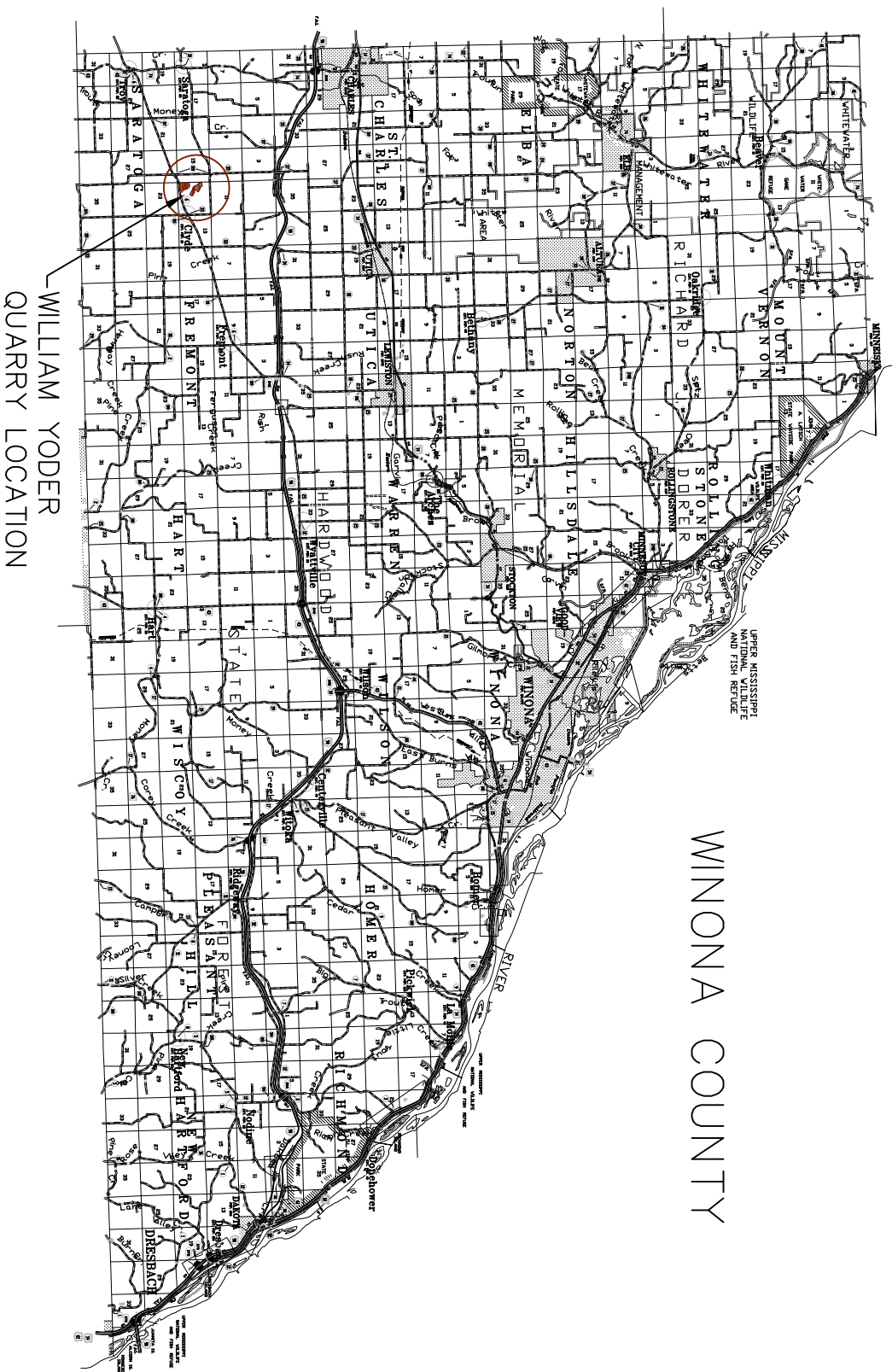
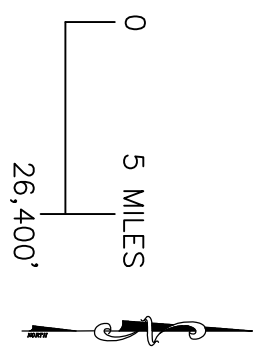


# WINONA COUNTY



WILLIAM YODER  
QUARRY LOCATION



LAST REVISED: 11/13/2012

**GENERAL SITE LOCATION MAP**  
**COUNTY MAP**  
**PROPOSED YODER QUARRY**  
**SARATOGA TOWNSHIP**  
**WINONA COUNTY, MINNESOTA**

**G<sup>3</sup>**  
**G-Cubed**  
**ENGINEERING**  
**SURVEYING**  
**PLANNING**

14070 Hwy 52 S.E.  
 Chatfield, MN 55923

Ph: 507-867-1666  
 Fax: 507-867-1665  
 WWW.G9910  
 FILE NO. 12-008EAW



WILLIAM YODER  
QUARRY LOCATION

0 1 MILE  
5280'



LAST REVISED: 11/13/2012

UNITED STATES GEOLOGICAL SURVEY MAP  
YODER QUARRY BOUNDARY  
USGS 7.5 MINUTE MAP  
SARATOGA TOWNSHIP  
WINONA COUNTY, MINNESOTA

**G<sup>3</sup>**  
**G-Cubed**  
ENGINEERING  
SURVEYING  
PLANNING  
14070 Hwy 52 S.E.  
Chalfield, MN 55923  
Ph. 507-867-1666  
Fax 507-867-1665  
www.g991o  
FILE NO. 12-008EAW

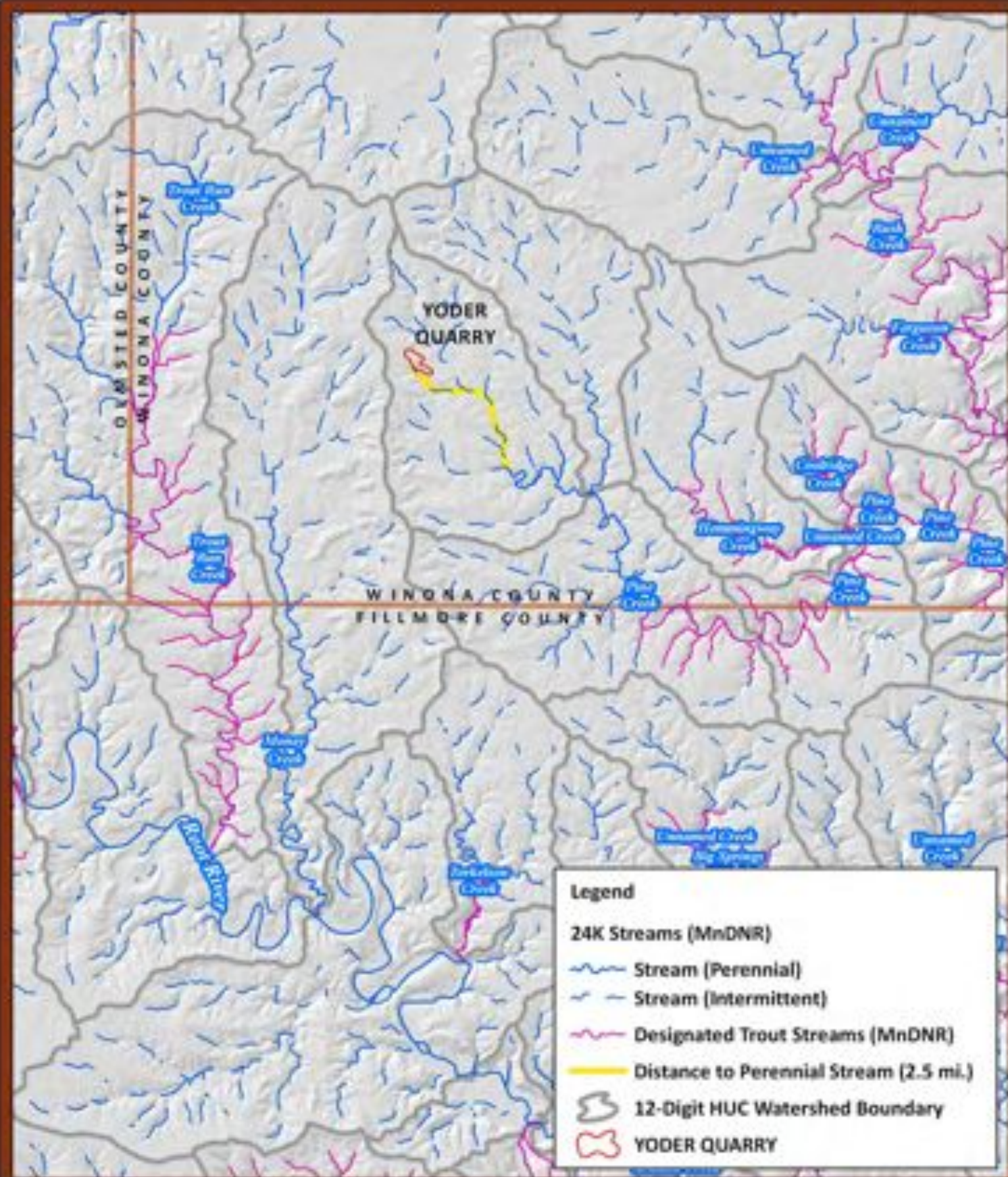


# Map of Proposed Silica Sand Mining Operations in Project Area

- ★ Indicates Proposed Mine in Fillmore Co.
- Indicates Proposed Mine in Winona Co.







## HYDROLOGY MAP

Winona County, MN

Map By: BMO

Map Scale: 1" = 10,000'

Date: Thursday, September 13, 2012

GIS Mapping  
& Spatial Analysis  
Wildland Disturbance  
& Planning  
Geologic Mapping

Environmental  
Assessment, Modeling  
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Assessments

Water Resource  
Assessment  
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## Minnesota Department of Natural Resources

Division of Ecological and Water Resources, Box 25

500 Lafayette Road

St. Paul, Minnesota 55155-4025

Phone: (651) 259-5109 E-mail: [lisa.joyal@state.mn.us](mailto:lisa.joyal@state.mn.us)

July 16, 2012

**Correspondence # ERDB 20120383**

Mr. Chris Priebe  
G-Cubed, Inc.  
14070 Hwy 52 SE  
Chatfield, MN 55923

RE: Natural Heritage Review of the proposed Winona County Sand Pits;  
T105N R10W Sections 9, 14-16, 21-23; Winona County

Dear Mr. Priebe,

As requested, the Minnesota Natural Heritage Information System has been queried to determine if any rare species or other significant natural features are known to occur within an approximate one-mile radius of the proposed project. Based on this query, rare features have been documented within the search area (for details, see the enclosed database reports; please visit the Rare Species Guide at <http://www.dnr.state.mn.us/rsg/index.html> for more information on the biology, habitat use, and conservation measures of these rare species). Please note that the following **rare features *may be adversely affected*** by the proposed project:

- The loggerhead shrike (*Lanius ludovicianus*), a state-listed threatened bird, was documented in the vicinity of the proposed project in 1993. Subsequent searches in 1995 did not find any shrikes. The nearest nesting record in the NHIS is about twenty miles from the project site.

