

2040 COMPREHENSIVE PLAN UPDATE

Approved by the Metropolitan Council 2019

Adopted by Linwood Township 2019



Linwood Township, Minnesota

DRAFT February 7, 2019
Project No. 18120

TABLE OF CONTENTS

I.	Introduction.....	1
A.	PURPOSE	2
B.	2040 REGIONAL DEVELOPMENT FRAMEWORK.....	2
II.	Township Background.....	7
A.	HISTORICAL BACKGROUND	8
B.	DEMOGRAPHIC DATA AND FORECASTS.....	10
C.	PHYSICAL FEATURES AND NATURAL RESOURCES.....	14
III.	Land Use	29
A.	EXISTING LAND USE	29
B.	FUTURE LAND USE	34
C.	LAND USE GOALS AND POLICIES	39
IV.	Housing.....	41
A.	HOUSING CHARACTERISTICS.....	41
B.	HOUSING ISSUES.....	43
C.	AFFORDABLE HOUSING - REGIONAL POLICIES	44
D.	HOUSING GOALS AND POLICIES.....	44
V.	Wastewater and Water Supply.....	45
A.	WASTEWATER MANAGEMENT PLAN.....	45
B.	WATER SUPPLY PLAN	48
C.	WASTEWATER AND WATER SUPPLY GOALS AND POLICIES	56
VI.	Local Water Management Plan	58
A.	PURPOSE AND EXECUTIVE SUMMARY	58
B.	WATER RESOURCE MANAGEMENT AGREEMENTS.....	58
C.	LAND USE, WATER AND NATURAL RESOURCES	60
D.	EXISTING /POTENTIAL WATER RESOURCE PROBLEMS.....	67
E.	GOALS AND POLICIES.....	69
F.	IMPLEMENTATION PLAN AND AMENDMENTS.....	72

VII.	Community Facilities and Services	73
VIII.	Transportation.....	74
	A. INTRODUCTION.....	74
	B. ROADWAYS.....	74
	C. TRANSPORTATION GOALS AND POLICIES	93
IX.	Parks, Trails, and Open Space	95
	A. PARKS, TRAILS AND OPEN SPACE.....	95
	B. GOALS AND POLICIES	98
X.	Special Resources	100
	A. SOLAR ACCESS PROTECTION	100
	B. HISTORIC RESOURCES.....	100
	C. GOALS AND POLICIES	101
XL.	Implementation.....	103
	A. OFFICIAL CONTROLS	103
	B. CAPITAL IMPROVEMENTS PLAN	103
	C. COMPREHENSIVE PLAN AMENDMENTS... ..	104
	Appendices.....	105

I. Introduction

The Metropolitan Land Planning Act requires Linwood Township to update the Township's Comprehensive Plan. All cities, townships and counties in the Seven-County Metropolitan Area are required to do the same. The original Linwood Township Comprehensive Plan was adopted in 1974. The Plan was updated and adopted many times through the years to keep Linwood's growth consistent and well thought out. The plan adopted in 2014 included a time frame from its adoption to 2030.

This plan updates the 2030 Comprehensive Plan with current land use, natural resources, transportation, housing and other information. The 2040 Comprehensive Plan covers the time frame from its expected adoption in 2019 through 2040. This Plan meets the requirements of the Metropolitan Council's *Local Planning Handbook*, *Thrive MSP 2040*, and the Metropolitan Land Planning Act.

Metropolitan Council forecasts predict a decrease in population and no increase in the number of households in the Township between 2020 and 2040. This anticipated growth is considered in the update of the Township's Plan and the goals and policies included in the plan.

The Township's Planning Commission and Board met jointly to complete the 2040 Comprehensive Plan update. Township residents also attended the joint meetings and commented on the plan at an open house and public hearing on the proposed plan.



A. PURPOSE

The Township's Comprehensive Plan is a guide for the Township to use in making decisions about land use, natural resources and infrastructure management. The Township will use the principles, maps, and goals set forth in this plan to guide its land use and planning decisions through 2040.

The goals of comprehensive planning include:

- a) preserving the character and quality of life in the Township,
- b) minimizing land use conflicts in the future to protect property values, and
- c) guiding the efficient and effective use of public resources and investment.

Unplanned development may result in an undesirable mixture of land uses. Land use relationships affect the stability of property values in a community. Conflicting land uses can lower property values while compatible land use relationships may raise these values. The land use plan provides for logical development of future land use patterns while preserving and enhancing areas of existing development. With implementation of this plan, future residents will find Linwood Township as attractive and appealing as it is today.



B. 2040 REGIONAL DEVELOPMENT FRAMEWORK

The Metropolitan Council's unifying policy document for long-term planning through 2040 is the *Thrive MSP 2040*. This document and the regional system plans include the Council's goals, policies, and strategies for managing land use and the regional systems through 2040. The *Thrive* document and regional plans provide the context for local planning efforts and provide guidelines and policies for the Township's 2040 Comprehensive Plans. The Township's 2040 Comprehensive Plan must be consistent with the goals and policies in *Thrive MSP 2040* and the regional system plans to be approved.

1. Community Designation - "*Diversified Rural*" for Entire Township

The Metropolitan Council's *Thrive MSP 2040* classified the Township as a "Diversified Rural" community. This is the same classifications the Council identified in the System Statement for the 2030 Comprehensive Plan. Exhibit 1, below, shows the areas included in each designation in *Thrive MSP 2040* and the *System Statement* for Linwood Township.

"Diversified Rural" communities may include a mix of large-lot residential and clustered housing, hobby farms, and agricultural uses. The Metro Council's policies state that Diversified Rural communities are expected to plan for growth not to exceed regional forecasts and in patterns that do not exceed 4 units per 40 acres.

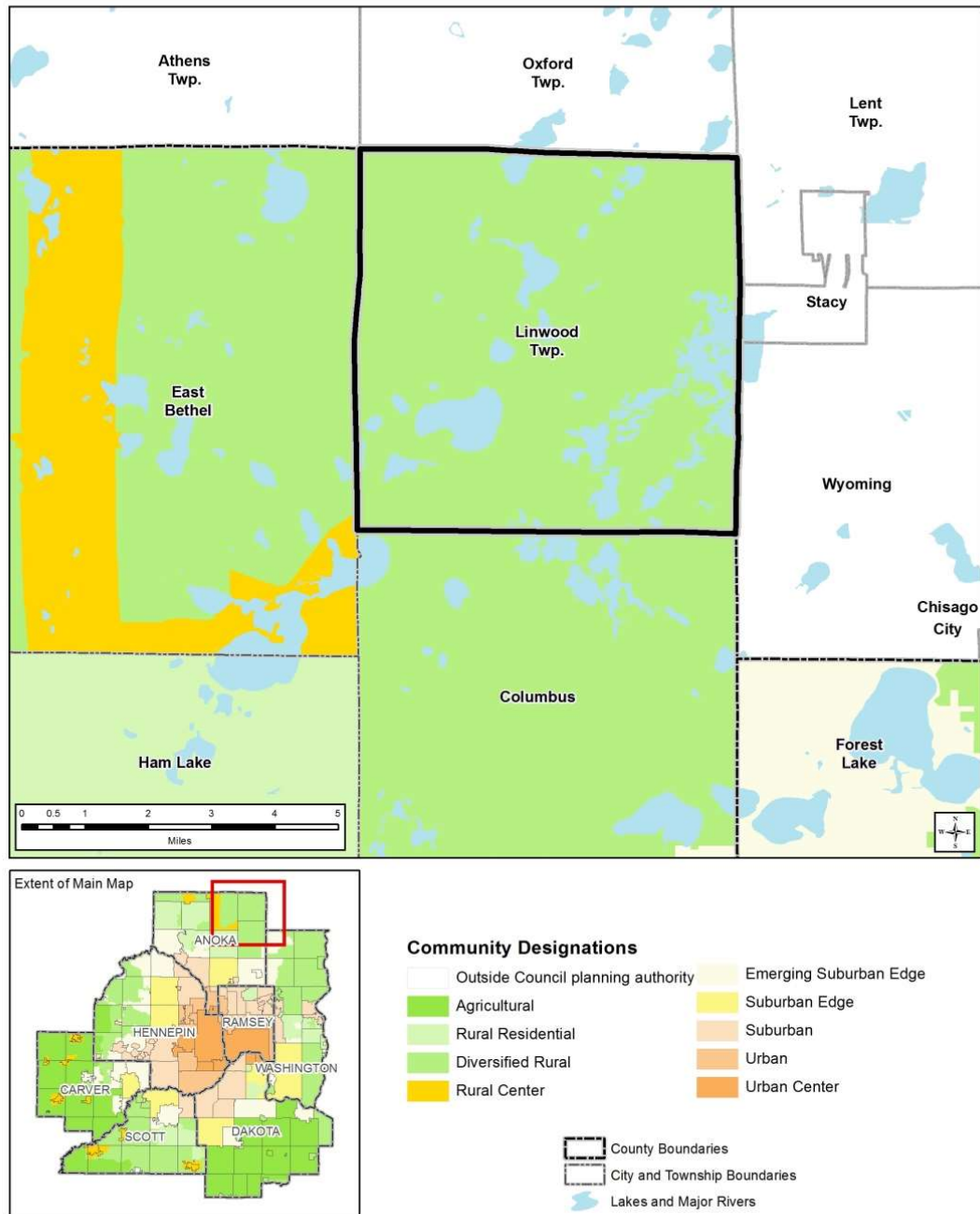
The Township agrees with the Council staff statements and stated that the Township has no desire to develop its own municipal sewer system, and will not develop such a system.

The Township will need to request a Comprehensive Plan Amendment in order to approve development on some sites with urban services in the future.

The Township emphasized that Linwood Township's development patterns have typically been large lot single family housing. Most of the Township has been developed already with 2.5-acre and 5-acre lots.

Exhibit 1:
Regional Planning Area Designation-Thrive
MSP2040

Community Designations
Linwood Township, Anoka County



2. Regional Policies for Diversified Rural Communities

The Metropolitan Council's *Thrive MSP 2040* includes the following guidance for land use planning for Diversified Rural communities:

- a) Implement conservation subdivision ordinances, cluster development ordinances, and environmental protection provisions in local land use ordinances, consistent with the Metro Council's flexible residential development guidelines
- b) Promote best management practices for storm water management, habitat restoration, and natural resource conservation in development plans and projects.

The Township has incorporated Land Use Goals and Policies for Diversified Rural Residential communities in this 2040 Comprehensive Plan Update, so that the plan is consistent with the regional guidance for Diversified Rural Communities, as follows:

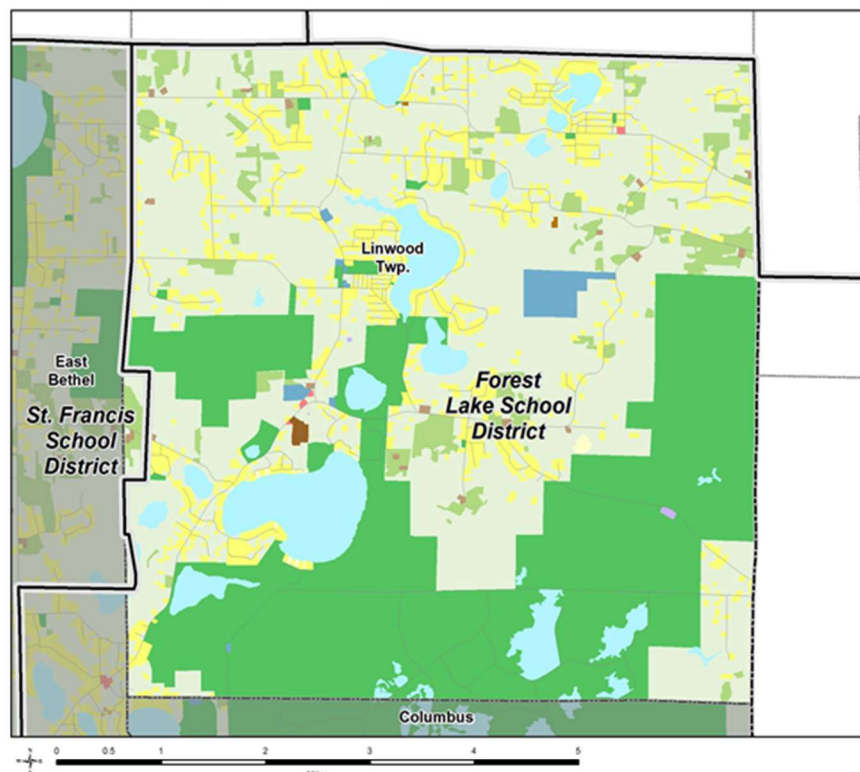
- a) The Township' Land Use Plan includes the following land use areas:
 - o Single-Family – R1 - 16 development units per 40 acres or 2.5 acre- minimum unsewered lots.
 - o Residential Agriculture – R/A – 8 development units per 40 acres or 5 acre minimum
- b) The Township's proposed Zoning Map includes the same districts and minimum lot sizes.
- c) The Township's Zoning and Subdivision Ordinances includes options for conservation/cluster subdivisions, lot averaging, and environmental protection that are consistent with the Metro Council's guidelines. The current ordinances are available on-line on the Township's website.
- d) The Township has adopted the Stormwater Management plan of the Sunrise River WMO. The Township enforces a Shoreland Ordinance in cooperation with Anoka County. These ordinances include requirements for stormwater management, habitat restoration, and natural resource conservation.

II. Township Background, History, and Forecasts

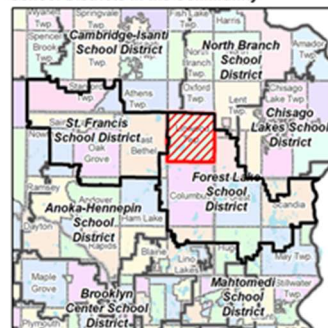
Linwood Township is located in the northeast corner of Anoka County. The Township is bounded on the north by Oxford Township in Isanti County, on the south by the City of Columbus, on the west by the City of East Bethel, and on the east by the City of Wyoming in the southeast and Lent Township at the northeast.

Exhibit 2: Regional Context

**Generalized Land Use: Communities and Affected School Districts
Linwood Township, Anoka County**



School Districts in the Community



2016 Generalized Land Use



A. HISTORICAL BACKGROUND

Linwood Township, located in the extreme northeast corner of Anoka County, started its existence as a part of Bethel & Columbus Township, but was separately organized by the Anoka County Commissioners, September 5, 1971. The first town officers were: Supervisors, J.G. Green; Chairman, F. McGregor and Michael Hurley; E.G. Smith was treasurer; and D.W. Green was the clerk and justice.

The south half of the township is flat and low, with much of the acreage across the central and east part in the Carlos Avery Wildlife Refuge. A chain of lakes extends from the center of the township to the southwest corner, including Linwood Lake from which the town derived its name; Island, Tamarack, Martin and Typo are other lakes.

The first settler of the area was Joseph Sausen who located in the southwest corner, section 24, in 1855. Other early settlers were Edward Shorrock and Timothy O'Connor.

In 1873 the Methodist Episcopal Society erected the first church. Shauton & Haskell built a steam saw and feed mill in 1875.

School district #4 was organized in 1860 and comprised nearly the whole town. In 1864 a log school house was built on section 23; in 1875 a frame building was erected. Districts #34 and #35 were organized in 1874 and a school built in 1875.

Sanford Broadbent came to Linwood in 1870 after the Civil War. S.L. Arnold, Jacob J. Buck, D.W. Green, Samuel Ridge, J.G. Green, John Grant, G.W. Haskell, Spencer Lyon, Michael Ryan and S.M. Sherman were other early residents. Stephen A. Carlisle came to Linwood in 1897 and actively entered the business of dealing in Anoka County lands and was therefore very prominent in the development of that area at that time.

Typical products of Linwood for the year 1880 were wheat, oats, corn, barley, rye, buckwheat, potatoes, sugar cane, cultivated hay, wild hay, apples, tobacco, wool, butter and honey.

Population in 1880 was 227.

Today Linwood Township remains the last Township in Anoka County, with 36.1 sections or approximately 23,117 acres of area.

The Anoka County Historical Society – History of Linwood
<https://anokacountyhistory.org/history-of-anoka-county/history-of-linwood/>

B. DEMOGRAPHIC DATA AND FORECASTS THROUGH 2040

The basis for comprehensive planning is population, household and employment forecasts and historic trends. Understanding past and expected change allows for anticipating Linwood Township's land, transportation, parks and other types of future needs. The Metropolitan Council prepares forecasts for future change in population, household and employment for local government within the seven-county region. Demographic data from the United States Census is available every ten years and illustrates long term patterns of community change or stability. The Township has adopted the Council's forecast data as the basis for planning in its 2040 Comprehensive Plan Update.

1. *Demographic Trends*

Linwood Township's population has experienced sustained growth since 1970. The 2000 United States Census shows that Linwood's population growth between 1990 and 2000 was notable, at a rate of 30.1 percent over the ten-year period, or by an increase of over 1000 people. Table 1 shows that population growth slowed in the Township between 2000 and 2010 from previous decades.

Household growth in the Township is related to population growth, and follows a national trend in declining average household size. Average household size in Linwood in 2019 was 2.8 persons per household, which is similar to household sizes in Anoka County, and slightly larger than the average household size in the Metropolitan Area.

2. *Past Growth*

Table 1: Past Growth

Year	Population	Ten-year % Change	Households	Ten-year % Change	Average Household Size
1970	1004		299	--	4.0
1980	2839	182.7	833	178.6	3.6
1990	3588	26.4	1146	37.6	3.0
2000	4668	30.1	1578	37.7	3.1
2010	5123	9.7	1884	19.4	2.8

Source: Linwood Township Comprehensive Plans, Metropolitan Council.

3. Demographic Forecasts

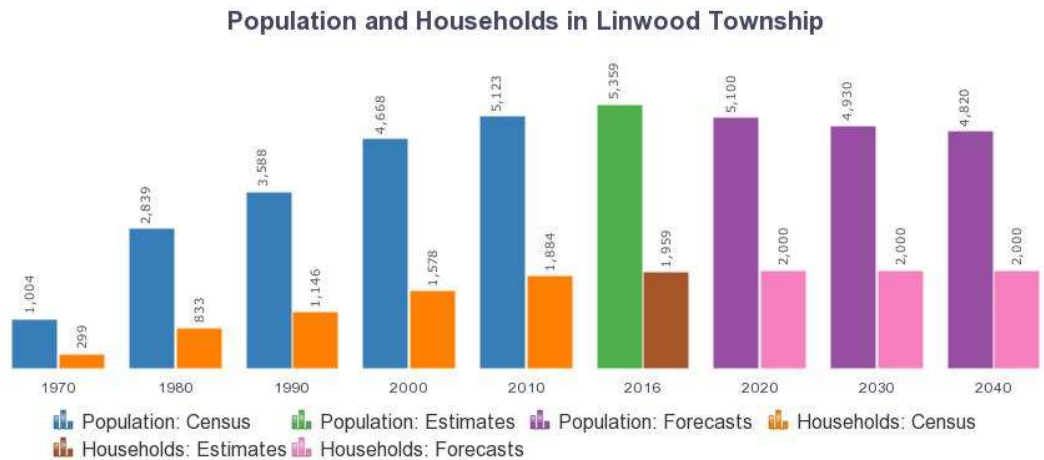
The Metropolitan Council provided population, household and employment forecasts to Linwood Township through the Systems Statement in September of 2015. Forecasts are useful to the Township in estimating the amount of land that will be needed.

No growth in population is expected from 2020 to 2040. This is due to smaller families moving in and children moving out. The Metro Council forecasts modest growth in employment between 2020 and 2040. Tables 1 and 2 identify past trends and future growth.

Table 2: Population Forecasts 2010-2040

	2010	2014 (est.)	2020	2030	2040
Population	5,123	5,212	5,100	4,930	4,820
Households	1,884	1,939	2,000	2,000	2,000
Employment	219	301	330	390	430

Source: Metropolitan Council



Sources: U.S. Census Bureau Decennial Census, Metropolitan Council Annual Estimates, and Metropolitan Council Forecasts.

4. Population Characteristics

An analysis and projection of population are at the base of many planning decisions. The primary goal of the population analysis is to anticipate the future need of Linwood Township with regard to land use, transportation, and community facilities. In order to do this, it is necessary to have some idea of the number and the characteristics of present residents of the Township.

In addition to reviewing past trends and future forecasts, it is important to understand the composition of the population. Age structure, family size, education, and income levels are a few of the characteristics that can affect the need for services of a township such as Linwood. In the section that follows, a few of these characteristics will be reviewed.

Age

The graph below shows the population Linwood Township's residents by age and gender. The largest proportions of Linwood's residents were between age 40 and 60 in 2010. There are also a significant proportion of young residents between the ages of 5 and 20.

Table 3 and 4: Population by Age and Gender in Linwood Township

Gender (C 2010)	
Males	2,667
Females	2,456

Age Distribution (C 2010)	
0-9 years	613
10-19 years	734
20-29 years	449
30-39 years	568
40-49 years	1,008
50-59 years	1,007
60-69 years	510
70-79 years	173
80+ years	61

Household Size and Type

Household size has gradually been decreasing in the Township, Anoka County, and the Metropolitan Area since 1990. The average household size in the Township was 2.7 persons per household in 2010.

