PRAIRIE ROSE DEVELOPMENT

PRAIRIE ROSE DRIVE, ROSCOE, IL 61073
25012

Submitted: April 1, 2025

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Introduction

The purpose of this report is to document the storm water management impacts for the proposed 29 unit duplex development for Little Mariano, Inc. on Prairie Rose Drive in Roscoe, IL.

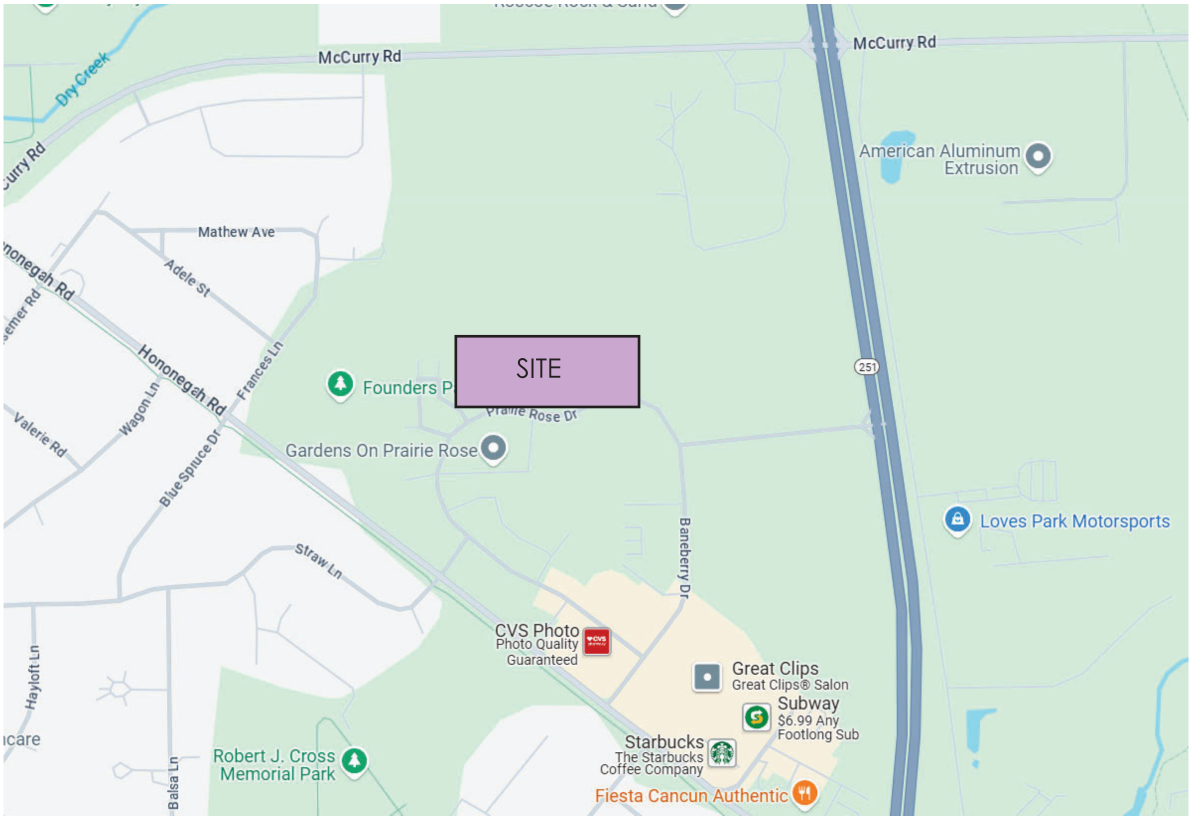


Figure 1: Site Vicinity Map

Existing Site Conditions

The site disturbance area consists of 5.47 acres located in Roscoe. The soil data was obtained from the Natural Resources Conservation Service (NRCS) online Web Soil Survey. The soil map as well as the different types of soil within the project site can be seen in **Appendix E** of the report on the Web Soil Survey obtained from the NRCS website. The majority of the soils on the site belong to hydraulic soil group B. The site is also immediately adjacent to a large sand and gravel quarry. Existing developments within this general area take advantage of the sandy soils and use drywells for infiltration of runoff.

