



City of Independence

2040 Comprehensive Plan



December 2018

**CITY OF INDEPENDENCE
COMPREHENSIVE PLAN 2040 UPDATE
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**CITY OF INDEPENDENCE
COMPREHENSIVE PLAN 2040 UPDATE
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1.0 INTRODUCTION

The City of Independence is located in western Hennepin County, 20 to 25 miles west of Minneapolis. The gently rolling terrain, rural residential and agriculturally oriented land use patterns are perhaps the two most distinguishing features of the community. Interspersed throughout the community are lakes, streams and wetlands.

The City was organized in 1858 as rural township. The tradition of farming has sustained to the present and horses have maintained their importance to this community. There has been an on-going conversion of land in the City from Agriculture to rural residential use. Properties, primarily surrounding Lake Sarah, Lake Independence and adjacent to the City of Maple Plain have been subdivided into residential home sites. The result is a blend of commercial agriculture, large lot residences, hobby farms and a modest amount of commercial/industrial development.

T.H. 12 bisects Independence southeasterly by northwesterly. The City of Maple Plain is surrounded on three sides by Independence and acts much as a local downtown for many Independence residents. The growing community of Delano and Franklin Township are west of Independence in Wright County. The cities of Greenfield, Medina, Orono and Minnetrista abut Independence on the north, northeast, southeast and south, respectively.

Independence has successfully implemented strong planning policy and zoning controls over the last several decades coupled with more recent planning of the Metropolitan Council to preserve land for urban development have forestalled "leap-frog" urban sprawl development. The orderly development prescribed in the past has helped retain agriculture and facilitated the location of hobby farms and large lot residential development. These controls were originally chosen by the community to retain its rural character and small-town appeal.

It is against this historical background of the City as an agricultural community in a growing urban county that this Comprehensive Plan is written. Suburbanization of the Twin Cities metropolitan area has focused growth pressure on the outer ring communities. Independence has affirmed that it wants to maintain a high standard of environmental quality, clean water and air, abundant open space and purposeful growth. By focusing growth to specified areas within the community, the City will be able to maintain its rural character and small-town feel while promoting and protecting its geographic and environmental advantage.

1.1 Community Vision, Goals and Policies

The goals and policies of Independence have been consistently and historically based on establishing clear objectives for rural residential and agriculture preservation. There is still a strong component of agriculture preservation within the City, but it is slightly less than a decade ago. The City has continued to experience growth and urbanization pressures as growth continues to migrate westward from the metropolitan center. The growing fusion of residential and agricultural land uses now yields a variety of lifestyle choices. Most residents refer to their particular living situation as "rural". But rural has a broad range of definitions. An engineer might define rural as "gravel roads, on-site septic systems and private wells". A farmer would define rural as "agriculture as a job and a way of life". A commuter could well define rural as "large lot residences, with long vistas, clean air and quiet evenings". In Independence, all of these viewpoints are represented.

Rural, in Webster's Dictionary, is defined: *"Pertaining to the country, as distinguished from a city or town, suiting the country or resembling it; pertaining to agriculture or farming".*

Suburban is defined: *"an outlying part of a city or town, a part without the boundaries but in the vicinity of the town ".*

From these definitions, a rural Independence is not part of Maple Plain or Delano but has a separate sense of place. The aesthetics to this "place in the country" has agricultural roots, a lack of obvious boundaries, and continuity with the natural landscape.

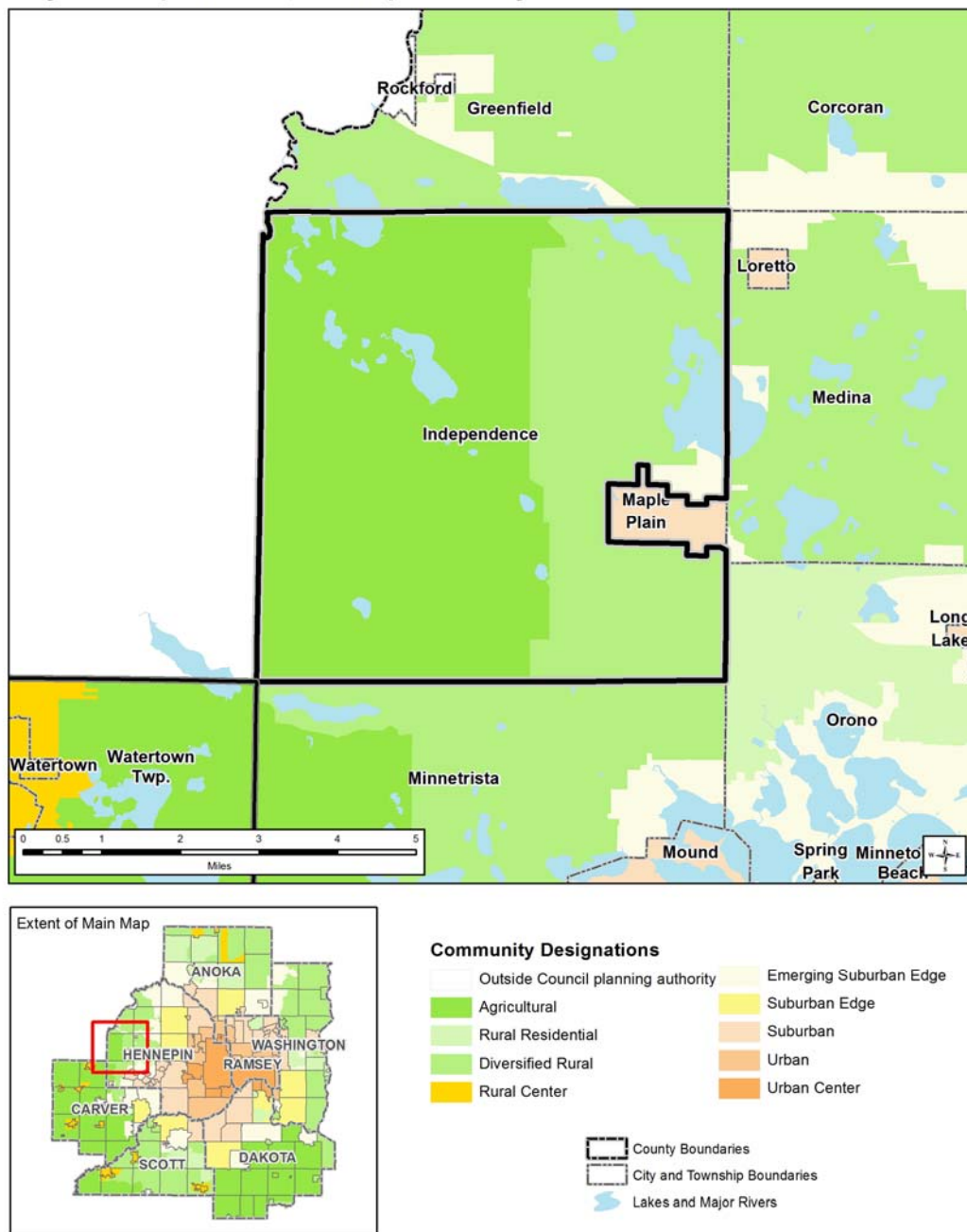
Early in the planning process, the City sought meaningful public input relating to the direction of the City's land use planning. The City undertook a community survey which asked residents to provide feedback relating to growth and development in the City. It was made clear by the responses provided that there is a strong connection and desire for residents of the City to maintain and enhance the rural character of the community. It was also clear that the resident's definition of "rural" is still extremely wide-ranging. Even with the broad array of the "rural" definition, the survey reaffirmed past planning efforts and the general direction that has guided the City over the last 40 years.

The resulting policy needs are to provide a broader, more inclusive definition of rural. Clearly Independence has little to label it urban. The expansive agriculture land, wetlands, parks, hobby farms and large lot residences are undisputedly rural in character. Yet rather than separate and compartmentalize these different land uses, the new plan should strive to find common ground, synthesizing the variety into a cooperative rural community.

The current Metropolitan Council System Statement for the City of Independence and the 2040 Regional Development Framework identify roughly the western two-thirds as "agricultural" and roughly the eastern one third as "diversified rural". While this map is somewhat similar to the adopted 2040 Independence Comprehensive Plan, the map does not identify the Cities existing commercial/industrial area. It also does not differentiate the existing areas subdivided prior to zoning controls around Lake Sarah and Lake Independence that are served with metropolitan sewer as a program to clean up and protect the regions lakes, streams, and ground water.

The Metropolitan Council's regional Blueprint and subsequent Development Framework has defined agriculture as 1 unit per 40 acres in density minimum and "Rural Residential", now "Rural Diversified" as 1 unit per 10 acres. Rather than adopting a policy that the City develop in its entirety as rural residential at 1 unit per 10 acres, the city adopted a policy in 1980 and again in 2001 of allowing 1 unit per 5 acres (with strict land compatibility requirements) in roughly the eastern one third in the rural residential and 1 unit per 40 acres in the western two-thirds agricultural area. The intent of this policy was to better serve the rural residential area with the various municipal services such as police, fire, and road maintenance, as well as provide controlled growth and better subdivision layout. A second intent of the policy was to guide the growth to an area near Maple Plain to help keep that community's commercial district healthy.

Community Designations City of Independence, Hennepin County



Although the plans in 1980 and 2001 included alternatives to the strict 1 unit per 10-acre density, the Metropolitan Council found this policy of controlled growth and preservation of agriculture “to meet all regional system plans and requirements of the Metropolitan Land Planning Act”.

The Metropolitan Council policies call for maintenance of commercial farming and related agri-business activities as the primary activity in the commercial agriculture region. This area should also provide land for other low intensity uses such as hobby farms, horticulture, and conservation of natural resources. The general rural use area permits commercial agriculture but anticipates primarily residential uses in a somewhat greater density. Independence permits development at one residence per 40 acres for prime agricultural land and one per five acres in the rural residential zone. Under the State agriculture preservation tax law, agriculture land parcels of at least 40 acres qualify for reduced taxable valuation and, therefore, a reduction in taxes. The City has historically supported agriculture preservation by designating and zoning any land that qualifies for agriculture

preserve for forty-acre maximum density upon request of a landowner. Enrollees in the agricultural preserve program covenant to maintain the land in agriculture for a minimum of eight years. An enrollee would be violating the covenant as well as zoning if the land is not maintained in agriculture during that period of time.

Many planning efforts in rural areas elaborate on rural centers as a mix of urban and rural uses. Maple Plain, Rockford, Loretto and Delano are cities that provide a full range of land use opportunities. With these urban centers so close, duplicating their features not only would appear unnecessary, but also would most likely be counter-productive. Independence is different than those communities and should complement the land use variety of those more urban settings. The land use in Independence is far more comprehensible when the interdependent dynamics with the surrounding communities are understood.

Attempting to duplicate the urban services and land use options provided in the neighboring urban areas are neither economically feasible nor a publicly desired effort for Independence. All cities cannot be all things to all people. Independence cannot provide a full range of public services any easier than Minneapolis could provide adequate farmland for people needing space to cultivate. This limit of what is possible directly translates into terms like "economically sustainable", "carrying capacity", or "publicly viable. This recognition of limits is a primary building block for local policy decision-making.

The previous land use plans have focused objectives on control of suburban growth and preservation of agriculture. While the latter was an attitude of community consensus, the on-going dispute over subdivision of land remains unresolved. Utilizing a carrying capacity method, the confluence of population, city services, transportation needs and ecological responsible development point toward a continued gradualism of development. Independence can be a place of mixed rural lifestyles, continuing to rely on surrounding urban areas for urban functions.

Considering the diversity of land uses in Independence, achieving a situation of community harmony will require a careful balancing of the policies underlying local decisions with successful communication of common goals. The objective of the process is mutual compatibility of local land uses within the community. The goal is rooted in preservation, to the greatest extent possible, the essence of a rural way of life in Independence. The hope is to blend the local variety of lifestyles into a peaceful and prosperous coexistence.

Community Vision

The City's Comprehensive Plan has been prepared to reflect the diversity and variety of values and needs within the community. The City will endeavor to retain its rural character, providing a variety of rural living choices, from rural residential and rural hobby farms to the preservation of prime agricultural lands and natural environmental features. The rural, non-farm lifestyle alternatives residents may pursue should be designed and maintained so as to preserve local aesthetic and natural feature amenities. These rural residential neighborhoods should also be planned and designed to maintain the high level of public service citizens have come to expect, without an undue increased burden on the rest of community. The City will also seek to develop standards for concentrated sewer residential in strategic areas of the City. These areas will be developed to seamlessly blend into the rural character of the community while maintaining a compact footprint allowing for the preservation of greater areas of open space.

The future physical, social, and economic decisions that will be made by the City require an overall policy direction, a means to implement these lifestyle options. The following goals and policies form the rationale for local decision-making.