Linwood Township

HOUSEHOLDS	
Total Households	2,040
Average Household Size	2.7
Family Households	1,589
Average Family Size	3

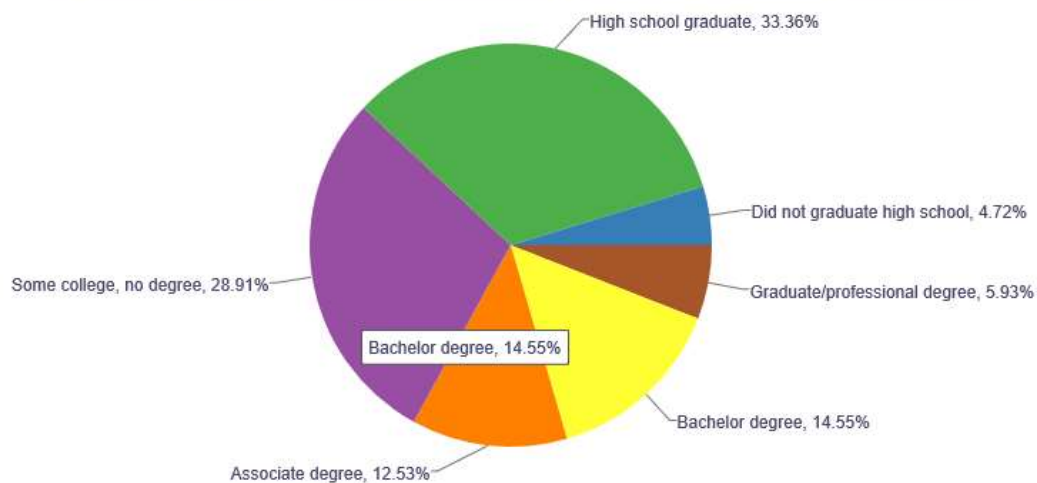
Anoka County

HOUSEHOLDS	
Total Households	128,800
Average Household Size	2.71
Family Households	92,812
Average Family Size	3

Educational Attainment/Income Levels

Linwood Township has a mix of education compared with Anoka County and the seven-county region. 20.48% of the adult population in Linwood has either a bachelors, graduate, or professional degree as compared with the county at 28.2%. Income is closely correlated with educational levels and yet median incomes are higher in Linwood compared to the area. In 2014, median family income was \$82,500 compared to \$73,579 in Anoka County and \$68,000 in the Metropolitan Region.

Highest Level of Education Attained by Linwood Township Residents



5. *Economic Background*

Linwood is not a large employment center, with only 219 jobs in 2010. This number is expected to grow slowly to 330 in 2020, to 390 in 2030, and to 430 in 2040.

The Township's land use plan includes areas for limited commercial development and existing employers, such as Country Schoolhouse Daycare Center, Inc. and Linwood Country Store and Pizza. The areas designated will accommodate the modest growth in employment that the Metro Council forecast through 2040 in Linwood Township

C. PHYSICAL FEATURES AND NATURAL RESOURCES

Linwood Township's environment should be respected, cared for and maintained for current and future residents. The citizens of Linwood Township have a high regard for their environment and have made major efforts to preserve their Township. However, the preservation of Linwood's natural features has not been an easy task considering the soils, slopes, drainage ways, wetlands, vegetation, lakes and streams that make up the Township. All of these features need protection though careful planning which recognizes the Township's developing needs. Following is a discussion of Linwood's various natural features.

1. *Soils*

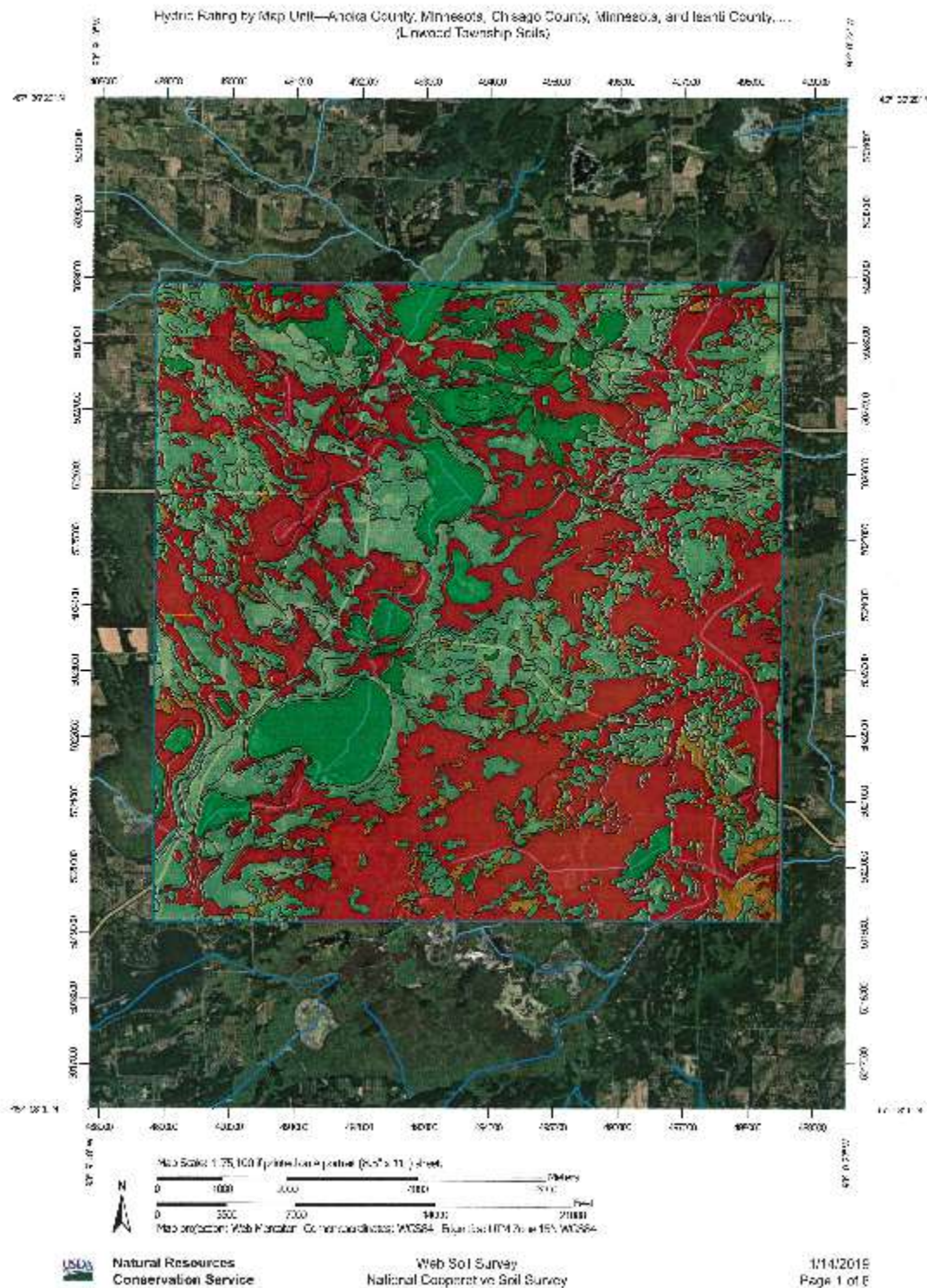
The map of soils in the Township using data from the U.S. Department of Agriculture, Natural Resources Conservation Service Soil Survey Geographic (SSURGO) Database is included as an exhibit. The soil survey indicates, among other things, the type of soil, the slope gradient, the suitability of the soil as a source of selected materials and features affecting use, and the degree and kind of soil limitation for selected uses. The soil map is a general guide for planning but does not eliminate the need for sampling and testing at a specific site.

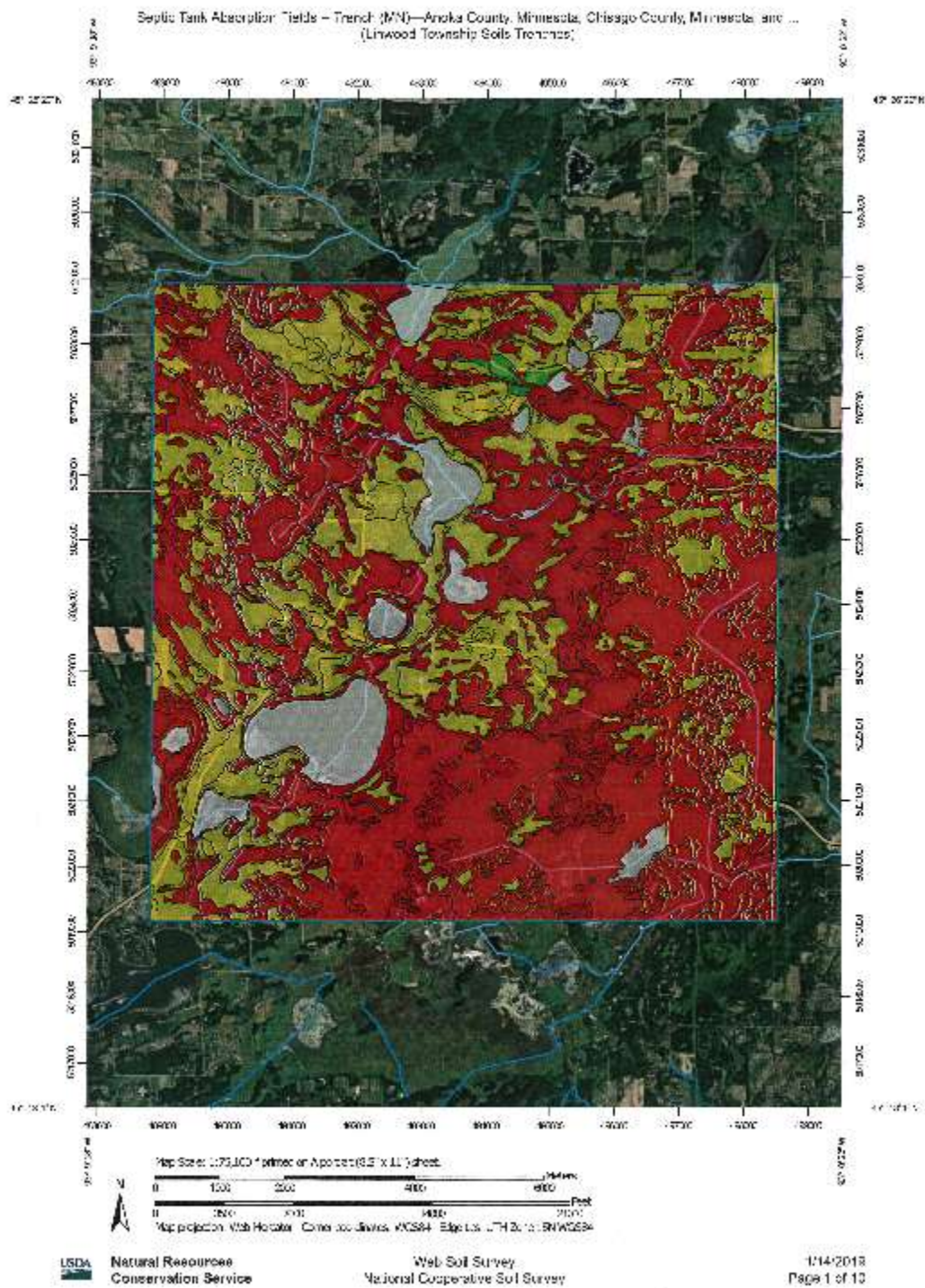
When you think hydric soils, think wetlands and low ground. The map is color coded based on the composition of hydric components. The five color classes are separated as RED has 100 percent hydric components, ORANGE has 66 to 99 percent hydric components, YELLOW has 33 to 65 percent hydric components, LIGHT GREEN has 1 to 32 percent hydric components, and DARK GREEN has less than one percent hydric components and can show either water bodies or high and dry ground.

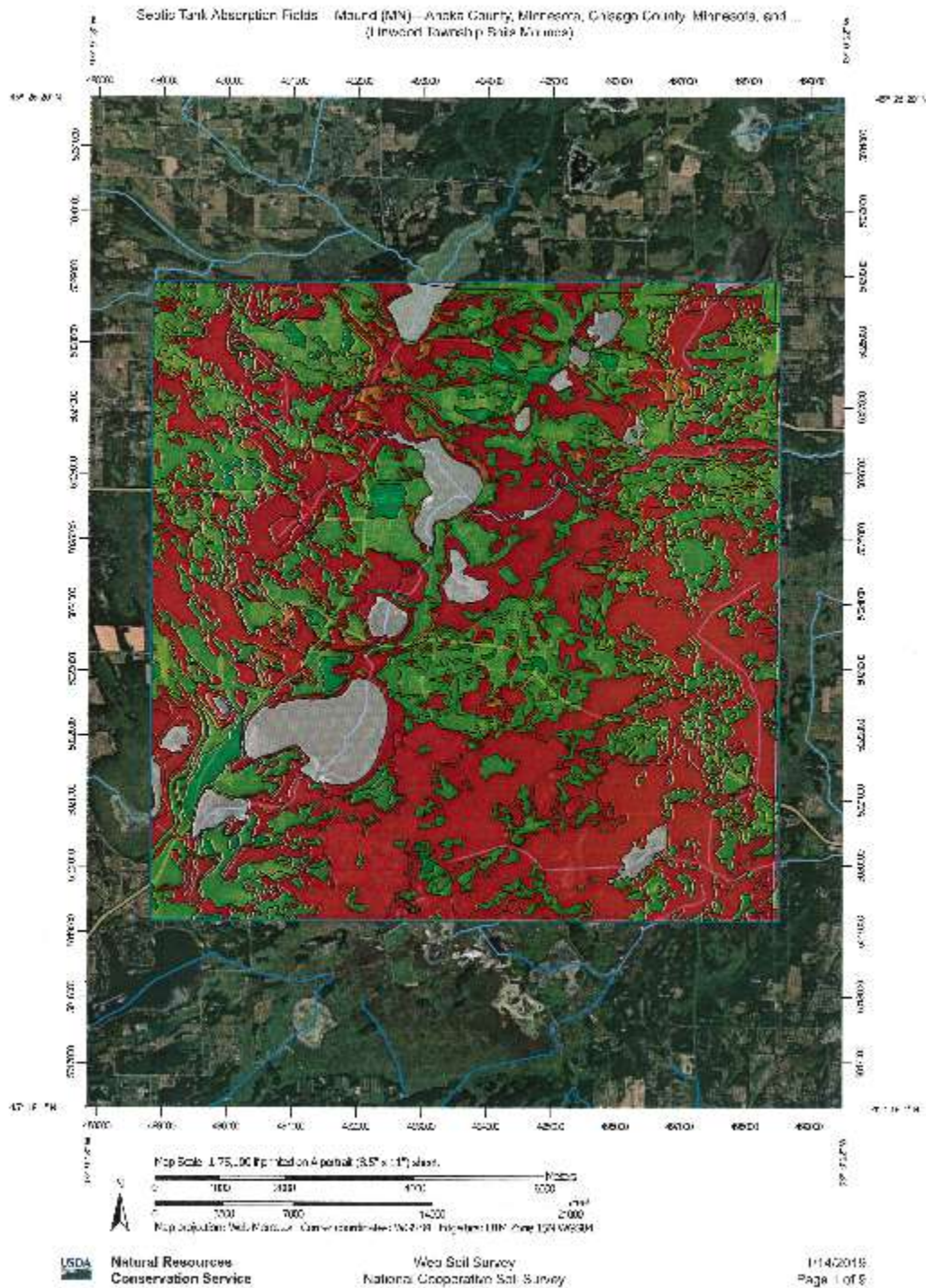
Indicated on the next exhibits are colors showing soils having varying degrees of limitations for septic tank absorption fields for trench or

inground systems and mound septic systems. Fast percolation rates, wet or periodically flooded areas, and steep slopes, cause soils to have degrees of limitations for septic tank drain fields. The LIGHT GREEN means some limitations due to excessive percolation rates the DARK GREEN indicates the best areas for septic systems. As can be seen from the soil maps, a significant portion of Linwood Township has either extreme or moderate limitations for these systems. Most of the red areas are due to our abundance of wetlands and seasonally flooded low grounds. The high ground in the Township is rated either slightly limited or minimally limited for septic systems which is great for onsite systems to be protecting of groundwater and lakes.

Wet areas are scattered throughout the Township and are especially present in the south eastern areas of the Township in Carlos Avery WMA. These soils are those that are periodically flooded or have a high-water table. The flooding referred to is local ponding which occurs after heavy rains, and may persist for several weeks or longer in the spring. Usually, a soil that has flooding characteristics will also have a high seasonal water table. The depth to the water table is the highest known elevation at which the soil profile is totally saturated. Thus, if a soil treatment system is installed at this depth or deeper, no sewage effluent will be able to move into the soil since the soil is already saturated. Hence, the sewage will either back-up in the residence or seep to the surface of the ground.







2. *Geography*

Linwood Township is characterized by a diversified landscape consisting of level areas, slight hills, moderate slopes, and marshy bottom land. The land formations along lakes and streams are indicative of the natural settings along many lakes and rivers that have been formed by the glaciers of old and the surface water run-off process.

Areas with slopes over 12% exist in scattered portions of Linwood Township. The Township's Zoning Ordinance regulates land disturbance and restoration on slopes greater than 12% to address the following concerns:

- a) The possibility of erosion
- b) Septic systems function poorly on steep slopes
- c) Erosion that may result in foundation or structural damage



3. *Vegetation*

Much of the high ground in the Township has been developed for residential and agricultural land uses; fortunately, large areas of natural vegetation remain in our WMA's and the Linwood School Forest. Other significant areas of native vegetative cover that remain in the Township are along Typo Creek and the Sunrise River. The areas are protected by a 50' buffer and our environmental zoning ordinance.

Numerous wetlands and ponding areas exist throughout the Township. The lakes, wetlands and waterways of the town are extremely valuable. Wetlands are important in their capacity to filter and purify surface waters. They naturally function as nutrient traps and as settling ponds. They act as water reservoirs during times of drought and as sponges during periods of high rain and run-off, retarding run-off and reducing the severity of flooding. Wetlands also provide essential breeding, nesting, resting and feeding grounds, and predator escape cover for myriad forms of wildlife. Wetlands are also important for recreational purposes.



4. Geology and Topography

The landscape of Linwood Township which lies completely within the Sunrise River Watershed was shaped by several ice advances into east central Minnesota during the last glaciation, which occurred about 10,000 years ago. In the Sunrise River Watershed a large glacial outwash deposit, called the Anoka Sand Plain is the dominant geomorphic feature. It was formed largely by glacial drainage (melt-water) from the receding Grantsburg sub-lobe of the Des Moines glacier. The surface of the Anoka Sand Plain is flat to moderately undulating. Low regions of upland represent areas of till left from previous ice movements that were not buried by the outwash sand. Other features of positive relief are patches of sand dunes, formed by southwesterly winds after the outwash streams left the sand plain. Landscape features of negative relief include numerous lakes and marshes, which formed as ice blocks, originally buried by the outwash sand that melted to create the depressions, and are now filled with water or organic soils. As a result of the above-mentioned glacial actions, glacial outwash is the predominant surficial geologic formation in the watershed, about one-third of which is covered by organic soils.

The Anoka Sand Plain is also characterized by a shallow water table. Often the water table is within 6 feet of the surface. The numerous wetlands and lakes in the watershed can be thought of as visible representations of the water table. There are notable connections between the shallow water table and all surface water resources. The area is generally considered a groundwater recharge area, which is of importance given the nearby metropolitan area which draws heavily upon groundwater. More detailed information about hydrogeology of the area is available in the Minnesota Geological Survey's "Anoka Sand Plain Regional Hydrogeologic Assessment" (1993). A more detailed "Anoka County Geologic Atlas" is in production with support from the SRWMO and is anticipated to be completed by 2015.

There are two different general soil associations within the watershed as determined by the "Soil Survey of Anoka County, Minnesota" (1977; see Map 3):

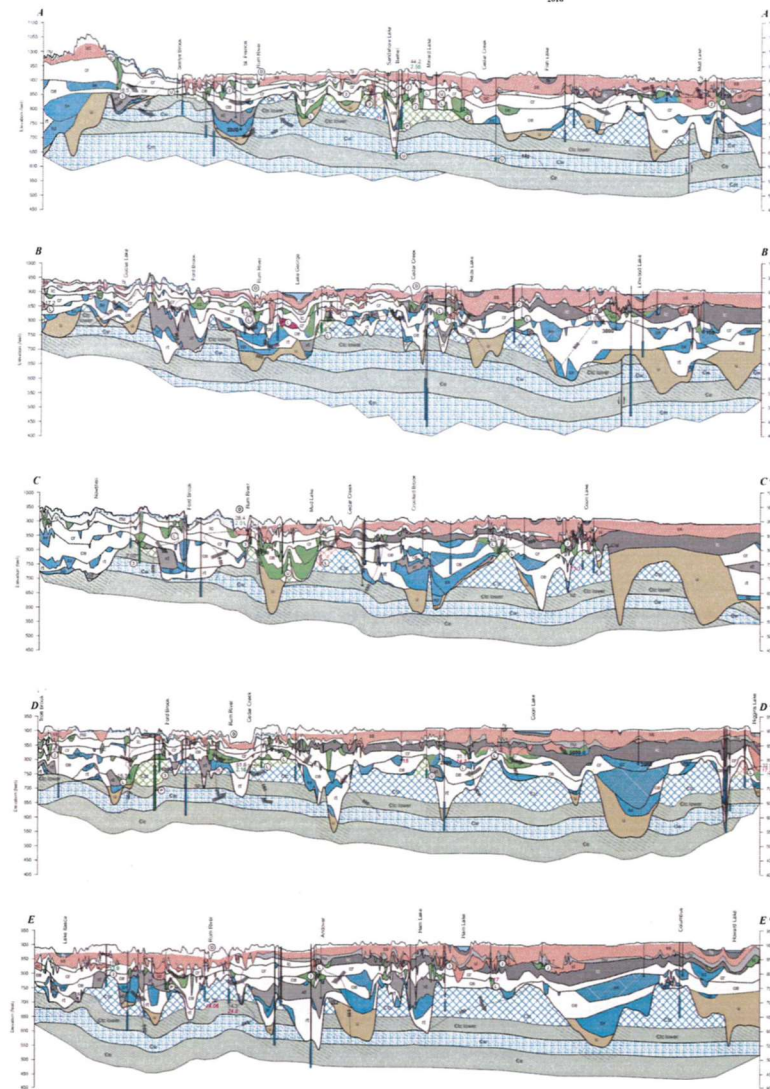
a) Zimmerman-Isanti-Lino Association

The topography of these soils is level to undulating. Drainage is excessive to very poorly drained. These soils are dominated by fine sands throughout.

b) Rifle-Isanti Association

The topography of these soils is nearly level. They are very poorly drained soils formed in organic material and fine sand.

