.

Numerical ratings indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The map unit components listed for each map unit in the accompanying Summary by Map Unit table in Web Soil Survey or the Aggregation Report in Soil Data Viewer are determined by the aggregation method chosen. An aggregated rating class is shown for each map unit. The components listed for each map unit are only those that have the same rating class as that listed for the map unit. The percent composition of each component in a particular map unit is given so that the user will realize the percentage of each map unit that has the specified rating.

A map unit may have other components with different ratings. The ratings for all components, regardless of the map unit aggregated rating, can be viewed by generating the equivalent report from the Soil Reports tab in Web Soil Survey or from the Soil Data Mart site. Onsite investigation may be needed to validate these interpretations and to confirm the identity of the soil on a given site.

**Tables—Surface Water Management, System (2017 Envirothon  
Scenario Attachment)**

Surface Water Management, System— Summary by Map Unit — Winona County, Minnesota (MN169)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
11D	Sogn silt loam, rocky, 6 to 30 percent slopes	Very limited	Sogn, rocky (95%)	Depth to bedrock (1.00)	5.2	3.3%
				Slope (1.00)		
				Water Erosion (1.00)		
103B	Seaton silt loam, ridge phase, 2 to 6 percent slopes	Somewhat limited	Seaton, ridge phase (95%)	Water Erosion (0.46)	15.4	9.7%
				Slope (0.22)		
			Pepin (2%)	Slow water movement (0.55)		
				Water Erosion (0.46)		
				Slope (0.22)		
			Mickle (1%)	Water Erosion (0.04)		
			Mt. Carroll (1%)	Water Erosion (0.26)		
				Slope (0.22)		
			Blackhammer, very deep phase (1%)	Water Erosion (0.26)		
				Slope (0.22)		
103C	Seaton silt loam, 6 to 12 percent slopes	Very limited	Seaton (95%)	Slope (1.00)	14.8	9.3%
				Water Erosion (1.00)		
194	Huntsville silt loam	Not limited	Huntsville, occasionally flooded (95%)		8.1	5.1%
301A	Lindstrom silt loam, 1 to 3 percent slopes	Not limited	Lindstrom (95%)		0.7	0.4%
401B	Mt. Carroll silt loam, 2 to 6 percent slopes, moderately eroded	Somewhat limited	Mt. Carroll, moderately eroded (90%)	Water Erosion (0.26)	30.2	19.0%
				Slope (0.22)		
			Brinkman, moderately eroded (5%)	Water Erosion (0.26)		
				Slope (0.22)		
			Pepin, moderately eroded (5%)	Slow water movement (0.55)		
				Water Erosion (0.46)		



Surface Water Management, System— Summary by Map Unit — Winona County, Minnesota (MN169)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Slope (0.22)		
401C	Mt. Carroll silt loam, 6 to 12 percent slopes, moderately eroded	Very limited	Mt. Carroll, moderately eroded (90%)	Slope (1.00)	20.5	12.9%
				Water Erosion (1.00)		
			Pepin, moderately eroded (5%)	Slope (1.00)		
				Water Erosion (1.00)		
				Slow water movement (0.55)		
			Seaton, moderately eroded (5%)	Slope (1.00)		
				Water Erosion (1.00)		
476C	Frankville silt loam, 6 to 12 percent slopes	Very limited	Frankville (95%)	Slope (1.00)	11.2	7.1%
				Water Erosion (1.00)		
				Slow water movement (0.20)		
501B	NewGlarus silt loam, 3 to 6 percent slopes	Somewhat limited	NewGlarus (95%)	Slope (0.22)	0.5	0.3%
				Slow water movement (0.20)		
				Water Erosion (0.12)		
501C	NewGlarus silt loam, 6 to 12 percent slopes	Very limited	NewGlarus (95%)	Slope (1.00)	5.6	3.5%
				Water Erosion (1.00)		
				Slow water movement (0.20)		
501D	NewGlarus silt loam, 12 to 20 percent slopes	Very limited	NewGlarus (95%)	Slope (1.00)	9.5	6.0%
				Water Erosion (1.00)		
				Slow water movement (0.20)		
501E	NewGlarus silt loam, rocky, 12 to 30 percent slopes	Very limited	NewGlarus, rocky (95%)	Slope (1.00)	1.0	0.6%
				Water Erosion (1.00)		
				Slow water movement (0.20)		
832F	Lacrescent-Rock outcrop complex, 30 to 45 percent slopes	Very limited	Lacrescent (65%)	Slope (1.00)	6.8	4.3%
				Water Erosion (1.00)		