Loggerhead shrikes use grasslands that contain short grass and scattered perching sites such as hedgerows, shrubs, or small trees. They can be found in native prairie, pastures, shelterbelts, old fields or orchards, cemeteries, grassy roadsides, and farmyards. Shrikes frequently shift territories between years so it is not unusual for a particular nesting area to be vacant for several years before it is used again. If the project boundary contains suitable habitat, then it is possible that loggerhead shrikes may breed in the area. Please refer to the DNR Rare Species Guide at <http://www.dnr.state.mn.us/rsg/index.html> for more information on the biology, habitat use, and conservation measures of this rare species.

Please contact the DNR Regional Nongame Specialist, Jaime Edwards at 507-206-2820, to discuss any additional data or concerns she may have regarding loggerhead shrikes in this area.

- There are a few areas within the project boundary that the Minnesota County Biological Survey considered for Sites of Biodiversity Significance, but these areas were determined to be below the minimum biodiversity threshold for statewide significance. These sites, however, may have conservation value at the local level as habitat for native plants and animals, corridors for animal movements, buffers surrounding higher quality natural areas, or as areas with high potential for restoration of native habitat. A GIS shapefile of MCBS Sites of Biodiversity Significance (including Sites ranked Below) can be downloaded from the DNR Data Deli at <http://deli.dnr.state.mn.us>.

NHIS DATA

[www.mndnr.gov](http://www.mndnr.gov)

AN EQUAL OPPORTUNITY EMPLOYER



The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological and Water Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. However, the NHIS is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. Therefore, ecologically significant features for which we have no records may exist within the project area. If additional information becomes available regarding rare features in the vicinity of the project, further review may be necessary.

The enclosed results include an Index Report and a Detailed Report of records in the Rare Features Database, the main database of the NHIS. To control the release of specific location information, which might result in the destruction of a rare feature, both reports are copyrighted.

The Index Report provides rare feature locations only to the nearest section, and may be reprinted, unaltered, in an environmental review document (e.g., EAW or EIS), municipal natural resource plan, or report compiled by your company for the project listed above. If you wish to reproduce the index report for any other purpose, please contact me to request written permission. **The Detailed Report is for your personal use only as it may include specific location information that is considered nonpublic data under Minnesota Statutes, section 84.0872, subd. 2. If you wish to reprint or publish the Detailed Report for any purpose, please contact me to request written permission.**

For environmental review purposes, the Natural Heritage letter and database reports are valid for one year; they are only valid for the project location (noted above) and the project description provided on the NHIS Data Request Form. Please contact me if project details change or if an updated review is needed.

Please note that locations of the gray wolf (*Canis lupus*), state-listed as special concern, and the Canada lynx (*Lynx canadensis*), federally-listed as threatened, are not currently tracked in the NHIS. As such, the Natural Heritage Review does not address these species.

Furthermore, the Natural Heritage Review does not constitute review or approval by the Department of Natural Resources as a whole. Instead, it identifies issues regarding known occurrences of rare features and potential effects to these rare features. Additional rare features for which we have no data may be present in the project area, or there may be other natural resource concerns associated with the proposed project. For these concerns, please contact your DNR Regional Environmental Assessment Ecologist (contact information available at [http://www.dnr.state.mn.us/eco/ereview/erp\\_regioncontacts.html](http://www.dnr.state.mn.us/eco/ereview/erp_regioncontacts.html)). Please be aware that additional site assessments or review may be required.

Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources. An invoice will be mailed to you under separate cover.

Sincerely,



Lisa Joyal  
Endangered Species Review Coordinator

enc.     Rare Features Database: Index Report  
          Rare Features Database: Detailed Report  
          Rare Features Database Reports: An Explanation of Fields

cc:     Melissa Doperalski  
          Jaime Edwards

Rare Features Database:

Element Name and Occurrence Number

Vertebrate Animal

Lanius ludovicianus (Loggerhead Shrike) #110	No Status	THR	S2B	G4	1993-07-07	17854
T105N R10W S16, T105N R10W S15, Winona County						
Lithobates palustris (Pickerel Frog) #68		NON	S4	G5	2000-07-27	28135
T105N R10W S3, T105N R10W S10, Winona County						

Vascular Plant

Hieracium longipilum (Long-bearded Hawkweed) #59		NON	SNR	G4G5	1992-09-30	15157
T105N R10W S13, T105N R10W S12, Winona County						

Records Printed = 3

Minnesota's endangered species law (*Minnesota Statutes*, section 84.0895) and associated rules (*Minnesota Rules*, part 6212.1800 to 6212.2300 and 6134) prohibit the taking of threatened or endangered species without a permit. For plants, taking includes digging or destroying. For animals, taking includes pursuing, capturing, or killing.

An Explanation of Fields:

**Element Name and Occurrence Number:** The Element is the name of the rare feature. For plant and animal species records, this field holds the scientific name followed by the common name in parentheses; for all other elements it is solely the element name. Native plant community names correspond to Minnesota's Native Plant Community Classification (Version 2.0). The Occurrence Number, in combination with the Element Name, uniquely identifies each record.

**Federal Status:** The status of the species under the U.S. Endangered Species Act: LE = endangered; LT = threatened; LE,LT = listed endangered in part of its range, listed threatened in another part of its range; LT,PDL = listed threatened, proposed for delisting; C = candidate for listing. If null or 'No Status,' the species has no federal status.

**MN Status:** Legal status of plant and animal species under the Minnesota Endangered Species Law: END = endangered; THR = threatened; SPC = special concern; NON = tracked, but no legal status. Native plant communities, geological features, and colonial waterbird nesting sites do not have any legal status under the Endangered Species Law and are represented by a N/A.

**State Rank:** Rank that best characterizes the relative rarity or endangerment of the taxon or plant community in Minnesota. The ranks do not represent a legal status. They are used by the Minnesota Department of Natural Resources to set priorities for research, inventory and conservation planning. The state ranks are updated as inventory information becomes available. S1 = Critically imperiled in Minnesota because of extreme rarity or because of some factor(s) making it especially vulnerable to extirpation from the state. S2 = Imperiled in Minnesota because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state. S3 = Vulnerable in Minnesota either because rare or uncommon, or found in a restricted range, or because of other factors making it vulnerable to extirpation. S4 = Apparently secure in Minnesota, usually widespread. S5 = Demonstrably secure in Minnesota, essentially intractable under present conditions. SH = Of historical occurrence in the state, perhaps having not been verified in the past 20 years, but suspected to be still extant. An element would become SH without the 20-year delay if the only known occurrences in the state were destroyed or if it had been extensively and unsuccessfully looked for. SNR = Rank not yet assessed. SU = Unable to rank. SX = Presumed extinct in Minnesota. SNA = Rank not applicable. S#S# = Range Rank: a numeric range rank (e.g., S2S3) is used to indicate the range of uncertainty about the exact status of the element. S#B, S#N = Used only for migratory animals, whereby B refers to the breeding population of the element in Minnesota and N refers to the non-breeding population of the element in Minnesota.

Minnesota Natural Heritage Information System  
Index Report of records within 1 mile radius of:  
ERBD# 20120383 - Winona County Sand Pits  
T105N R10W Sections 9, 14-16, 21-23  
Winona County

basis) to G5 (demonstrably secure, though perhaps rare in parts of its range). Global ranks are determined by NatureServe, an international network of natural heritage programs and conservation data centers.

**Last Observed Date:** Date that the Element Occurrence was last observed to be extant at the site in format YYYY-MM-DD.

**EO ID #:** Unique identifier for each Element Occurrence record.

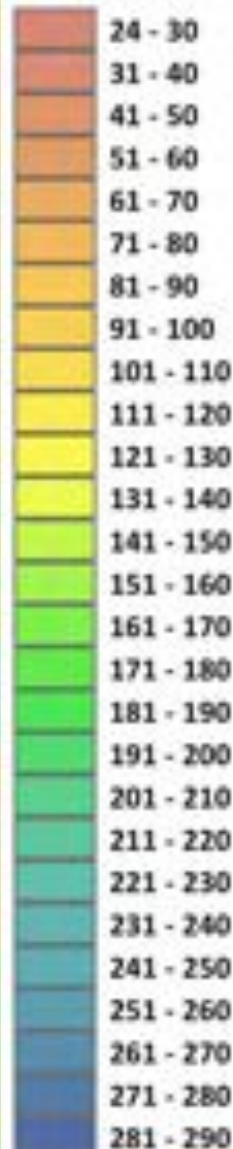
**Element Occurrence:** An area of land and/or water in which an Element (i.e., a rare species or community) is, or was, present, and which has practical conservation value for the Element as evidenced by potential continued (or historical) presence and/or regular recurrence at a given location. Specifications for each species determine whether multiple observations should be considered 1 Element Occurrence or 2, based on minimum separation distance and barriers to movement.



# Legend

 YODER QUARRY

## Ecological Benefits Index



YODER  
QUARRY

## ENVIRONMENTAL BENEFITS INDEX

The Environmental Benefits Index (EBI) is a composite score of multiple ecological benefits. The score is based on a 0-300 scale, where a score of 300 is most valuable from a conservation perspective. The EBI is the sum of the three independent layers described elsewhere on this site: soil erosion risk, water quality risk, and a wildlife habitat quality layers. Each of those component layers contributes 0-100 points to the EBI. This layer was created with the intention to rank CRP and other critical lands on multiple ecological benefits simultaneously. This approach is similar to the EBI used by the Farm Service Agency to rank farmers requests to enroll land in the Conservation Reserve Program. Our approach differs in that it offers flexibility in the weighting scheme, and allows users to explore both the spatial distribution of the data and the consequences of using alternative weighting systems. For example if identifying lands of high soil erosion risk is important, the habitat quality and water quality risk maps can be downweighted (e.g. scaled from 0-50). This would produce a different map than when all attributes are weighted equally.