Hydrogeologic Cross Sections
By James A. Berg
2016



CROSS-SECTION EXPLANATION

Aquifers and aquitards grouped by stratigraphy

Interpreted from age is indicated by background color

Interpreted from age is indicated by pattern color

Surficial sand	Bedrock
01 01	01 01
02 02	02 02
03 03	03 03
04 04	04 04
05 05	05 05
06 06	06 06
07 07	07 07
08 08	08 08
09 09	09 09
10 10	10 10
11 11	11 11
12 12	12 12
13 13	13 13
14 14	14 14
15 15	15 15
16 16	16 16
17 17	17 17
18 18	18 18
19 19	19 19
20 20	20 20
21 21	21 21
22 22	22 22
23 23	23 23
24 24	24 24
25 25	25 25
26 26	26 26
27 27	27 27
28 28	28 28
29 29	29 29
30 30	30 30
31 31	31 31
32 32	32 32
33 33	33 33
34 34	34 34
35 35	35 35
36 36	36 36
37 37	37 37
38 38	38 38
39 39	39 39
40 40	40 40
41 41	41 41
42 42	42 42
43 43	43 43
44 44	44 44
45 45	45 45
46 46	46 46
47 47	47 47
48 48	48 48
49 49	49 49
50 50	50 50
51 51	51 51
52 52	52 52
53 53	53 53
54 54	54 54
55 55	55 55
56 56	56 56
57 57	57 57
58 58	58 58
59 59	59 59
60 60	60 60
61 61	61 61
62 62	62 62
63 63	63 63
64 64	64 64
65 65	65 65
66 66	66 66
67 67	67 67
68 68	68 68
69 69	69 69
70 70	70 70
71 71	71 71
72 72	72 72
73 73	73 73
74 74	74 74
75 75	75 75
76 76	76 76
77 77	77 77
78 78	78 78
79 79	79 79
80 80	80 80
81 81	81 81
82 82	82 82
83 83	83 83
84 84	84 84
85 85	85 85
86 86	86 86
87 87	87 87
88 88	88 88
89 89	89 89
90 90	90 90
91 91	91 91
92 92	92 92
93 93	93 93
94 94	94 94
95 95	95 95
96 96	96 96
97 97	97 97
98 98	98 98
99 99	99 99
100 100	100 100

Quaternary aquifers

Grouped by texture ranging from highest to lowest sand content indicating relative hydraulic conductivity

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

Percent sand

Hydrogeologic unit code

This map was compiled and generated as a geographic information system (GIS) digital data product, including metadata data, as available from the Minnesota Department of Natural Resources (DNR) Geological and Water Resources Division (GW) water resources section. This map was prepared from publicly available information. Every reasonable effort has been made to ensure the accuracy of the data and the map. However, the DNR does not warrant the accuracy, completeness, or any implied trust of these data. Users are advised to verify critical information, such as the accuracy of the data and the information on file in the office of the Minnesota Geological Survey and the DNR. Every effort has been made to ensure the map is accurate and reflects the most current data and information available. This map should not be used to establish legal title, boundaries, or locations of responsibilities.

Base modified from Minnesota Geological Survey, Anoka County Geologic Atlas, Part 5, 2011.

Topographic base map modified from Minnesota Department of Natural Resources, North American Vertical Datum of 1988.

GIS and cartography by James A. Berg and Holly Johnson, Edited by Beth McDonald.

The DNR Information Center

Minnesota Department of Natural Resources
Geological and Water Resources Division
101 Lafayette Street
St. Paul, MN 55155-4000
For more information call 651-296-6157 or 651-644-4767
http://www.dnr.state.mn.us

This information is available in alternative format on request.

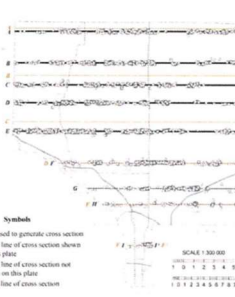
The Minnesota DNR provides information in the programs and services based on race, color, creed, religion, national origin, sex, public assistance status, age, marital status or disability. Persons with disabilities may request reasonable accommodations in access to programs or services by contacting the Minnesota DNR, 101 Lafayette Street, St. Paul, MN 55155-4000, or Office of Civil Rights, U.S. Department of the Interior, 1443 C Street, NE, Washington, DC 20240.

© 2016 State of Minnesota, Department of Natural Resources and the Property of the University of Minnesota.

SCALE 1:100,000
VERTICAL EXAGGERATION X 30

0 1 2 3 4 5 6 7 8 9 10
MILES

0 1 2 3 4 5 6 7 8 9 10
KILOMETERS



Symbols

Well used to generate cross section

Part B line of cross section shown on this plate

Part B line of cross section not shown on this plate

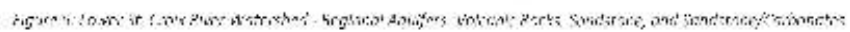
Part A line of cross section

SCALE 1:300,000

0 1 2 3 4 5 6 7 8 9 10
MILES

0 1 2 3 4 5 6 7 8 9 10
KILOMETERS

Lower St. Croix River - Regional Aquifers



10

5. *Hydrogeology*

The ground-water resources of Linwood Township are located in 3 aquifers from the Cambrian Period. The aquifers are the Upper Tunnel City, the Wonewoc, and the Mt. Simon. In bedrock aquifers, which are overlain with a confining geologic layer, the ground-water is under artesian pressure. The artesian pressure causes the water within the aquifer to move from high to lower pressure elevations. In water-table aquifers, the ground-water is under atmospheric pressure. The elevation an aquifer's static water level is at is called the potentiometric surface.

The water-table is located below where the ground is completely saturated with water and the water-table exist in many types of ground or geologic material. Some of this geologic material, such as gravel or sand, will yield water to wells. Almost all of Linwood is located over the water-table aquifer that will yield water to wells. The movement of the ground-water is to the southeast and the elevation of the water-table decrease gradually from just over 900 feet above sea level in the west to under 700 feet above sea level along the St. Croix River.

6. *Sensitivity of Groundwater Systems to Pollution*

As part of the Anoka County Geologic Atlas, a map of sensitivity of groundwater systems to pollution was prepared for the water-table system (aquifer) and one was prepared for the highest bedrock aquifer. The highest bedrock aquifer for most of Anoka County is the Upper Tunnel City and that is true in Linwood Township as well. It is noted on the maps that were prepared using assumptions and, therefore, the classifications are not absolute.

The sensitivity to pollution of the ground-water of the water-table system in Linwood is mostly in the "High" rating category. The "High" rating indicates the "contaminants will probably reach the system in weeks to years."

The above information pertaining to geologic conditions can be seen in graphic form by consulting the Anoka County Geologic Atlas.

Geologic Period	Geologic Unit	Hydrogeologic Unit	Hydrogeologic Unit Properties
Ordovician	Plehanville Formation		relatively low intergranular permeability with high permeability fractures
	Clenwood Formation	aquitard	
	St. Peter Sandstone (Osp)	St. Peter aquifer	moderate intergranular permeability
	Prairie du Chien Group		
	Shakopee Formation (Os)	Prairie du Chien aquifer	relatively low intergranular permeability with high permeability fractures
	Onondaga Dolomite (Oo)	aquitard	aquifer in shallow conditions
Cambrian	Jordan Sandstone (Cj)	Jordan aquifer	relatively high intergranular permeability with high permeability fractures
		aquitard	aquifer in shallow conditions
	St. Lawrence Formation (Csl)		
		aquitard	aquifer in shallow conditions
	Tunnel City Group		
	Mazonian Formation (Cic)		moderate intergranular permeability
	Lone Rock Formation (Cic)	Upper Tunnel City aquifer	relatively low intergranular permeability with high permeability bedding fractures
	Lone Rock Formation (Cic lower)	aquitard	aquifer in shallow conditions
	Wonewoc Sandstone (Cw)	Wonewoc aquifer	moderate intergranular permeability
	Eau Claire Formation (Ce)	aquitard	aquifer in shallow conditions
	Mt. Simon Sandstone (Cm)	Mt. Simon aquifer	moderate intergranular permeability

High permeability bedding fractures

Figure 11. Bedrock stratigraphy and hydrostratigraphy

Geologic stratigraphic units (formations or groups) do not always correspond to hydrogeologic units (aquifers and aquitards). Stratigraphic column not to scale.

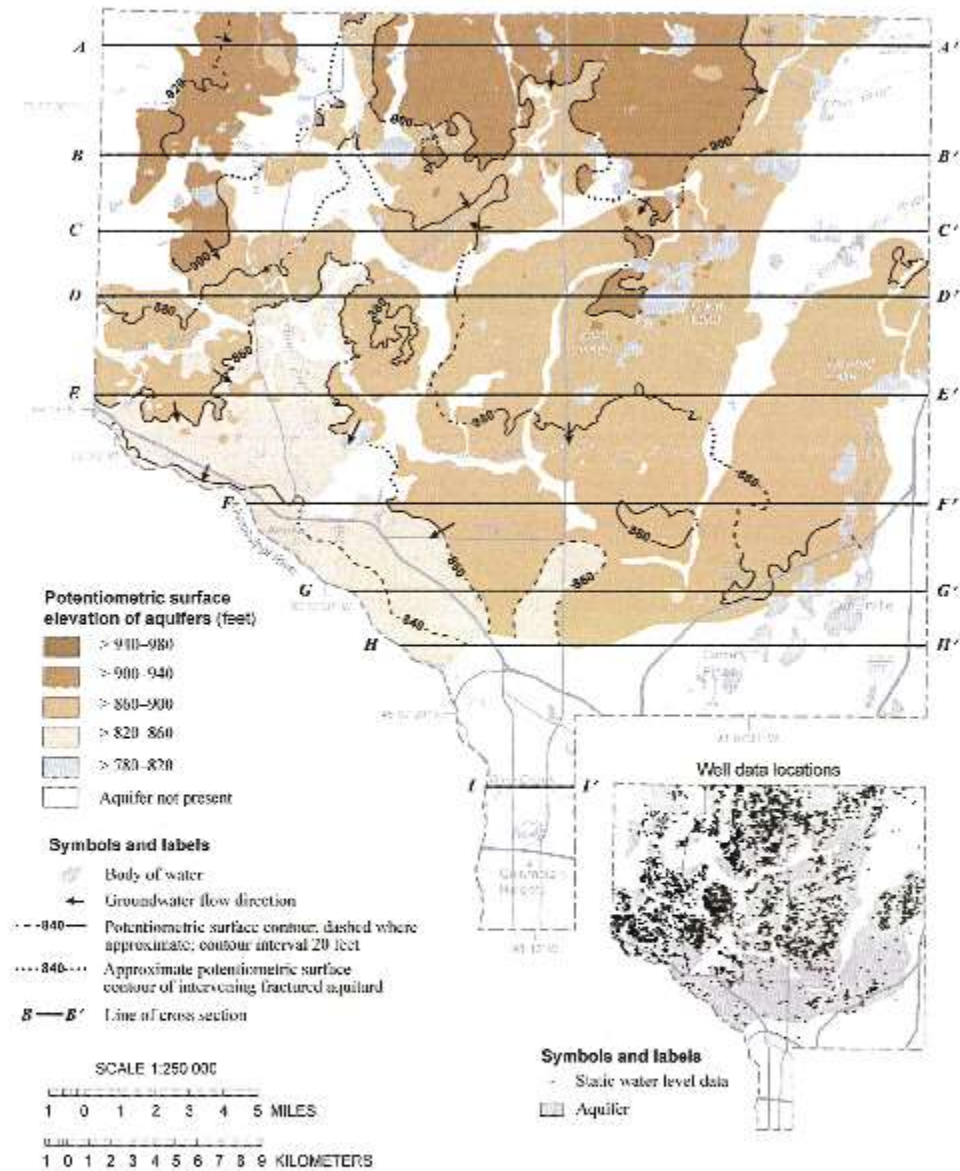


Figure 13. Potentiometric surface of the Upper Tunnel City aquifer

General groundwater flow directions are toward the Mississippi River, with the exception of the northeastern portion of the county where general flow directions are easterly toward the St. Croix River. Discharge to the Rum River creates locally convergent flow.

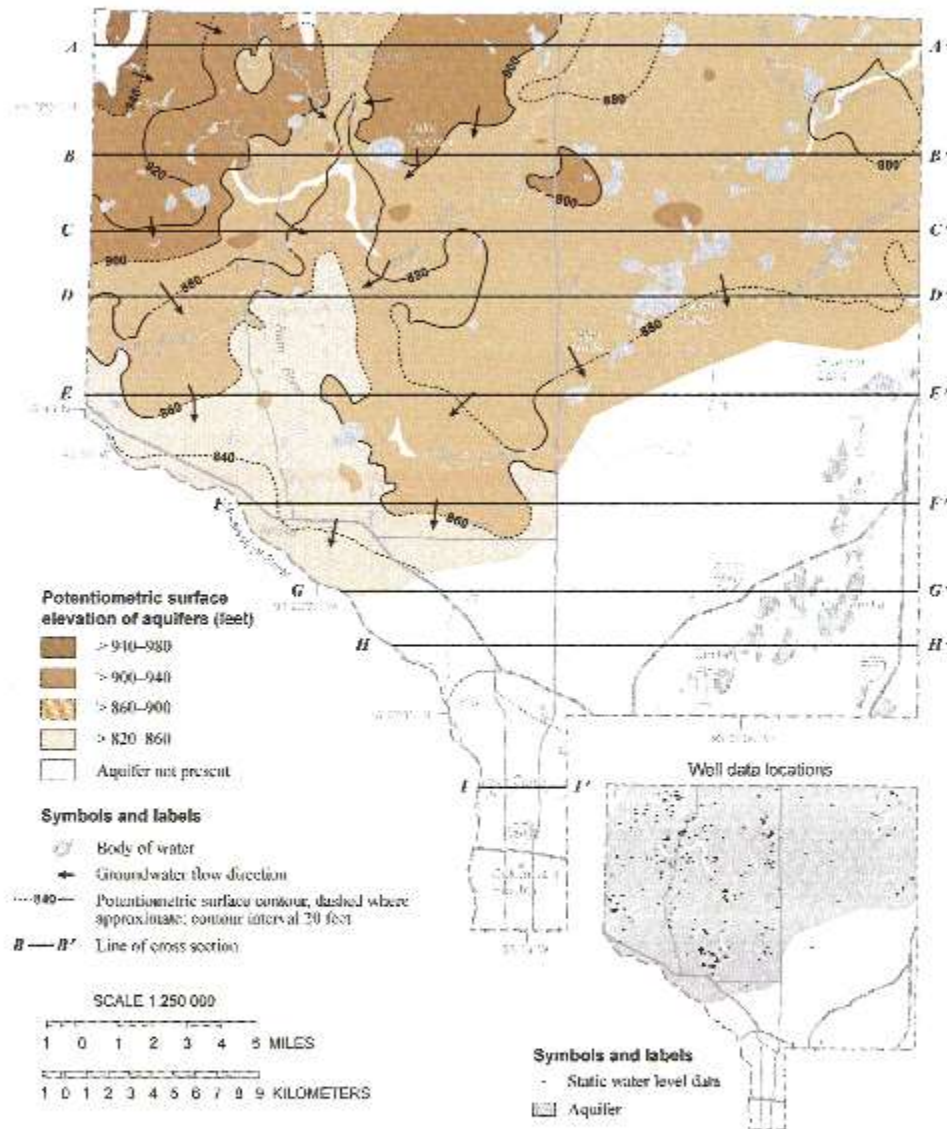


Figure 14. Potentiometric surface of the Wonegan aquifer

General groundwater flow directions are toward the Mississippi River valley. Discharge to the Rum River creates locally convergent flow.

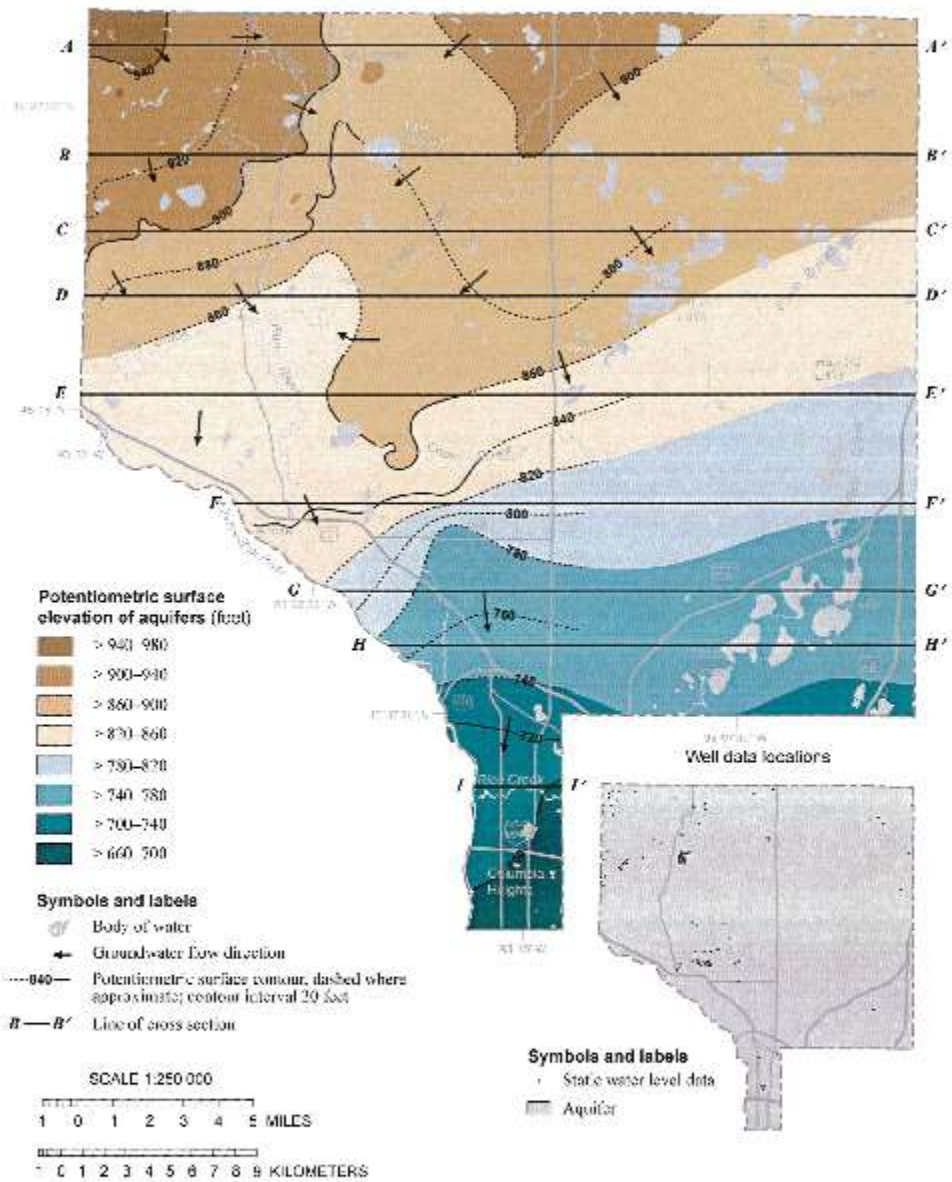


Figure 15. Potentiometric surface of the Mt. Simon aquifer

Groundwater flows toward the center of the Twin Cities basin, with the exception of local flow toward the Mississippi River valley in the area of the city of Anoka.

Copyright 2014 by Minnesota Department of Natural Resources. All rights reserved.