The existing site is made up of 12 adjoining and undeveloped parcels owned by Little Marino, Inc. The parcels are considered undeveloped although there are some excavated areas and a shed sitting on the site. Site elevations range from 758 to 750 with the site generally sloping to the east. The existing site is 99% pervious grass area with an excavated ditch along Prairie Rose Drive. The roadside ditch is identified as a detention area within current platted documents. We corroborated with Village staff to determine any past history of this ditch and intended purpose. No records were found by the Village. During a preliminary coordination meeting, we agreed with Village staff to assume that the ditches were not to be counted for any of the development water, but we would maintain their current volume as excess detention with any improvement. Per our current survey, the total volume that can be held in the existing ditch system is

0.20 acre feet. There is also an excavated area on the north side of the property that has been determined to be a soil borrow pit for the neighboring properties and is not considered a detention area.

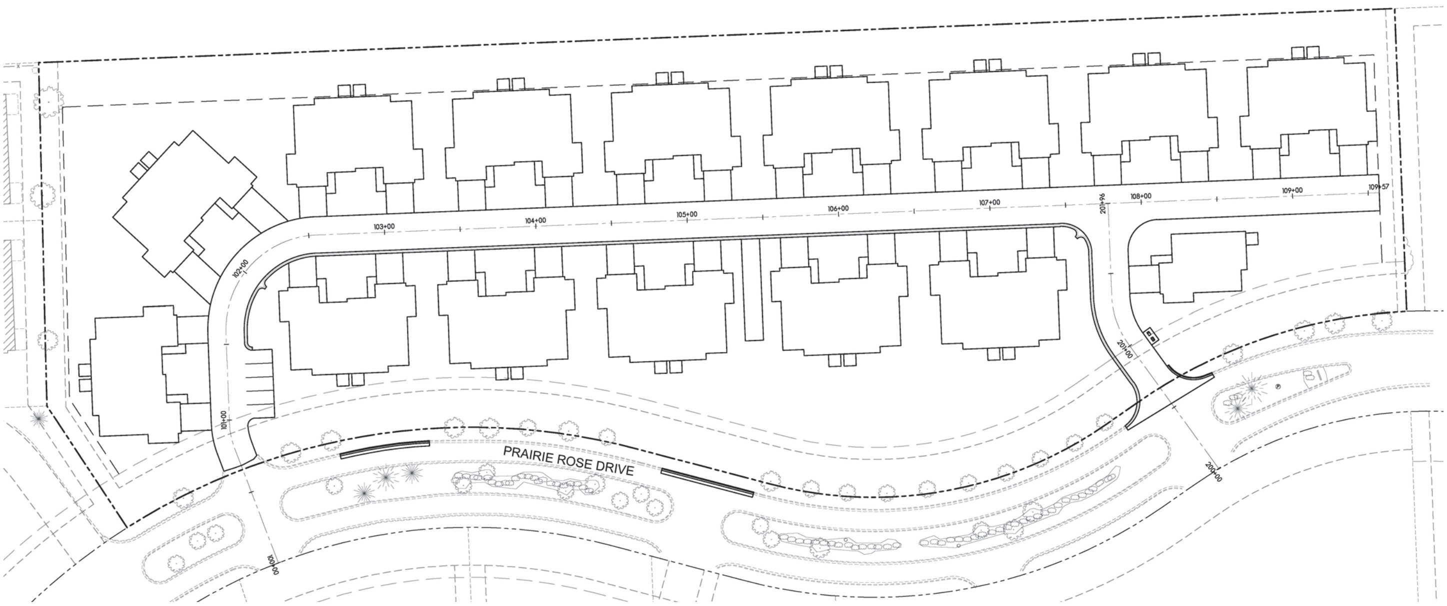


Figure 2: Proposed Work Overview

<u>Proposed Site Conditions</u>

The proposed project will consist of fourteen 2,290 square foot duplexes and one single unit half duplex, for a total of 29 units. A private road will be constructed through the lot to provide driveway access to the homes. The buildings and additional impervious areas and subsequent stormwater management, which is the subject of this report, will consist of 5.47 acres of hydraulic disturbance to the site. The development will be on one single lot, and will be considered a planned unit development (PUD).

Watershed 3 consists of 0.05 acres of pervious grass area that drains freely towards the east property line. Based on how narrow this strip of land is, there is no practical way to collect this water. This area will be allowed to drain overland to the adjacent east property, as it does in the existing condition. However, for detention calculation purposes, this area is included in the volume needed for the basins. The rest of the site has been split into two watersheds with the majority draining to a combined basin on the south side of the site. A watershed map can be found in **Appendix A**.