## Environmental Benefits Index

Winona County, MN

Map By: EMO

Map Scale: 1" = 1,000'

Date: Tuesday, September 11, 2012

GIS Mapping  
& Spatial Analysis

Soil Data Collection  
& Processing

Ecological Services

Environmental  
Assessment, Monitoring  
& Impact Assessment



Environmental Data  
Interpretation, Map  
& Design

Water Use Quality

Landowner  
Assistance

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St. Paul, MN 55108  
Phone: 612.261.1100  
www.mcghiebetts.com







**COUNTY WELL INDEX MAP**  
Winona County, MN  
(Source: MN DEPT of HEALTH)

Map By: E060

Map Scale: 1" = 4,000'

Date: Tuesday, September 11, 2012

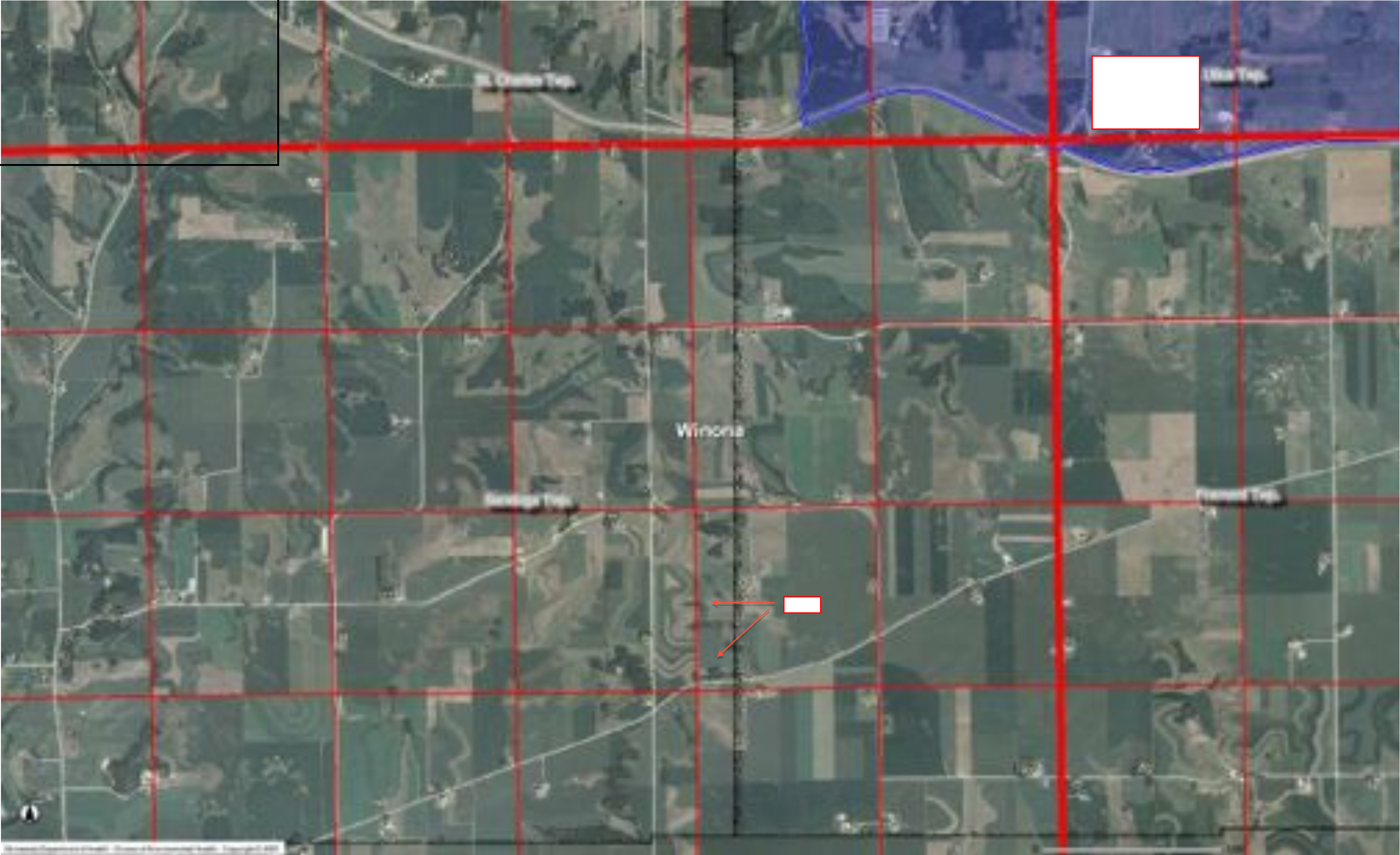
GIS Mapping  
& Spatial Analysis  
Wildland Evaluation  
& Planning  
Ecological Services  
Environmental  
Assessment, Remediation  
& Impact Statement



Environmental Site  
Investigations, Map  
& Design  
Surface Air Quality  
Landmarks  
Archaeology  
1000 Third Ave. S.E.  
St. Paul, MN 55108  
Phone: 612-291-7340  
www.mcghiebetts.com









Minnesota Department of Health

Last Date when data was updated: 10/29/2012

[Print Version](#)

**ID Number:** 1850011

**Facility Contact:** Wayne Getz  
(507) 932-4227  
Utica  
Utica Water Superintendent  
c/o Mr. Wayne Getz  
633 East Fourth Street  
St. Charles, MN 559721371

**MDH Contact:** Pat Bailey  
(507) 206-2741  
18 Woodlake Drive Southeast  
Rochester, MN 55904  
[pat.bailey@state.mn.us](mailto:pat.bailey@state.mn.us)

**Status of the Source Water Protection Plan:**

The water supply system is implementing the wellhead protection plan that has been approved by the Minnesota Department of Health under Minnesota Rules 4720.

**Source Water Protection Area:** - Click [Map1](#) to view SWPA map(s).

Yes - A Source Water Protection Area has been designated for this well.

**Description of the source water** - The water supply for Utica is obtained from 1 primary well. Well depth (in feet), well status, aquifer (s) used, and sensitivity of the source(s) of drinking water are listed in the following table.

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00150344	New Well #3	420	Primary	Bedrock	High	See (2)	Yes

**Well construction assessment** - The water well used by the Utica meets current standards for construction and maintenance. These factors do not contribute to the susceptibility of the source water to contamination.

**Well Sensitivity** - Well sensitivity refers to the integrity of the well due to its construction and maintenance. It is based on the results of the well construction assessment. It can be one of the following:

- (1) The well is susceptible to contamination because it does not meet current construction standards or no information about well construction is available, regardless of aquifer sensitivity.
- (2) The well is not susceptible because it meets well construction standards and does not present a pathway for contamination to readily enter the water supply.

**Aquifer Sensitivity** - Aquifer sensitivity refers to the degree of geological protection afforded the aquifer(s) used by the public water supply.

High - The aquifer is considered to exhibit a high sensitivity to contamination because of the local geological setting.

**Source Water Susceptibility** - Source water susceptibility refers to the likelihood that a contaminant will reach the source of drinking water. It reflects the results of assessing well sensitivity, aquifer sensitivity, and water quality data.

High - The source of drinking water is considered to exhibit a high susceptibility to contamination because of the local geological setting.

**Contaminants of concern** - The following statement summarizes the potential contaminants for which a source of drinking water may be at risk:

One or more contaminants regulated under the federal Safe Drinking Water Act for this public water supply system have been detected



in the source water. However, the water supplied to users meets state and federal drinking water standards for potability. For further information, please contact the MDH representative listed at the beginning of this assessment.

651-201-5000 Phone  
888-345-0823 Toll-free  
651-201-5797 TTY

Information on this website is available in alternative formats to individuals with disabilities upon request.

Updated



Minnesota Department of Health

Last Date when data was updated: 10/29/2012

[Print Version](#)

**ID Number:** 1850009

**Facility Contact:** Kyle Karger  
(507) 932-3020  
Saint Charles  
St. Charles Water Superintendent  
c/o Mr. Kyle A. Karger  
830 Whitewater Avenue  
St. Charles, MN 55972

**MDH Contact:** Pat Bailey  
(507) 206-2741  
18 Woodlake Drive Southeast  
Rochester, MN 55904  
[pat.bailey@state.mn.us](mailto:pat.bailey@state.mn.us)

**Status of the Source Water Protection Plan:**

The water supply system is designating its wellhead protection area(s) and preparing assessments of well and aquifer vulnerability as specified under Minnesota Rules Chapter 4720.

**Source Water Assessment Area: -**

No - A Source Water Assessment Area has yet to be designated for this well.

**Description of the source water** - The water supply for Saint Charles is obtained from 3 primary wells. Well depth (in feet), well status, aquifer(s) used, and sensitivity of the source(s) of drinking water are listed in the following table.

Unique Well No	Well ID	Depth	Well Use	Aquifer	Aquifer Sensitivity	*Well Sensitivity	SWPA
00161426	Well #4	736	Primary	Bedrock	High	See (2)	No
00161430	Well #5	702	Primary	Bedrock	High	See (2)	No
00219162	Well #3	667	Primary	Bedrock	High	See (2)	No

**Well construction assessment** - The water wells used by the Saint Charles meet current standards for construction and maintenance. These factors do not contribute to the susceptibility of the source water to contamination.

**Well Sensitivity** - Well sensitivity refers to the integrity of the well due to its construction and maintenance. It is based on the results of the well construction assessment. It can be one of the following:

- (1) The well is susceptible to contamination because it does not meet current construction standards or no information about well construction is available, regardless of aquifer sensitivity.
- (2) The well is not susceptible because it meets well construction standards and does not present a pathway for contamination to readily enter the water supply.

**Aquifer Sensitivity** - Aquifer sensitivity refers to the degree of geological protection afforded the aquifer(s) used by the public water supply.

High - The aquifer is considered to exhibit a high sensitivity to contamination because of the local geological setting.

**Source Water Susceptibility** - Source water susceptibility refers to the likelihood that a contaminant will reach the source of drinking water. It reflects the results of assessing well sensitivity, aquifer sensitivity, and water quality data.

High - The source of drinking water is considered to exhibit a high susceptibility to contamination because of the local geological setting.

High - The source water is considered to be susceptible because of the tritium content of the well water in bedrock.

**Contaminants of concern** - The following statement summarizes the potential contaminants for which a source of drinking water may be at risk:

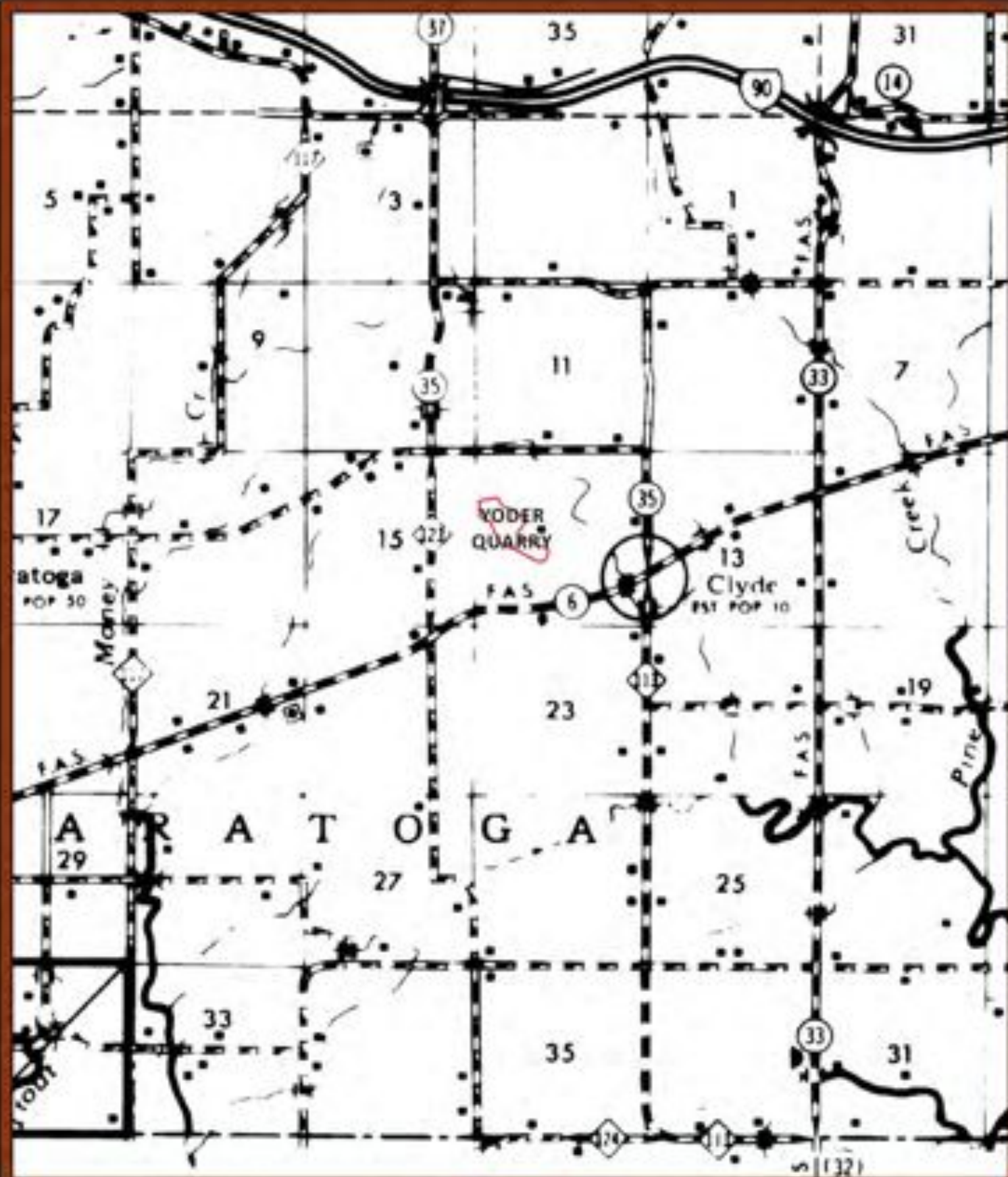


One or more contaminants regulated under the federal Safe Drinking Water Act for this public water supply system have been detected in the source water. However, the water supplied to users meets state and federal drinking water standards for potability. For further information, please contact the MDH representative listed at the beginning of this assessment.

651-201-5000 Phone  
888-345-0823 Toll-free  
651-201-5797 TTY

Information on this website is available in alternative formats to individuals with disabilities upon request.

Updated



# **PROTECTED WATERS MAP**

Winona County, MN

Map by ERM

Map Scale: 1" = 4,000'

Date: Tuesday, September 11, 2012

GIS Mapping  
& Spatial Analysis  
Statistical Analysis  
& Planning  
Ecological Services  
Environmental  
Assessment & Impact  
Statement

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Engineering  
Construction  
Cost Estimation  
Air Quality  
Permitting  
Regulatory Compliance







**BEDROCK GEOLOGY MAP**  
Winona County, MN

Map By: E080

Map Scale: 1" = 4,000'

Date: Tuesday, September 11, 2012

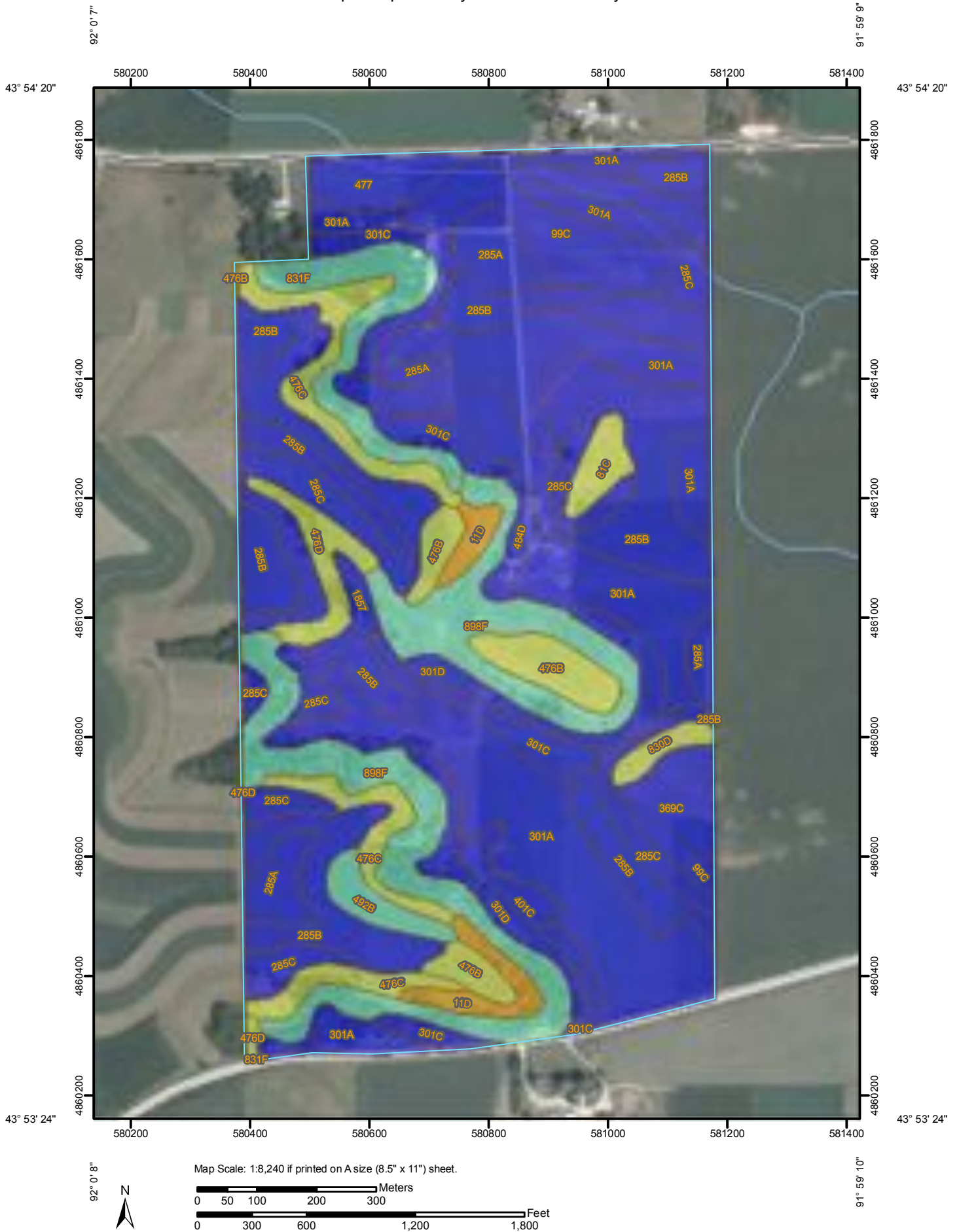
100 Mapping  
& Spatial Analysis  
Wildland Evaluation  
& Planning  
Ecological Services  
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Custom Soil Resource Report  
Map—Depth to Any Soil Restrictive Layer



## Custom Soil Resource Report

### MAP LEGEND






#### Area of Interest (AOI)

 Area of Interest (AOI)

#### Soils

 Soil Map Units


#### Soil Ratings

 0 - 25  
 25 - 50  
 50 - 100  
 100 - 150  
 150 - 200  
 > 200






#### Political Features

 Cities

#### Water Features

 Streams and Canals

#### Transportation

 Rails  
 Interstate Highways  
 US Routes  
 Major Roads  
 Local Roads

### MAP INFORMATION

Map Scale: 1:8,240 if printed on A size (8.5" × 11") sheet.

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 accurate map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>  
Coordinate System: UTM Zone 15N NAD83

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 7, Jun 1, 2012

Date(s) aerial images were photographed: 8/16/2003

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.



# Custom Soil Resource Report

## Table—Depth to Any Soil Restrictive Layer

Depth to Any Soil Restrictive Layer— Summary by Map Unit — Winona County, Minnesota (MN169)				
Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
11D	Sogn silt loam, rocky, 6 to 30 percent slopes	30	4.8	1.7%
81C	Boone loamy fine sand, 6 to 15 percent slopes	76	2.6	0.9%
99C	Racine silt loam, 6 to 12 percent slopes	>200	10.8	3.8%
285A	Port Byron silt loam, 1 to 3 percent slopes	>200	9.8	3.4%
285B	Port Byron silt loam, 3 to 6 percent slopes	>200	52.2	18.2%
285C	Port Byron silt loam, 6 to 12 percent slopes	>200	27.8	9.7%
301A	Lindstrom silt loam, 1 to 3 percent slopes	>200	64.2	22.4%
301C	Lindstrom silt loam, 6 to 12 percent slopes	>200	12.9	4.5%
301D	Lindstrom silt loam, 12 to 20 percent slopes	>200	9.7	3.4%
369C	Waubee silt loam, 6 to 12 percent slopes	>200	5.8	2.0%
401C	Mt. Carroll silt loam, 6 to 12 percent slopes	>200	2.4	0.8%
476B	Frankville silt loam, 2 to 6 percent slopes	76	8.4	2.9%
476C	Frankville silt loam, 6 to 12 percent slopes	76	12.9	4.5%
476D	Frankville silt loam, 12 to 18 percent slopes	76	4.7	1.6%
477	Littleton silt loam	>200	8.7	3.0%
484D	Eyota fine sandy loam, 12 to 20 percent slopes	>200	2.0	0.7%
492B	Nasset silt loam, 3 to 6 percent slopes	127	3.0	1.0%
830D	Eleva-Seaton complex, 12 to 30 percent slopes	76	1.8	0.6%
831F	Spinks-Boone-Sogn complex, rocky, 15 to 60 percent slopes	127	8.9	3.1%
898F	Bellechester-Brodale complex, rocky, 15 to 60 percent slopes	140	32.2	11.2%
1857	Eitzen silt loam, channeled	>200	1.4	0.5%
<b>Totals for Area of Interest</b>			<b>287.1</b>	<b>100.0%</b>

## **Rating Options—Depth to Any Soil Restrictive Layer**

*Units of Measure:* centimeters

*Aggregation Method:* Dominant Component

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Lower

*Interpret Nulls as Zero:* No



# Legend

Karst Features	Sinkhole Probability
● Sinkhole	High
● Spring	Moderate to High
	Low to Moderate



## KARST INVENTORY MAP

Wisconsin County, MN  
(Source: Mts Geologic Survey)

Map By: E080

Map Scale: 1" = 4,000'