Lower St. Croix River - Pollution Sensitivity of Near-Surface Materials

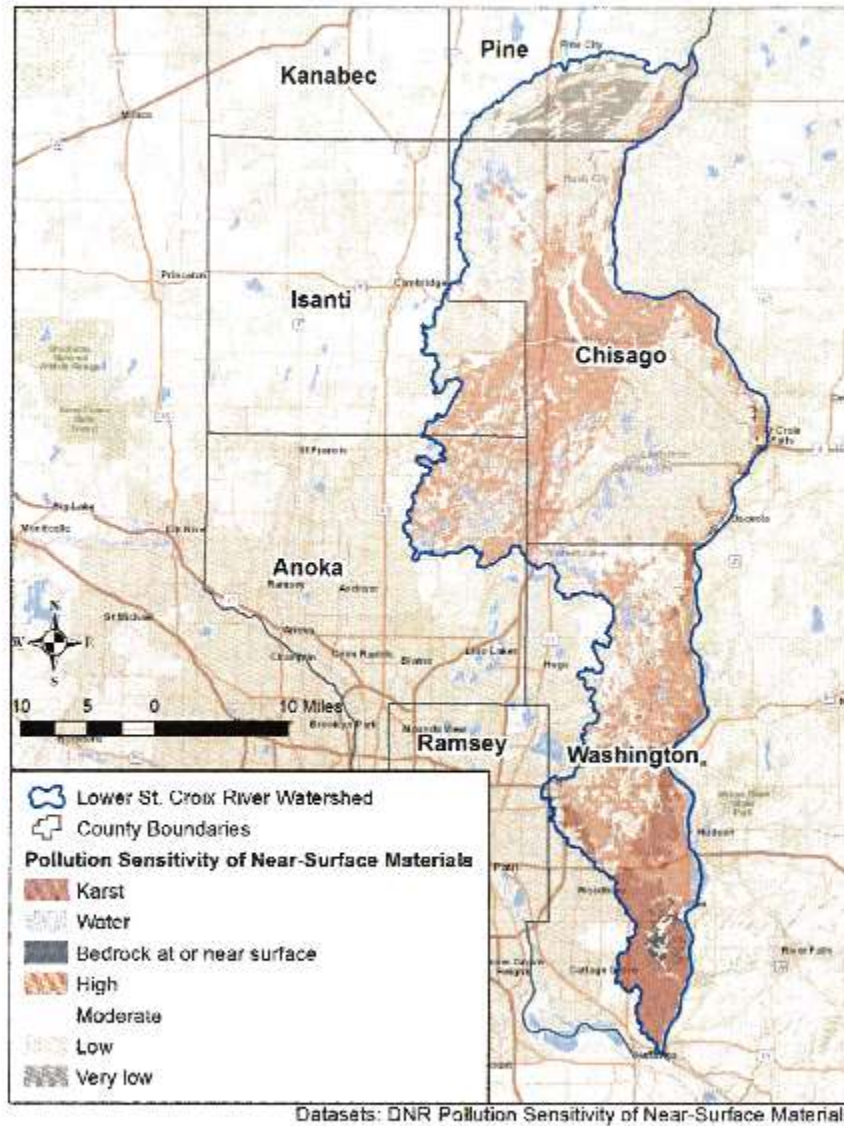


Figure 7. Lower St. Croix River Watershed - Pollution Sensitivity of Near-Surface Materials

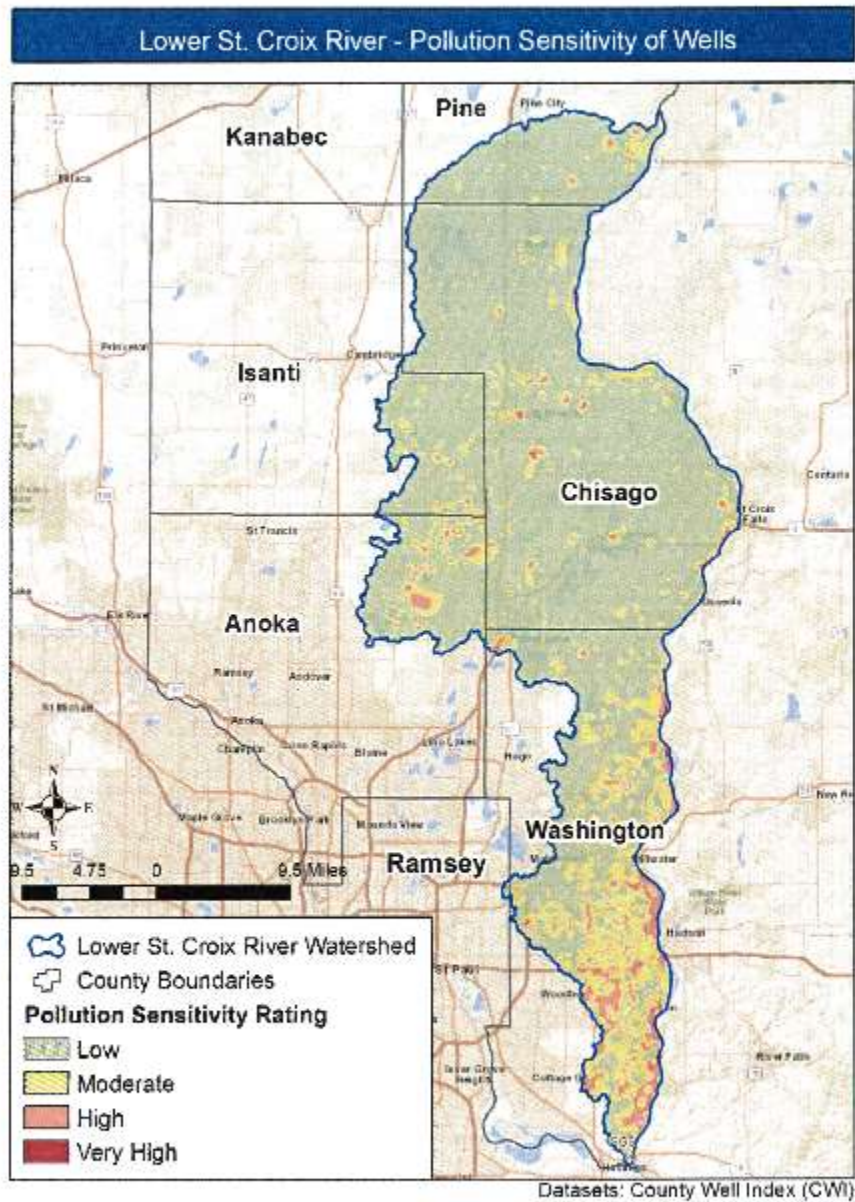


Figure 9: Lower St. Croix River Watershed - Pollution Sensitivity of Wells

III. Land Use

A. EXISTING LAND USE

The Metropolitan Council provided maps of existing land use in the Township and tables that estimate the area of use by land use classification in 2005 and 2010. The Council's data is shown on the Existing Land Use Map (Exhibit 8) and the table below indicates the distribution of land uses by acreage in Linwood Township.

Table 3: Existing Land Use

Year	Land Use	Acres	Total Acres	Percent of Total
2016	Agriculture	1,103	23,117	5 %
2016	Farmstead	60	23,117	0 %
2016	Industrial and Utility	8	23,117	0 %
2016	Institutional	208	23,117	1 %
2016	Manufactured Housing Park	22	23,117	0 %
2016	Mixed Use Residential	5	23,117	0 %
2016	Open Water	1,748	23,117	8 %
2016	Park, Recreational or Preserve	7,313	23,117	32 %
2016	Retail and Other Commercial	9	23,117	0 %
2016	Seasonal/Vacation	47	23,117	0 %
2016	Single Family Detached	2,502	23,117	11 %
2016	Undeveloped Land	10,090	23,117	44 %

Data source: Metro Council

1. *Agriculture*

Agriculture lands make up approximately 5% of the Township's area, and are not particularly concentrated anywhere in the Township.

Prior to 1960, Linwood Township was almost entirely agricultural, but since then a significant amount of residential development has occurred in the Township. Linwood Township has been steadily losing agricultural land over the past years.

2. *Residential Development- R-1 Single Family Land Use areas and Zoning District*

Land use in Linwood Township consists primarily of large lot single family residential land uses, concentrated in the R-1 Single-Family zoning district. The Metropolitan Council forecasts that the number of households within the Township will increase from 1,884 households in 2010, to 2,000 in 2020, and maintain 2,000 through 2040. This is a 6% increase from 2010 to 2020, and no growth from 2020 to 2040. Future development is likely to occur at similar patterns and densities to past development.

3. *Public Lands*

Public lands in the Township include the Carlos Avery and the Gordie Mikkelson Wildlife Management Areas, the Anoka County Martin-Island-Linwood Lakes Regional Park, and the Linwood School Forest.

Carlos Avery occupies approximately 6000 acres of Linwood Township. Hunters, trappers and wildlife watchers in the Anoka and Chisago county area benefit from the management, habitat and oversight work of the Minnesota Department of Natural Resources' Carlos Avery Wildlife Management Area office. DNR staff oversee 25,000 acres of forest, sweeping grasslands, wetlands and small lakes that provide extensive outdoor recreation opportunities just 30 miles north of the Twin Cities. This popular hunting and wildlife watching area includes 23 actively managed pools that provide waterfowl habitat across more than 11,700 acres. Wetlands cover nearly two-thirds of the WMA. These extensive marshes, along with intensively managed uplands, are home to uncommon species and are favorites to hunters, trappers and bird and wildlife watchers.

The Gordie Mikkelson Wildlife Management Area is 816 acres in size and is primarily managed for woodland and wooded wetland wildlife like deer and turkeys. It consists of 55% wetland and wooded wetland, 36% upland woodland and 9% grassland/food plot. Mikkelson Wildlife Management Area has grown rapidly in size in recent years and was acquired from a variety of previous landowners. A large portion was previously operated as a Camp Fire USA children's camp.

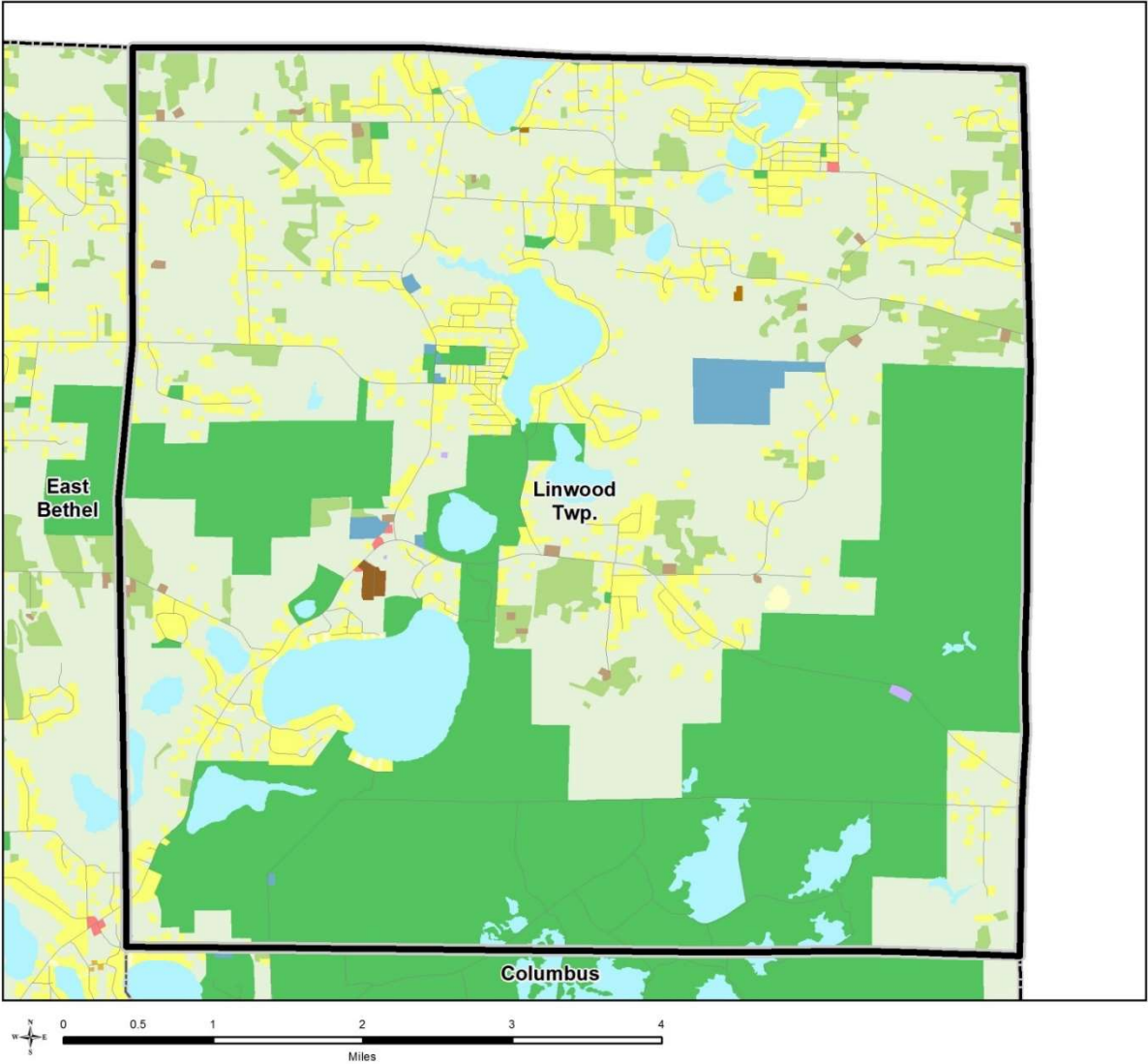
Martin-Island-Linwood Lakes Regional Park is a 737-acre park is in close proximity to the Carlos Avery Management Area. The park contains significant undisturbed landscape communities identified in the State's County Biological Survey. Facilities include nature trails, a small picnic area, rustic beach, and a group camp named Camp Salie. The park remains mostly in a natural state.

Linwood School Forest is a community park of approximately 210 acres, and is managed in cooperation with the Forest Lake School District, Linwood Elementary, MN DNR and the Linwood Park Board. The Forest is one of the largest school forests in the state of Minnesota.

4. Institutional Use

The areas identified on the Land Use Map as "institutional" are properties occupied by Linwood Covenant Church (6565 Viking Blvd NE), Sunnyside Lutheran Church (22745 Typo Creek Drive NE), and Linwood Elementary School (21900 Typo Creek Drive NE). These areas occupied by these uses are expected to remain unchanged through 2040.

**2016 Generalized Land Use
Linwood Township, Anoka County**



2016 Generalized Land Use

- | | | |
|-----------------------------|--------------------------------|------------------------------|
| Farmstead | Mixed Use Residential | Major Highway |
| Seasonal/Vacation | Mixed Use Industrial | Railway |
| Single Family Detached | Mixed Use Commercial and Other | Airport |
| Manufactured Housing Park | Industrial and Utility | Agricultural |
| Single Family Attached | Extractive | Undeveloped |
| Multifamily | Institutional | Water |
| Retail and Other Commercial | Park, Recreational or Preserve | |
| Office | Golf Course | |
| | | County Boundaries |
| | | City and Township Boundaries |
| | | NCompass Street Centerlines |

B. FUTURE LAND USE

Linwood Township has made changes to its future land use plan in this Comprehensive Plan Update from the plan that was approved in the 2030 Plan. The proposed 2040 Land Use Plan is shown on Exhibit 9.

The Township is a rural residential community and wishes to preserve its character, sense of community, and existing Township borders. In order to preserve the Township's goals and policies which reinforce these values, the Township does not plan to provide municipal waste water services within the Township. The Township's land use plan proposes that most of the Township be developed as single-family neighborhoods and agricultural uses. Other smaller areas of future commercial, public and institutional uses are included in the plan.

Consistency with Metropolitan Council Forecasts. The proposed land use areas in the Township provide for land use types and areas to provide for the modest growth in housing that is predicted by the Metropolitan Council forecasts through 2040. The Council has forecast a decrease in the amount of people, and approximately 200 new jobs in the Township between 2010 and 2040. There is sufficient undeveloped area in the agricultural and residential land use areas to accommodate the population and household growth forecast, and additional employment in the Township may occur in the Institutional (schools) and Agricultural land use classifications. The Township estimates that there are approximately 840 developable acres remaining within the Single-Family land use district.

Changes from 2030 Comprehensive Plan Land Use. The Township's proposed 2040 Land Use map is similar to the 2030 proposed land use map.

Location of future growth. The majority of the expected growth in the Township will occur in the Residential Single-Family area identified on the land use map by division of the larger parcels remaining in this zone into smaller, single-family residential parcels

The intent and purpose of each land use area that is identified on the Township's 2040 Land Use Plan is as follows:

1. Residential / Agriculture (8 density units/40 acres)

The purpose of this area is to preserve land which can be utilized for interim agriculture on lots smaller than those required in the Agricultural Preserves designation, and includes aggregate mining operations. This category allows for rural low density housing and will be developed at a density of 8 density units per 40 acres (1 home per 5 acres). This district helps to preserve the rural character of

the Township. It allows agricultural and single-family residential uses, and permits aggregate mining and places of worship with a Conditional Use Permit.

2. Single Family Residential (16 density units/40 acres)

Single Family Residential lands will be developed with single-family residential uses at a minimum density of 16 density units per 40 acres (1 home per 2.5 acres). This is the largest land use designation within the Township. The district allows agricultural and single-family residential uses, schools, public recreational facilities, and other uses with a Conditional Use Permit.

3. Public / State Land, County Park, City Park

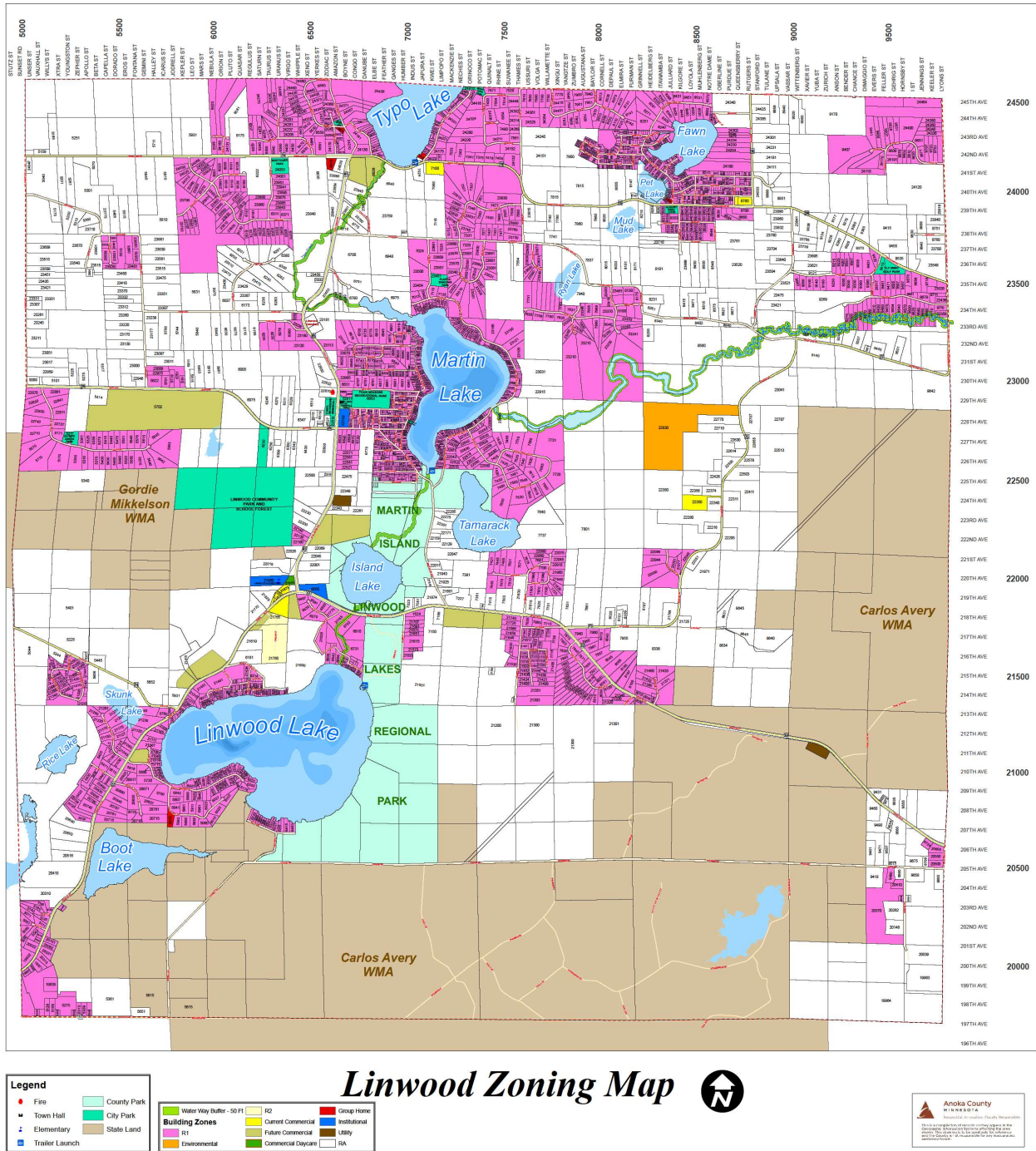
This classification includes lands that are publicly or privately owned and operated for public purposes. The designation also includes the Carlos Avery Wildlife Management Area and the Gordy Mikkelson Wildlife Management area; they are managed by the Minnesota Department of Natural Resources.



4. Institutional

This district permits uses such as public and private schools, government buildings, churches, and other institutional uses.