Watershed 1 includes 0.20 acres (24%) impervious area and 0.62 acres (76%) pervious grass area draining to an existing drywell that connects to an adjacent property via storm sewer. The drywell was installed by others on our client's property. It appears to be well functioning and will be maintained as part of this project. As in the existing condition, the drywell promotes infiltration and the area overflows to the north and the adjacent gravel pit in the event of a large rain event.

Watershed 2 includes 1.28 acres (28%) impervious buildings and pavement area and 3.32 acres (72%) pervious grass area. This area drains via storm sewer to two connected basins on the south side of the site that include three drywells. The drywells promote infiltration and the basins overflow to the east property line in a large rain event. The overland flow route at the top of the basin is the only gravity release for the development. So in effect, all of the rain water is collected and infiltrated into the ground.

Methodology & Assumptions

There is not sufficient space to contain all the site runoff in one basin, so we have designed two connected basins to meet volume requirements for watershed 2. The Winnebago County stormwater worksheet with Bulletin 71 rainfall data was used for detention volume requirement calculations along with the Winnebago County detention facility worksheet to calculate basin volumes. An additional 0.20 acre feet of detention was provided to account for the existing on-site ditch volume.

The drywell in watershed 1 is to remain untouched. The existing depression area surrounding the drywell below the overflow elevation of 753.59 holds 0.17 acre feet of storage. The proposed depression area surrounding the drywell below the same elevation point holds 0.17 acre feet of storage. Watershed 1 draining to the existing drywell holds the same volume of water on the proposed site as the existing site. Existing volume calculations can be found in **Appendix B**, and proposed volume calculations in **Appendix D.**

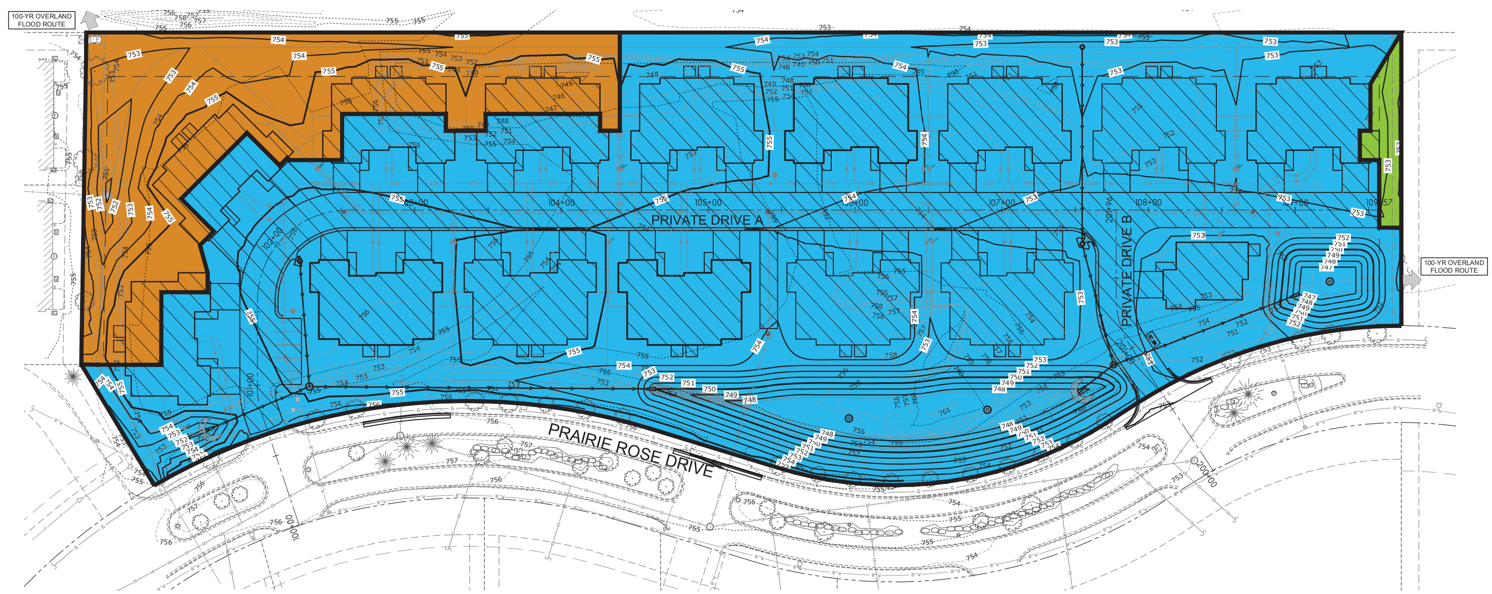
Watershed 2 drains via vee-gutter along the inside of the road and a storm sewer system to two combined basins. This watershed also receives runoff from two storm pipes from adjacent properties to the west and south. Existing ditches along Prairie Rose Drive have been sufficient in containing the runoff for the site and the adjacent sites runoff with a volume of 0.2 acre feet. The existing basin had 1 drywell for infiltration and overflows to the east property line. Using the Winnebago County stormwater worksheet, the proposed development requires a storage volume of 1.16 acre feet. The combined volume required with the existing volume and proposed development is 1.36 acre feet of storage. Proposed detention requirement calculations can be found in **Appendix C**. The proposed development will have two connected basins with a volume of 1.43 acre feet including drywell volume. The existing site is relatively flat and there is no storm sewer on Prairie Rose Drive so a traditional basin with a single outlet point is not feasible on this site. The basins have been sized to contain a 100-year rainfall event with 3 drywells to promote infiltration. Per the soils report in **Appendix E**, the majority of the site soil is warsaw loam with a drainage class of "well drained." The east basin has an overflow weir set at 752.25 to route the east property line in the event of a rainfall event larger than the 100-year.