Date: Tuesday, September 11, 2012

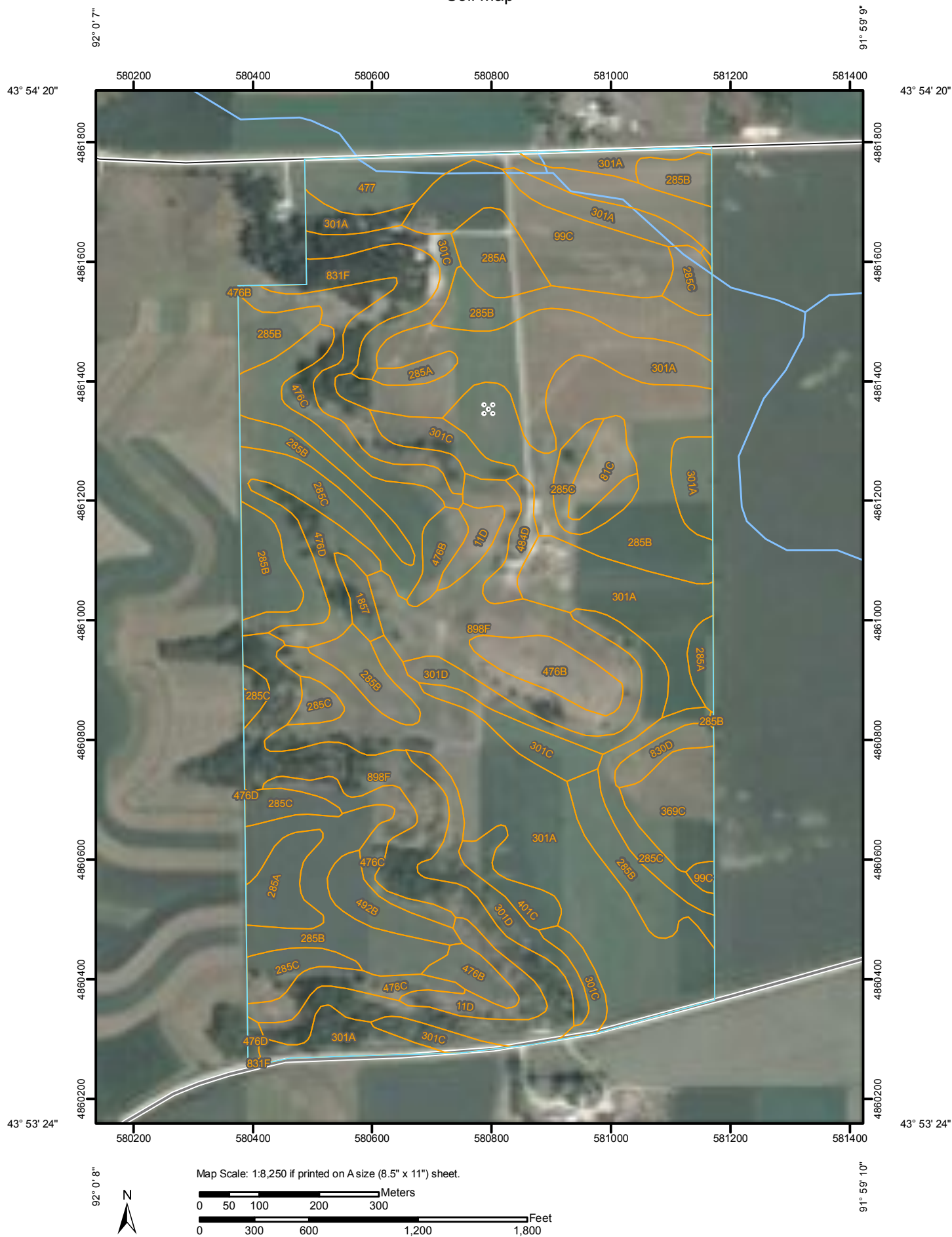
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& Spatial Analysis  
Road Collection  
& Planning  
Ecologic Services  
Environmental  
Assessment, Remediation  
& Impact Statement

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Tel: 612-261-7100  
Fax: 612-261-7101  
www.mcghiebetts.com






































N  
0 2,000 4,000  
Feet

# Custom Soil Resource Report Soil Map





## MAP LEGEND

	Area of Interest (AOI)		Very Stony Spot
	Area of Interest (AOI)		Wet Spot
<b>Soils</b>			Other
	Soil Map Units	<b>Special Line Features</b>	
<b>Special Point Features</b>			Gully
	Blowout		Short Steep Slope
	Borrow Pit		Other
	Clay Spot	<b>Political Features</b>	
	Closed Depression		Cities
	Gravel Pit	<b>Water Features</b>	
	Gravelly Spot		Streams and Canals
	Landfill	<b>Transportation</b>	
	Lava Flow		Rails
	Marsh or swamp		Interstate Highways
	Mine or Quarry		US Routes
	Miscellaneous Water		Major Roads
	Perennial Water		Local Roads
	Rock Outcrop		
	Saline Spot		
	Sandy Spot		
	Severely Eroded Spot		
	Sinkhole		
	Slide or Slip		
	Sodic Spot		
	Spoil Area		
	Stony Spot		

## MAP INFORMATION

Map Scale: 1:9,320 if printed on A size (8.5" x 11") sheet.

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 accurate map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>  
Coordinate System: UTM Zone 15N NAD83

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 7, Jun 1, 2012

Date(s) aerial images were photographed: 8/16/2003

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

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	1.7	0.5%
81C	Boone loamy fine sand, 6 to 15 percent slopes	2.6	0.7%
99C	Racine silt loam, 6 to 12 percent slopes	10.3	3.0%
285A	Port Byron silt loam, 1 to 3 percent slopes	13.8	4.0%
285B	Port Byron silt loam, 3 to 6 percent slopes	98.0	28.1%
285C	Port Byron silt loam, 6 to 12 percent slopes	39.3	11.3%
301A	Lindstrom silt loam, 1 to 3 percent slopes	65.7	18.9%
301C	Lindstrom silt loam, 6 to 12 percent slopes	12.3	3.5%
301D	Lindstrom silt loam, 12 to 20 percent slopes	6.3	1.8%
369C	Waubee silt loam, 6 to 12 percent slopes	9.0	2.6%
401C	Mt. Carroll silt loam, 6 to 12 percent slopes	0.3	0.1%
476B	Frankville silt loam, 2 to 6 percent slopes	7.7	2.2%
476C	Frankville silt loam, 6 to 12 percent slopes	12.2	3.5%
476D	Frankville silt loam, 12 to 18 percent slopes	6.1	1.8%
477	Littleton silt loam	18.7	5.4%
484D	Eyota fine sandy loam, 12 to 20 percent slopes	2.0	0.6%
830D	Eleva-Seaton complex, 12 to 30 percent slopes	1.8	0.5%
831F	Spinks-Boone-Sogn complex, rocky, 15 to 60 percent slopes	15.5	4.4%
898F	Bellechester-Brodale complex, rocky, 15 to 60 percent slopes	23.6	6.8%
1857	Eitzen silt loam, channeled	1.4	0.4%
<b>Totals for Area of Interest</b>		<b>348.1</b>	<b>100.0%</b>



## National Clean Diesel Campaign (NCDC) Quantifier Use The Quantifier

*Working Together for Cleaner Air*

Not logged in | [login](#)

[DEQ FAQs](#)

1) Fleet Entry >> 2) Vehicle Group Entry >> 3) Technology Entry >> 4) Quantify Results >> 5) Health Benefits

**Note:** Your session will time out after 30 minutes of inactivity.

Enter Fleet Information

[Start Over](#)

Yoder

Fleet Type On Highway / Non-road

State Minnesota

[Edit Fleet](#)

| [Start Over](#)

Mining

No retrofit technologies currently applied. To apply a retrofit technology, click on the link below.

[Add a new technology](#)



Add your first retrofit technology

Quantity 30  
Type On Highway  
Target Fleet Short Haul  
Class/Equipment Class 8a (33,001-60,000)  
Model Year 2009  
Retrofit Year of Action 2013

Fuel Type Regular Diesel (ULSD), 15 ppm  
Fuel Volume 500000  
Veh. Miles Traveled 100000  
Idling Hours 400

[Edit Group](#)

| [Delete](#)

[Add a New Vehicle Group](#)

[Quantify Emissions](#)





## National Clean Diesel Campaign (NCDC)

# Quantifier Use The Quantifier

Working Together for Cleaner Air

Not logged in | [login](#)

[DEQ FAQs](#)

1) Fleet Entry >> 2) Vehicle Group Entry >> 3) Technology Entry >> 4) Quantify Results >> 5) Health Benefits

**Note:** Your session will time out after 30 minutes of inactivity.

## Emissions Results:

The results are broken into four sections: Emissions Results: Annual, Daily; Emissions Results: Lifetime; Funding Sources; and Detailed Results. The data that appear in the Results tables are an aggregation of the emissions from all vehicle groups and technologies that you entered. For information on the results, refer to the User's Guide, 3. Emission Results Screen.

[Start Over](#)

Yoder

Fleet Type On Highway / Non-road

State Minnesota

[Edit Fleet](#)

[Summary Emissions Results](#)

[Detailed Results](#)

[Download Results](#)

[Health Benefits](#)

## Summary Emissions Results

Annual	NOx (short tons/year)	PM2.5 (short tons/year)	HC (short tons/year)	CO (short tons/year)	CO2 (short tons/year)	Diesel- Equivalent (gallons/year)
Baseline of Entire Fleet	16.0866	0.1569	0.4013	2.1161	5,550.0000	500,000.0000
Baseline of Vehicles Retrofitted	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Percent Reduced (%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Amount Reduced Per Year	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Daily	NOx (kg/day)	PM2.5 (kg/day)	HC (kg/day)	CO (kg/day)	CO2 (kg/day)	Diesel- Equivalent (gal/day)
Kilograms Reduced Per Day (kg/day)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Lifetime	NOx (short tons)	PM2.5 (short tons)	HC (short tons)	CO (short tons)	CO2 (short tons)	Diesel- Equivalent (gallons)
Baseline of Entire Fleet	402.1643	3.9222	10.0328	52.9030	138,750.0000	12,500,000.0000
Baseline of Vehicles Retrofitted	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Percent Reduced(%)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Amount Reduced	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Amount Emitted After Retrofit, Retrofitted Vehicles	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Amount Emitted After Retrofit, Entire Fleet	402.1643	3.9222	10.0328	52.9030	138,750.0000	12,500,000.0000
Fleet Capital Cost Effectiveness (\$/ton), Retrofitted Vehicles	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Total Cost Effectiveness (\$/ton), Retrofitted Vehicles	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Remaining Lifetime	Short Haul   Class 8a (33,001-60,000)25.0 years					

## Detailed Results

### Detailed Annual Results

Vehicle Class	Target Fleet	Class/Equipment	Model Year	Retrofit Year	Number of	Usage Rate/Year	Horsepower	Fuel Type	Fuel Usage	Vehicle Miles Traveled/Year	Technology	Number of Vehicles	Installation Cost	Unit Cost	To Pr
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Number					Vehicles				(gal)	(VMT)		Retrofitted			Cc

Detailed Lifetime Results

Vehicle Class Number	Target Fleet	Class/Equipment	Model Year	Retrofit Year	Number of Vehicles	Usage Rate/Year	Horsepower	Fuel Type	Fuel Usage (gal)	Vehicle Miles Traveled/Year (VMT)	Technology	Number of Vehicles Retrofitted	Installation Cost	Unit Cost	To Pr Cc

Download Results

You have the option to download the results and inputted data in a Comma Separated Value (CSV) format which can be opened by most spreadsheet software. The downloaded information will appear as it does in the Detailed Results and will include any funding and contact information inputted. For more information on downloading data, refer to the User's Guide [3.3 Preview/Download Data](#).