EXHIBIT 9



White colors are R/A zoning

C.LAND USE GOALS AND POLICIES

Goals

1. Maintain the geographic boundaries of the Township.
2. Require future development to be consistent with the adopted Comprehensive Plan.
3. Reinforce and improve the sense of community identity through land use planning and development.
4. Establish and maintain an advantageous property tax situation and pursue a strengthened and sound tax base.
5. Encourage development to occur in an orderly manner that makes Linwood more attractive to residents and retains the rural character of the Township.
6. Promote and maintain commercial activity that is viable and responsive to the needs of the community.
7. Land use and development is to be compatible with features of the natural environment and is to be accommodated without destroying environmental features and natural amenities.
8. Implement a flexible residential development ordinance in order to protect and preserve the remaining natural features and achieve the Township's land use goals.
9. Update performance standards regarding landscaping and outdoor storage to maintain attractive residential, commercial, and industrial areas.
10. Promote best management practices for stormwater management, habitat restoration, and natural resource conservation in development plans and projects.
11. Restrict or prohibit uses which adversely affect shorelands, wetlands, floodplains, or other natural areas.

Policies

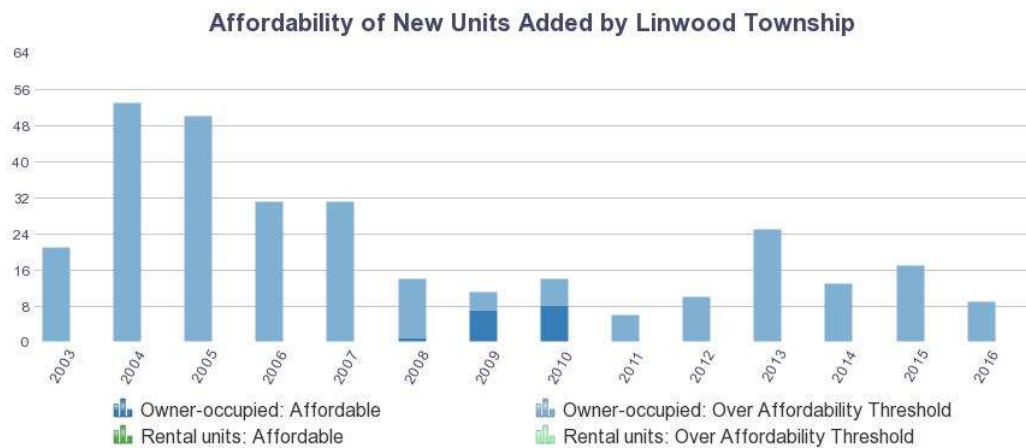
1. The Township will update its Zoning Map and Ordinances to be consistent with the land use plan and goals in this Comprehensive Plan.
2. The Township will update its ordinances as needed to meet the natural resource goals in this plan and its Local Surface Water Management Plan.
3. All land development cost will be borne by the developer including but not limited to road construction, drainage improvements, landscaping, attorney fees, planning fees, and engineering fees associated with each.
4. All development shall be accessed by public streets.
5. Limit or prohibit development on shorelands, wetlands, floodplains, and other natural areas that perform important environmental functions in their natural state.
6. Land adjacent to the river/stream corridors, wetlands and shorelands shall be protected from over-intensification of use and development.
7. Establish and utilize a Planned Unit Development process to allow for innovation and flexibility in residential and commercial development.
8. Developers of new subdivisions must demonstrate that each newly created lot can accommodate, first, two (2) proper subsurface sewage treatment systems and, second, a house meeting all setback requirements in both the zoning ordinance and subsurface sewage treatment system ordinance.
9. Requests for subdivisions of land must meet current Township, County and state regulations regarding adequate lot frontage, access, provision of septic/water, and other minimum lot requirements.

IV. Housing

The Township's land use goals identify the Township's intent to remain a low-density, single family residential community and maintain the rural and rural/residential character of the Township through 2040.

A. HOUSING CHARACTERISTICS

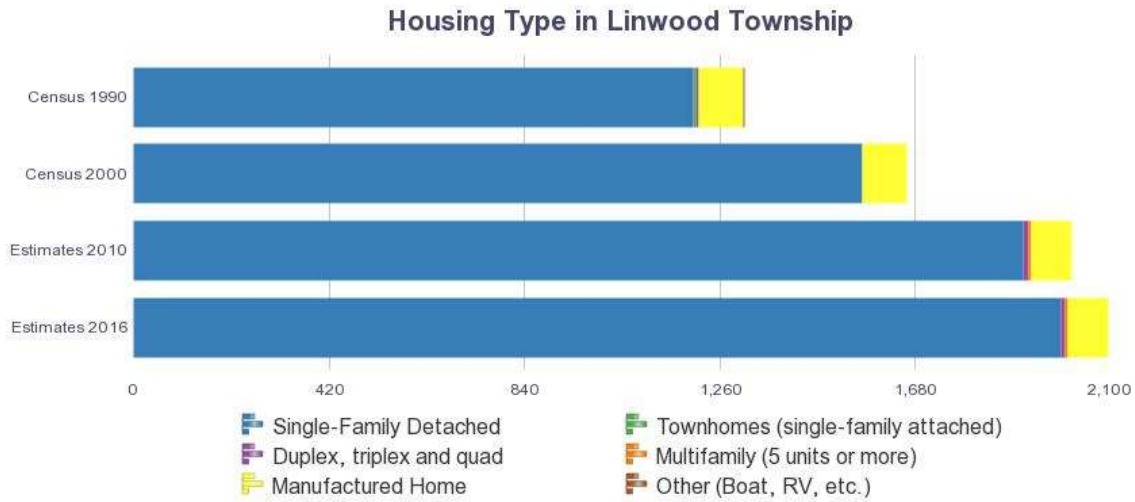
Linwood Township's housing stock consists largely of single family residential homes. The Metropolitan Council provided the following data that describe the housing stock in the Township and its affordability to a variety of households.



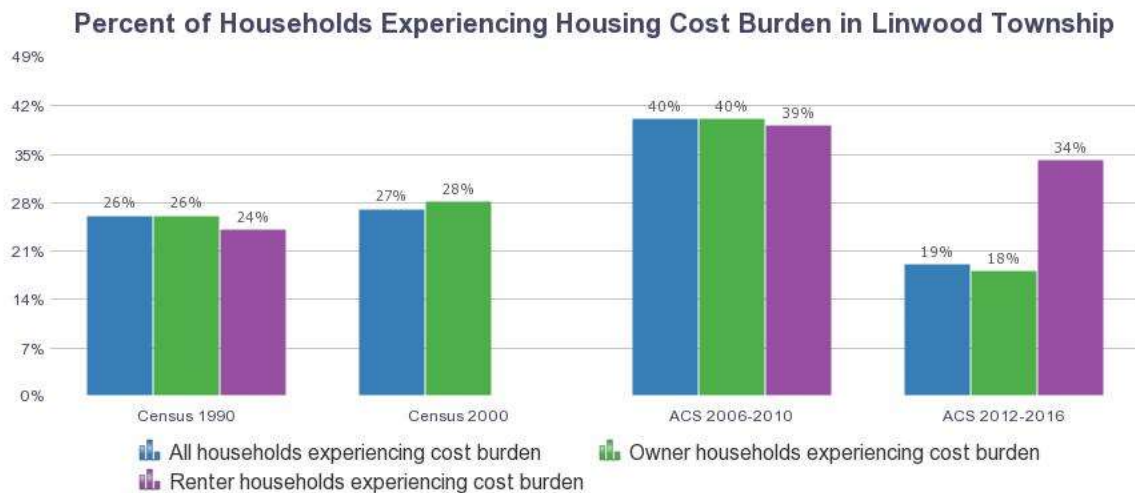
Source: Metropolitan Council Affordable Housing Production Survey.



Source: U.S. Census Bureau Decennial Census and American Community Survey.



Source: U.S. Census Bureau Decennial Census and Metropolitan Council Housing Stock Estimates.



Source: U.S. Census Bureau Decennial Census and American Community Survey.

The U.S. Census data for 2016 and Metro Council data for 2015 provides the following information about the housing stock in Linwood Township:

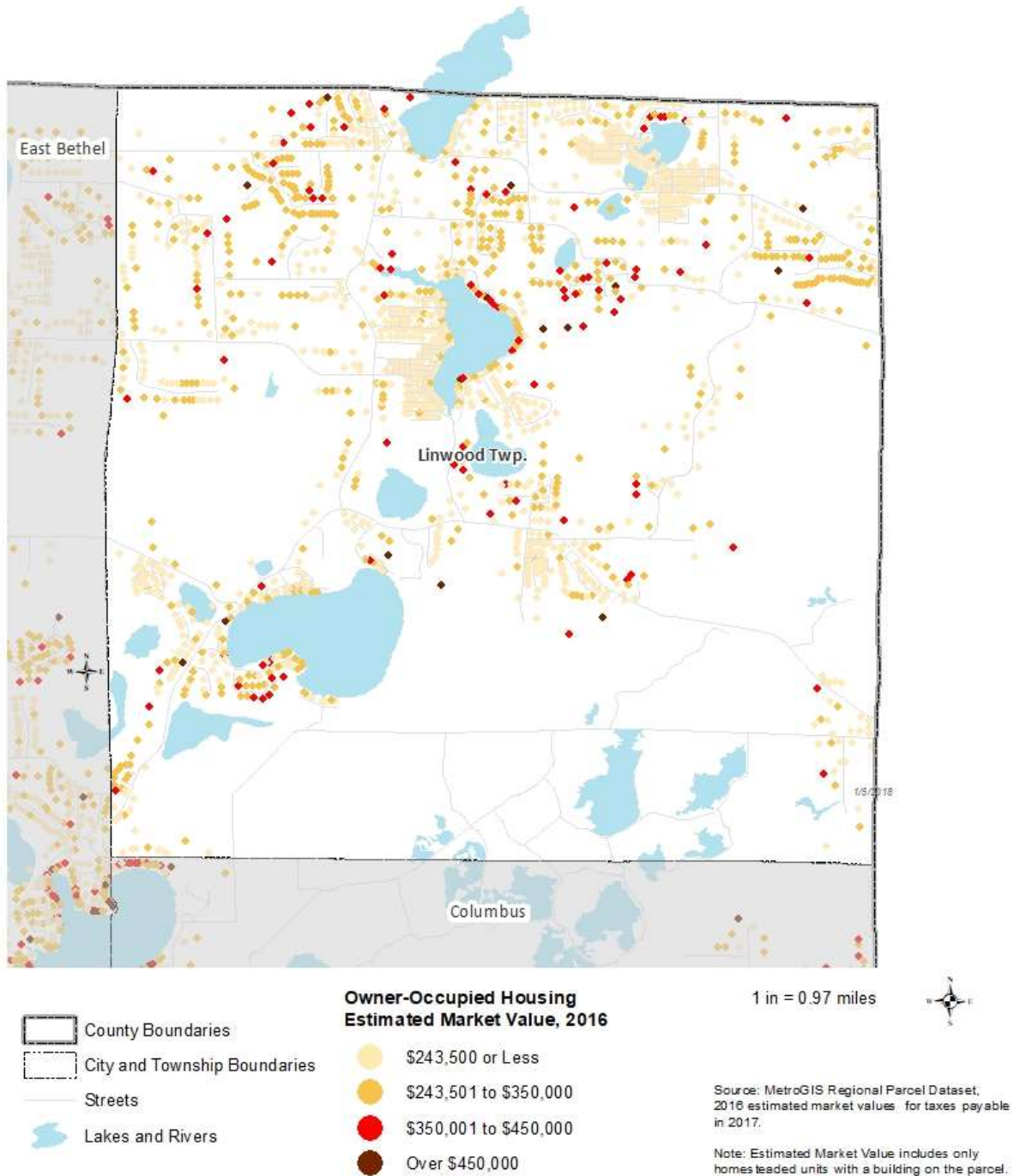
- The Township included 2086 households in 2016.
- The U.S. Census data showed that over 95% of the homes in the Township were single- family detached homes..

The Census data indicated that new housing units between 2001 and 2007 were at a Township high with 207 units added during that time frame. From 2008 to 2016 only 117 new houses were added with 2011 being the low point with only 5 units added. The stock of vacant lots is low at this point and few new homes are expected in the near future, this is reflected in Metropolitan Councils future calculations.

- Approximately 93% of the homes in the Township are owner-occupied.
- The median home value in the Township was \$216,300.00 in 2016. The map on the next page shows the estimated market value of homes in the Township in 2016.

Owner-Occupied Housing by Estimated Market Value

Linwood Twp.



Senior Housing

The Township had a senior housing study done in 2015 to see if a need existed in the Township for senior housing. The conclusion was that there was a need for 17 active senior units and 16 congregate units in 2015. The need rises to 24 and 24 by 2020.

Linwood Township is currently working with Anoka county on possibly locating some detached senior housing in the Township in the next several years.

Group Homes, Accessory Apartments and Housing for Care Givers

There are currently multiple group homes ("Community Residences") in Linwood Township.

Most of these homes have not registered with the Township as required by their state licenses, however many in the community know where they are located.

The Township's Zoning Ordinance currently allows for accessory apartments within single family homes, and temporary housing units for persons receiving health care. These options provide for some diversity in housing, and can help to meet the needs of aging or disabled residents for care.

B. HOUSING ISSUES

The major housing issue facing Linwood Township over the next 20 years is:

- Maintaining the quality of existing housing through code enforcement

The Town Board and its attorney are actively working to address maintenance and code violation issues on a number of properties in the Township, and will continue to do so as needed.

C. AFFORDABLE HOUSING - REGIONAL POLICIES

The Metropolitan Council has determined that Linwood Township does not have a share of the region's need for low- and moderate-income housing.

D. HOUSING GOALS AND POLICIES

Goal

1. Retain low-density single-family residential development and the rural character of Linwood Township.

Policies

1. Single family detached homes will be the preferred type of housing in

Linwood Township.

2. Individual property owners will be encouraged and required to maintain or rehabilitate existing homes where needed to meet code and ordinance requirements.
3. Future housing development will work within the existing zoning framework of the Township to promote the rural residential character of the Township.
4. Anoka County and Regional programs that meet the residential needs of a diverse and/or aging population through home improvement and housing assistance programs will be supported by the Township.
5. The Township will support the County and its Housing and Redevelopment Authority (HRA) to meet the need for future senior housing.
6. Home occupations will be regulated so as not to create problems with adjoining land uses.

V. Wastewater and Water Supply

A. WASTEWATER MANAGEMENT PLAN

I. Subsurface Septic Treatment Systems (SSTS) Management Program

Linwood Township is currently without public water or sanitary sewer service. Water and sewer needs are currently provided via individual wells and septic systems. Due to the rural character and low density development which exists within the Township, the construction of private wells and septic systems (if properly installed and inspected) and communal sewage systems on a limited and tightly controlled basis (collection and treatment) appears to be the most reasonable, cost effective method of providing this service. Additionally, the Township shall review and approve all documents related to establishing associations for the purpose of maintenance of communal sewage systems. The Township shall be provided adequate legal and monetary protection in such case an association does not maintain such sewage systems.

There are currently 1,917 identified septic systems in Linwood Township. There is also a community septic system for the mobile home park that accounts for the difference in number of residences and number of septic systems. This facility is licensed by the PCA.

The Township, in cooperation with Anoka County, has adopted policies for sewer and water system installation. All new systems are inspected to comply with these requirements and to ensure proper functioning and compliance with environmental considerations. In the Appendix, there is a copy of the Township's current septic ordinance. Anoka County has recently updated their septic ordinance, and this ordinance will be reviewed and ensured to be consistent. The Town also will be establishing a new monitoring program to ensure proper septic maintenance is being conducted.

There are areas of the Township that developed at historic densities greater than allowed by today's standards. The Township recognizes that these higher densities may cause future issues regarding the provision of independent septic systems. Therefore, in these historic development areas the Township may entertain proposals for community septic systems or other such alternatives.

In such areas where high residential densities exist, concern has also been raised in regard to the effect that the large number of wells will have upon ground water quality. To address these concerns, consideration should be

given to the establishment of centralized wells. Centralized facilities have the advantage of improving the quality of drinking water, while boosting the supply of water available for fire protection services. The use of centralized water supply facilities may be addressed through the revision of current Zoning Ordinances.

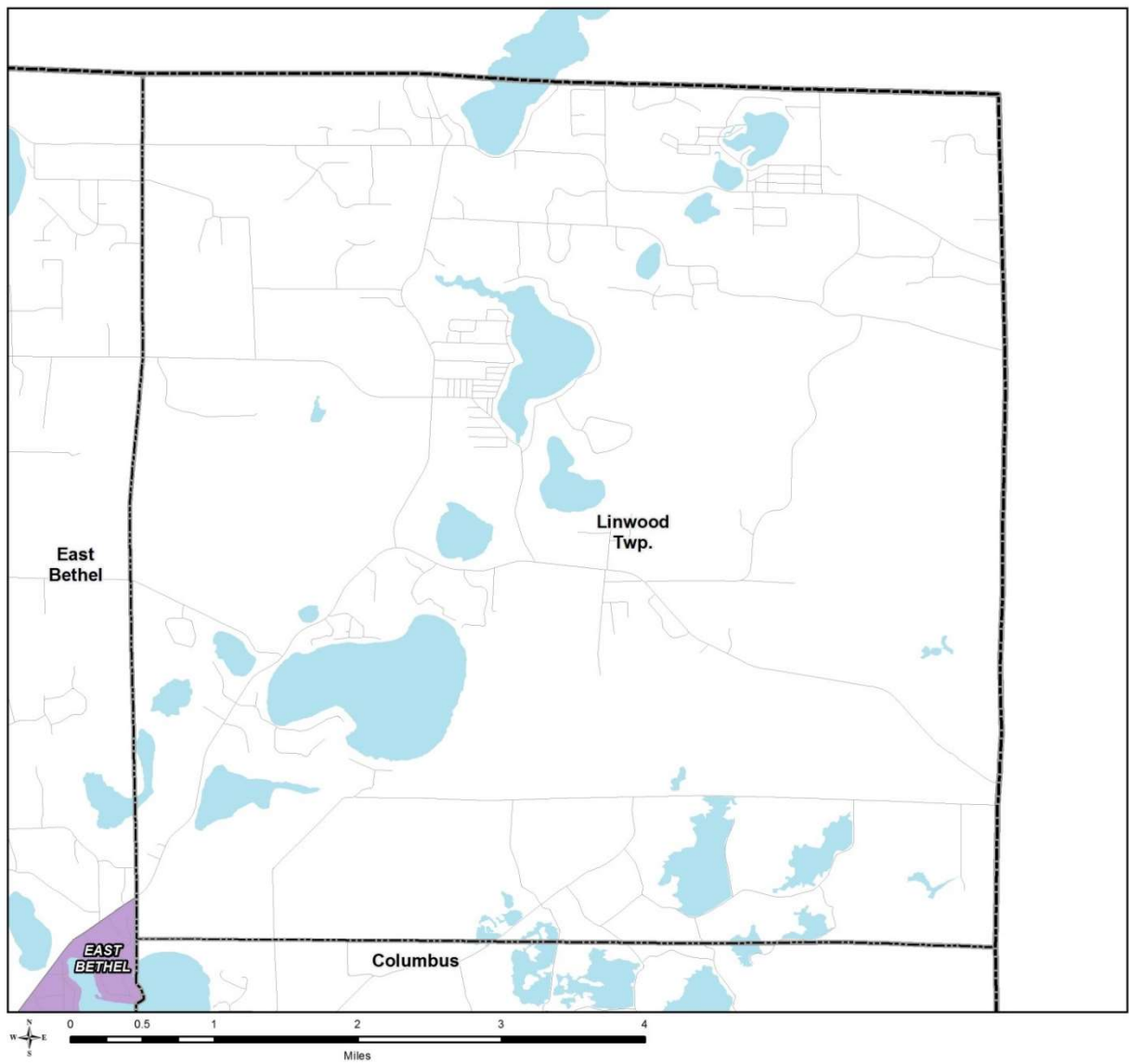
2. Private Wastewater Treatment Plants (Community Systems)

Private community systems exist at the Linwood Terrace manufactured home community and at the Linwood Elementary School. These systems are licensed by the Minnesota Pollution Control Agency.

3. Centralized Sewer Services

Regional sewer services are not available to Linwood Township. The closest regional treatment plant is the East Bethel facility and it does not appear that it will be extended to the Township until possibly a later period of time than this 2040 plan.

Regional Wastewater System Long-Term Service Areas Linwood Township, Anoka County



- County Boundaries
- City and Township Boundaries
- NCompass Street Centerlines
- Lakes and Rivers

Treatment Plant Service Areas

	Current	Potential
Rural Centers		
Metro		
Blue Lake		
Seneca		
Empire		
Eagles Point		
St. Croix Valley		
Hastings		
Rogers		
East Bethel		

- Shakopee Mdewakanton Sioux Community
- Scott Co. Urban Expansion
- Scott Co. Rural Center Expansion
- Wildlife Mgmt. Area

Orderly Annexations

- Rural Centers Pre-2030
- Blue Lake Pre-2030
- Rural Centers Post-2030
- Blue Lake Post-2030
- Empire Post-2030

B. WATERSUPPLYPLAN

1. Ground Water System

All of the homes and institutions in Linwood Township rely on private wells for water. The Town has no plans to provide municipal water services.

Linwood Township adopts and enforces the Sunrise River Watershed Management Plan as it's water plan. The Township is 100% within the watershed. Groundwater generally flows toward the center of the Township and enters Martin Lake, then exiting the lake to form the Sunrise River:

Most of Linwood Township is an aquifer recharge area. Precipitation infiltrates through soil layers and through some wetlands to recharge the aquifers below ground.

The map below provided by the Metropolitan Council shows the surface water types in and near Linwood Township in relationship to groundwater resources.

2. Locations of Groundwater Level Monitoring and Aquifer Testing

The Minnesota Pollution Control Agency monitors ground water levels near the Township. The monitoring locations are shown on the map below.