Conclusion

The Prairie Rose Development proposes an increase in the impervious area of the site. The increase is in the form of 15 duplex units and private road, which will drain to two different watersheds. Both watersheds will be discharged via infiltration aided by drywells. Watershed one has the same volume as the existing condition. Watershed 2 has been sized to accommodate the proposed development and existing volume.

APPENDIX A:

PROPOSED WATERSHED MAP



LEGEND

- SITE BOUNDARY
- EXISTING LOT LINE
- PROPOSED LOT LINE
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- 800 PROPOSED CONTOUR LINE
- 800 EXISTING CONTOUR LINE

AREAS TOTAL AREA = 5.47 ACRES

WATERSHED 1 = 0.82 ACRES
WATERSHED 2 = 4.60 ACRES
WATERSHED 3 = 0.05 ACRES

PROPOSED WATERSHED NOTES

- WATERSHED 1 FLOWS NORTH AND WEST TO AN EXISTING DRYWELL, OVERFLOWS NORTH
- WATERSHED 2 FLOWS SOUTH AND EAST TO AN ON-SITE BASIN THAT OVERFLOWS EAST TO ADJACENT PROPERTY
- WATERSHED 3 FLOWS EAST TO ADJACENT PROPERTY

N
0 40' 60' 80'

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PROJECT NAME
OWNER'S NAME

PRAIRIE ROSE DEVELOPMENT

PRAIRIE ROSE DROVE
ROSCOE, IL
WINNEBAGO COUNTY

LITTLE MARIANO, INC.
P.O. BOX 66
ROCKTON, IL 61072
(815) 543-8801

CONSULTANTS

ISSUED FOR	DATE
1. ---	---
2. ---	---
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REVISIONS

ITEM	DATE
1. ---	---
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6. ---	---

SHEET TITLE
PROPOSED WATERSHED MAP

DRAWN	RMG
CHECKED	JSL
PM	JSL

PROJECT NUMBER
SHEET NUMBER
25012
PR1

APPENDIX B:

EXISTING VOLUME CALCULATIONS

Detention Volume Computation

Existing Ditch Volume

Elevation (Feet)	Planimeter (Sq. Feet)	Area (Acres)	Volume (Acre-Feet)	Volume Sum (Acre-Feet)
752.22	0.00	0.0000		0.0000
			0.0104	
753.00	1157.00	0.0266		0.0104
			0.0453	
754.00	2792.00	0.0641		0.0557
			0.0122	
754.18	3121.00	0.0716		0.0679
749.24	0.00	0.0000		0.0000
			0.0038	
750.00	440.00	0.0101		0.0038
			0.0206	
751.00	1351.00	0.0310		0.0244
			0.0489	
752.00	2912.00	0.0669		0.0733
			0.0204	
752.28	3432.00	0.0788		0.0937
750.14	0.00	0.0000		0.0000
			0.0047	
751.00	479.00	0.0110		0.0047
			0.0320	
751.78	3098.00	0.0711		0.0368
			Total Volume:	0.20