Goals and Policies

Community goals are generally defined as the objectives or end products that a City hopes to achieve through local decision-making. These broad objectives are usually community-wide and describe an optimum social and physical environment. Policies are the means by which the goals are achieved. They are more detailed, providing guidelines for specific decision alternatives.

The combination of goals and their supporting policies provide the framework for public decisions. They are meant to minimize misunderstanding between community residents and decision makers. Imperative to this understanding is that any decision or action taken by the City should be appraised and evaluated in light of these goals and policies. In this way, decisions made by the City are both reasonable and consistent. These goals and policies are meant to be flexible enough to apply to present needs and adaptable enough to appropriately address future demands.

Some of the goals and policies from the previous plan remain relevant. However, the city and its environs have changed, becoming more complex. The policy plan reflects this new complexity in addressing a much broader range of issues in a more precise way.

1.2 Goals Summary

CHAPTER	TITLE	GOALS
TWO	HOUSING	<ul style="list-style-type: none"> ▪ To maintain the good condition of the City's existing housing stock, thereby reducing the need for additional new housing construction. ▪ Accommodate affordable housing initiatives. ▪ Ensure the availability of lifecycle housing.
THREE	LAND USE	<ul style="list-style-type: none"> ▪ Establish a visual identity in harmony with the physical context that reflects and respects the City of Independence's rural characteristics, historical past, and future with design solutions that are innovative, efficient, durable, beautiful and economically viable. ▪ Foster a harmonious, convenient, compatible, workable relationship among a balance of all land uses and local supporting services within the community. ▪ To preserve and enhance local property values. ▪ To set standards to protect the health, safety and welfare of City residents, but to limit the standards to those necessary in order to preserve property owner's rights. ▪ To concentrate rural residential development in areas where services can most economically be provided. ▪ To allow continued agriculture within the rural residential area while permitting rural non-farm lifestyles to co-exist in an agricultural setting. ▪ To guide growth in conjunction with the logical and economical extensions of urban services. ▪ Provide ample safe and clean park and trail facilities for everyone to enjoy. ▪ Preserve, maintain, enhance and protect the region's natural resources.
FOUR	TRANSPORTATION	<ul style="list-style-type: none"> ▪ Complete the CSAH 90/92 and Highway 12 intersection improvement projects. ▪ Work with MNDOT and Hennepin County to maximize the existing infrastructure and create safe intersection to access Highway 12 from the north and south sides of the community. ▪ Provide a well-planned and fully-functional transportation system. ▪ Establish a well-planned transportation system which safely links our community.
FIVE	WATER RESOURCES	<ul style="list-style-type: none"> ▪ Maintain the existing sanitary sewer system in the most efficient and economical manner feasible. ▪ Develop a new trunk system as necessary to serve future development in designated areas. The new system should be developed to reduce future maintenance costs. ▪ Manage land disturbance that creates impervious surface to prevent flooding and adverse impacts. ▪ Protect the City's wetlands, lakes, streams, groundwater, and natural areas to preserve the functions and values of these

		<p>resources for future generation through Wetland Conservation Act, buff standards, groundwater protection rules and coordination with outside agencies.</p> <ul style="list-style-type: none"> ▪ Cooperate with Local Water Management Organizations. ▪ Coordinate development review with LWMO. ▪ Participate in Resource Management Plans. ▪ Cooperate in implementation of the Hennepin County Groundwater Plan.
SIX	ECONOMIC DEVELOPMENT, COMPETITIVENESS AND RESILIENCE	<ul style="list-style-type: none"> ▪ Promote and attract quality industrial and commercial business to the City of Independence by promoting the City and its high quality of life. ▪ Maintain an economic balance and enhance the geographic advantage of the City.
SEVEN	IMPLEMENTATION	<ul style="list-style-type: none"> ▪ Work to update official controls and ordinances to accommodate the projected comprehensive plan.



2.0 HOUSING

A demographic analysis clarifies the picture of who we are, what we do, and how we have changed. Historically, the City has been a homogeneous, low density, rural community with a focus on agriculture. The City desires to maintain a similar housing makeup that preserves the rural character and agriculture culture.

2.1 Local Demographics

Population and Households

Growth in Independence has slowed since its peak rate during the 1970's. There was a spike in growth that was consistent with the region during the 1990's. The rate of growth has essentially leveled off during the last decade and has been consistent around 8%. growth during the 1990's was more than double the 6.9% increase in population during the decade of the 1980's. Compared to the 1990's the rate of population increase doubled during the first half of this decade with a gain of 14.8%, which translates into a population gain of 30% on a ten-year basis. This rate is comparable to the rate of growth experienced in the 1970's. Overall population residing in Independence almost doubled from the 1970 census to present.

TABLE 1 POPULATION GROWTH 1960 - 2017

	Population	Increase	% Increase
1960	1446		
1970	1993	547	38%
1980	2640	647	33%
1990	2822	182	7%
2000	3236	414	15%
2010	3504	268	8%
2017	3790	286	8%

Source: U.S. Census; 2017 Estimate: Metropolitan Council

The average size of an Independence household in 2010 was approximately 2.81 persons, down from 2.96 in 2000 and reflecting a national trend. The reduction in average household size is

projected to continue between 2020 and 2040 due to the planned sewer residential north and south of Maple Plain. This housing will potentially accommodate a continuum of housing, which could include senior housing. Households equate closely to dwelling units and, in land consumption terms, is a better indicator of growth, than population.

TABLE 2 HOUSEHOLD GROWTH 1970 - 2017

	Number of Households	Increase	% Increase
1970	580		
1980	789	209	36%
1990	925	136	17%
2000	1088	163	18%
2010	1241	153	15%
2017	1295	54	4%

Source: U.S. Census; 2017 Estimate: Metropolitan Council

Residential construction slowed during the later part of the last decade due to a national recession. Population increases of 17% and 18% are projected over the next two decades. These forecasts have been provided to the City by the Metropolitan Council. Independence could experience increased growth as regional sewer becomes available to this area. Independence is projecting some sewer growth directly adjacent to the existing sewer development in Maple Plain.

TABLE 3 POPULATION, HOUSEHOLD AND EMPLOYMENT FORECAST 2010 - 2040

	Population	Increase - No. of Persons	%	Households	Increase - No. of Households	%	Employment	Increase - No. of Jobs	%
2010	3504			1241			587		
2020	3830	326	36%	1400	159	36%	680	93	36%
2030	4040	210	17%	1560	160	17%	740	60	17%
2040	4290	250	18%	1700	140	18%	770	30	18%

Source for 2010 Existing Households: City of Independence Assessor; Hennepin County

Independence's rate of growth during the 2000's was not that dissimilar to nearby communities. Several historically rural communities began experiencing urbanized development during the last decade which is reflected in their strong growth rates.

TABLE 4 ADJACENT COMMUNITIES POPULATION COMPARISON 1970 - 2010

	1970	1980	1990	2000	2010	Increase - 1970-2010	%
Independence	1993	2640	2822	3262	3504	1511	176%
Corcoran	1656	4252	5299	5630	5379	3723	325%
Greenfield	973	1391	1450	2544	2777	1804	285%
Loretto	340	297	404	570	650	310	191%
Maple Plain	1169	1421	2005	2088	1768	599	151%
Medina	2396	2623	3096	4005	4892	2496	204%
Minnetrista	2878	3236	3439	4358	6384	3506	222%
Orono	6787	6845	7285	7538	7437	650	110%

Source: U.S. Census

School age, middle age and older population groups experienced significant growth in numbers between 2000 and 2010 while post high school to age 44 population declined.

TABLE 5 AGE GROUPS 1990 - 2010

Age	1990	2000	2010	Increase - 1990-2010	%
Under 5	218	222	194	-24	-11%
5-17	592	752	667	75	13%
18-24	220	163	220	0	0%
25-34	409	237	203	-206	-50%
35-44	557	702	361	-196	-35%
45-54	381	550	740	359	94%
55-64	254	345	645	391	154%
65-74	120	183	293	173	144%
75+	81	82	260	179	221%

Source: U.S. Census

As of 2010, approximately 4% of people residing in Independence, were non-white.

TABLE 6 ETHNICITY 2000 - 2010

Age	2000	2010	Increase - 2000-2010	%
Black	3	22	19	633%
Hispanic	28	103	75	268%
Multi-racial	22	20	-2	-9%
Islander	35	8	-27	-77%
Native	6	0	-6	-100%
Other	0	8	8	800%
Asian	0	0	0	0%
White	3163	3526	363	11%

Source: U.S. Census

Educational attainment increased significantly during the decade of the 2000's among Independence residents. Residents achieving a bachelor's degree or higher increase more than 100% during the last decade. Independence surpasses the national trend of increasing levels of education.

TABLE 7 EDUCATIONAL ATTAINMENT 1990 - 2010

	1990	2000	2010	Increase - 2000-2010	%
No High School Diploma	138	83	38	-45	-54%
High School Graduate	1243	1264	961	-303	-24%
Bachelor's Degree	333	562	1208	646	115%
Graduate or Professional Degree	87	162	295	133	82%

Source: U.S. Census

Economic Base

The number of households in Independence earning over \$100,000 also increased significantly during the 2000's. These numbers have not been adjusted for inflation and such an adjustment would bring all income levels down.

TABLE 8 INCOME LEVELS 1990 - 2010

	1990	2000	2010	Increase - 2000-2010	%
Less than \$10,000	44	24	4	-20	-83%
\$10,000 to \$14,999	12	18	0	-18	-100%
\$15,000 to \$24,999	49	38	24	-14	-37%
\$25,000 to \$34,999	212	88	57	-31	-35%
\$35,000 to \$49,999	174	115	105	-10	-9%
\$50,000 to \$74,999	242	205	190	-15	-7%
\$75,000 to \$99,000	119	187	139	-48	-26%
\$100,000 to \$199,999	72	304	490	186	61%
\$200,000 +	87	111	213	102	92%

Source: U.S. Census

The number of jobs based in Independence increased from 150 to 587 during the 2000's, giving the City a significant job base increase during the last decade. With the future expected growth in the Urban Commercial area on the west side of the community adjacent to Delano, job growth is expected to accelerate significantly during coming decades. The Metropolitan Council had forecasted 93 additional jobs by 2020 and 90 new jobs by 2040, respectively.

TABLE 9 JOB GROWTH 1990 - 2040

	1990	2000	2010	2020	2030	2040	Increase - 1990- 2040	%
Employment	90	150	587	680	740	770	680	453%

Source: Metropolitan Council (plus job growth in Urban Commercial/CLI in 2020-2040)

Single-family homes continue to increase in value in Independence during the 2000's. Home values have not fully recovered from the recession but should surpass historical highs within the next 3-5 years.

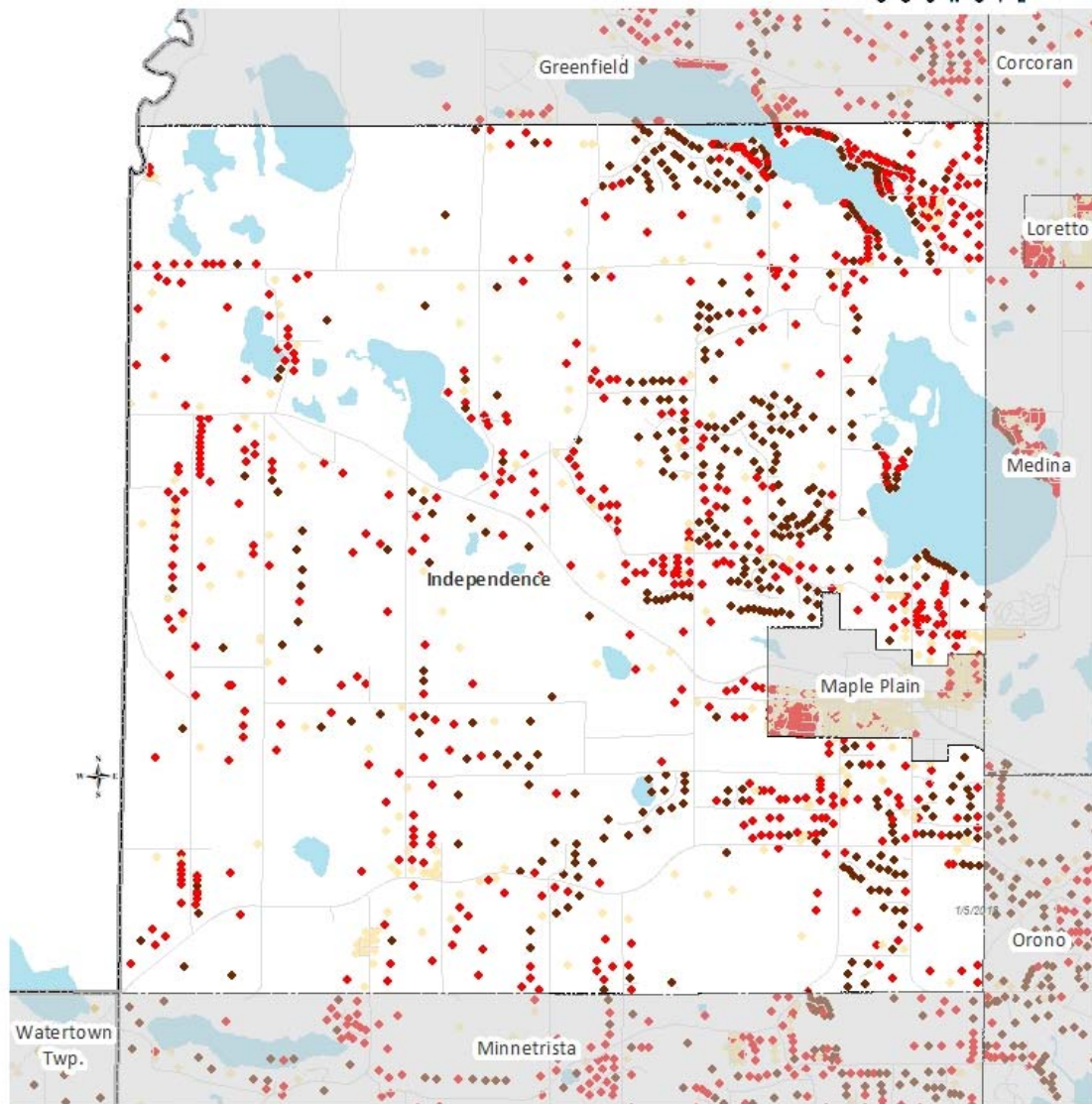
TABLE 10 MEDIAN HOME VALUES 1990 - 2010

	Median Home Value	Increase - 1990-2010	%
1990	\$113,000		
2000	\$234,900	\$121,900	52%
2010	\$394,500	\$159,600	40%