Detailed Report

View/Download detailed report as  
[Microsoft Excel file](#)  
[CSV \(comma separated values\) file](#)

Summary Report

View/Download summary report as  
[Microsoft Excel file](#)  
[CSV \(comma separated values\) file](#)

Health Benefits

The Health Benefits Module allows you to estimate the health benefits associated with the scenarios you have developed through the Quantifier, as a result of reductions in fine particulate matter. For more information about what the Health Benefits results do and do not include, please refer to the Health Benefits Methodology document.

Please choose up to five counties where the emission reductions will take place. The percentage of reductions in all the counties chosen must add up to 100 percent.

State

Minnesota

Select State...

Select State...

Select State...

Select State...

County

Select County...

Select County...

Select County...

Select County...

Select County...

Total  
Percent

Calculate Benefits





**Chris Priebe**

---

**From:** Thomas Cinadr [thomas.cinadr@mnhs.org]  
**Sent:** Wednesday, May 16, 2012 2:30 PM  
**To:** Chris Priebe  
**Subject:** Re: SHPO Inquiry - Winona County Sand Pits  
**Follow Up Flag:** Follow up  
**Flag Status:** Red  
**Attachments:** Historic.rtf

**THIS EMAIL IS NOT A PROJECT CLEARANCE.**

**This message simply reports the results of the cultural resources database search you requested. The database search produced results for only previously known archaeological sites and historic properties. Please read the note below carefully.**

No archaeological sites were identified in a search of the Minnesota Archaeological Inventory and Historic Structures Inventory for the search area requested. **A report containing the historic properties identified is attached.**

The result of this database search provides a listing of recorded archaeological sites and historic architectural properties that are included in the current SHPO databases. Because the majority of archaeological sites in the state and many historic architectural properties have not been recorded, important sites or structures may exist within the search area and may be affected by development projects within that area. Additional research, including field survey, may be necessary to adequately assess the area's potential to contain historic properties.

If you require a comprehensive assessment of a project's potential to impact archaeological sites or historic architectural properties, you may need to hire a qualified archaeologist and/or historian. If you need assistance with a project review, please contact Kelly Gragg-Johnson in Review and Compliance @ 651-259-3455 or by email at [kelly.graggjohnson@mnhs.org](mailto:kelly.graggjohnson@mnhs.org).

The Minnesota SHPO Survey Manuals and Database Metadata and Contractor Lists can be found at <http://www.mnhs.org/shpo/survey/inventories.htm>

**SHPO research hours are 8:00 AM – 4:00 PM Tuesday-Friday.  
The Office is closed on Mondays.**

STATE HISTORICAL PRESERVATION OFFICE REPORT

7/16/2012

***Tom Cinadr***

Survey and Information Management Coordinator  
651-259-3453

On Mon, May 14, 2012 at 11:27 AM, Chris Priebe <[chrisp@ggg.to](mailto:chrisp@ggg.to)> wrote:

May 14, 2012

Tom Cinadr

Survey and Information Management Coordinator

Minnesota State Historic Preservation Office

[thomas.cinadr@mnhs.org](mailto:thomas.cinadr@mnhs.org)

[651-259-3453](tel:651-259-3453)

RE: Winona County Sand Pits Database Search, Saratoga Township, Winona County, MN

Tom Cinadr,

G-Cubed Engineering is requesting a database search for historical architecture and archaeological sites located in the given area.

The SE ¼ of Section 9, the E ½ of Section 16, the W ½ of Section 15, The NE ¼ of Section 21, the NW ¼ of Section 22, the W ½ of Section 14, the SE ¼ of Section 14, and the N ½ of Section 23 all in Township 105 N, Range 10 W, in Winona County, MN.

An EAW is being prepared for a surface excavation and mining operation in Saratoga Township, Winona

7/16/2012

County, Minnesota. Please call me with any questions.

Please respond to my email at [chrisp@ggg.to](mailto:chrisp@ggg.to)

Thank you,

Chris Priebe

**Christopher Priebe**

Engineering Specialist

***G-Cubed***

14070 Hwy. 52 SE

Chatfield, MN 55923

Phone: (507)-867-1666 ext. 104

Cell: (507)-259-5266

Fax: (507)-867-1665

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7/16/2012



# History/Architecture Inventory

PROPERTY NAME	ADDRESS	Twp	Range	Sec	Quarters	USGS	Report	NRHP	CEF	DOE	Inventory Number
COUNTY:	Winona										
CITY/TOWNSHIP:	Saratoga Twp.										
school	off Co. Hwy. 35	105	10	15	NW-NE-NW	St. Charles					WN-SAR-008
Evergreen Lodge No. 46	SW corner Co. Hwy. 6 & Co. Hwy. 35	105	10	14	SE-NE-SE	Utica					WN-SAR-009
District School No. 63 (moved)	off Co. Hwy. 6	105	10	21	NE-NW-SE	St. Charles					WN-SAR-011
Saratoga Township Hall		105	10	21	SW-SE-NE	St. Charles					WN-SAR-012

# **Soil Information for All Uses**

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## **Suitabilities and Limitations for Use**

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

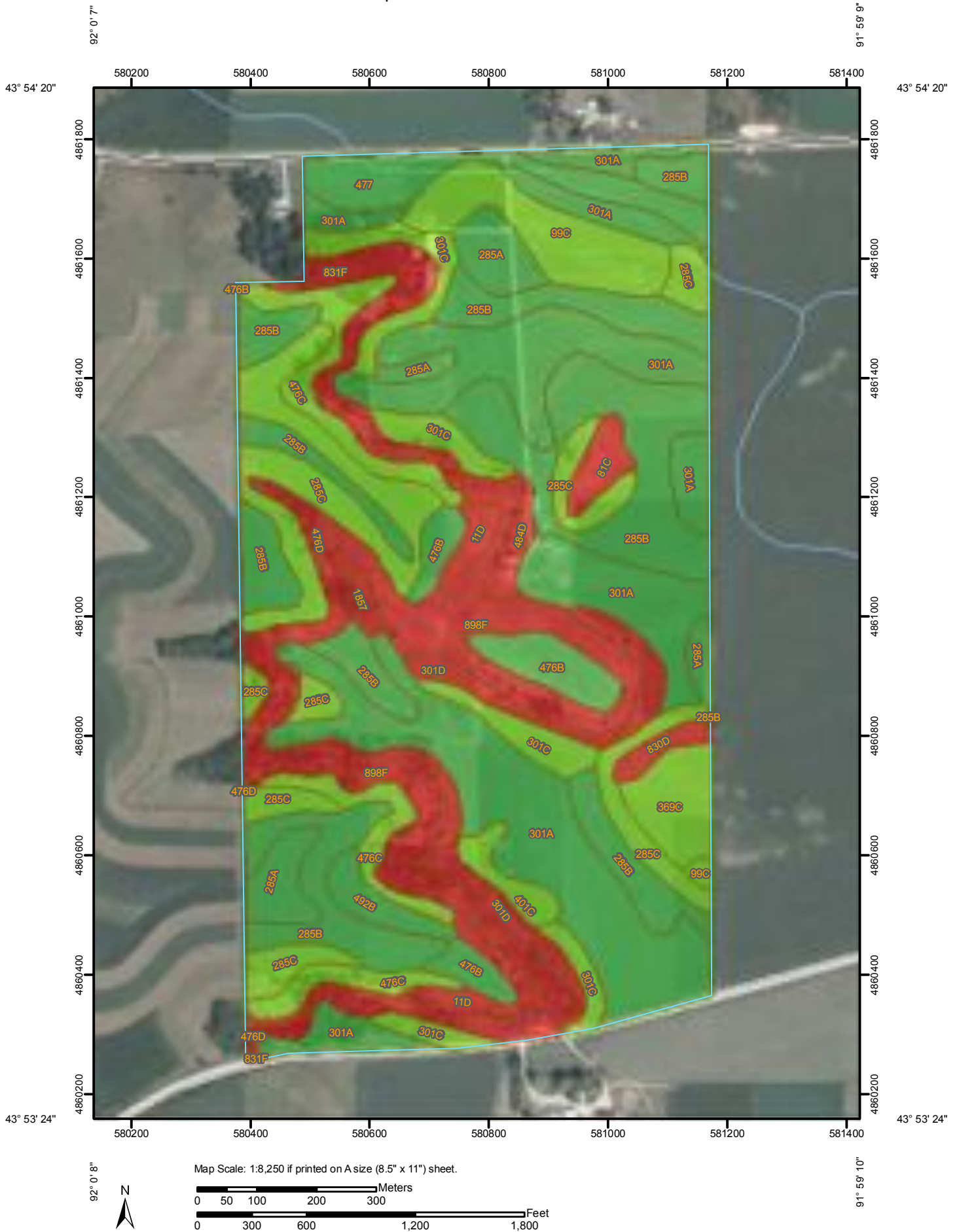
## **Land Classifications**

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

## **Farmland Classification**






















Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

# Custom Soil Resource Report Map—Farmland Classification





MAP LEGEND

	Prime farmland if subsided, completely removing the root inhibiting soil layer		Major Roads
	Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60		Local Roads
	Soil Map Units		
	Soil Ratings		
	Not prime farmland		Prime farmland if irrigated and reclaimed of excess salts and sodium
	All areas are prime farmland		Farmland of statewide importance
	Prime farmland if drained		Farmland of local importance
	Prime farmland if protected from flooding or not frequently flooded during the growing season		Farmland of unique importance
	Prime farmland if irrigated		Not rated or not available
	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season		
			Political Features
			Cities
			Water Features
	Prime farmland if irrigated and drained		Streams and Canals
	Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season		Transportation
			Rails
			Interstate Highways
			US Routes

MAP INFORMATION

Map Scale: 1:8,250 if printed on A size (8.5" x 11") sheet.

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 accurate map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>  
Coordinate System: UTM Zone 15N NAD83

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 7, Jun 1, 2012

Date(s) aerial images were photographed: 8/16/2003

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.