Existing Watershed 1 Volume Below Overflow

Elevation (Feet)	Planimeter (Sq. Feet)	Area (Acres)	Volume (Acre-Feet)	Volume Sum (Acre-Feet)
750.78	0.00	0.0000		0.0000
			0.0004	
751.00	166.00	0.0038		0.0004
			0.0217	
752.00	1721.00	0.0395		0.0221
			0.0701	
753.00	4382.00	0.1006		0.0921
			0.0748	
753.59	6656.00	0.1528		0.1669

APPENDIX C:

DETENTION CALCULATIONS

DETENTION FACILITY WORKSHEET WEST WATERSHED

PROJECT: Prairie Rose Development

DATE: 3/26/2025

PROJECT #: 25012

BY: JSL

CLIENT: Tony Pipitone

TOTAL AREA (A_3) = 5.47 (acres)

RELEASE RATE = 0.20 (cfs/acre)

$Q_{RELEASE}$ = 1.094 (cfs)

IMPERVIOUS DRAINAGE AREA (A_1)	2.59
RUNOFF COEFFICIENT (C_1)	0.90
$A_1 \times C_1$	2.33
PERVIOUS DRAINAGE AREA (A_2)	2.88
RUNOFF COEFFICIENT (C_2)	0.25
$A_2 \times C_2$	0.72
TOTAL TRIBUTARY AREA (A_3)	5.47
COMPOSITE RUNOFF COEFFICIENT (C_3)	0.56

THIS CALCULATION IS BASED ON CITY OF ROCKFORD REGS. OF 0.20 CFS-PER-ACRE WITH STORAGE FOR THE 100-YR STORM IN ILLINOIS ZONE 1

STORM DURATION (BULLETIN 71) T (HR)	TOTAL RAINFALL (BULLETIN 71) R (IN)	AVERAGE RAINFALL INTENSITY I = R / T (IN/HR)	INFLOW RATE $Q_I = C_3 \times I \times A_3$ (CFS)	INFLOW VOLUME $V_{IN} = Q_I \times T$ (ACRE-FT)	OUTFLOW VOLUME $V_{OUT} = \frac{1}{2} \times Q_{RELEASE} \times T$ (ACRE-FT)	STORAGE REQUIRED $V = V_{IN} - V_{OUT}$ (ACRE-FT)
0.08	0.89	11.13	33.94	0.224	0.00	0.221
0.17	1.62	9.53	29.07	0.408	0.01	0.401
0.25	1.99	7.96	24.29	0.502	0.01	0.490
0.33	2.25	6.82	20.80	0.567	0.01	0.552
0.50	2.77	5.54	16.90	0.698	0.02	0.676
1.00	3.51	3.51	10.71	0.885	0.05	0.840
2.00	4.47	2.24	6.82	1.127	0.09	1.037
3.00	4.90	1.63	4.98	1.236	0.14	1.100
4.00	5.18	1.30	3.95	1.306	0.18	1.125
5.00	5.44	1.09	3.32	1.372	0.23	1.146
6.00	5.69	0.95	2.89	1.435	0.27	1.163
9.00	6.10	0.68	2.07	1.538	0.41	1.131
12.00	6.51	0.54	1.66	1.641	0.54	1.099
18.00	6.92	0.38	1.17	1.745	0.81	0.931
24.00	7.36	0.31	0.94	1.856	1.08	0.771
48.00	8.07	0.17	0.51	2.035	2.17	-0.135
72.00	8.87	0.12	0.38	2.237	3.25	-1.018
120.00	9.97	0.08	0.25	2.514	5.42	-2.911
240.00	11.09	0.05	0.14	2.796	10.85	-8.053

MAX.REQUIRED STORAGE VOLUME = V_{MAX} = 1.163 ACRE-FT

APPENDIX D:

PROPOSED VOLUME CALCULATIONS

Drywell Volume

Drywell Storage for 5' dia. At 10' effective depth

196.25 cu ft

Storage in Surrounding Stone

1580.47	total frustrom volume	
282.60	less drywell	
1297.87	result	
432.62	cu ft	x 1/3 for void volume
628.87	cu ft	total volume of storage per drywell

Detention Volume Computation

West Detentin Basin

Elevation (Feet)	Planimeter (Sq. Feet)	Area (Acres)	Volume (Acre-Feet)	Volume Sum (Acre-Feet)
747.50	4504.00	0.1034		0.0000
			0.0573	
748.00	5479.00	0.1258		0.0573
			0.1508	
749.00	7660.00	0.1758		0.2081
			0.2040	
750.00	10109.00	0.2321		0.4121
			0.2622	
751.00	12737.00	0.2924		0.6743
			0.3237	
752.00	15465.00	0.3550		0.9980
			0.0914	
752.25	16387.00	0.3762		1.0894