Source: U.S. Census

Owner-Occupied Housing by Estimated Market Value

Independence



- County Boundaries
- City and Township Boundaries
- Streets
- Lakes and Rivers

Owner-Occupied Housing Estimated Market Value, 2016

- \$243,500 or Less
- \$243,501 to \$350,000
- \$350,001 to \$450,000
- Over \$450,000

1 in = 0.96 miles



Source: MetroGIS Regional Parcel Dataset,
2016 estimated market values for taxes payable
in 2017.

Note: Estimated Market Value includes only
homes/leased units with a building on the parcel.

2.2 Housing Needs

Independence has seen an increase in housing demand over the last 5 years. Housing demand, particularly in the Orono School District, is poised to continue strong demand. The City has positioned itself to realize a continuum of housing options by guiding specific properties that are directly adjacent to the City of Maple Plain. In order for these properties to develop, they will need to demonstrate the ability to be services with utilities. The City will continue to support the development of rural residential housing options within the portion of the City guided for RR-Rural Residential. Preservation of the majority of land within the City as agriculture will allow Independence to maintain its rural character, protect natural resources and continue support strong property values. The City further details proposed housing within the land use section of this plan.

2.3 Affordable Housing

The Metropolitan Council has identified affordable housing needs for all cities and townships within the Twin Cities Metropolitan Area for the period from 2021-2030. The housing plan element of local comprehensive plans is required to reflect the allocated portion of the forecasted demand for affordable housing. The Metropolitan Council has identified that the metro region of the state has the need for 37,900 additional affordable housing units by 2030. The Metropolitan Council defines affordable housing for three income ranges which are proportional to the area median income. The established price of an affordable home in the region in 2016 was considered to be \$243,500 if household income was 80% of the area median income. The City's share of this allocation is 72 affordable housing units.

Independence is fortunate to have some inventory of existing affordable housing within the community. In order to accommodate the additional affordable housing needs, a new Urban Residential zoning district will be established directly adjacent to the City of Delano on the far west side of the City. This location provides the best location for urban density located adjacent to grocery, medical, pharmacy, jobs, schools and similar amenities. Independence will incorporate a set of tools and regulations into the new zoning standards for this district to promote housing affordability. The tools that will be incorporated into the new Urban Residential zoning district in the City include the following:

- Zoning which provides for a minimum density of 12 units per acre. This projected density will promote a housing product which should be able to support affordable units that will meet the housing allocation.
- Planned Unit Development—to allow more flexibility to develop multiple unit types on a range of lot sizes and with varying price points.
- Density bonuses—to promote higher quality development at more affordable prices.
- Existing Housing Stock – Independence will continue to support the maintenance of the existing housing stock.

As growth continues to occur within the City, a substantial inventory of both new and existing affordable housing units should be maintained. A large portion of this inventory will be found in existing housing stock. Independence anticipates using the aforementioned tools to promote the development of affordable housing within the community. The City should consider working with existing owners to maintain and enhance the existing housing stock. The City may consider applying for grants and looking for other funding mechanisms and partners (Minnesota Housing) that could promote the maintenance and enhancement of existing structures.

It is important to recognize that the allocation of units should be interpreted as a goal for the community, especially serving the lowest end of the income range. The allocation goals cover a

10-year time period and would include both rental and ownership housing options. However, in most cases, these would tend to represent rental housing creation, as serving low and moderate-income households with ownership options would be extremely difficult, especially for households below 50% of the median income level. In comparison to recent patterns, these allocations are very high. In actual practice between 2000 and 2010, no affordable units were created in Independence based on these standards. To achieve 72 units over the ten-year allocation period, Independence would have to realize an average of approximately 7 units per year moving forward.

Independence will strive to accommodate the projected demand for 72 affordable new housing units during this planning period. In order to accommodate the projected affordable housing needs,

TABLE 15 AFFORDABLE HOUSING NEEDS ALLOCATION

Income Level	Units
At or Below 30 AMI	38 Units
From 31 to 50 AMI	18 Units
From 51 to 80 AMI	7 Units
Total Units	72 Units

AMI = Area Median Income

Source: Metropolitan Council

2.4 Goals, Policies and Implementation Strategies

GOALS	POLICIES	IMPLEMENTATION
1. The City should encourage new and alternative types of housing which meet housing performance standards as a means of obtaining larger open space areas and protection of natural resources within residential areas.	<ul style="list-style-type: none">• Maintain and continue to advance the cluster development standards to promote opportunities for housing alternatives.	<ul style="list-style-type: none">▪ Review existing standards and develop new standards that will allow for the development of land use categories designated in the plan.
2. Identify ways to achieve affordable housing goals within the City.	<ul style="list-style-type: none">• Review development standards and seek to better understand obstacles to achieving affordable housing within the City.	<ul style="list-style-type: none">▪ Identify opportunities for development of the urban residential land use area to achieve affordable goals.▪ Pursue outside funding such as grants and other sources for development of affordable housing.



3.0 LAND USE

The Independence Land Use Plan is a result of five decades of municipal planning activity, citizen's involvement and reasonable decision-making. This plan responds to the variety of social, economic and environmental forces at work in the City. The Plan is multi-faceted in that it considers regional, state and county plans; coordinates with adjacent municipal, watershed and government agency plans; balances competing forces of development, environment, private citizen and community wide needs; and serves as a principal local decision-making tool.

In order to accomplish this broad range of purposes, the City has developed guidelines for local development, enacted protective regulations for environmentally sensitive lands, completed studies and plans for future transportation and utility needs, and made a commitment to continue as an active participant in shaping the growth of the community.

The future land use plan distinguishes between two basic planning areas in the City, a rural residential area and an agriculture area. The plan recognizes certain evolving trends and eventualities:

- Independence will continue to experience growth pressure due to its geographic position, excellent home values, high quality natural resources and its unique rural character.
- Growth occurring around and within the City is placing new demands on state, county and local transportation facilities and City services

The plan is built on a series of priorities that have evolved through policy development, public participation and issue resolution. These basic plan tenets are:

- Preserve and enhance the rural character of the community
- Protect environmentally sensitive areas
- Protect local agriculture
- Concentrate opportunities for commerce and industry to strategic locations
- Expand housing opportunities in locations directly adjacent to Maple Plain and Delano where existing utilities can accommodate growth
- Empower the local community to control its future
- Diversify the local tax base where feasible, but not at the peril of Independence's high quality and rural character

The land use plan will function to define the relationship of natural resources and land use development decisions as well as coordinate with zoning laws and other regulations to provide logical, efficient and effective decision-making. The land use plan is also an intergovernmental document, coordinating the City's plans with regional, county and adjacent municipal planning activities. The 2040 Land Use Plan is shown on Figure 7.

3.1 Existing Land Use

The City of Independence is 22,400 acres or approximately 35 square miles in land area, most of which is non-urbanized. Only 1.5% of the land area, the single family sewer, is serviced with sewer. One-third of the land area is contained in parcels 40 acres or more in size and another one-third is in parcels of land from five to 40 acres. Of the land area, 6,108 acres consist of wetlands. Existing land use is shown on Figure 1. Currently the City has a gross density of 1 unit per 17 acres.

TABLE 11 EXISTING LAND USE IN ACRES 2017

	Housing Type		Undeveloped/Agricultural Land	All Other Land Uses	Total Land
	Single-family	Multi-family			
Delano School District	1,030	0	401	9,879	11,310.00
Orono School District	1,129	0	305	5,528	6,962.00
Rockford School District	24	0	0	502	526.00
Westonka School District	221	0	0	1,587	1,808.00

Source: Metropolitan Council

Agriculture

While remaining the predominant land use in the City in terms of acreage, agriculture land use has continued to decline as development occurs within the City. In 2017 approximately 7,500 acres of land remained in agriculture.

Residential

The 2010 census indicates that there were 1,241 occupied dwelling units in the City, an increase of 153 units or 15% over 2000. About 98% of the occupied dwelling units in the City are single family detached and about 95% are owner-occupied.

TABLE 12 OCCUPIED HOUSING UNITS BY TYPE 1990-2010

	1990		2000		2010	
	Owners	Renters	Owners	Renters	Owners	Renters
Single-family detached	838	62	1,034	44	1,302	50
Single-family attached	2	0	0	0	0	0
Duplexes	2	5	0	0	0	0
Multi-family	0	3	0	0	0	0
Mobile Homes	3	2	0	0	0	0
Other Units	4	4	0	0	0	0

Source: Metropolitan Council, US Census

The City remains exclusively a single-family residential community. Building permits for construction of new housing during the 1980's, 1990's, 2000's and so far, this decade have all been for single-family detached housing.

TABLE 13 BUILDING PERMITS 1970-2010

Housing Type	1970-1979	1980-1989	1990-1999	2000-2009	2010-2017
Single-family detached	242	140	238	206	54
Single-family attached	0	0	0	0	0
Duplexes	0	0	0	0	0
Multi-family	21	0	0	0	0
Mobile Homes	0	0	0	0	0
Total Permits	263	140	238	206	54