# Custom Soil Resource Report

**Table—Farmland Classification**

Farmland Classification— Summary by Map Unit — Winona County, Minnesota (MN169)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
11D	Sogn silt loam, rocky, 6 to 30 percent slopes	Not prime farmland	4.8	1.7%
81C	Boone loamy fine sand, 6 to 15 percent slopes	Not prime farmland	2.6	0.9%
99C	Racine silt loam, 6 to 12 percent slopes	Farmland of statewide importance	10.7	3.8%
285A	Port Byron silt loam, 1 to 3 percent slopes	All areas are prime farmland	9.6	3.4%
285B	Port Byron silt loam, 3 to 6 percent slopes	All areas are prime farmland	51.6	18.2%
285C	Port Byron silt loam, 6 to 12 percent slopes	Farmland of statewide importance	27.6	9.7%
301A	Lindstrom silt loam, 1 to 3 percent slopes	All areas are prime farmland	63.6	22.4%
301C	Lindstrom silt loam, 6 to 12 percent slopes	Farmland of statewide importance	12.9	4.6%
301D	Lindstrom silt loam, 12 to 20 percent slopes	Not prime farmland	9.7	3.4%
369C	Waubee silt loam, 6 to 12 percent slopes	Farmland of statewide importance	5.5	2.0%
401C	Mt. Carroll silt loam, 6 to 12 percent slopes	Farmland of statewide importance	2.4	0.8%
476B	Frankville silt loam, 2 to 6 percent slopes	All areas are prime farmland	8.4	2.9%
476C	Frankville silt loam, 6 to 12 percent slopes	Farmland of statewide importance	12.7	4.5%
476D	Frankville silt loam, 12 to 18 percent slopes	Not prime farmland	4.7	1.6%
477	Littleton silt loam	All areas are prime farmland	8.7	3.1%
484D	Eyota fine sandy loam, 12 to 20 percent slopes	Not prime farmland	2.0	0.7%
492B	Nasset silt loam, 3 to 6 percent slopes	All areas are prime farmland	3.0	1.1%
830D	Eleva-Seaton complex, 12 to 30 percent slopes	Not prime farmland	1.7	0.6%
831F	Spinks-Boone-Sogn complex, rocky, 15 to 60 percent slopes	Not prime farmland	8.2	2.9%
898F	Bellechester-Brodale complex, rocky, 15 to 60 percent slopes	Not prime farmland	32.2	11.3%
1857	Eitzen silt loam, channeled	Not prime farmland	1.4	0.5%
<b>Totals for Area of Interest</b>			<b>284.1</b>	<b>100.0%</b>

## **Rating Options—Farmland Classification**

*Aggregation Method:* No Aggregation Necessary

*Tie-break Rule:* Lower

## **Vegetative Productivity**

Vegetative productivity includes estimates of potential vegetative production for a variety of land uses, including cropland, forestland, hayland, pastureland, horticulture and rangeland. In the underlying database, some states maintain crop yield data by individual map unit component. Other states maintain the data at the map unit level. Attributes are included for both, although only one or the other is likely to contain data for any given geographic area. For other land uses, productivity data is shown only at the map unit component level. Examples include potential crop yields under irrigated and nonirrigated conditions, forest productivity, forest site index, and total rangeland production under of normal, favorable and unfavorable conditions.

## **Crop Productivity Index**

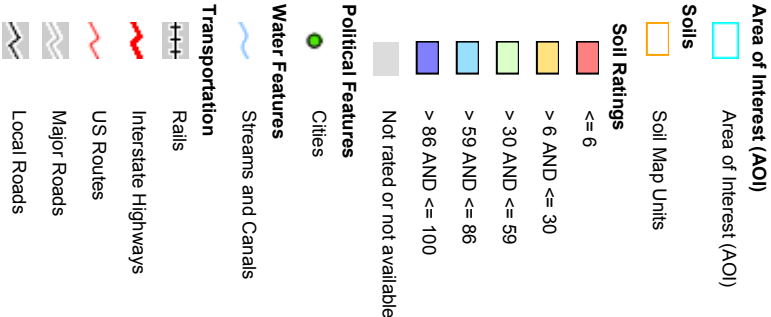
Crop productivity index ratings provide a relative ranking of soils based on their potential for intensive crop production. An index can be used to rate the potential yield of one soil against that of another over a period of time. Ratings range from 0 to 100. The higher numbers indicate higher production potential. The rating is not crop specific.

When the soils are rated, the following assumptions are made: a) adequate management, b) natural weather conditions (no irrigation), c) artificial drainage where required, d) no frequent flooding on the lower lying soils, and e) no land leveling or terracing. Even though predicted average yields will change with time, the productivity indices are expected to remain relatively constant in relation to one another over time.





MAP LEGEND



MAP INFORMATION

Map Scale: 1:8,250 if printed on A size (8.5" x 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:20,000.

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

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

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>  
Coordinate System: UTM Zone 15N NAD83

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 7, Jun 1, 2012

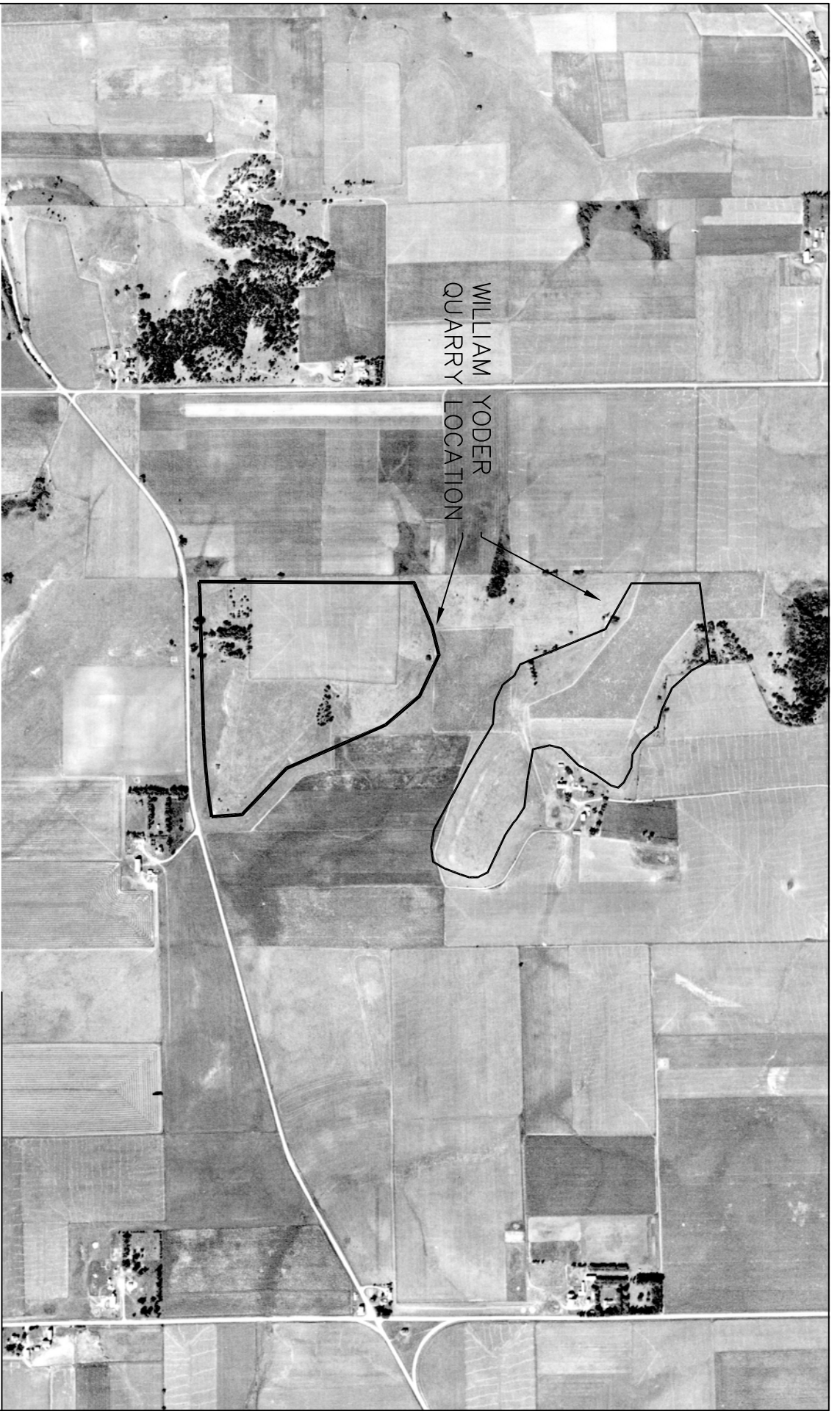
Date(s) aerial images were photographed: 8/16/2003

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.

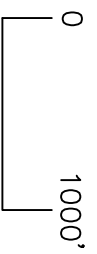
**Table—Crop Productivity Index**

<b>Crop Productivity Index— Summary by Map Unit — Winona County, Minnesota (MN169)</b>				
<b>Map unit symbol</b>	<b>Map unit name</b>	<b>Rating</b>	<b>Acres in AOI</b>	<b>Percent of AOI</b>
11D	Sogn silt loam, rocky, 6 to 30 percent slopes	6	4.8	1.7%
81C	Boone loamy fine sand, 6 to 15 percent slopes	21	2.6	0.9%
99C	Racine silt loam, 6 to 12 percent slopes	76	10.7	3.8%
285A	Port Byron silt loam, 1 to 3 percent slopes	99	9.6	3.4%
285B	Port Byron silt loam, 3 to 6 percent slopes	98	51.6	18.2%
285C	Port Byron silt loam, 6 to 12 percent slopes	91	27.6	9.7%
301A	Lindstrom silt loam, 1 to 3 percent slopes	99	63.6	22.4%
301C	Lindstrom silt loam, 6 to 12 percent slopes	92	12.9	4.6%
301D	Lindstrom silt loam, 12 to 20 percent slopes	73	9.7	3.4%
369C	Waubee silt loam, 6 to 12 percent slopes	80	5.5	2.0%
401C	Mt. Carroll silt loam, 6 to 12 percent slopes	80	2.4	0.8%
476B	Frankville silt loam, 2 to 6 percent slopes	58	8.4	2.9%
476C	Frankville silt loam, 6 to 12 percent slopes	55	12.7	4.5%
476D	Frankville silt loam, 12 to 18 percent slopes	43	4.7	1.6%
477	Littleton silt loam	100	8.7	3.1%
484D	Eyota fine sandy loam, 12 to 20 percent slopes	59	2.0	0.7%
492B	Nasset silt loam, 3 to 6 percent slopes	86	3.0	1.1%
830D	Eleva-Seaton complex, 12 to 30 percent slopes	30	1.7	0.6%
831F	Spinks-Boone-Sogn complex, rocky, 15 to 60 percent slopes	1	8.2	2.9%
898F	Bellechester-Brodale complex, rocky, 15 to 60 percent slopes	3	32.2	11.3%
1857	Eitzen silt loam, channeled	20	1.4	0.5%
<b>Totals for Area of Interest</b>			<b>284.1</b>	<b>100.0%</b>

**Rating Options—Crop Productivity Index***Aggregation Method:* Weighted Average*Component Percent Cutoff:* None Specified*Tie-break Rule:* Higher*Interpret Nulls as Zero:* Yes