3. Groundwater Management and Regulatory Areas

Private well owners are responsible for their own drinking water quality. The county offers a private well water testing program for residents. This program includes consultation with Public Health and Environment Department staff about drinking water concerns and testing options for general drinking water quality (nitrate and coliform bacteria). The county program also offers other testing options for private well owners such as lead and arsenic

The Minnesota Health Department (MDH) licenses well contractors, administers the permitting process for constructing wells and sealing abandoned wells, and inspects well in Washington County. The Minnesota Well Code became effective in 1974.

Local geologic conditions may require special well construction methods. The MDH also regulates well construction in regions of known contamination. These areas are designated Special Well and Boring Construction Areas (SWBCA).

The map below, provided by the Metropolitan Council, shows all of the public water supply information for the Township and the regulatory management areas:

Lower St. Croix River - MPCA Ambient Groundwater Monitoring Well Network

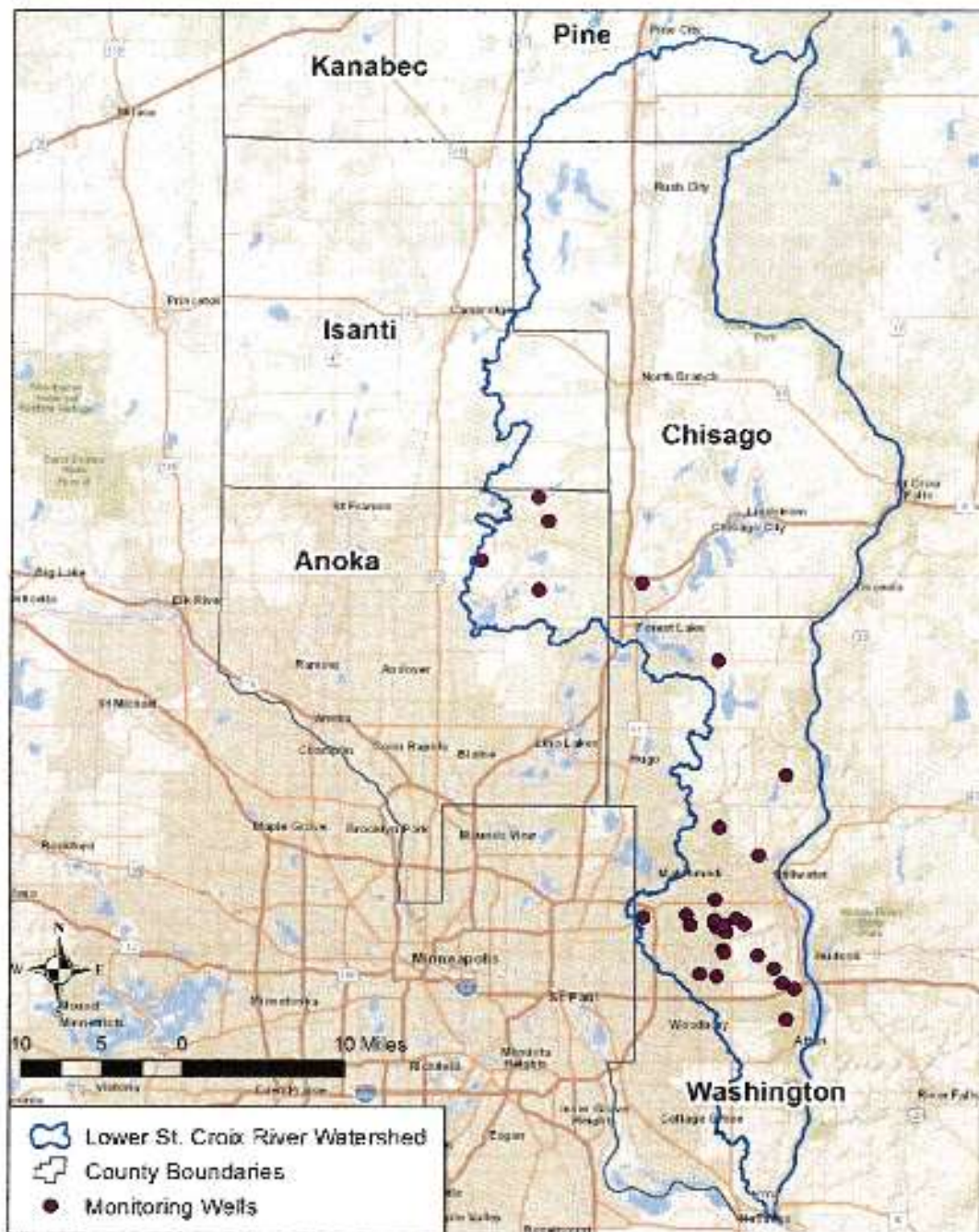
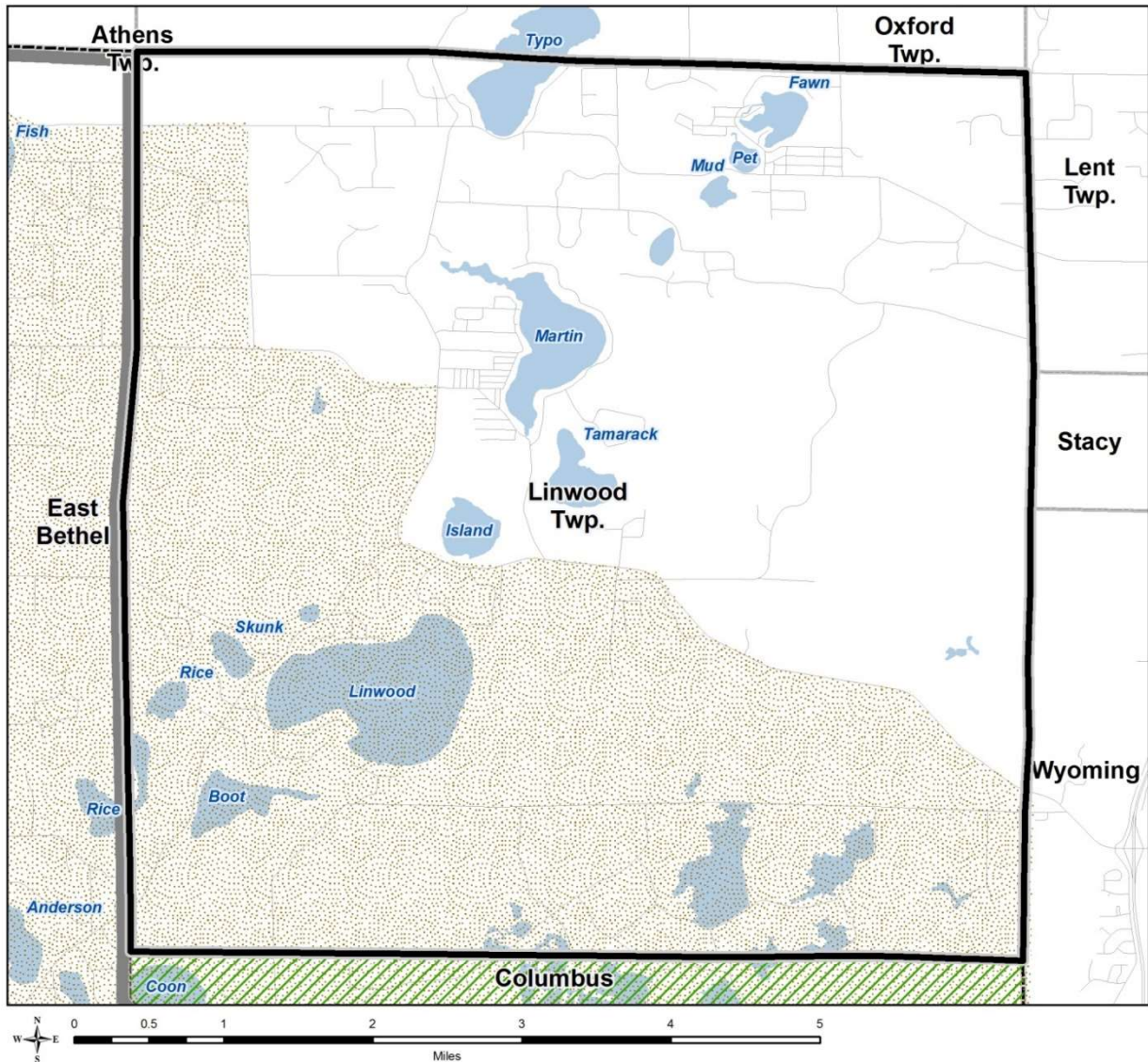


Figure 22: Lower St. Croix River Watershed - MPCA Ambient Groundwater Monitoring Well Network

Municipal Public Water Supply System Interconnections and Management Areas Linwood Township, Anoka County



Special Well and Boring Construction Areas (MDH)



The community's most recent local water supply plan reports that the public water supply system has no interconnections



The community's most recent local water supply plan reports that the public water supply system has one or more interconnections



North and East Metro Groundwater Management Area (DNR)



Drinking Water Supply Management Area for Minneapolis/St. Paul



Moderate to Highly Vulnerable Drinking Water Supply Management Areas (MDH)



County Boundaries



City and Township Boundaries



Open Water Features



NCompass Street Centerlines

4. Anoka County Water Resources Management Plan and the Sunrise River WMO Management Plan Groundwater Elements

The Anoka County Water Resources Management Plan provides a county-wide framework for the protection and conservation of groundwater resources. There is a collaborative approach bringing all agencies and affected parties together to build a workable long-term plan that does not rely on area only information to guide the future. The local watershed management organization management plans also provide detailed information on the interaction between groundwater and surface water resources within each district. All plans include goals and policies that seek to protect the quality and quantity of ground water resources. The Township supports the County Water Resources Management Plan and the goals and policies related to groundwater resources in the watershed organization plans as a means to protect and conserve the County's groundwater resources.

C. WASTE MANAGEMENT AND WATER SUPPLY - GOALS AND POLICIES

Goals

1. Work with Anoka County, the Minnesota Health Department, and local residents to manage wastewater and water supply systems to protect the health, safety and welfare of the present and future residents of Linwood Township.
2. Continue to rely on private wastewater systems and water supply systems to provide waste water and water supply in Linwood Township. The Township will not develop its own municipal sewer or water system.
3. Support regular monitoring and inspection programs for private water supply and wastewater systems to protect the quality of groundwater resources.
4. Work with Sunrise River Watershed Management Organization to protect the quality of surface waters and related ground water resources.

Policies

1. The Minnesota Department of Health will continue to regulate new well construction pursuant to Minnesota Statutes, Chapter 1031 and Minnesota Rules, Chapter 4725.
2. All new septic systems will be placed above the 100-year flood levels of lakes, wetlands, ponds, and streams.
3. Protect individual water supply wells from contamination by enforcing ordinance requirements to exclude inadequate or improperly designed, located, or maintained subsurface sewage treatment systems.
4. Promote public awareness of proper use and maintenance of subsurface systems. Linwood Township will continue to require tri-annual maintenance of septic systems.
5. Permit new subsurface sewage treatment systems only where soil capabilities are adequate to provide for proper treatment system installations.
6. Require each lot developer to prove through soil borings and percolation test that there is sufficient area of suitable soils for the location of two (2) sewage system drain fields.

VI. Local Water Management Plan

A. PURPOSE OF THE PLAN AND EXECUTIVE SUMMARY

This Local Surface Water Management Plan will guide Linwood Township in conserving, protecting and managing its surface water resources through 2040. This plan has been created to meet the requirements detailed in Minnesota Statutes 103B and Minnesota Rules 8410, administered by the Minnesota Board of Water and Soil Resources. This plan is also consistent with the goals and policies of the Metropolitan Council's Water Resources Management Policy Plan, and the plans of the watershed management organization having jurisdiction within the Township.

Linwood Township is located 100% within the geographic area of the Sunrise River Watershed Management Organization (SRWMO): The area of Linwood Township drains to the St. Croix River.

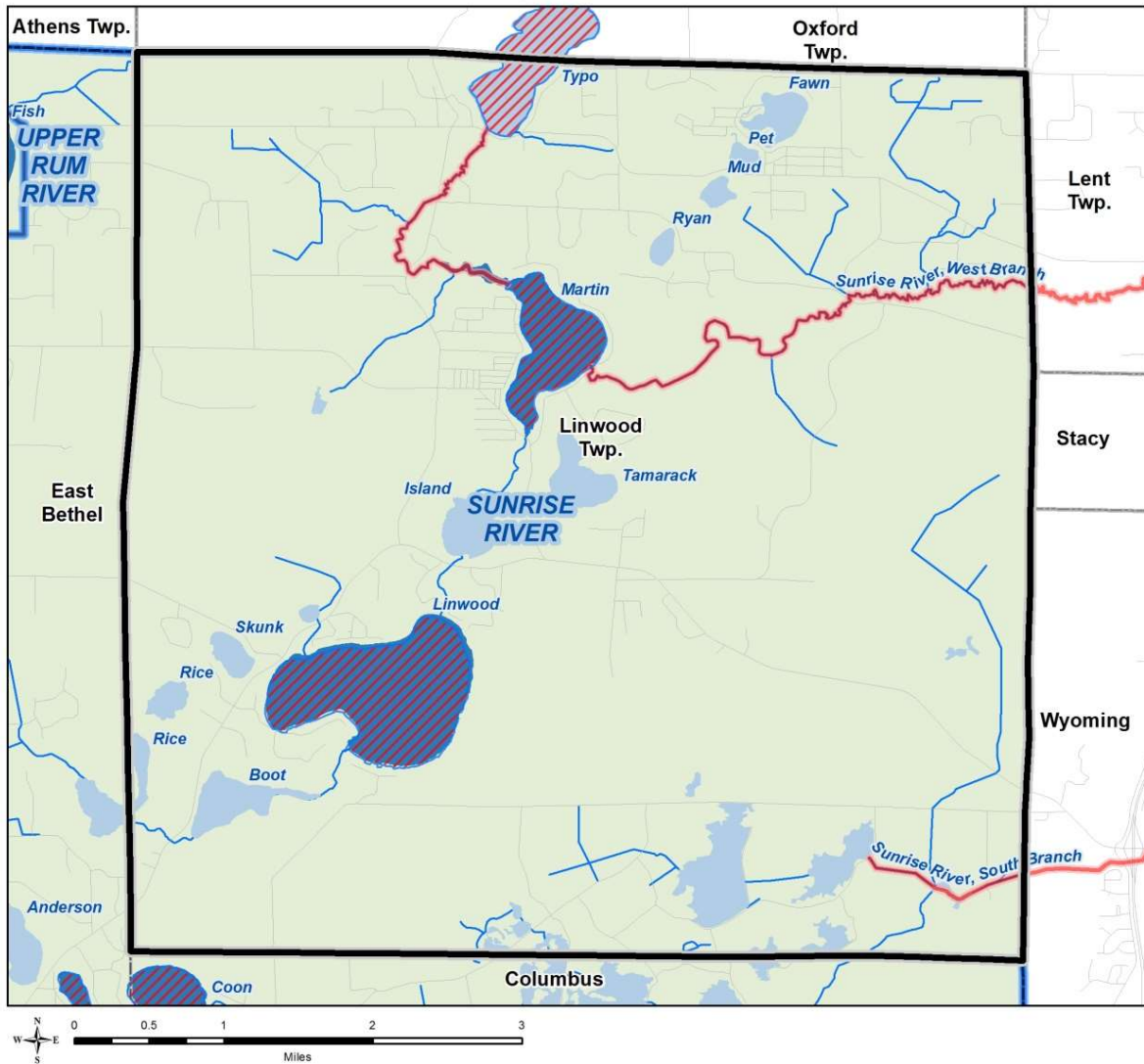
The *Sunrise River Watershed Management* was adopted in September, 2015. The Township reviewed those plans and adopts the plans and rules by reference in this Local Water Management Plan. This plan is consistent with the watershed management organization plans. The Township will need to update this LWMP again within two years of the next expiration date of the local water management organization plans.

B. WATER RESOURCE MANAGEMENT AGREEMENTS

The Sunrise River WMO is a joint powers organization consisting of the communities of Columbus, East Bethel, Ham Lake, and Linwood. Through the SRWMO the communities jointly and cooperatively manage water resources, particularly those that flow across municipal boundaries. The organization is operated by a board of managers consisting of two representatives from each community. The SRWMO Joint Powers Agreement provides rules and procedures for operation of the SRWMO

The Township will enforce storm water rules with the Sunrise River Watershed Management Organization based on the new Stormwater Ordinance that the Township will adopt in 2016.

Surface Water Resources Linwood Township, Anoka County



Watershed Management Organization Boundaries

Watershed Management Organization Type

- County
- Watershed District
- Watershed Management Organization

Impaired Lakes (2014 Draft MPCA 303(d) List)

Impaired Rivers & Streams (2014 Draft MPCA 303(d) List)

2014 Priority Lakes

County Boundaries

City and Township Boundaries

Other Lakes and Major Rivers

Other Streams

NCompass Street Centerlines

C. LAND USE, WATER AND NATURAL RESOURCES IN LINWOOD TOWNSHIP

1. *Land Use in Linwood Township*

Land use in Linwood Township is dominated by rural residential and agricultural uses. The Township's land use goals and policies for 2040 will maintain the existing types and patterns of land uses in the Township for the duration of the 2040 Comprehensive Plan. The table below summarizes the existing land uses in the Township based on Metropolitan Council data.

The figure following the table shows the Township's proposed 2040 Land Use Plan and is included in the 2040 Comprehensive Plan.

Table 4: Linwood Township Future Land Use						
Gross Acreage Mapped						
Land Use Category	Existing	2010	2015	2020	2025	2030
Rural Residential-Agriculture	13,833	13,833	13,833	13,833	13,833	13,833
Manufactured Home Park	35	35	35	35	35	35
Commercial	37	37	37	37	37	37
Park & Open Space	7,496	7,496	7,496	7,496	7,496	7,496
Total	21,401	21,401	21,401	21,401	21,401	21,401

2. *Surface Water Resources*

Sunrise River Water Management Organization (SRWMO)

The SRWMO area is rich in water and natural resources. Approximately 50% of the area is water and wetlands, including 19 lakes. Five are major recreational lakes (Coon, Fawn, Linwood, Martin, and Typo). 19% of the SRWMO area is high quality natural communities that have undergone little human disturbance since pre-settlement times. Many of these areas have been designated by the State as sites of biodiversity significance or regionally significant ecological areas. 27 plant and animal species that are state endangered, threatened, special concern, or rare are known to occur in the SRWMO. These water and natural resources are at the heart of the character of these north Twin Cities metro communities.

The Sunrise River Watershed was designated by the Minnesota Pollution Control Agency (MPCA) as a high priority subwatershed of the St. Croix River. The Sunrise River was identified as one of the greatest contributors of phosphorus and sediment to the St. Croix River

The impaired lakes within Linwood Township include the following:

- a) Linwood Lake
- b) Martin Lake
- c) Typo Lake
- d) There are also impairments in Typo Creek flowing from Typo Lake to Martin Lake and the west branch of the Sunrise river starts at the outflow of Martin Lake.

Lower St. Croix WMO (LSCW)

Linwood Township is also fully within the borders of the Lower St. Croix Watershed. Linwood and the Sunrise River Watershed Management Organization will be partnering with the Lower St. Croix watershed in a “*One Watershed, One Plan*” process. Partners will develop a collaborative and comprehensive plan to guide the protection and restoration of priority natural resources in our region over the next ten years.

Strategies

- 1. Enhance collaboration and consistency between upstream and downstream neighbors, and between different levels of government;
- 2. Identify and address gaps in data, technology, or implementation funding across the region;
- 3. Avoid duplication of efforts; and
- 4. Make efficient use of federal, state and local funds to address priority issues and protect/improve valuable natural resources in the Lower St. Croix Watershed.

Protected Waters within Linwood Township

List of Protected Waters Within Linwood Township

Number	Name
2-21	Tamarack Lake
2-22	Island Lake
2-26	Linwood Lake
2-28	Boot Lake
2-29	Unnamed Lake
2-30	Unnamed Lake
2-34	Martin Lake
There are other smaller protected waters	
in Linwood Township as well	

Impaired and Outstanding Resource Waters

Impaired waters within Linwood Township include the following:

Impaired Waters

Waterbody	Impaired Use	Pollutant or Stressor
Linwood Lake	Aquatic Recreation	Excess Nutrients
Martin Lake	Aquatic Recreation	Excess Nutrients
Typo Lake	Aquatic Recreation	Excess Nutrients
Sunrise River West Branch Typo Lake to Martin Lake	Aquatic Recreation	pH and turbidity
Sunrise River West Branch Martin Lake to Sunrise pool 1	Aquatic Life	pH, turbidity, and biota (fish)

3. Prohibited outstanding resource value waters.

For the purposes of MN Administrative Rules parts 7050.0250 to 7050.0335, the following surface waters are prohibited outstanding resource value waters: Until such time that surface waters identified as state or federally designated wild river segments and surface waters necessary to maintain state designated scientific and natural areas are designated in rule as prohibited outstanding resource value waters, the commissioner shall prohibit any proposed activity that results in a net increase in loading or other causes of degradation.

BOOT LAKE is a prohibited outstanding resource value water.

Upland Resources

The pre-settlement vegetation in Linwood Township was dominated by oak savanna and oak openings, with smaller areas of hardwood forest and prairies. Much of this original vegetation has been replaced as a result of agricultural or residential land use.