Source: City of Independence

Figure 1: Existing Land Use

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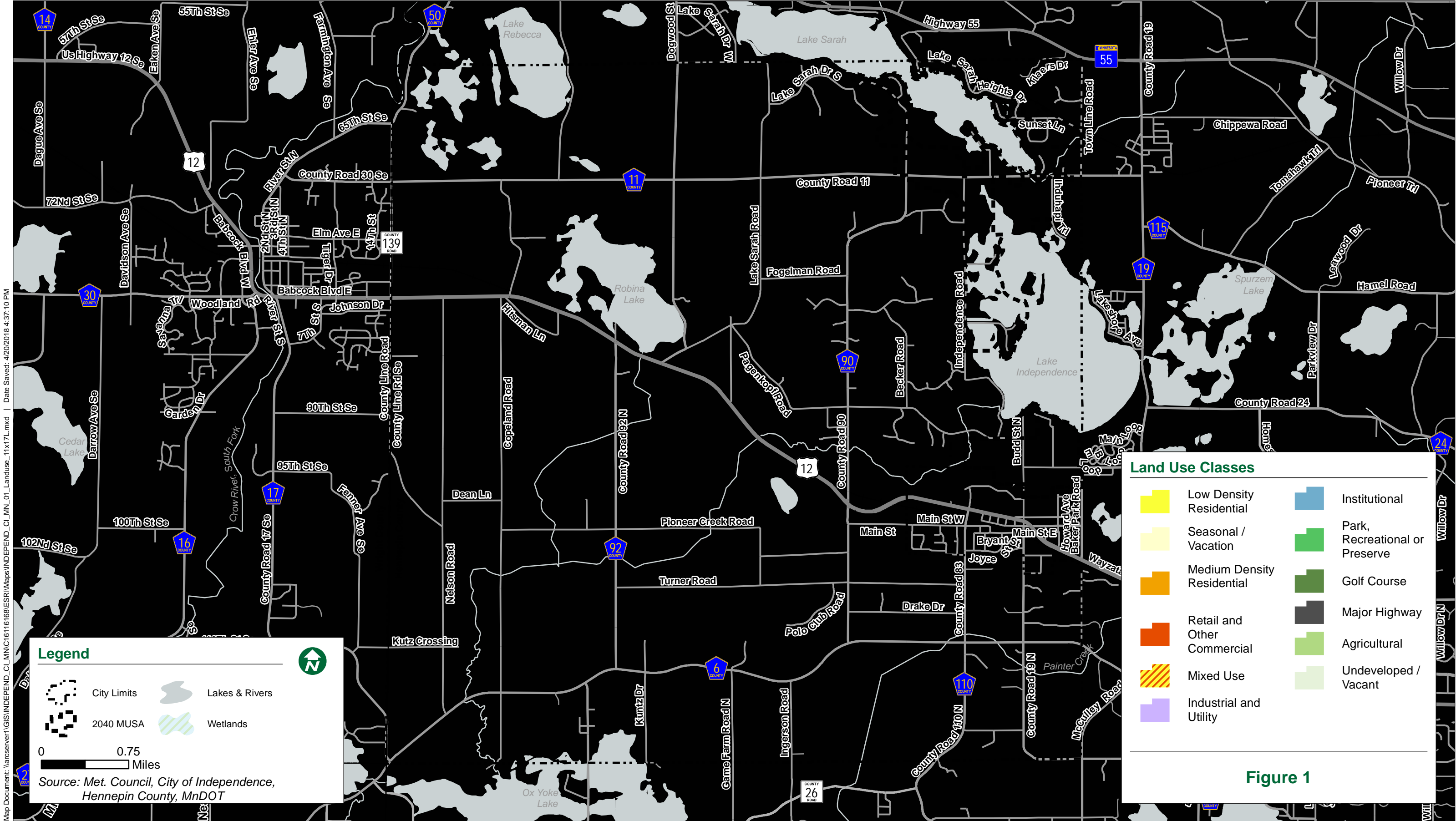


Figure 1

3.2 Natural Resources

Effective land use planning necessitates a comprehensive understanding of the natural features, physical resources and environmental limitations of the land. Appropriate uses for land are determined through an inventory of the soils, slopes, wetlands and vegetation.

Geology

Independence lies within two general landscape units, as identified in "Landscapes of Hennepin County" published by the Hennepin County Soil Conservation Service in 1976. The western central part, lying west of County Road 92, is part of the Corcoran Till Plain and is the best farmland in the community. The land is gently rolling with wet basins, low knolls, and ridges, and is primarily a utilitarian landscape rather than a scenic one. According to the report, it is a land formation "made for agriculture in a world that needs this land". Many of the soils in this landscape unit have a high seasonal water table, hence are unsuitable for residential developments utilizing conventional on-site sewage disposal systems.

The balance of the City is in the landscape unit known as the Loretto Highlands, a landscape with more relief containing soils with more clay content. Steep slopes, deep marshes and poorly drained upland flats dominate the landscape. Although suited for agriculture, they pose problems for efficient utilization of the land. Farm managers must use effective planning to realize a profitable use for this land.

Soils

Independence has three general identifiable soil characteristics.

1. The Erin-Kilkenny-Peat Association is located in the central and northwest portion of the City and occupies the largest area of the three associations. This association is characterized by rolling to hilly relief with major soil conditions consisting of clay loam, heavy clay and peat. The clay soils are found on gentle to steep slopes, are well drained and generally suited for urban development. Heavy clay is, for the most part, a subsoil condition and is also conducive for development. Peat soils located in low-lying areas have high moisture capacity and are generally poorly drained. Peat soils are a limiting factor for development.
2. The Lester-Hamel-Peat Association, located in the southern and southwestern portions of Independence, is characterized by undulating relief with major soil conditions consisting of black loam, clay loam and peat. The black and clay loams are suited for urban development.
3. The third association, Hayden-Cordova-Peat, is located in the northwest part of the City and is the smallest in area of the three groups. The terrain is basically undulating to rolling. The soil conditions generally consist of brown loam, clay loam and light clay loam. Many of the soils in this association are poorly drained, and wet areas are often intermingled closely with better-drained soils. The sporadic wetness and poor drainage of the soil must be a consideration for any development. Peat soils severely restrict development because of their wetness and location.

On the soils map (Figure 2), in addition to the three soil associations, a breakdown has been given as to the suitability of the land for development. The categories are broken down into four groups: marsh, peat, loam and clay loam. Basically marsh is not developable, while peat areas offer very limited opportunities due to lowness, wetness, and close proximity to marshes. Certain areas in the loam category have poor drainage and relatively steep slopes could hinder development of areas with clay loam.

Suitability

The soils of a particular site are important in determining which uses are compatible with the environment. Soil fertility, permeability, stability and so on, limit certain types of development or use. This soil assessment is only a preliminary overview, not site specific. It is an approximation of area soil limitations and should function to guide general planning determinations.

Soil suitability was based according to urban land use characteristics. The Soil Conservation Service inventory rated soils according to similarity of limitation. These ratings were based on:

<i>Slope steepness</i>	<i>Permeability</i>	<i>Corrosivity of steel and concrete</i>
Depth to water table	Erosion hazard	
Soil strength and stability	Frost action potential	

Steep Slopes

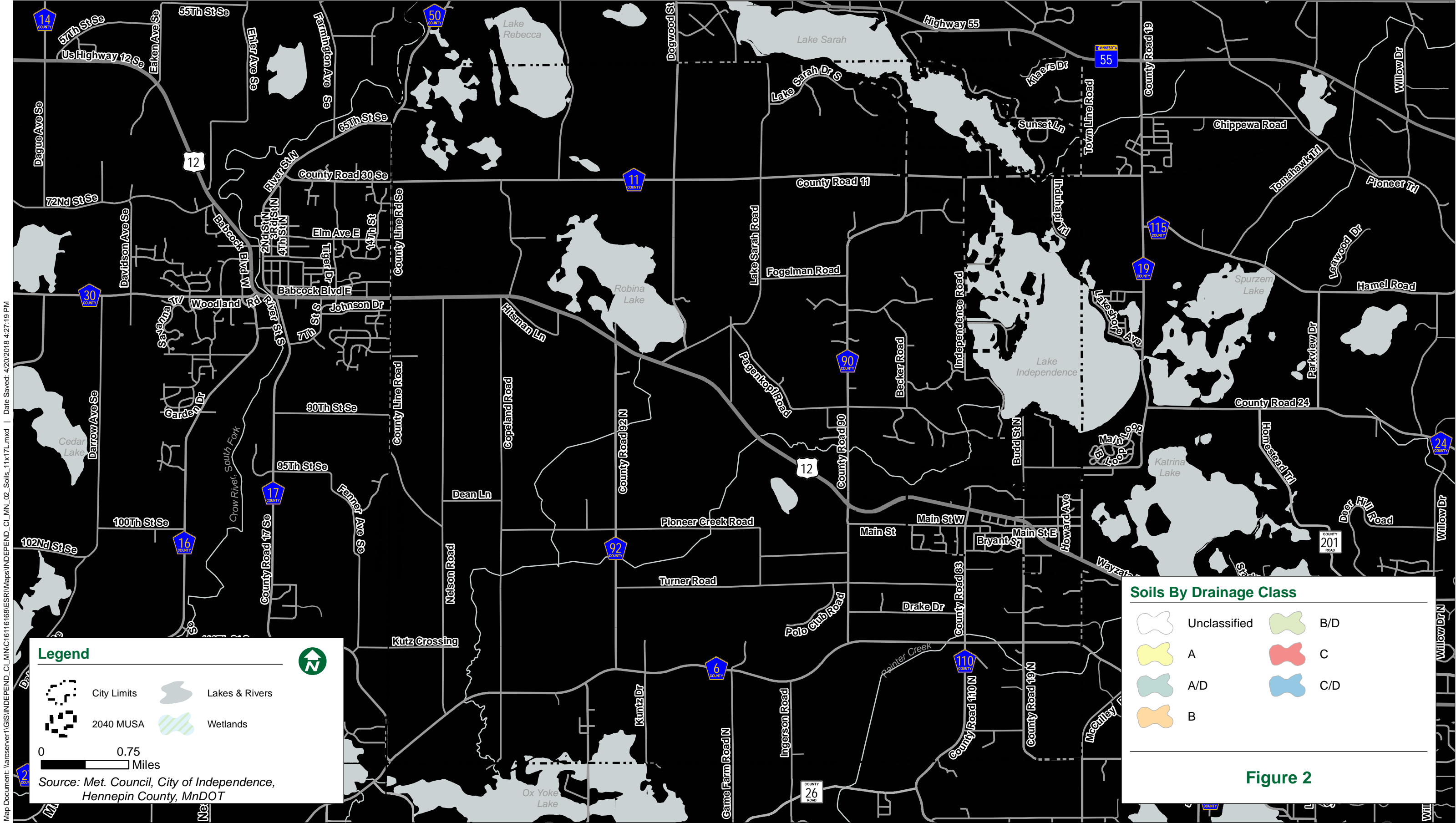
Altering land with slopes in excess of 12% is both environmentally hazardous and very expensive. Due to their shallow soils, steep slopes have a greatly reduced capacity for water retention. Alteration can increase the already rapid runoff to produce sheet erosion, damaging the land and causing subsequent sedimentation to lakes and streams. When steep slope land is converted to urban use, runoff increases by a factor of 10 to 100 times. Increased runoff causes "flashy" streams and flooding problems in lower areas.

The general relief of Independence can be described as gently rolling. This is especially true in the central and western area. This type of terrain has a slope of 5-20%. Those areas approaching 12% slope are susceptible to erosion, especially during construction. Areas that contain a 0-5% slope are the marshlands and their perimeters. As noted before, wetlands are located throughout the community.

There are a few isolated locations in the City that have slopes of over 20%. One such area is near the City's southern boundary, east of Lyndale. Another location is in an area that runs between Lakes Independence and Sarah. These slopes should not be developed, as they are very susceptible to severe erosion damage. With the large amounts of rolling to level land in Independence, the slope of the terrain cannot be considered as a major factor that will limit development.

Figure 2: Soils Map





Permeability

Permeability is the capability of soils that allows water to pass through them. Excessively coarse soils, soils with bedrock close to the surface, or soils with a high water table are severely limited for many types of development. These soils are subject to pollution problems when used for on-site sewage disposal systems. Coarse soils percolate too rapidly, tight soils too slowly. Development can increase flood hazard on soils with low permeability. These lands are also susceptible to excessive shrink-swell alterations with changes in moisture content.

Flood Hazard

Flood plains and wetlands are generally recognized as unwise to develop for any urban use if it restricts the flow of floodwater or hinders the capacity of soils to absorb and store runoff. The costs of altering water recharge areas and spaces subject to periodic flooding have become very apparent. Flood-prone soils are better used as recreation and open space areas.

Water Resources

Water quality and supply are primary elements used to determine the location and amount of development appropriate for an area. The abundance of local lakes has stimulated the current demand for housing development as well as sustaining local and regional recreation facilities. Water can provide transportation, create recreational opportunities, supply wildlife habitat, assimilate sewage effluent, and of course, replenish well water facilities.

Historically residential development has altered natural drainage routes, destroying the land's ability to store and retain water. Wetlands have been filled or drained and paved and runoff and erosion problems have developed. Subsequent flooding and sedimentation occurs in drainageways, necessitating costly repairs or control devices to retard overflow and pollution hazards. Laws intending to preserve wetlands including the State Wetland Conservation Act make the filling of wetlands much more difficult.

Responsible water resource management by local government is necessary to protect the community's natural systems. This is being accomplished by implementation of the City's Local Surface Water Management Plan in cooperation with the Minnehaha Creek Watershed District and the Pioneer Sarah Watershed Management Commission. Utilizing appropriate development in accordance with land capabilities is the first step in effectively ensuring future public health and safety.

Watersheds and Drainage Patterns

The City of Independence is within the jurisdiction of the Pioneer-Sarah Creek Watershed Management Commission (PSCWMC) and the Minnehaha Creek Watershed District (MCWD). In general, water from the PSCWMC drains west to the Crow River then north to the Mississippi River and water from the MCWD drains to Lake Minnetonka and Minnehaha Creek then east to the Mississippi River.

With the existing creeks and ditches in place, the drainage patterns for the City of Independence are fairly well defined. Four major watersheds were identified for Independence; they include Painter Creek, Pioneer Creek, Sarah Creek and South Fork Crow River. These four watersheds and the Watershed District and Watershed Management Commission boundaries are shown on Figure 3.

The Painter Creek Watershed is located in the southeast corner of Independence. This is the only watershed in Independence under the jurisdiction of the MCWD. The drainage area includes parts of Independence, Medina, Orono, and Minnetrista. The drainage flows from Katrina Lake in Medina to the west and south to Jennings Bay in Lake Minnetonka.