WILLIAM YODER  
QUARRY LOCATION



LAST REVISED: 11/13/2012

1940 AERIAL MAP  
YODER QUARRY BOUNDARY  
SARATOGA TOWNSHIP  
WINONA COUNTY, MINNESOTA

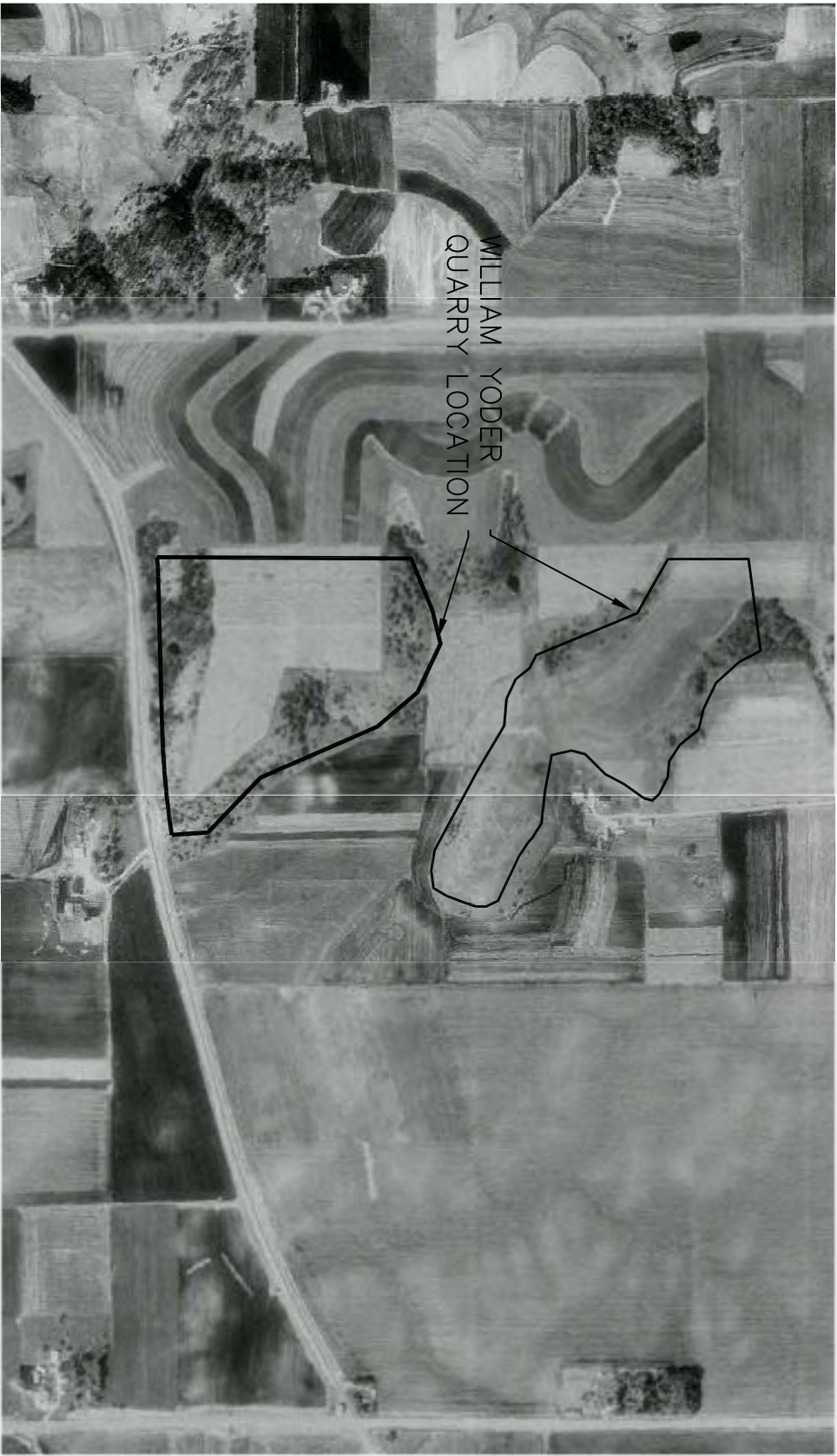
**G<sup>3</sup>**  
**G-Cubed**

ENGINEERING  
SURVEYING  
PLANNING

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Ph: 507-867-1666  
Fax: 507-867-1665  
www.g991o  
FILE NO. 12-008EAW





0 1000'



LAST REVISED: 11/13/2012

1991 AERIAL MAP  
YODER QUARRY BOUNDARY  
SARATOGA TOWNSHIP  
WINONA COUNTY, MINNESOTA

**G<sup>3</sup>**  
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September 17, 2012

Mr. Stuart Hagen  
301 Water Street, Suite #3  
Eau Claire, WI 54703

Subject: Archaeological Assessment for the Proposed Frac Sand Processing Operations, William and Ida Yoder Property, Winona County, Minnesota

Dear Mr. Hagen:

Summit Envirosolutions, Inc. (Summit) is pleased to submit the following letter report describing the archaeological assessment completed for the proposed Frac Sand Processing Operations on the Yoder property in Winona County, Minnesota.

### **Introduction**

This letter report describes the Area of Potential Effect (APE) for archaeological resources, identifies previously recorded archaeological sites and surveys in proximity to the project area, provides results of the visual assessment of the APE, and provides recommendations for further archaeological investigations.

### **Area of Potential Effect (APE)**

The project is located within the Southeast Riverine West Region, as defined by the State Historic Preservation Office (Anfinson 1990). The project area is located in Township 105 North, Range 10 West, Section 14, in Saratoga Township, Winona County, Minnesota. The APE for archaeology was defined by the landowner and is depicted in Figure 1.

### **Background Research**

Laurie Ollila, Staff Archaeologist at Summit, conducted literature and archival research at the State Historic Preservation Office (SHPO), the Minnesota Historical Society (MHS) and the University of Minnesota, Twin Cities Campus (U of M) in September 2012. The purpose of this research was to identify previously recorded archaeological sites and previous cultural resources surveys conducted in the vicinity of the project area. Topographic maps, soil surveys, original vegetation maps, aerial photographs, Trygg maps and historic plat maps were consulted to obtain historical information about the proposed project area and its potential to contain previously-unidentified cultural resources.

### **Recorded Sites within One Mile of the Project Area**

Results of the literature and archival research indicate that there are no previously recorded (field-verified) or reported (not field-verified) sites in or within one mile of the project area.

### **Previous Surveys within the Project Area**

Background research results indicate that no archaeological investigations have been previously conducted within or adjacent to the project area.

### **Archaeological Potential of the Project APE**

The assessment of an area's potential to contain precontact archaeological resources is based on the analysis of the terrain, water sources, and other natural resources in and adjacent to that area. Permanently wet areas (e.g., wetlands and streams), poorly drained areas, and areas with slopes greater than 20 percent are generally considered inhospitable to human occupation and are unlikely to contain cultural resources. In general, areas with higher precontact archaeological potential are in proximity to a relatively substantial water source, typically within 500 feet, though the exact distance often varies according to environmental conditions such as the size of the body of water, the nature of the water source (perennial versus intermittent), and the extent of the floodplain. Topographic prominence and proximity to previously recorded precontact sites are also typically indicative of high precontact archaeological potential.

The USGS topographic map of the project area indicates that the project area encompasses a peninsula-like upland landform that overlooks intermittent streams to the southwest and northeast. Based on its topographic relationship and proximity to the water sources, the project area is considered to have moderate potential for containing precontact archaeological resources.

Areas in proximity to former or existing historic-period buildings or structures are considered to hold higher potential for containing historical-archaeological resources. These areas are not limited to the locations of buildings, as often the most important information comes from deposits within associated features, such as privies, cisterns, or middens, which were located away from primary buildings.

A review of historical maps dating to 1853, 1867, 1874, 1894, 1914, 1927, and 1939 indicate that sometime between 1867 and 1894, a farmstead was established in the SE  $\frac{1}{4}$  of the SE  $\frac{1}{4}$  of the NW  $\frac{1}{4}$  of Section 14, T105N, R10W, immediately east of the current APE (General Land Office 1853; Bennett 1867; Andreas 1874; Foote 1894; Webb Publishing Company 1914; Farm Stock and Home 1927; Rockford Map Publishers 1939). As of 1894, the farmstead was owned by T. B. Clawson and comprised 240 acres. Within the next twenty years, the property was expanded to encompass a total of approximately 260 acres. Although the 1927 historical map does not depict buildings, it indicates that by that date, the property included 297 acres and ownership of the farmstead had been transferred to H. B. Clawson. This acreage was maintained through at least 1939, when the property is listed as being under the management of the Bernard Wisconsin Farm Development Corporation (Foote 1894; Webb Publishing Company 1914; Farm Stock and Home 1927; Rockford Map Publishers 1939).

Historical aerial photographs dating to 1936, 1940, 1947, 1951, 1954, 1962, 1968, and 1991/1992 and current aerial photographs of the project area were also reviewed. These photographs show that the project area has been at least partially cultivated since the mid 1930s. Two small outbuildings associated with the aforementioned farmstead appear just

outside of the east-central edge of the APE on photographs dating from 1936 through at least 1968. Tree cover in that portion of the farmstead on more recent aerial photographs obscures the location of the northernmost of the two outbuildings, though the southernmost building appears extant. Based on the proximity of the farmstead to the APE, the project area is considered to have moderate potential for containing historical-archaeological resources (Aerial Photographs 1936, 1940, 1947, 1951, 1954, 1962, 1968, 1991/1992).

### **Visual Assessment**

Garrett Knudsen, Principal Investigator at Summit, conducted the field assessment on September 20, 2012. The field assessment consisted of a surface survey reconnaissance of the project APE, specifically to determine if there is any evidence of burial mounds or other prehistoric land use in the APE and to determine potential methods for a possible Phase I Archaeological Survey.

Visual assessment was used in conjunction with results of the literature search to ascertain which portions of the APE hold moderate to high potential for containing archaeological sites (generally, raised landforms in proximity to water with less than 20% slope), especially burial mounds. These areas were investigated through archaeological surface survey, which consisted of a systematic pedestrian transects by field personnel walking in regular intervals (15 meters/50 feet) to observe exposed surfaces for the presence of cultural materials.

Two areas were investigated, both currently in use as fenced pastures for horses and cows. Weathered bedrock was frequently exposed on the ground surface. In addition grazing and trampling left other large areas of ground surface exposed. The entire area of the APE surveyed maintained above 30% surface visibility. On the north terrace, a windmill has been excavated into sandstone, revealing the shallow depth of soils here. Photos were taken of areas surveyed (see **Plate 1**)

The systematic pedestrian survey identified no evidence of cultural resources in the APE. No burial site or other evidence of prehistoric land use was identified within the project APE during this survey. No artifacts of cultural debris were identified during survey.

### **Recommendations**

No evidence of prehistoric land use was encountered during systematic survey of portions of the APE with medium-probability for holding unrecorded precontact archaeological sites. No further survey is recommended for these areas.

Based on the moderate potential of the east-central portion of the project area to contain historical-archaeological resources, a Phase I survey is recommended for those portions of the APE in proximity to the farmstead.

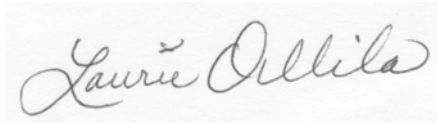
Should the project area be expanded to include portions of the farmstead outside of the current APE, a Phase I survey of the additional areas is recommended.



If you have any questions or require additional information, feel free to contact me at the phone number or e-mail address provided below.

Sincerely,

**Summit Envirosolutions, Inc.**



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Laurie Ollila, M.A., RPA  
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**Plate 1.** Photos of project area APE, including elevated areas, exposed ground surface, and sub-surface stratigraphy.