A few areas of relatively natural vegetation remain today within Linwood Township. Thanks to public and private collaboration Linwood has its own School Forest that borders the Gordie Mikkelson WMA. This area is known and recognized by the DNR's County Biological Survey for having "high biodiversity significance." The County Biological Survey identifies sites around the state with high quality native plant communities, and rare and endangered species.

Carlos Avery wraps around the southern and lower east side of the township which seeks to conserve habitat corridors and areas of high habitat quality for the purpose of sustaining fish, wildlife and native plant communities.

Groundwater Resources and Issues

Due to local soils and geology, the aquifers in and near Linwood Township are highly sensitive to contamination. Most soils in the area are classified as rapidly permeable, and most areas are either close to lakes, streams, and rivers or are next to aquifer recharge areas. This means we must carefully protect all our water for the future.

The groundwater resources in the Township, relationship to its water supply, and the Township's goals and policies related to groundwater resources are included in the Sunrise River Watershed Management Organization Water Supply Plan which we adopt by reference in our ordinances. The water plan is currently being updated with a completion date sometime in 2019.

D. EXISTING AND POTENTIAL WATER RESOURCE PROBLEMS

Each of the watershed management organizations in the Township has identified the water resource problems within its geographic area. The Township concurs with this assessment, and has summarized the information included in each of the organizations' plans below.

1. Sunrise River Watershed Organization

The Sunrise River Watershed Organization **Watershed Management Plan** identifies the following significant water management issues in its plan:

- a) Water quality degradation
- b) Aquatic invasive species control and management
- c) Water quality monitoring and reporting
- d) Implementation and maintenance of water quality improvement projects
- e) Collaboration with other entities to reduce pollutant loading and improve water quality
- f) Flooding and water level issues
- g) Surface water/ground water interaction
- h) Management of groundwater quality and quantity
- i) Participation in local and regional groundwater management planning
- j) Managing the impacts of erosion and sedimentation

The Goals and Policy section of this plan identifies the specific areas in which Linwood Township will contribute to the efforts to protect and improve surface and ground water management within the Watershed District to address the issues identified above and the goals in the District plan.

2. Lower St. Croix Watershed

Linwood Township will participate in any way possible to help in working on the “*One Watershed, One Plan*”. The Sunrise River Watershed drains through the Sunrise River and wetlands to end up in the St. Croix River. The Township will help prevent downstream degradation by managing runoff, erosion, and sediment control to minimize impacts to the St. Croix is a concern within this watershed area.

E. GOALS AND POLICIES

Linwood Township will protect and manage its valuable water and natural resources in cooperation with the local watershed management organizations. The Township recognizes the need to work with others, including the Sunrise River Watershed Management Organization (SRWMO), Lower St. Croix Watershed (LSCW), Anoka County, and the State of Minnesota to achieve its goals for the protection of surface waters, ground water and related natural resources within the community.

The SRWMO is updating their watershed management plan. The Township will adopt the updated plan, and will support the SRWMO efforts by updating and enforcing its Zoning and Subdivision Ordinance, as described in the goals and policies that follow.

Goal 1 – Nondegradation of lakes

1. Linwood Township is committed to a goal of nondegradation of the lakes, wetlands, streams, and groundwater within the Township, and will work with local WMO's, Anoka County and State agencies to achieve this goal.

Policies

1. The Township will work cooperatively with local watershed organizations, state agencies and landowners to protect local wetlands, lakes, streams and groundwater, to preserve the values of these resources for future generations.
2. The Township will continue to enforce surface water regulations within the Township area that is within the District's boundaries.
3. The Township will adopt an Ordinance consistent with the SRWMO performance standards and requirements for stormwater management, wetland management, and resource protection. The Township will enforce these requirements, with review and implementation assistance from SRWMO and ACD staff and Board.
4. The Township will support the SRWMO in planning and implementation of its standards for control of peak runoff, infiltration and filtration, and best management practices to control Total Suspended Solids (TSS), Total Phosphorus (TP), and runoff from development or redevelopment within the Township.
5. The Township will manage land use to support protection of surface and ground waters within the Township through its Comprehensive Plan, Zoning and Subdivision Ordinance, including:
 - a. Land Use Plan and Zoning Regulations
 - b. Subdivision Regulations
 - c. Shoreland Ordinance (County ordinance)

- G. Floodplain Ordinance
- H. Stormwater Management Ordinance
- I. Subsurface Septic Treatment Systems Ordinance

Goal 2: Protect the quality of local lakes.

Policies

1. The Township supports the Sunrise River Watershed District's goals and monitoring programs for managing lakes in the Township, including goals to address the spread and impacts of aquatic invasive species.
2. Policy: The Township will update its land use plan, and zoning and subdivision ordinances to protect shoreland areas and lake water quality, and work with the SRWMO and Lake associations to achieve lake management goals.
3. The Township will continue to cooperate with Anoka County to manage shoreland areas under the Anoka County Shoreland Ordinance, which has been approved by the Minnesota DNR.

Goal 3: Protect wetland resources.

Policies

1. The Township will support the Watershed Organizations' Wetland Management Plans. These plans include functions and values assessments of the wetlands in the Township, and wetland management requirements.
2. The Township will continue to work with the Anoka Conservation District to provide wetland management services to the Township.
3. The Township supports and will adopt ACD and SRWMO requirements for wetland buffers based on the functions and values assessments and wetland classifications identified in the WMO Wetland Management Plans, and will enforce these requirements throughout the Township.

Goal 4: Protect the quality of Outstanding Resource Value Waters (ORVW), including Boot Lake and the St. Croix River downstream.

Policy

1. The Township will work with the Watershed Management Organizations and other agencies to achieve the nondegradation goals for ORV Waters by enforcing its Zoning and Subdivision Ordinances, Shoreland and Floodplain Ordinances, and Stormwater Ordinance.

Goal 5: Protect groundwater quality.

Policy

1. The Township will cooperate with the Minnesota Pollution Control Agency, Minnesota Department of Health, and local watershed management organizations to address groundwater quality issues, and enforce its Zoning and Subdivision ordinances, and Township enforcement of its SSTS Ordinance to protect groundwater quality.

Goal 6: Provide education and outreach to residents to encourage good stewardship of surface and groundwater resources

Policy

1. The Township will cooperate with SRWMO efforts to provide education and outreach to local residents to promote good stewardship of water and natural resources and reduce pollution and degradation of these resources. The Township will include information in its newsletter and on its website as available to support education and outreach efforts.

G. IMPLEMENTATION PLAN AND AMENDMENTS

Linwood Township is a rural community, and is not an MS4 (Municipal Separated Storm Sewer System) community. It does not own or operate any storm water management facilities, and does not plan to develop any facilities through 2040. The Township does own, inspect, and manage culverts, ditches, and drainage within the Township road rights-of-way. Town Board members inspect these facilities, identify needs for maintenance, and ensure that it is completed.

The Township will complete the specific actions listed below to implement this Local Water Management Plan:

1. The Township concurs with and adopts the SRWMO Water Management Plans and rules.
2. The Township will continue to manage land use, subdivision, private well maintenance, and subsurface septic treatment systems based on its ordinances and in cooperation with the Minnesota Department of Health and Anoka County.
3. The Township supports the cost-share and monitoring projects included in the watershed management organization plans, and will provide information about these programs and watershed stewardship to Township residents.
4. The Township will implement its road maintenance policies, including the use of vegetated swales along its roadways to filter and absorb stormwater and associated pollutants, and minimize the use of salt and sand.

Capital Improvement Plan

The Township does not have a Capital Improvements Program (CIP). Improvements needed to culverts or other Township facilities will be funded through the Township's annual budget. Any storm water facilities outside Township property will be developed by the watershed management organizations under their CIP plans, or by private developers.

Plan Timetable and Amendments

This LWMP will be amended as needed with future updates to the watershed management organization plans and the Township's Comprehensive Plan.

VII. COMMUNITY FACILITIES AND SERVICES

Linwood Township owns and manages its Town Hall, Senior and Community Center, Maintenance Garage, Recycling Center, Fire Department, and numerous community parks.



Town Hall - New Town Hall Section enlarged and rebuilt in 2016



Senior and Community Center – Redone in 2016



Maintenance Garage – Resided and re-roofed in 2016



Recycle Center – New Multi Bay Building added in 2017



Linwood Fire Department - Building completed September 2002

The Township has various other buildings on its campus.

The Anoka County Sheriff's Office is currently providing police protection to Linwood Township and is expected to continue to provide this service.

VII. Transportation

A. INTRODUCTION

The transportation system in Linwood Township includes state, county, and local roads, and trails. It is a diverse transportation system that meets many needs for movement and access.

The Township does not expect significant changes to its local transportation facilities through 2040. This chapter identifies current transportation facilities, expected growth in facility use, and transportation issues for the 2040 planning period. The Township obtained much of the data and mapped information included in this chapter from recent Metropolitan Council and Anoka County plans and maps. The Township reviewed the transportation goals and policies included in the Council's 2015 System Statement and 2040 Transportation Policy Plan, and the Township developed its goals and policies to be consistent with the regional goals and policies for transportation infrastructure. This Comprehensive Plan provides guidance as the Township plans for its local transportation system and works with other entities on transportation issues.

This chapter:

- a) Summarizes the existing transportation facilities in the Township and expected growth and change
- b) Identifies key issues for the future of its multimodal surface transportation system
- c) Includes the Township's goals and policies to guide transportation planning

B. ROADWAYS

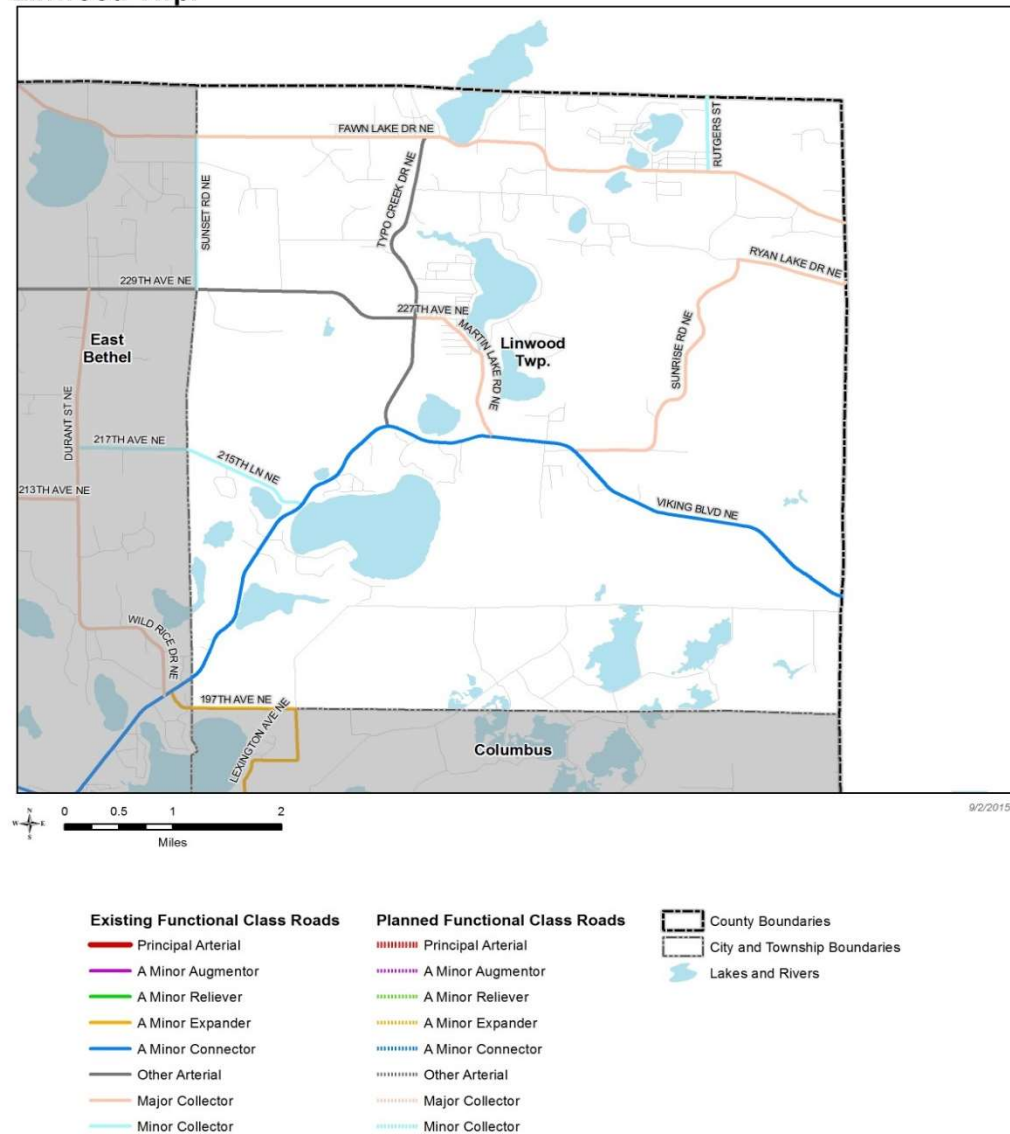
1. Roadway System

Linwood Township is served by a combination of State, County and local roads. The Existing Transportation System and Functional Classification System Map below show the major roadways in and near Linwood Township and the functional classification of each existing road.

Functional Classification of Roadways—Linwood Township

Regional Transportation System - Functional Class Roads

Linwood Twp.



Classification of streets and highways is the first step in preparing a coordinated transportation plan. Functional classification involves the determination of what function each street or highway should perform before determining street widths, speed limits, intersection control or other design features. The attractiveness of functional classification assures that non- transportation factors such as land use and development are taken into account.

The functional classification of roadways in Linwood Township includes:

A Minor Expanders (A type of A-Minor Arterials) - A street or highway which connects adjacent sub regions. Minor arterials are primarily oriented toward the provision of sub- metropolitan mobility and any land access should be oriented to public streets and major generators rather than closely spaced driveways onto the street.

The only Expander roadway in Linwood Township is 197th Ave. as it leads to Lexington Ave.

A Minor Connectors (A type of A-Minor Arterials)- streets primarily oriented toward mobility to destinations within the metropolitan region. Mobility is generally prioritized over access to individual parcels.
Viking Blvd is classified as an A Minor Connector.



Major Collector - collector roadways provide connections between neighborhoods and from neighborhoods to regional job concentrations and local centers. They provide for mobility and for land access.

Fawn Lake Drive Martin Lake Road, Ryan Lake Drive, and Sunrise Road are Major Collector roadways.

Other Arterial – these go between major and minor collectors.
Typo Creek Drive and 227th Ave are other arterials.

Minor Collector – These usually connect to A Minor Connectors.
215th Ave. is a Minor Collector.

Local - A street which functions to provide access to parcels and neighborhoods.

There are no principal arterials within Linwood Township's limits. State Highway 65 and interstate 35 are classified as principal arterials. Viking Blvd is the connector to both principal arterials.

All other roads not specifically mentioned above are considered local roads.

2. *County Traffic Volumes, Forecasts, and Capital Improvements Plan*

In comparing existing volumes with forecasted 2040 volumes, the County predicts that Viking Blvd will see a growth in traffic of roughly 1000 vehicles per day through Linwood Township both going west towards State highway 65 and to the east to interstate 35. On the north end of the township going east on Fawn Lake Drive the traffic count is also estimated to grow by 450 vehicles a day. The County forecasts that all arterials and collectors in and around the Township will increase in traffic due to growth in Linwood and to the north.



Anoka County Current Traffic Volumes in Linwood Township



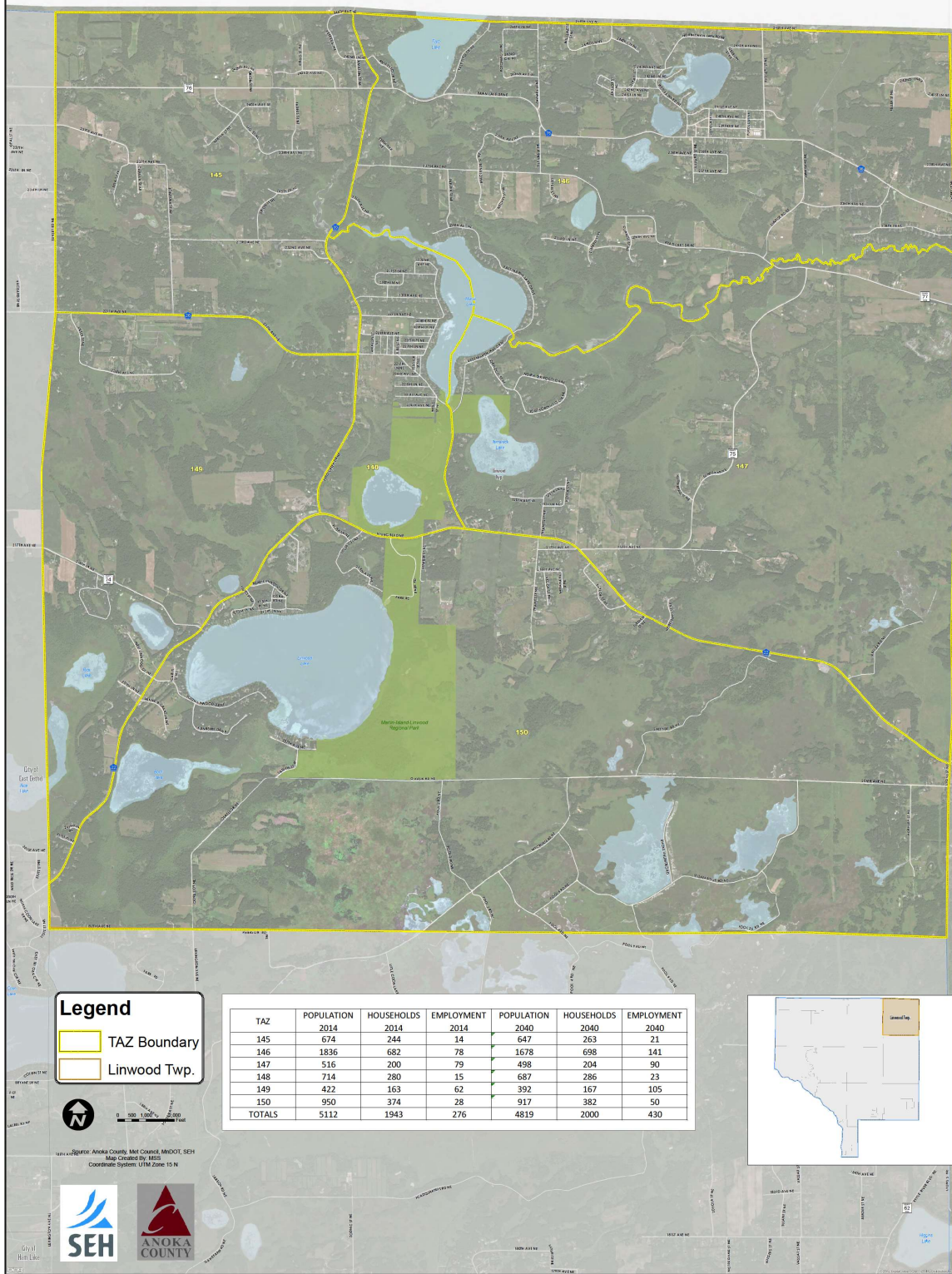
3. *Transportation Analysis Zones (TAZ's) and Forecasts*

Transportation Analysis Zones (TAZs) are a planning tool used to determine how land use relates to the transportation system. The population, household and employment forecasts are allocated to the TAZs that share the Township's geography. These allocations are detailed in the table below. The Township used Anoka County's transportation modeling data to complete this portion of the Plan Update and the TAZ data described below indicates estimates and forecasts derived from Anoka County.

The TAZ's in Linwood Township are shown on the map below.

The Township is included in 6 full TAZ zones and parts of 3 TAZ zones that overlap with neighboring communities. The population, household, and employment forecasts for each TAZ are consistent with the Metropolitan Council forecasts for Linwood Township, and indicate slow growth through 2040 throughout the Township.

LINWOOD TWP. TRANSPORTATION MAP



**TAZ Forecast
Data**

2020 Projections by TAZ				
TAZ	Population	Households	Retail Employment	Non-Retail Employment
1785	603	254	0	2
1786	590	237	0	24
1787	306	111	0	0
1788	290	116	0	34
1789	732	297	0	30
1790	851	340	0	33
1791	1628	595	7	1

2030 Projections by TAZ				
TAZ	Population	Households	Retail Employment	Non-Retail Employment
1785	679	280	0	4
1786	648	258	0	25
1787	319	116	0	0
1788	316	125	0	35
1789	808	324	0	32
1790	932	368	0	35
1791	1698	619	7	2

2040 Projections by TAZ				
TAZ	Population	Households	Employment	Employment
145	647	263	21	
146	1678	698	141	
147	498	204	90	
148	687	286	23	
149	392	167	105	
150	917	382	50	
Totals	4819	2000	430	

4. Access Management

The Township works with Anoka County to regulate the number of access points to County roads and with MN/DOT regarding access onto State Highways. The Township's Subdivision Regulations incorporate spacing and access guidelines for county, state and local roadways. The land use associated with proposed access points also determines the appropriate spacing.

Seaplane Use

Under Mn/DOT Office of Aeronautics, MR 8800.2800, seaplane operations are permitted on the surface waters of the Linwood Lake.

TRANSPORTATION GOALS AND POLICIES

Goals

1. Provide safe and efficient movement of persons and vehicles through and within Linwood Township without undue maintenance costs to the Township.
2. Work with other governments and organizations to accomplish multimodal local and regional transportation goals and manage transportation facilities in Linwood Township.