The Pioneer Creek Watershed is located in central Independence. It drains from Lake Independence to the west and south to Ox Yoke Lake in Minnetrista. The drainage area includes parts of Independence and Medina. Approximately 65% of the City drains to Pioneer Creek. Major water bodies in the watershed include Lake Independence and Lake Robina.

The Sarah Creek Watershed is located in northeastern Independence and includes drainage from Greenfield, Corcoran, Medina, and Independence. The general flow is from east to west through Lake Sarah to the Crow River. Lake Sarah is the only major water body in this watershed.

The South Fork Crow River Watershed is located in western and northwestern Independence. The drainage flows from east to west to the Crow River. Major water bodies in this watershed include Lake Rebecca and Haughey Lake.

MnDNR Protected Waters, Wetlands and Water Courses

The Minnesota Department of Natural Resources (MnDNR) has designated certain waters of the state as public waters (Minn. Rules 6115.1060). MnDNR “Protected Waters and Wetlands” maps show public waters within the City. A MnDNR permit is required for work within a designated public water.

Figure 4 shows the protected waters, wetlands, and water courses located in the City. Sections below summarize the protected waters, wetlands and watercourses in Independence.

Figure 3: Watershed Map



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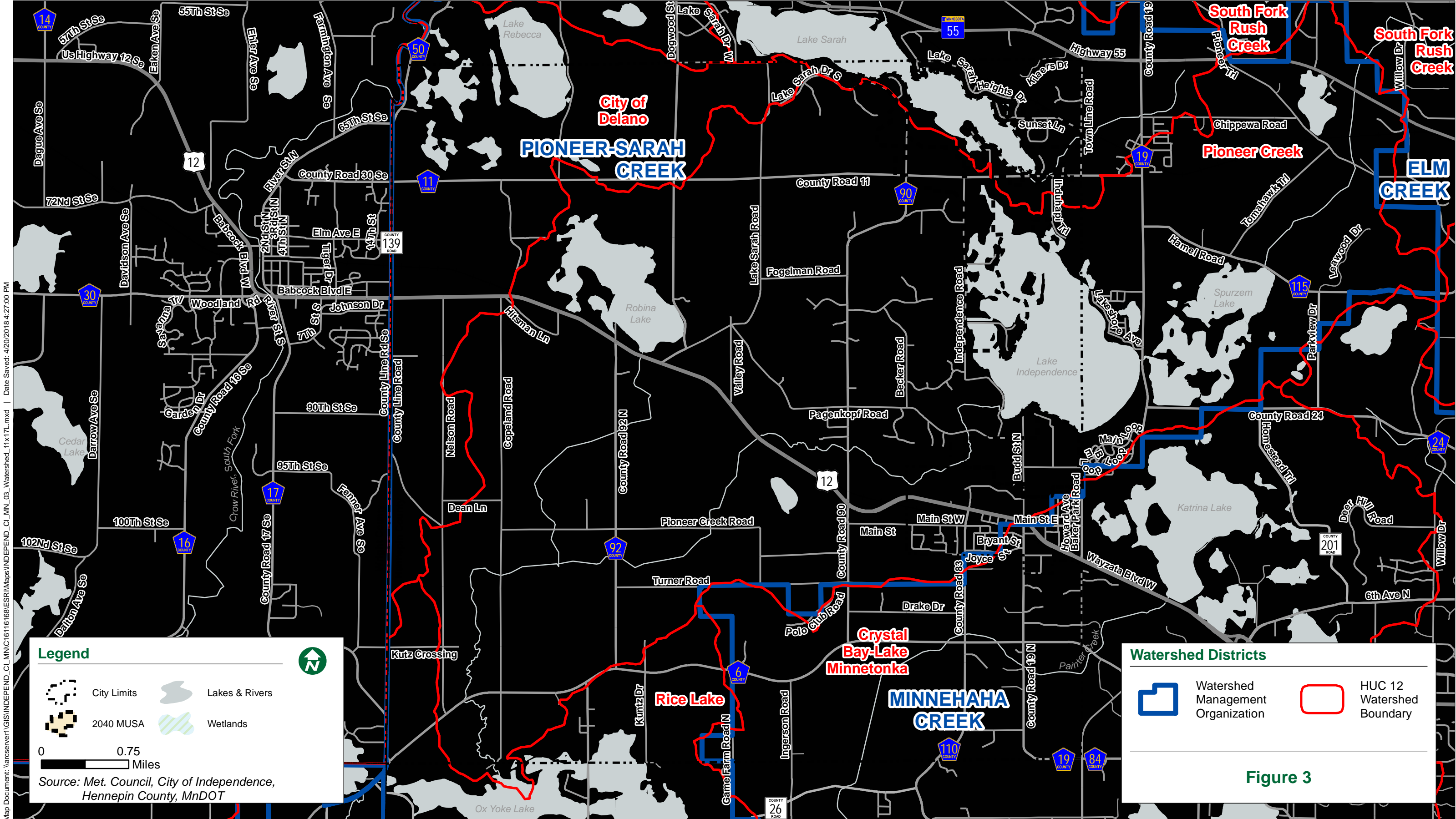
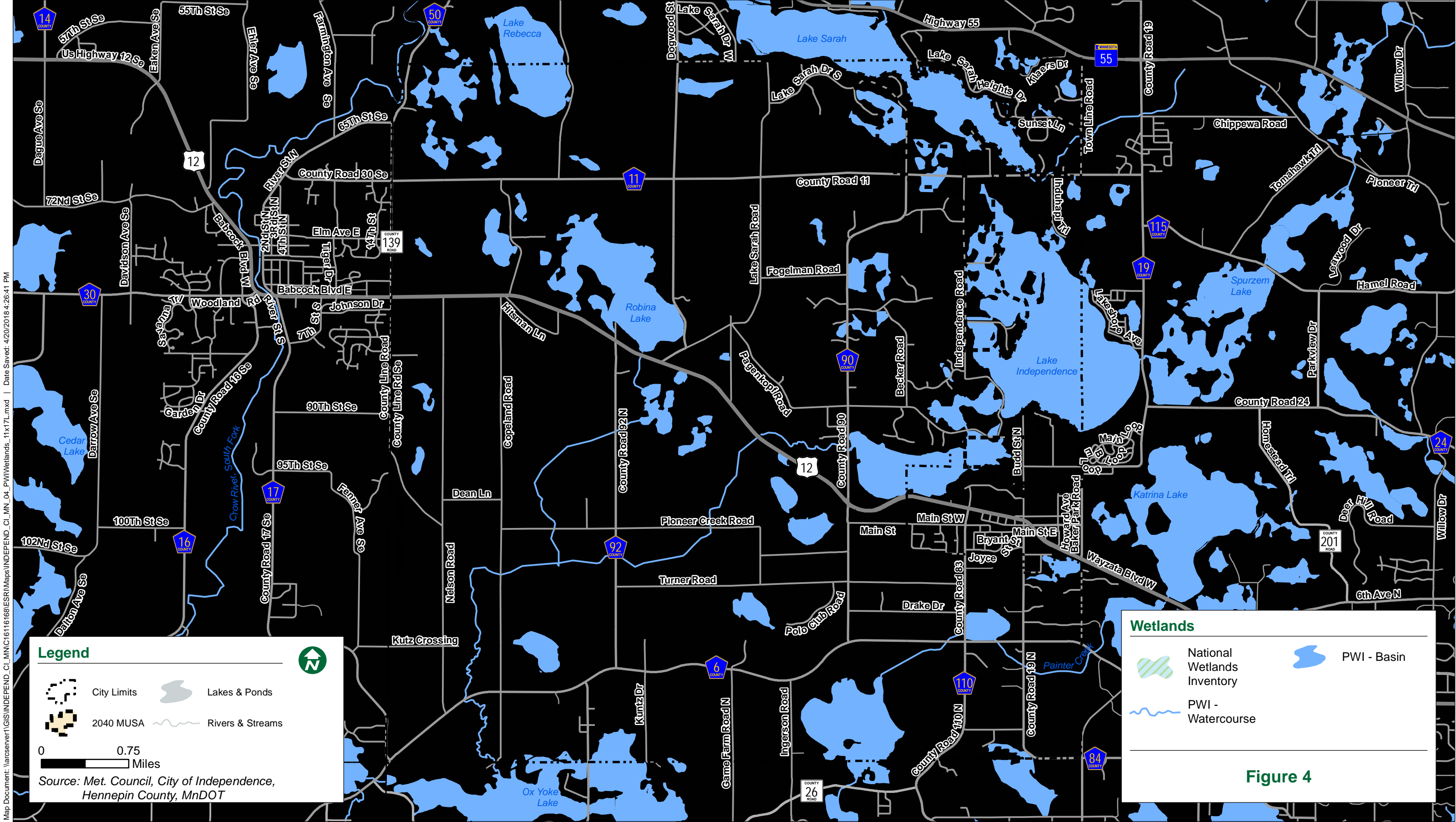


Figure 4: Protected Waters Map



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Protected Waters

There are 12 protected waters, identified with a number and the letter “P”, in the City of Independence. With the exception of Lake Independence and Lake Sarah, all of these basins are relatively shallow, ranging from partially-drained wetland areas to moderately shallow lakes (average depth less than 10 feet). Table 16 lists the protected waters within Independence.

Protected Wetlands

In addition to the 12 protected waters, there are 40 other basins within the Independence area that have been inventoried by MnDNR. All of these basins are known as public waters wetlands (M.S., section 103G.005, subdivision 18) and therefore their beds along with the lakes are subject to regulatory authority of the MnDNR.

Public waters wetlands includes all type 3, 4 and 5 wetlands, as defined in United States Fish and Wildlife Service Circular 39 (USDI, 1971), not included within the definition of public waters, that are ten or more acres in size in unincorporated areas, or 2.5 acres in incorporated areas. Table 17 lists the public waters wetlands subject to MnDNR jurisdiction.

TABLE 16 INDEPENDENCE PROTECTED WATERS

I.D. No.	Name	Twp./Range	Section(s)	Local Government Unit	Area (acres)	DNR Shoreland Classification ¹	OHW
27-176P	Lake Independence	118/23,24	7,12,13,18,19,24	PSCWMC	1024	RD	956.8
27-178P	Ox Yoke lake	117,118/24	5,6,31,32	PSCWMC	325	NE	915.4
27-188P	Lake Robina	118/24	8,9,16,17	PSCWMC	395	RD	N/A
27-189P	Lake Irene	118/24	22	PSCWMC	27	RD	N/A
27-191P	Lake Sarah	118,119/24	1,2,3,34,35	PSCWMC	635	RD	979.9
27-192P	Lake Rebecca	118,119/24	5,31,32	PSCWMC	260	NE	N/A
27-379P	Unnamed	118,119/24	Jun-31	PSCWMC	15	NR	N/A
27-380P	Unnamed	118/24	6	PSCWMC	24	NR	N/A
27-381P	Unnamed	118/24	5	PSCWMC	9	NR	N/A
27-411P	Unnamed	118,119/24	6,31	PSCWMC	81	NR	N/A
27-412P	Unnamed	118/24	6	PSCWMC	32	NR	N/A
27-926P	Unnamed	117,118/24	4,5,32,33	PSCWMC	245	NR	N/A

¹ NE = Natural Environment, RD = Recreational Development, GD = General Development, NR = Not regulated by DNR shoreland rules.