Surface Water Management, System— Summary by Map Unit — Winona County, Minnesota (MN169)						
Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
				Large rock fragments (1.00)		
1822B	Abscota variant sand, 1 to 6 percent slopes	Somewhat limited	Abscota, variant, occasionally flooded (95%)	Slope (0.22)	0.6	0.4%
1857	Eitzen silt loam, channeled	Somewhat limited	Eitzen, channeled, occasionally flooded (95%)	Water Erosion (0.01)	22.8	14.4%
1955B	Waukee loam, bedrock substratum, 2 to 6 percent slopes	Somewhat limited	Waukee, bedrock substratum (95%)	Slope (0.22)	5.8	3.7%
Totals for Area of Interest					158.7	100.0%

Surface Water Management, System— Summary by Rating Value		
Rating	Acres in AOI	Percent of AOI
Somewhat limited	75.4	47.5%
Very limited	74.6	47.0%
Not limited	8.8	5.5%
Totals for Area of Interest	158.7	100.0%



# Custom Soil Resource Report Map—Surface Water Management, System (2017 Envirothon Scenario Attachment)





## MAP LEGEND



## MAP INFORMATION

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## T Factor (2017 Envirothon Scenario Attachment)

The T factor is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

**Table—T Factor (2017 Envirothon Scenario Attachment)**

T Factor— Summary by Map Unit — Winona County, Minnesota (MN169)				
Map unit symbol	Map unit name	Rating (tons per acre per year)	Acres in AOI	Percent of AOI
11D	Sogn silt loam, rocky, 6 to 30 percent slopes	1	5.2	3.3%
103B	Seaton silt loam, ridge phase, 2 to 6 percent slopes	5	15.4	9.7%
103C	Seaton silt loam, 6 to 12 percent slopes	5	14.8	9.3%
194	Huntsville silt loam	5	8.1	5.1%
301A	Lindstrom silt loam, 1 to 3 percent slopes	5	0.7	0.4%
401B	Mt. Carroll silt loam, 2 to 6 percent slopes, moderately eroded	5	30.2	19.0%
401C	Mt. Carroll silt loam, 6 to 12 percent slopes, moderately eroded	5	20.5	12.9%
476C	Frankville silt loam, 6 to 12 percent slopes	2	11.2	7.1%
501B	NewGlarus silt loam, 3 to 6 percent slopes	2	0.5	0.3%
501C	NewGlarus silt loam, 6 to 12 percent slopes	2	5.6	3.5%
501D	NewGlarus silt loam, 12 to 20 percent slopes	2	9.5	6.0%
501E	NewGlarus silt loam, rocky, 12 to 30 percent slopes	2	1.0	0.6%
832F	Lacrescent-Rock outcrop complex, 30 to 45 percent slopes	3	6.8	4.3%
1822B	Abscota variant sand, 1 to 6 percent slopes	5	0.6	0.4%
1857	Eitzen silt loam, channeled	5	22.8	14.4%
1955B	Waukeea loam, bedrock substratum, 2 to 6 percent slopes	4	5.8	3.7%
<b>Totals for Area of Interest</b>			<b>158.7</b>	<b>100.0%</b>

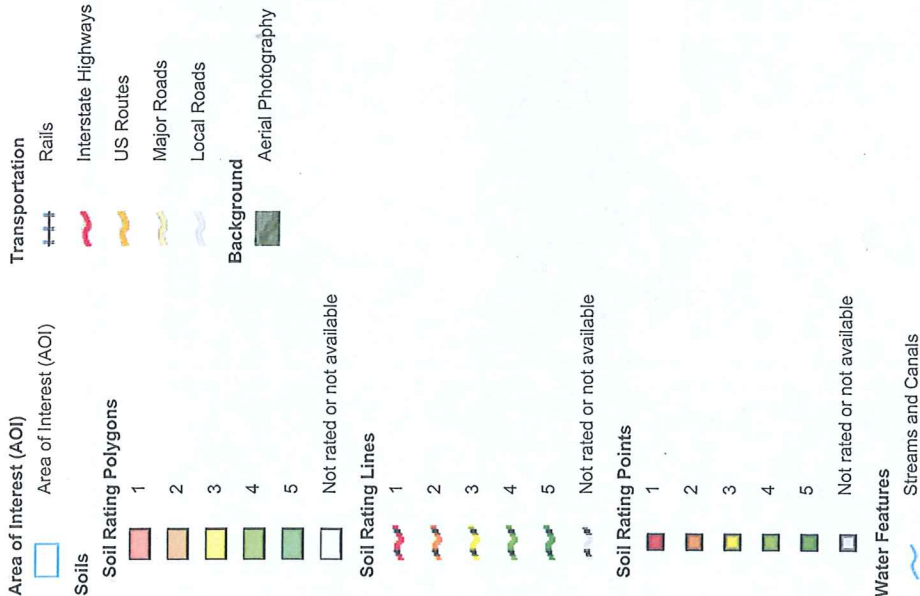


# Custom Soil Resource Report Map—T Factor (2017 Envirothon Scenario Attachment)





MAP LEGEND



MAP INFORMATION

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Survey Area Data: Version 10, Sep 18, 2015