East Detentin Basin

Elevation (Feet)	Planimeter (Sq. Feet)	Area (Acres)	Volume (Acre-Feet)	Volume Sum (Acre-Feet)
747.00	747.00	0.0171		0.0000
			0.0232	
748.00	1271.00	0.0292		0.0232
			0.0363	
749.00	1888.00	0.0433		0.0594
			0.0516	
750.00	2609.00	0.0599		0.1110
			0.0693	
751.00	3430.00	0.0787		0.1804
			0.0893	
752.00	4352.00	0.0999		0.2697
			0.0258	
752.25	4639.00	0.1065		0.2955

Basin Volume:	1.38
Drywell Volume:	0.04
Total Volume:	1.43

Proposed Watershed 1 Volume Below Overflow

Elevation (Feet)	Planimeter (Sq. Feet)	Area (Acres)	Volume (Acre-Feet)	Volume Sum (Acre-Feet)
750.78	0.00	0.0000		0.0000
			0.0001	
751.00	38.00	0.0009		0.0001
			0.0146	
752.00	1238.00	0.0284		0.0147
			0.0671	
753.00	4611.00	0.1059		0.0819
			0.0835	
753.59	7712.00	0.1770		0.1653

APPENDIX E:

SOIL REPORT

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

Winnebago County, Illinois

March 27, 2025

Preface

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

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

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

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

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

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

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Contents

How Soil Surveys Are Made

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

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

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

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

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

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

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

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

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

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

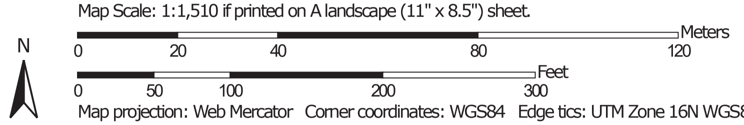
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in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

Soil Map

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

Soil Map

Map Scale: 1:1,510 if printed on A landscape (11" x 8.5") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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

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

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

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
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: Winnebago County, Illinois
Survey Area Data: Version 20, Aug 21, 2024

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

Date(s) aerial images were photographed: Jul 10, 2023—Aug 16, 2023

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

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
290A	Warsaw loam, 0 to 2 percent slopes	6.0	93.2%
354A	Hononegah loamy coarse sand, 0 to 2 percent slopes	0.4	6.8%
Totals for Area of Interest		**6.5**	**100.0%**

Map Unit Descriptions

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

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

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

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

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

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

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

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

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

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

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

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

Winnebago County, Illinois

290A—Warsaw loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2tjx9
Elevation: 680 to 1,020 feet
Mean annual precipitation: 33 to 37 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 138 to 193 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Warsaw and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Warsaw

Setting

Landform: Outwash plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits over calcareous sandy and gravelly outwash

Typical profile

Ap - 0 to 15 inches: loam
Bt - 15 to 31 inches: clay loam
2C - 31 to 79 inches: stratified very gravelly loamy sand to extremely gravelly coarse sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 24 to 40 inches to strongly contrasting textural stratification
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: B
Ecological site: F095XB010WI - Loamy and Clayey Upland
Forage suitability group: Mod AWC, adequately drained (G095BY005WI)
Other vegetative classification: Mod AWC, adequately drained (G095BY005WI)

Hydric soil rating: No

Minor Components

Will

Percent of map unit: 5 percent
Landform: Outwash plains, stream terraces, kames
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F095XA004WI - Wet Loamy or Clayey Lowland
Hydric soil rating: Yes

Kane

Percent of map unit: 5 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F095XB005WI - Moist Loamy or Clayey Lowland
Hydric soil rating: No

354A—Hononegah loamy coarse sand, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 5v3f
Elevation: 680 to 1,020 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 45 to 52 degrees F
Frost-free period: 150 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hononegah and similar soils: 88 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hononegah

Setting

Landform: Outwash plains, stream terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian sands over outwash

Typical profile

H1 - 0 to 19 inches: loamy coarse sand
H2 - 19 to 24 inches: loamy coarse sand
H3 - 24 to 60 inches: very gravelly loamy coarse sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very high (20.00 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Available water supply, 0 to 60 inches: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: A
Ecological site: F095XB009WI - Sandy Upland
Hydric soil rating: No

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