Source: MnDNR

TABLE 17 INDEPENDENCE PROTECTED WETLANDS

I.D. No.	Name	Twp./Range	Section(s)	Local Govt. Unit	Area (acres)	DNRShoreland ¹ Classification	OHW
27-187W	Haughey Lake	118/24	7,8	PSCWMC	51	NE	953.2
27-362W	Unnamed	118,119/24	1,36	PSCWMC	17	NR	N/A
27-367W	Unnamed	118/24	1	PSCWMC	12	NR	N/A
27-368W	Unnamed	118/24	1	PSCWMC	7	NR	N/A
27-369W	Unnamed	118/24	1	PSCWMC	5	NR	N/A
27-373W	Unnamed	118/24	12	PSCWMC	11	NR	N/A
27-374W	Unnamed	118/24	2,11	PSCWMC	20	NR	N/A
27-375W	Unnamed	118/24	2	PSCWMC	3	NR	N/A
27-376W	Unnamed	118/24	2	PSCWMC	10	NR	N/A
27-377W	Unnamed	118/24	2	PSCWMC	10	NR	N/A
27-378W	Unnamed	118/24	2	PSCWMC	68	NR	N/A
27-382W	Unnamed	118/24	4	PSCWMC	30	NR	N/A
27-383W	Unnamed	118/24	8	PSCWMC	7	NR	N/A
27-385W	Unnamed	118/24	16,21	PSCWMC	47	NR	N/A
27-386W	Unnamed	118/24	16	PSCWMC	6	NR	N/A
27-387W	Unnamed	118/24	16	PSCWMC	3	NR	N/A
27-388W	Unnamed	118/24	21	PSCWMC	18	NR	N/A
27-389W	Unnamed	118/24	21	PSCWMC	5	NR	N/A
27-391W	Unnamed	118/24	22	PSCWMC	4	NR	N/A
27-392W	Unnamed	118/24	22,27	PSCWMC	43	NR	N/A
27-393W	Unnamed	118/24	23,24	PSCWMC	278	NR	N/A
27-394W	Unnamed	118/24	13,14,23,24	PSCWMC	63	NR	N/A
27-395W	Unnamed	118/24	24	PSCWMC	4	NR	N/A
27-396W	Unnamed	118/24	25	MCWD	29	NR	N/A
27-397W	Unnamed	118/24	10	PSCWMC	8	NR	N/A
27-398W	Unnamed	118/24	11,14	PSCWMC	47	NR	N/A
27-399W	Unnamed	118/24	14,15	PSCWMC	15	NR	N/A
27-400W	Unnamed	118/24	14	PSCWMC	5	NR	N/A
27-401W	Unnamed	118/24	14	PSCWMC	4	NR	N/A
27-402W	Unnamed	118/24	12	PSCWMC	3	NR	N/A
27-413W	Unnamed	118/24	18	PSCWMC	12	NR	N/A
27-414W	Unnamed	118/24	19	PSCWMC	10	NR	N/A
27-921W	Unnamed	117,118/24	1,36	MCWD	88	NR	N/A
27-922W	Unnamed	118/24	25	MCWD	52	NR	N/A
27-923W	Painter Lake	117,118/24	2,3,34,35	MCWD	292	NR	938.4
27-924W	Unnamed	118/24	27	MCWD	36	NR	N/A
27-925W	Unnamed	118/24	29,32	PSCWMC	49	NR	N/A
27-927W	Unnamed	117,118/24	4,33	PSCWMC	7	NR	N/A
27-1090W	Unnamed	118/24	7	PSCWMC	7	NR	N/A
27-1097W	Unnamed	118/24	8	PSCWMC	10	NR	N/A

¹ NE = Natural Environment, NR = Not regulated by DNR shoreland rules.

Watercourses

Public waters also include all natural and altered watercourses with a total drainage area greater than two square miles. Painter Creek, Pioneer Creek, Robina Creek and Loretto Creek are four protected watercourses in Independence. The four watercourses are discussed below.

- ***Painter Creek***

Painter Creek is located in the southeast corner of Independence. The creek is the outlet of Katrina Lake and flows west to south to Jennings Bay on Lake Minnetonka.

- ***Pioneer Creek***

Pioneer Creek is located in central Independence. The creek is the outlet of Lake Independence and flows west to south to Ox Yoke Lake, which is south of Independence. Ox Yoke Lake eventually discharges to the South Fork Crow River.

- ***Robina Creek***

Robina Creek is a tributary of Pioneer Creek and is located in central Independence. The Creek is the outlet of Robina Lake and flows from north to south to Pioneer Creek.

- ***Loretto Creek***

A portion of Loretto Creek is located in the northeast corner of Independence. The creek flows from east to west and discharges to Lake Sarah. Lake Sarah then discharges through Sarah Creek to the west to the South Fork Crow River.

Other Regulated Wetlands

In addition to the MnDNR waters previously discussed, many additional wetlands within the City are included on the National Wetland Inventory (NWI) maps but are not MnDNR water bodies. Figure 5 includes other regulated wetlands based on the NWI maps. The following three characteristics make these water bodies exclusive from the MnDNR public waters and public waters wetlands.

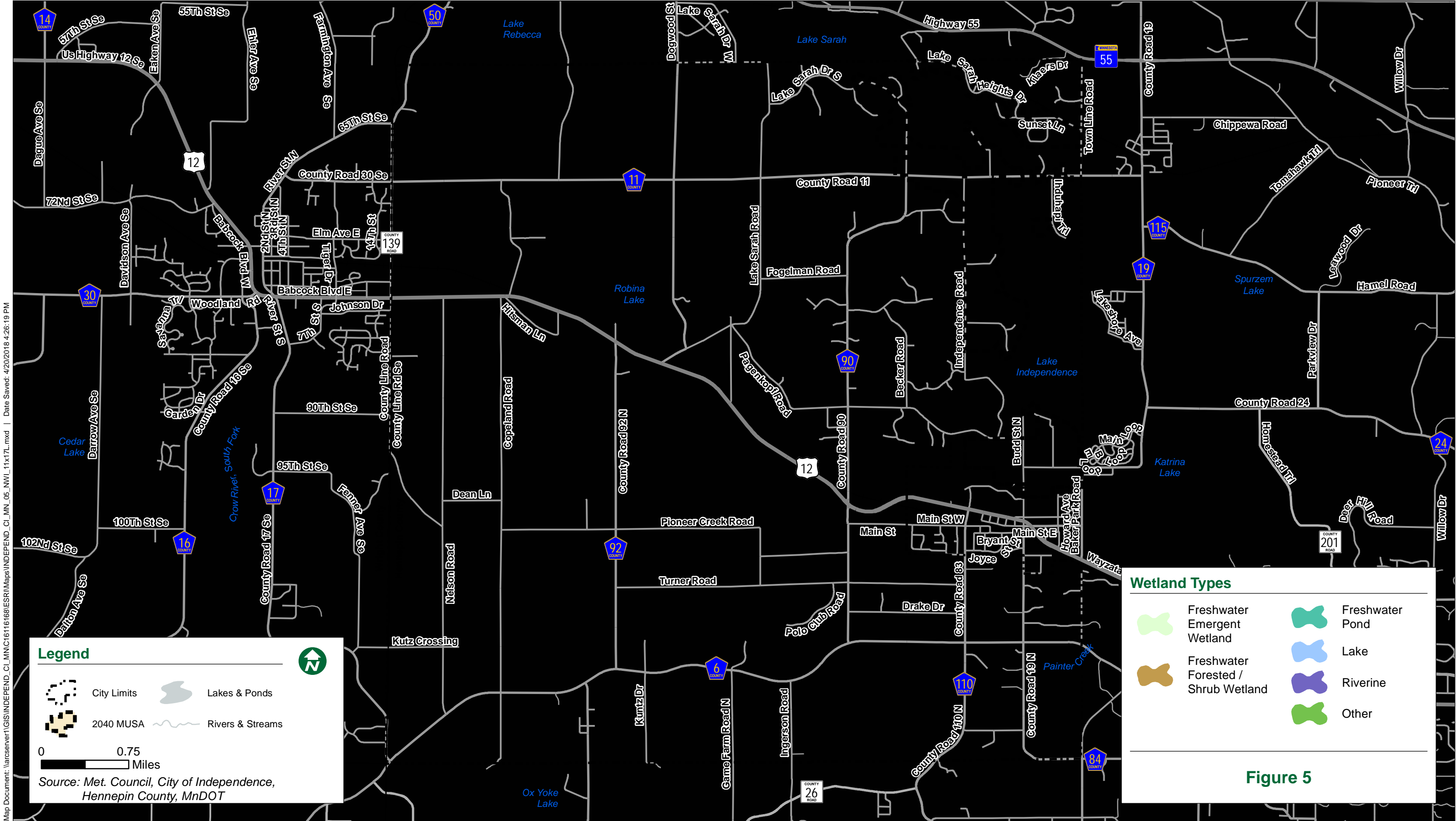
- First, an individual basin may be dominated by wetland habitat (Types 1, 2, 6, and 7 [USDI, 1971] not statutorily covered by MnDNR and yet is immediately adjacent to an inventoried MnDNR basin or watercourse.
- Second, an individual isolated wetland basin may be smaller than the minimum MnDNR size (2.5 or 10 acres) as discussed previously.
- Third, an individual isolated wetland basin may be dominated by habitat types (Types 1, 2, 6, and 7) not statutorily covered by MnDNR.

Excavation, filling, grading and/or development actions which may adversely affect these resources may be subject to federal permitting authority under Sections 404 and 401 of the Clean Water Act, (33 USC 125 et. seq.) and City approval under the 1991 Wetland Conservation Act (WCA). The City is the local governmental unit that administers the WCA.

Figure 5: NWI Map



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Water Quality

Water quality is directly affected by seepage, percolation and runoff. When these actions adversely alter water quality, they are termed either point source or non-point source pollution. Point source pollutants enter water and wetlands at specific locations via a pipe or a permanent outfall structure; the most common examples being sewage treatment plant outfalls and industrial discharge pipes. Non-point source pollutants are far more dispersed, entering waterways via runoff, seepage and sedimentation. Common examples of non-point pollution include stormwater runoff, agricultural field drainage and septic systems.

Uncontrolled stormwater runoff is currently the greatest single pollutant of our water resources. Common pollutants in stormwater runoff include: sediments, nutrients, oxygen-demanding substances, heavy metals, chlorides, oil and grease, pesticides, PCB's and bacteria. These pollutants may create a "shock" load on lakes and streams during low flow conditions associated with warm weather. Sediment from stormwater runoff may carry those pollutants to local wetlands causing water quality degradation and eutrophication.

Non-point pollution may be caused by the improper use of fertilizers and pesticides on both agricultural and residential land. Compact development in non-sewered areas can lead to overburdening of the area's soils, causing pollution of local groundwater. The result is the same as an inadequate septic system - a health hazard to individuals using local water supplies. Any development that has not provided necessary water retention facilities, erosion control devices, or stringent control of individual septic systems may create a potential pollution hazard to local residents.

Cover Types

Independence is covered with three basic cover categories—vegetation, open water and artificial or manmade surfaces. Vegetated cover includes land that is cultivated or planted, woodland, shrubland, herbaceous, oak forest, maple-basswood forest, lowland hardwood forest, forest on flooded or saturated soils or other upland forest.

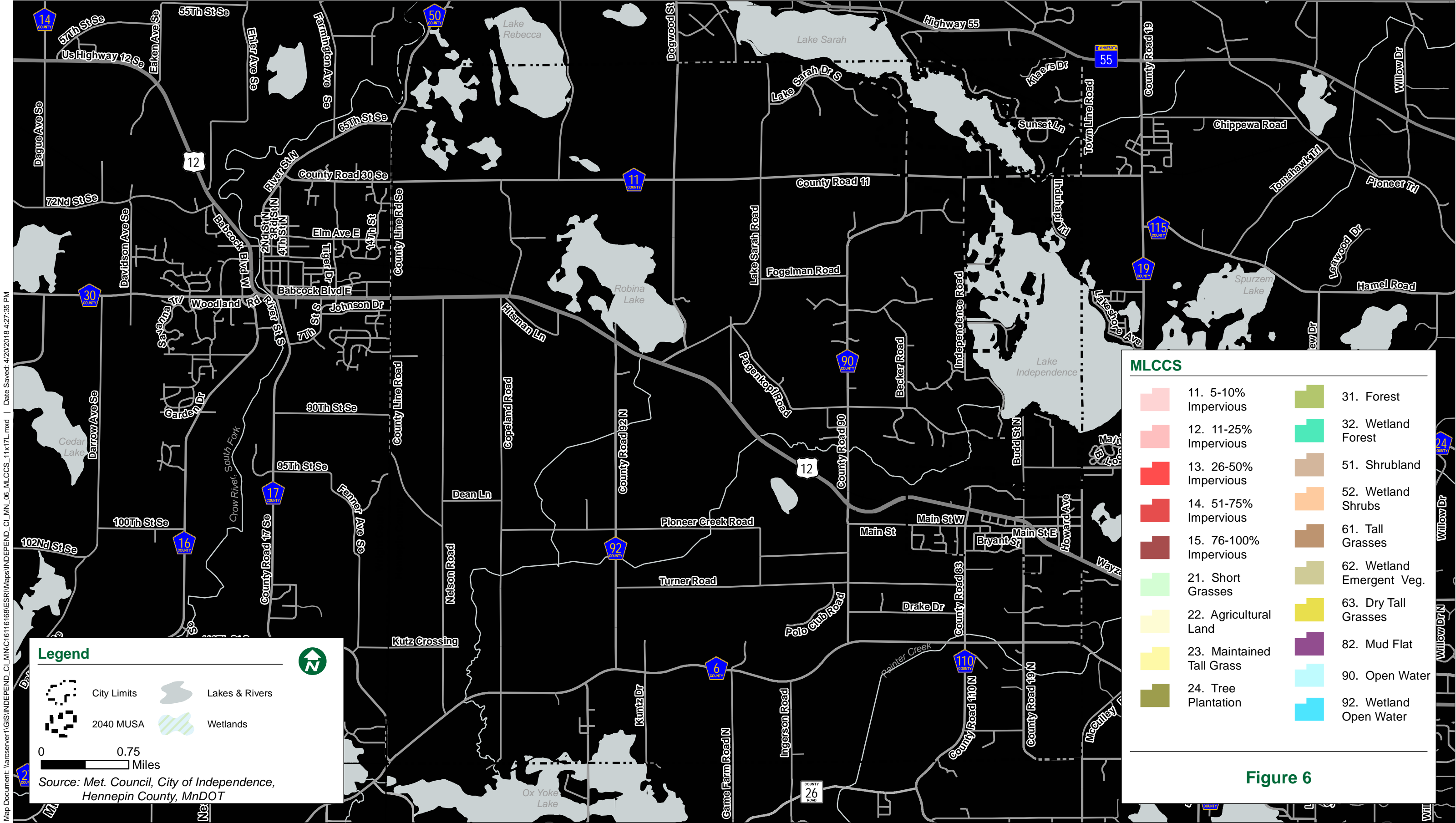
Agriculture - A large share of the land area is under cultivation, with the major crops being corn, alfalfa, soybeans, small grains and orchards. Other fields are used for open pasture and the grazing of horses and cattle.