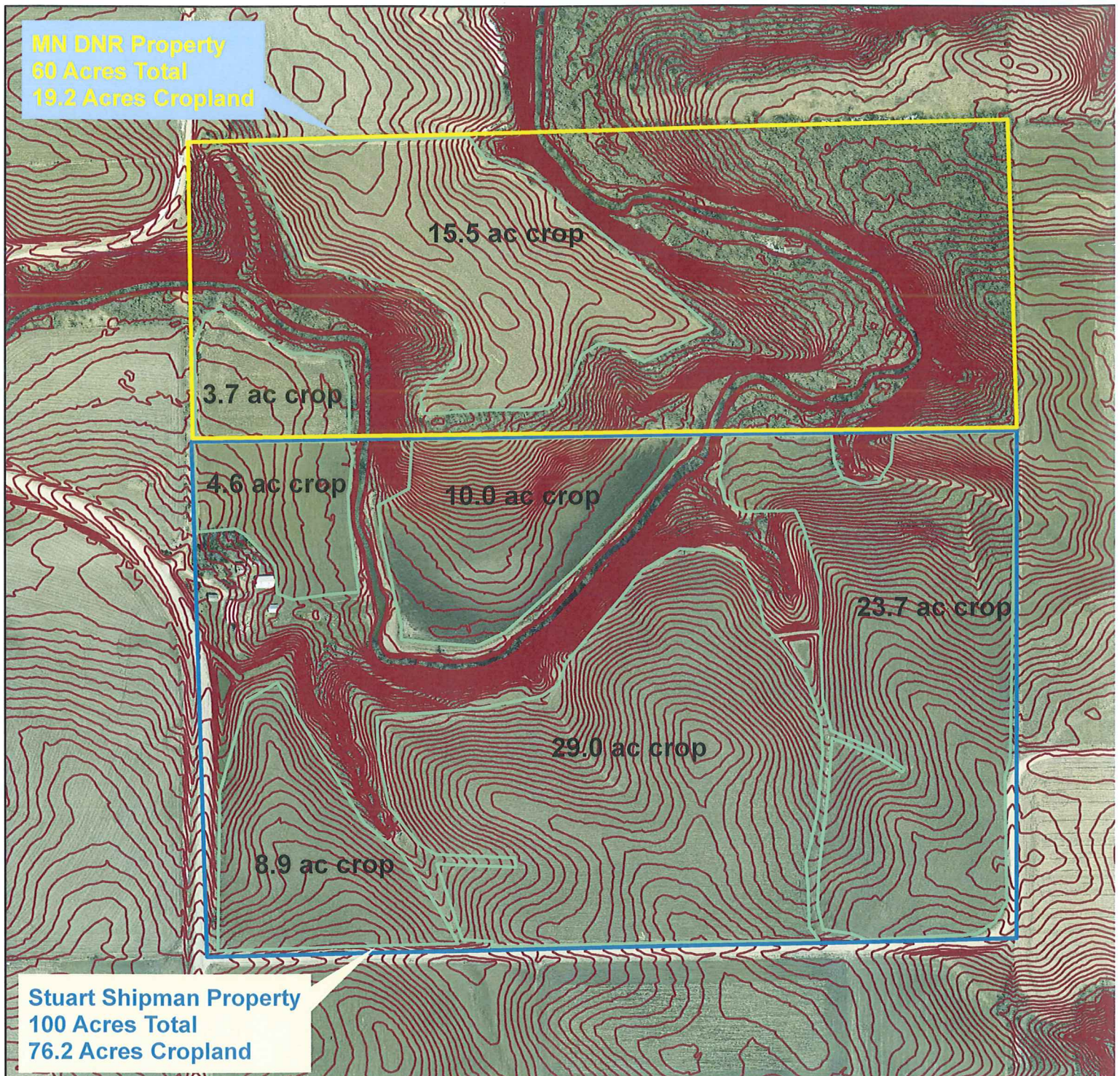
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## 2017 State Envirothon Scenario Contour/Topographic Map



0 250 500 1,000 Feet  
1 inch = 450 feet

### Legend

— 2ft contours - County



# 2017 State Envirothon Scenario

## Existing BMP Structure and ACPF Proposed Recommendations Map