Policies

1. The Township will require new roads to meet the appropriate engineering standards (State, County, and Township) and the requirements of the Township's Subdivision Ordinance.
2. The Township will require driveway access spacing to meet County and local requirements.
3. The roadway network will provide for accessibility for services such as police and fire vehicles and school buses.
4. All newly constructed roads in major subdivisions will have a bituminous surface to reduce maintenance cost to the Township.
5. The Township encourages the location of a carpool, vanpool or park and ride lot next to state or county roads to encourage traffic concentration near the existing regional transportation network. The Township supports the location of a carpool/vanpool or park and ride lot within the Township.
6. The Township supports the development of regional bicycle trails, county bicycle and pedestrian trails, and linkages to existing local trails.

VIII. Parks, Trails, and Open Space

A. PARKS, TRAILS AND OPEN SPACE

1. *Parks*

The numerous park areas within Linwood are a valuable amenity and community pride. With the Township expressing a desire to promote its community identity, it must be recognized that the Township's park and recreational facilities may serve as a major tool in realizing this goal.

Existing parks within Linwood are well suited to serve the majority of Township residents; however, future development will undoubtedly increase community recreational demands. While the Township's 1989 Park and Recreation Study identifies activities which should be added to Linwood's park system, it does not constitute a comprehensive planning effort identifying future park locations, trail linkages, etc. Such planning efforts should, at some future point, be pursued through the preparation of a park and trail system plan.

Park land acquisition is currently facilitated through park land dedication/cash contribution requirements in the subdivision process. This is an approach that yields an economical method of acquiring park land for the Town. If such contributions do not provide adequate funding for desired improvements, various park projects may be integrated within a Township capital improvement program.

The financial feasibility of a park system must be carefully considered prior to the development of a park system. The community must evaluate the feasibility based on the following considerations:

- a) Acquisition. The cost of acquiring desirable land for the establishment of parks and trails
- b) Development and Maintenance. The development of parks is a significant investment and the maintenance of parks is an ongoing expense for materials and personnel.
- c) Administration. Costs associated with organized activities include continuing costs for materials and staffing.

Linwood Township parks listing.

Allquist Park at 23890 Julliard St., consists of a basketball court, picnic benches, baseball field, horseshoe pit and a playground.



Boettcher Farm Park on the corner of Fawn Lake Dr. and Taurus St. NE., consists of a playground, a picnic shelter with grill, adult fitness equipment, and equipment for seniors that helps them strengthen their mobility.



Broadbent Memorial Park at 22810 Typo Creek Drive NE currently has 2 Ballfields, Horseshoes, Handicap Accessible Full-Court Basketball, Handicap Accessible Double Tennis Court, Swings, Slide, Playground Equipment, Picnic Tables, Benches, Dual-purpose Lighted Football & Soccer Field, a Parking Lot and a Picnic Pavilion.



East Side of Town Hall (not named) at 22817 Typo Creek Dr NE has a Ballfield.



Fairway Flyerz Disc Park at 9410 236th Ave NE consists of a challenging 9 hole disc-golf park.



Four Seasons Recreational Park currently offers three Ball fields, a Skateboard Facility, a BMX Bike Track, Volleyball Court, Children's Playground Equipment, Skating Rinks and a Parking Lot.



Givens Park is located at 6659 242nd Lane NE. It consists of a blacktopped basketball court, and a playground with a handicapped swing.



Linwood Community Park and School Forest, located at County Rd 26 and 227th Ave NE is a cooperative effort between Linwood Elementary School and the Township. It is the largest park at 210 acres with a variety of land formations, picnic tables, benches, trails for hiking, boardwalks and groomed cross-country ski trails in the winter. Staff and students at Linwood take advantage of the vast educational experiences that can be gained from studying nature in the midst of nature. The School Forest Committee sponsors naturalist programming for each classroom three times a year in Fall, Winter and Spring.



Martin Lake Shores Beach, located on West Martin Lake Drive N.E. has a picnic table and benches.



North Star Park at 24470 East Typo Lake Drive N.E. has a few walking trails.



Olympic Green at 5211 - 226th Avenue N.E has a basketball court, swings, playground equipment, picnic tables, benches and parking lot.



Playful Shadows Park at 23461 Japura Street NE consists of a playground and a woodland nature walking trail.



Linwood Township currently has 4 undeveloped parks:

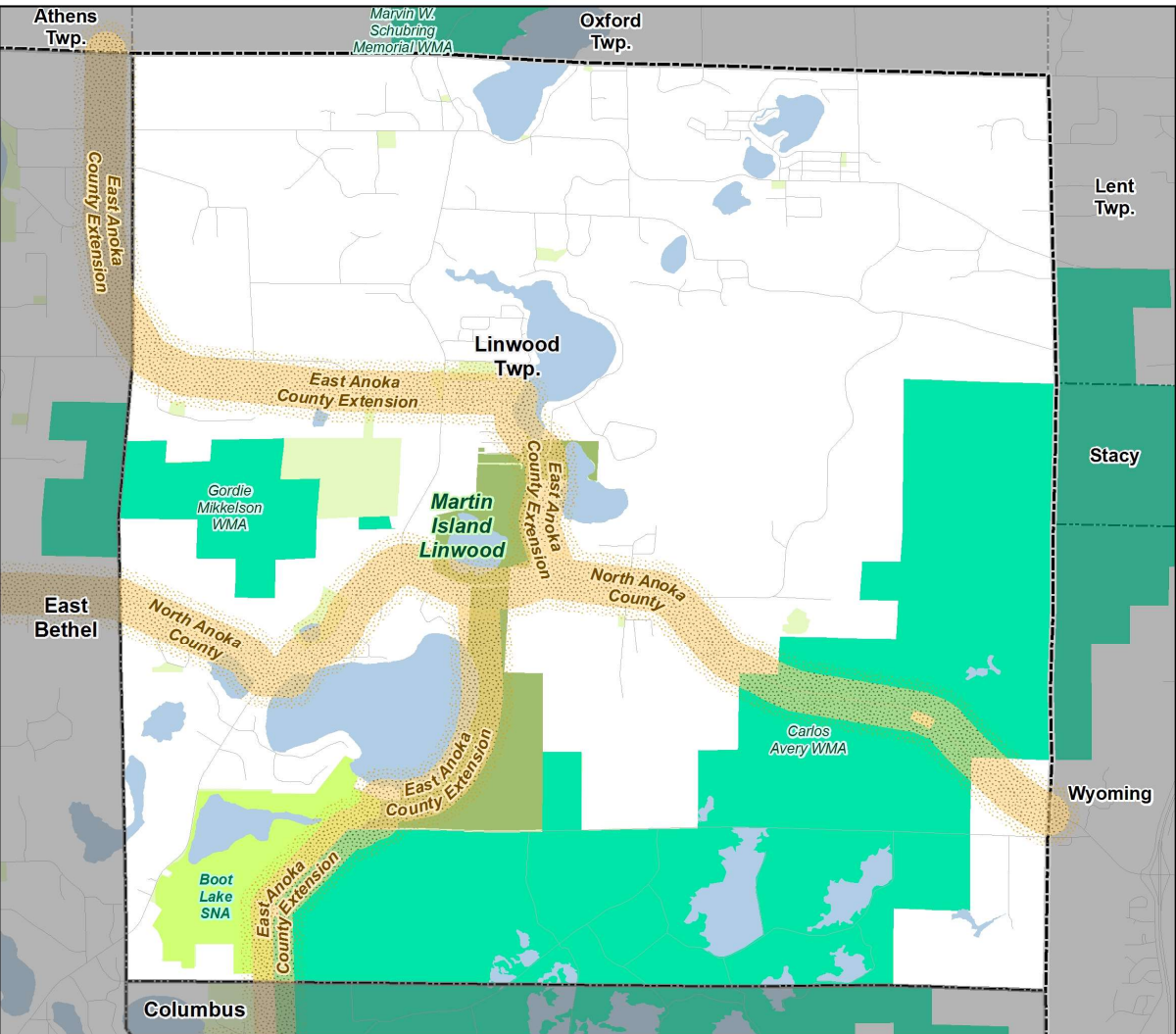
- a) **Birchwood Park** 21350 W. Birchwood Circle NE.,
- b) **Deer Run Park** located on the shores of Boot Lake.
- c) **Paradise Point Park** 24289 West Fawn Road NW, and
- d) **Woodlyn Park** 24051 Purdue Street NE

2. Trails

Linwood Township recognizes that regional plans call for the two future regional trails to cross through Linwood Township. The North Anoka County Regional Trail will run east/west across the Township, connecting Martin-Island-Linwood Regional Park with Lake George Regional Park (in Oak Grove) and continuing to the Anoka County border. The approximate alignment can be seen on the map below – Parks, Public Lands, & Regional System. A second trail, The East Anoka County Regional Trail, is planned to run through the township, on a north-south axis. The proposed course of the trail can be seen on the map below – Regional Park System

Regional Parks System

Linwood Township, Anoka County



- Regional Parks**
- Existing
 - In Master Plan
 - Planned Parks and Reserves
- Regional Trails**
- Existing Regional Trails
 - Planned Regional Trails
 - Regional Trail Corridor Land

- Regional Park Search Areas and Regional Trail Search Corridors**
- Boundary Adjustments
 - Search Areas
 - Regional Trail Search Corridors
 - Regional Trails - 2040 System Additions

- Minnesota Valley National Wildlife Refuge
- State Parks
- State Wildlife Management Areas (Publicly Accessible)
- Scientific and Natural Areas (SNA)
- Other Parks and Preserves
- Existing State Trails
- Street Centerlines (NCompass)
- Lakes and Major Rivers

3. *Open Space and Recreational Open Space*

Public open space areas in Linwood Township include the Carlos Avery Wildlife Management Area, the Martin-Island-Linwood Lakes Area Regional Park, Gordie Mikkelson WMA, Boot Lake SNA, and Linwood School Forest.

Carlos Avery Wildlife Management Area (WMA) - Minnesota DNR

Carlos Avery WMA is approximately 23,000 acres in size and consists of about 2/3 wetland and 1/3 upland with a mix of oak savanna and grasslands. The area was established in 1934 and is named for Carlos Avery who was Minnesota's first Game and Fish Commissioner. It is one of the largest blocks of wildlife lands in the Twin Cities Metro area and is managed primarily for deer, waterfowl, and turkeys. There are two parts to the WMA, the Sunrise Unit, located east of Stacy, MN and the main portion, the Carlos Avery Unit which contains the WMA headquarters. There are 20 Pools where water is actively managed to produce habitat for waterfowl. The area is very popular for bird watching. A wildlife sanctuary of 4,500 acres is closed to all trespassing. There are 57 miles of roads in the WMA, including a 7-mile self-guided auto tour which begins at WMA headquarters and many miles of hiking trails.

Gordie Mikkelson Wildlife Management Area (WMA) - Minnesota DNR

Gordy Mikkelson WMA is 816 acres in size and is primarily managed for woodland and wooded wetland wildlife like deer and turkeys. It consists of 55% wetland and wooded wetland, 36% upland woodland and 9% grassland/food plot. Mikkelson WMA has grown rapidly in size in recent years and was acquired from a variety of previous landowners. A large portion was previously operated as a Camp Fire USA children's camp. Wheelchair access is limited to gravel parking lots on the east and south. Windswept Prairie Environmental Education Area is a planted prairie that was established in 1999 in cooperation with neighboring Linwood Elementary School and education grant money.

Boot Lake Scientific and Natural Area - Minnesota DNR

Boot Lake is one of MN DNR's Scientific and Natural Areas (SNA). Boot Lake SNA is part of a chain of ice-block lakes which were formed by sub-glacial rivers. The site contains a diversity of native plant communities including oak forest, aspen-shrub thickets, white pine stands, wooded bogs and wet meadows. Rare and notable flora and fauna make their home in Boot Lake SNA.

Martin Island Linwood Lake Area Regional Park – Anoka County

This 737-acre park is in close proximity to the Carlos Avery Management Area. The park contains significant undisturbed landscape communities identified in the State's County Biological Survey. Facilities include nature trails, a small picnic area, rustic beach, and a group camp named Camp Salie. The park remains mostly in a natural state.

B. PARKS, TRAILS AND OPEN SPACE GOALS AND POLICIES

1. Goals

- a) Encourage the development of regional parks, trails, open space, recreation and fish and wildlife areas that are consistent with the rural character of the Township.
- b) A plan identifying future park and trail locations should be developed. The Township Planning Commission, in collaboration with the Town Board, should determine the most appropriate time to develop a park plan based on economic feasibility and public need.
- c) Support the development of the Middle St. Croix Valley Regional Trail and regional and local trail connections to the trail corridor.
- d) Protect and enhance fish and wildlife habitat and water recreational facilities in the Township for the short- and long-term.
- e) When financially feasible, provide facilities for pedestrians and bicyclists in conjunction with street improvement projects.

2. Policies

- a) The Township will identify opportunities to connect local trails to the regional trail system.
- b) The Township will provide a portion of park dedication fees to those communities in which the Township's residents utilize the park system, at its discretion and as deemed appropriate by the Township.
- c) The Township will encourage preservation of open space and the preservation of ecologically sensitive areas, wildlife habitat, natural resources, open spaces, and natural and scenic views through subdivision approvals.
- d) The Township will support and participate in County or State planning efforts to create trail connections within the Township.
- e) The Township supports funding through grants, donations, or other funding opportunities which will assist in the development of regional, county, and local trail systems.

X Special Resources and Resilience

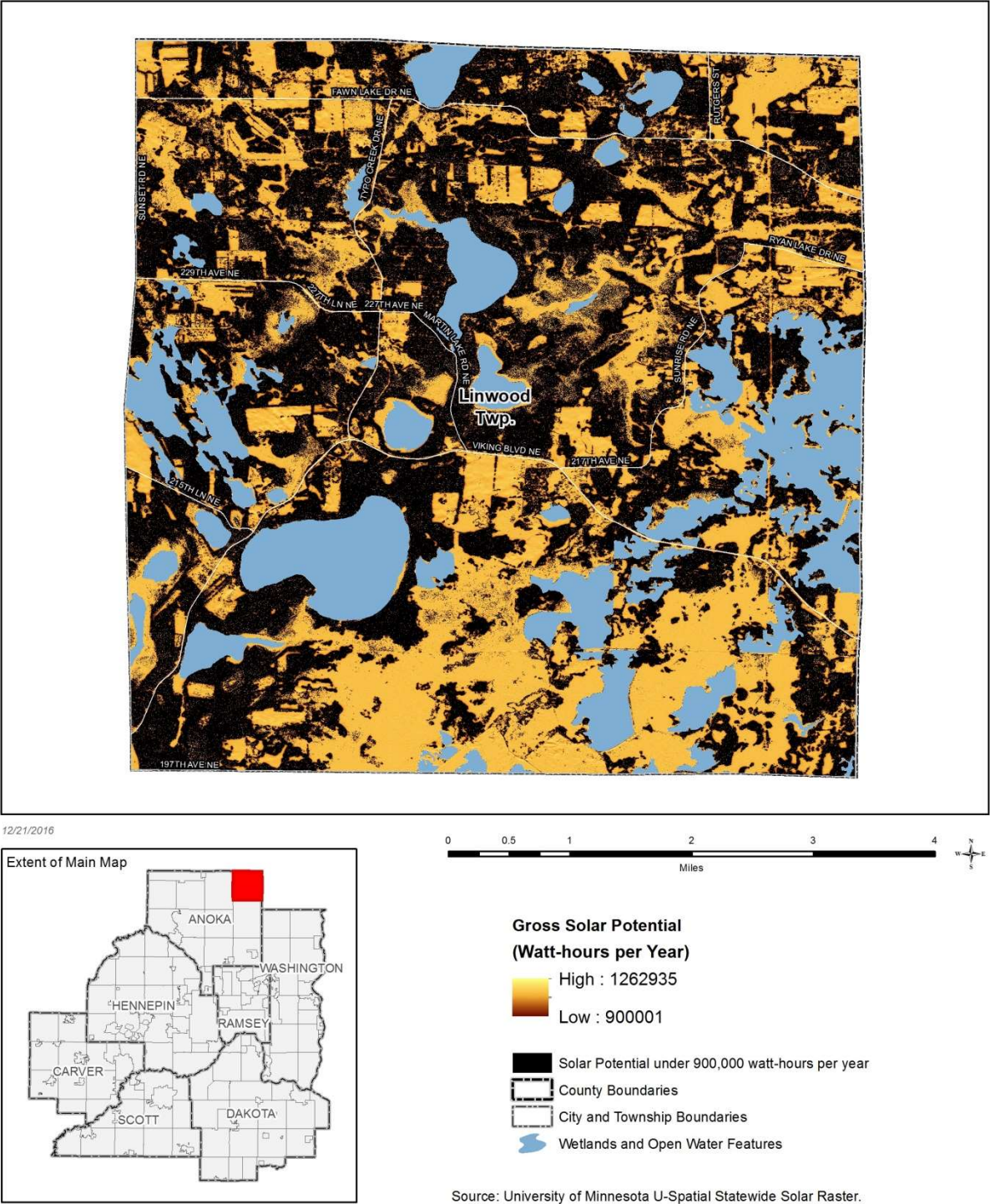
A..SOLAR ENERGY

There are two basic kinds of solar energy systems: passive and active. In a passive energy system, the building structure itself collects and stores solar energy at the point of use. In an active solar energy system, solar energy is collected at one location (for example a roof) and then transferred to the point of use or storage by mechanical power.

All solar energy systems, both passive and active, need to have direct sunlight fall on their collectors to function properly. Structures, trees or other objects that come between the sun and the solar collector will shade the collector and reduce its efficiency. Protecting solar access means the adjacent structures or vegetation are prevented from shading solar collectors (or the probable location of future collectors).

Solar access is protected in Linwood Township by the maximum structure height permitted in all land use districts (35 feet) and the required minimum setbacks for all structures. The Township's zoning ordinance includes a state criterion for variances that variances may not be approved that would impact solar access for adjacent parcels or uses. Linwood Township has great solar potential as demonstrated by the following map.

Gross Solar Potential Linwood Township, Anoka County



B. GOALS AND POLICIES FOR SPECIAL RESOURCES

1. Solar Energy Resources Goals

- a) Assure adequate solar access for Township residents and regulate alternative energy sources.
- b) Encourage investment in electric grid infrastructure and solar development that makes electric service more reliable and resilient to weather-related disruptions.
- c) Adopt solar zoning and permitting best practices for accessory use solar development.
- d) Enable solar garden development that enhances the community's and landowners' ability to limit nonrural housing or commercial development.
- e) Encourage residential solar development that maintains community character.

2. Policy

- a) All new subdivisions and planned unit developments will be designed to accommodate use of passive and active solar energy systems with special attention given to street, lot and building orientation through implementation of local zoning ordinance dimensional requirements.
- b) Township encourages development of community solar gardens that retain community character and capture co-benefits such as creation of pollinator habitat.
- c) Adopt solar zoning and permitting best practices for accessory use solar development.
- d) Reserve areas in sections 5,6,29, and 30 for development of community solar gardens and solar farms.

XI. Implementation

Implementation of the Comprehensive Plan is an ongoing process and may occur as the Township reviews development proposals and other projects. The Township may also need to review and amend the plan as conditions change during the next 20 years.

The Plan represents a commitment to a set of goals and policies that will guide the future of the Township. It is the result of careful study of the Township's physical, economic and social elements, discussion with the community and other organizations, and integration of Linwood's plans for the future into a unified vision, goals, and policies. The Township is committed to implementing the Plan and achieving the goals and policies identified in this Comprehensive Plan.

Knowledge of the Plan and understanding of its importance and benefits, and a commitment to fulfilling the Plan are the key components in successful implementation. The major stakeholders in this activity include the Town Board and Planning Commission, other local, regional, and state agencies, citizens, developers, and businesses.

A. OFFICIAL CONTROLS

The Township's Ordinances are tools for Linwood to use to maintain the community character, manage growth, restrain competitive land uses, and protect natural resources.

The Township will review its ordinance and update them as needed to be consistent with the 2040 Comprehensive Plan within 9 months of the adoption of this plan.

Township will also update its zoning map to be consistent with the 2040 Comprehensive Plan.

B. CAPITAL IMPROVEMENTS PLAN

The Capital Improvements Plan (CIP) is the financial planning mechanism used by many communities to plan for long-term major expenditures. A capital improvement is any major non-recurring expenditure or any expenditure for physical facilities of government, such as costs for acquisition of land, construction of buildings or other structures, including additions or major alterations, construction of highways, utility lines, fixed equipment and similar expenses. The Township does not have a formal CIP, but rather adopts an annual budget that includes a limited number of capital projects.

C. COMPREHENSIVE PLAN AMENDMENTS

Changes to the Township's land use and zoning maps may be proposed during the next 10 years and may require Comprehensive Plan Amendments. Amendments to the Comprehensive Plan can be initiated by citizens, developers, the Township, or others.

Changes to the Plan are made through an amendment process that includes a public hearing and analysis of impacts on adjacent areas and the Township. All Comprehensive Plan Amendments must also be approved by the Metropolitan Council and may then result in approval of changes to the Township's Zoning Ordinance and Map.

APPENDICES

- A. Stormwater and Wetland Standards
- B. Standard Specifications for Developers
- C. SRWMO Watershed Management Plan
- D. To Be Completed: Comment Letters from Adjacent Jurisdictions