Overstory - The deciduous forest of the dry phase category is characteristic in central Minnesota. In the City, the forests are scattered, with no one area predominating. Large stands of trees exist on many farms and along lakes and streams. The most common trees are oak, maple, elm, linden, box elder and a variety of evergreen.

Pioneer - This form of vegetation and plant life is found near creeks and drainage basins. Soils are well drained and are usually covered extensively with vegetation. Predominant plants found are willow, poplar, cottonwood and sumac.

Native Grasslands and Prairie - In the areas that have escaped cultivation, these forms of grasses are found to be rich, moist and poorly drained. Tall prairie grasses generally are found adjacent to the deciduous forest. In Independence these grasses frequently can be found in higher lands. Cover types are shown on Figure 6.

Figure 6: Cover Types



3.3 Future Land Use

The land use plan provides the City with a road map to ensure the community can sustainably develop from now until the year 2040. The plan is wholly similar to the three previous comprehensive plan maps. The Rural Residential line has been slightly adjusted at the very north end to align with existing land uses and historic subdivisions. Within the Rural Residential land use area, there is approximately 1,200 acres of Agricultural Preserve (1 residence per forty acres) that will remain.

The plan defines the preferred future development pattern for the City. The plan designates two primary planning areas as well as several smaller sub-planning areas. The first primary planning area is guided for long-term agricultural, is comprised of approximately two-thirds of the City and is situated on the western side. The second primary planning area is guided for rural residential development, is comprised of approximately one-third of the City and is situated on the eastern side. The rural residential area encourages rural character by utilizing large lot development, cluster development design, protection of environmentally sensitive areas and limited extension of urban services.

The plan has evolved from the 2030 plan to refine several sub-areas within the City. The first sub-area is a new land use category for sewer residential development. There are essentially three areas where this designation has been established. The areas established for sewer residential are strategically located on properties that can be serviced with utilities and generally compliment surrounding land uses. The second sub-area, urban residential, is an existing land use category that has been refined from the 2030 plan to increase projected densities. This area has been moved to the western side of the City to take advantage of existing services and amenities in the adjacent community of Delano.

The land use plan is meant to provide a graphic guide when considering rezoning, planned unit development, conditional use, subdivision and other land use requests.

Table 14 provides data showing existing land use and planned land use in five-year increments, based on the land use plan:

Land Use Categories

Agriculture District

Agriculture, horse ranches, hobby farms and landscape operations will continue to be a principal land use component in the City. Agriculture including grain crops, truck farms and the raising of beef, swine and turkeys will be encouraged to remain a vital component in the local mix of people and commerce. It is anticipated that the number and amount of agricultural operations will continue to diminish due to ongoing socio-economic trends and rising land prices. However, it is the belief that it is the best interest of the citizens of Independence to engage in specific measures to protect the local agricultural community.

The area guided for agriculture places commercial agriculture as the highest land use priority that is supplemented by uses that preserve large expanses of permanent open space. Those secondary uses include golf courses, nature preserves and public parks. Property owners are encouraged to place their land in agriculture preserves or green acres. No restrictions on non-commercial agricultural operations concerning dust, odor or hours of operation will be applied to these lands.

To preserve long-term agricultural operations, the Plan allows a 1 per 40-acre maximum density of development in the Agriculture District. This allows owners the option of enrolling in the Metropolitan Agricultural Preserves Program. Any farm requesting designation as an agricultural preserve property must file for such status with the City, and the land will be so designated.

Rural View Lots

The City recognizes that the local farming community is an extremely valuable asset. Many land owners are relying on the latent value of their land to provide for financial sustainability. The land use plan acknowledges the worth of local landowners' properties for residential development. It also firmly believes in agricultural preservation. To achieve both ends, the City allows landowners in the agricultural area to create low-density rural view lots. The City Zoning Ordinance allows for the creation of rural view lots if the following criteria are adhered to:

- The subject property is zoned and guided agriculture.
- One rural view lot, in addition to the original homestead, may be created for each 40 acres or each quarter-quarter section of land. If 40-acre tracts under single ownership are not contiguous, the city Council may consider a density transfer option.
- The proposed lot is no less than 2.50 or more than 10 acres in size.
- A lot must be a minimum of 2.50 acres buildable with a demonstrated capability to accommodate two on-site waste disposal systems.
- Buildable land must be contiguous and not separated by streams, wetlands or slopes in excess of 10%, or other physical impediments.
- A lot must have no less than the following frontage on an improved public road or street:

2.50 - 3.49 acres	200 feet of frontage
3.50 - 4.99 acres	250 feet of frontage
5.00 - 10.0 acres	300 feet of frontage

Granting a small amount of intensification in the use of agricultural land through creation of rural view lots has provided ample economic and regulatory relief to enable a number of owners of agricultural land to continue to own.

Rural Residential District

The rural residential comprises approximately the eastern one third of the City. Land in this district will be used and developed so as to preserve its open, scenic and natural characteristics as well as its ecological and economic functions. A majority of this low-density residential area is located around Lake Independence, Lake Sarah and adjacent to Maple Plain.

Unlike the predominance of land being utilized for agricultural operations in the west, this area has been developing with a large lot estate character. While on-going agricultural operations and hobby farming are encouraged to continue in this area, it is anticipated that the aesthetic amenities of eastern Independence will continue to draw persons desiring a more spacious residential lifestyle.

To accommodate this growth, residential development is planned to occur at an "8 per 40" density. Traditionally this would translate into 5-acre lots. The City is a proponent of a more creative subdivision process, which would include clustering of homes on no less than 2-1/2 acre lots, but with open space and scenic viewshed components incorporated into the subdivision design. Within the Rural Residential District there is approximately 1,500 acres of land that is currently in the Agriculture Preserve program. Consistent with past plans, land designated Agriculture Preserve will have a minimum density of 1 unit per 40 acres. Agricultural Preserves are protected by State Statute at a maximum density of 1 unit per 40 acres. At the petition of the owner, the land within the Agriculture Preserve area can be removed from the Agriculture Preserve in accordance with all applicable program standards. Following the removal of property from the Agriculture Preserve program, the underlying land will be guided for Rural Residential.

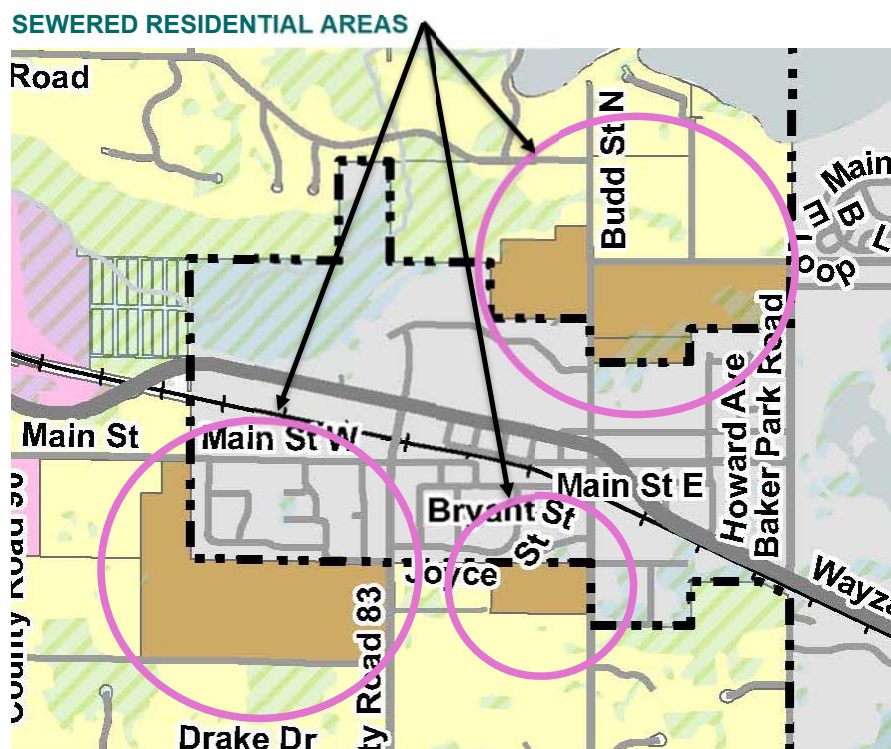
Single-family residential development should be located adjacent to existing residential concentrations, filling in any previous "leap frog" developments. In this way growth can be guided in conjunction with logical and economic extensions of urban services.

The City of Independence is endowed with an abundance of natural resources including many natural lakes. These lakes are under siege and the three largest, located partly in the City of Independence, are classified as impaired because they fail to meet one or more federal water quality standards. Lake Rebecca Regional Park surrounds the portion of Lake Rebecca in Independence but the land in Independence along the shores of Lake Sarah and Lake Independence is largely privately owned. Many of the single-family dwellings along the shores of Lake Sarah and some along Lake Independence are connected to the metropolitan sewer system but a number are serviced with individual septic treatment systems.

To eliminate and prevent further contamination of Lake Sarah and Lake Independence, as well as the streams and groundwater around the portion of these lakes in Independence, the area around the lakes is informally being designated as the Environmental Protection Residential area. Lots with individual septic treatment systems that are not in compliance with current state and local requirements will be encouraged to connect to an approved community sewage treatment system or, if already available, to the metropolitan sewer system (See Figures 10 and 11). All connections to the metropolitan sewer system will be required to follow the Metropolitan Council's revised Municipal Urban Service Area Guidelines. Lots of record will be allowed to develop at existing densities but new construction will be required to comply with the Shoreland Management Ordinance.

Sewered Residential District

The City has experienced pressure from existing land-owners and the development community to consider the development of sewered residential properties within the City. In the 2030 Comprehensive Plan, the City identified an area directly north of the City of Maple Plain for sewered development. The proposed density of that area was 4.7-7.0 units per acre. Over the last ten years, the City has determined that the density considered for this area was not feasible and did not fit the character of the surrounding area. In order to respond to and accommodate the Metropolitan Council's projected growth, Independence has guided three specific areas for sewered residential development. The three areas are positioned directly adjacent to similar development in Maple Plain.



The City has established that these areas will have a minimum density of 2.7 units per acre and a maximum density of 4.0 units per acre. This density will accommodate single-family detached homes on approximately 12,000-15,000 SF lots. This type of development will be more reflective

of the lot size of existing single-family detached development that is directly adjacent in Maple Plain. The City will need carefully prepare development and design standards relating to this area. The development of the standards will be in the form of a zoning ordinance amendment. Careful consideration should be given to the following elements:

- Preservation and enhancement of existing natural resources
- Site design which respects the existing conditions of the property
- Enhancement of the rural character of the community by incorporating berming, landscaping and similar site elements which significantly reduce visual impacts of the proposed development on the surrounding property
- High quality residential architecture
- Consideration and accommodation of traffic on the surrounding properties and local, regional and state infrastructure.

The three areas identified for sewer residential have the following characteristics:

Budd Avenue/Perkinsville Road Area (211 acres) – This area will be served by existing sanitary sewer facilities owned by the City of Independence along Perkinsville Road. An amendment to the Tri-City Agreement will be required in order to extend sanitary services to this area. The are proposed to be developed is less than the approved area identified in the 2030 Comprehensive Plan. Water will need to be provided by the City of Maple Plain. The Cities have previously agreed to consider a joint powers agreement which would provide this area with water service.

County Road 19 Area (20 acres) – This area will be served by new sanitary sewer facilities which will be owned by the City of Independence and connect directly to the regional lift station located at the end of Willow St. in Maple Plain. A new sanitary sewer pipe will need to be developed to serve this property as well as future sewer residential properties to the south and west. The City has prepared a conceptual sanitary sewer routing plan to ensure that this area can be developed. Water will need to be provided by the City of Maple Plain.

County Road 83/Main Street Area (224 acres) – This area will be served by new sanitary sewer facilities which will be owned by the City of Independence and connect directly to the regional lift station located at the end of Willow St. in Maple Plain. A new sanitary sewer pipe will need to be developed from the east to serve this property as well as future sewer residential properties to the south and west. The City has prepared a conceptual sanitary sewer routing plan to ensure that this area can be developed. Water will need to be provided by the City of Maple Plain.

Urban Residential District

Single-family detached residences comprise 98% of the housing in the community. Currently there is a mix of starter homes (modest cost entry level housing), mid-range and executive homes. There are few vacancies and a limited number of rental units in the community. While this housing serves the needs of current residents of the City it does not typically provide for resident's housing needs as they move through different phases of their lives.

To encourage alternative types of housing and fill the void of life cycle and affordable housing, the City is proposing to guide an approximately 12-acre area for urban residential development. This area is proposed to be located between Highway 12 and the BNSF railroad in the far western side of the City. The area would be surrounded by future Urban Commercial development and is proposed to have a minimum density of 12 units per acre. This type of housing would require some level of additional amenities to serve its prospective tenants. The City carefully evaluated locations that could be supported by the proximity of amenities such as grocery, medical, pharmacy, retail, restaurants, schools and jobs. The City anticipates that this area could be served via an on-site community sanitary sewer system. Independence will prepare a more detailed land

use study and plan in the future to facilitate the development of this urban residential area. When this occurs, the City will be able to more accurately determine the projected demand that this area will have for services and how and from where the services will be provided. Services to be studied will include utilities, transportation and public services. The City has developed a zoning district that generally implements this land use designation. The ordinance may need to be reviewed and updated to respond to the increased minimum densities identified in this plan.

Commercial/Light Industrial

Much of the area identified on the Guide Plan map for commercial and industrial use is presently undeveloped. Rather than designating a specific area as industrial or commercial, the City recognizes new business development can be most effectively accomplished through a planned development design process. Technology industries are many times best suited in mixed-use business parks. Given the environmental constraints common throughout Independence, design flexibility is a key component to achieving the employment base, local services and environmental protection the City desires.

While the City will encourage development and intense utilization of the buildable land in the designated commercial/industrial area, several design factors are included in the development process:

- Development must appropriately address surface runoff and potential groundwater contamination.
- Development must meet high standards of landscaping and building design.
- As development occurs, new development should relate building design, which is complimentary to existing structures, landscaping, and circulation design.
- Business should be kept in good physical repair including exterior appearance and appropriate landscaping.
- Direct access to T.H. 12 should be kept to a minimum, joint use of parking areas and access driveways are strongly encouraged.

Three factors govern the site selections for local industry: adjacent land use, transportation access, and site conditions. Proper locations of industry are imperative to ensuring a safe, healthy and economically sound community. The requirements for roadways, appropriate parking facilities, building/land relationships, setbacks, and environmental safeguards are all exceedingly important in choosing proper site locations for industry. New industrial sites should be part of an orderly progression of land use. “Clean and quiet” industrial uses should be especially encouraged to locate in the area.

The City has approximately 160 acres of land available to develop for industrial use. 40 additional acres have been added to the Commercial/Light Industrial area south of Highway 12, west of CSAH 90 and north of Quass Cutoff Rd. This industrially guided land is anticipated to meet the community’s industrial land use needs to 2040.

Urban Commercial

A 60-acre area along T.H. 12 in the western part of the City is designated as urban commercial to allow for the natural extension of commercial services from the shopping areas to the west in Delano. No other community commercial services are provided within the municipal limits of Independence to avoid duplication of existing and future services provided in the City of Maple Plain and Delano. This area will be master-planned and served with sanitary sewage treatment, water and storm sewer from an on-site system or connection to an adjacent community.

No convenience commercial centers (gasoline station, repair, laundry, dry cleaning, superette, etc.) are specifically designated on the plan. However, they may be located in areas designated for

highway/industrial commercial development. Spot or strip commercial development of this nature shall be discouraged.

Public/Semi Public

This planned land use category includes institutional facilities used for religious, governmental, educational, social and health care purposes as well as land used for parks, recreation, open space, utilities and railway.

TABLE 14 CURRENT AND FUTURE LAND USE 2017-2040

Within Urban Service Area	Allowed Density Range Housing Units/Acre		Existing (2017)	Ex. %	2020	2025	2030	2035	2040	Future %	Change 2017-2040
	Minimum	Maximum									
Residential Land Uses											
Low Density Residential	0.0	0.0	351	2%	391	391	391	391	391	2%	40
Sewered Residential	2.7	4.0	0	0%	20	60	140	180	220	1%	220
Urban Residential	12.0	30	0	0%	0	0	12	12	12	0%	12
Urban Commercial	20 per net acre sewered		0	0%	0	0	15	30	60	1%	60
Subtotal Sewered			351	2%	411	451	558	613	683	195%	332
Rural Uses	Minimum lot size	Maximum lot size	Existing (2018)	Ex. %	2020	2025	2030	2035	2040	Future %	Change 2018-2040
C/I Land Uses	Est. Employees/Acre										
Industrial/Commercial	1.5 per acre existing		115	1%	115	145	214	243	273	1%	158
Urban Commercial	20 per net acre sewered		0	0%	0	0	15	30	60	0%	60
Public/Semi Public Land Uses											
Institutional/Parks and Open Space			2135	10%	2135	2153	2135	2125	2125	9%	-10
Road Rights of Way			1137	5%	1137	1137	1137	1137	1137	5%	0
Rural Land Uses											
Rural Residential	less than 5	5 acres	1664	7%	1874	1932	2008	2128	2208	10%	544
Rural Residential 5-39 acres	5 acres	40 acres	7403	33%	7509	7509	7425	7385	7305	33%	-98
Agricultural 40+ acres	40 acres	n/a	7506	34%	7130	6984	6819	6650	6520	29%	-986
Undeveloped	--	--	671	3%	671	671	671	671	671	3%	0
Wetlands	--	--	6108	27%	6108	6108	6108	6108	6108	27%	0
Open Water, Rivers and Streams	--	--	1418	6%	1418	1418	1418	1418	1418	6%	0
Subtotal Unsewered			22049	98%	21989	21949	21842	21787	21717	97%	-332
Total			22400	100%	22400	22400	22400	22400	22400	100%	0

Source: City of Independence

3.4 Historic Preservation

In an effort to identify, preserve and protect local historic places and sites, the City should give consideration to adopting provisions relating to the protection and enhancement of historic structures. The City could also consider the establishment of a local heritage preservation commission. If these provisions are established, the City could become eligible for State and Federal programs as a Certified Local Government. As part of the Certified Local Government program, the City could receive matching funds for planning work concerning historic preservation. Until the City is in a position to take the next steps pertaining to historic preservation, emphasis should be made to preserve historically significant buildings or sites.

The planning component of the heritage preservation activity would result in creation of a local historic context, the basis for local survey efforts. Coordination with the State Archaeologist and Minnesota Historical Society would help place local sites on the State or Federal register of historical places.

3.5 Parks, Trails and Open Space

Regional Parks

The Three Rivers Park Reserve District has three park facilities that have a direct impact on the City. These parks have acted as a stimulus for growth in the eastern and northwestern sections of the City due to the natural features and recreation amenities. Figure 13 shows the Regional Park System including Lake Rebecca Park Reserve, Lake Sarah Regional Park and Baker Park Reserve.

Lake Rebecca Park Reserve is located in the northwest corner of Independence, extending into Greenfield. Total park acreage; including land, water, and wetlands, amount to 2577 acres. The park opened in 1971 and provides a combination of active and passive recreational opportunities. Lake Rebecca, surrounded by the park reserve, is designated as a fishing, swimming and non-power boat recreation area. Existing facilities in the park include a mountain bike trail, swimming beach, picnic area, group camp and trails.

Lake Sarah Regional Park is located on the west side of Lake Sarah in Independence and Greenfield. The 174-acre park is currently undeveloped, with plans to utilize the lakefront for boating, fishing and picnicking. Proposed development includes trail linkage to Lake Rebecca Park Reserve.

The park contains a 20-acre parcel that is west of South Lake Sarah Drive, not contiguous to the park proper. The Three Rivers Regional Park District Master Plan identifies this parcel as surplus property and calls for the parcel to be sold.

Baker Park Reserve is adjacent to portions of the eastern border of Independence and is easily accessible by boat to Independence residents. The park consists of approximately 3,313 acres and provides a great deal of active recreation opportunities. Existing facilities include: swimming beach, picnic areas, day camping, overnight camping, hiking and horseback riding trails, a golf course and boating.

Robina State Wildlife Management Area

Land recently given to the State of Minnesota between Highway 12 and Robina Lake by the Robina Lake Foundation has been designated as a wildlife management area (WMA). This 198-acre area is managed for the State by the Minnesota Department of Natural Resources. The location of this area is indicated on Figure 13.

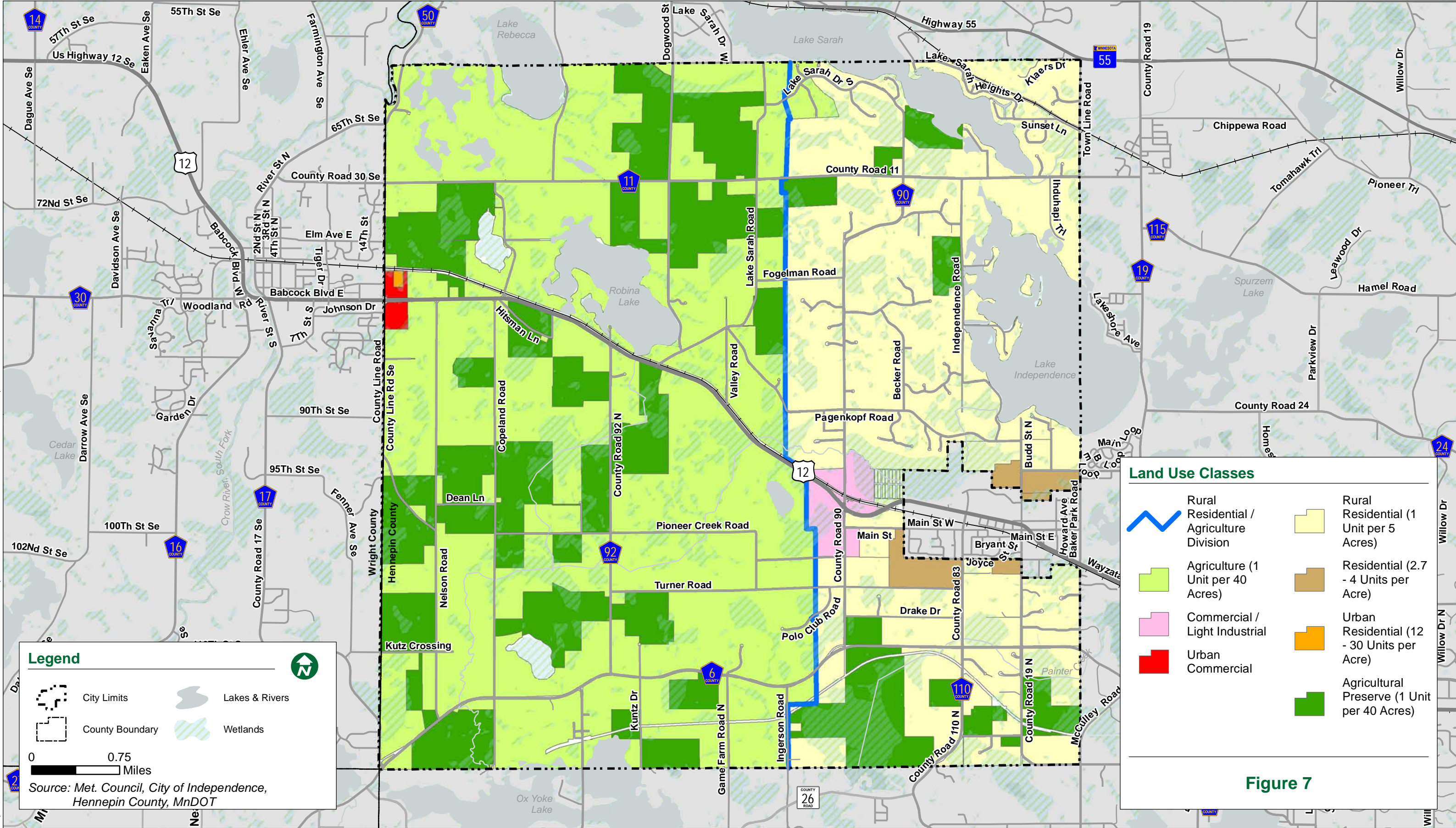


2040 Comprehensive Plan

Independence, MN

Future Land Use

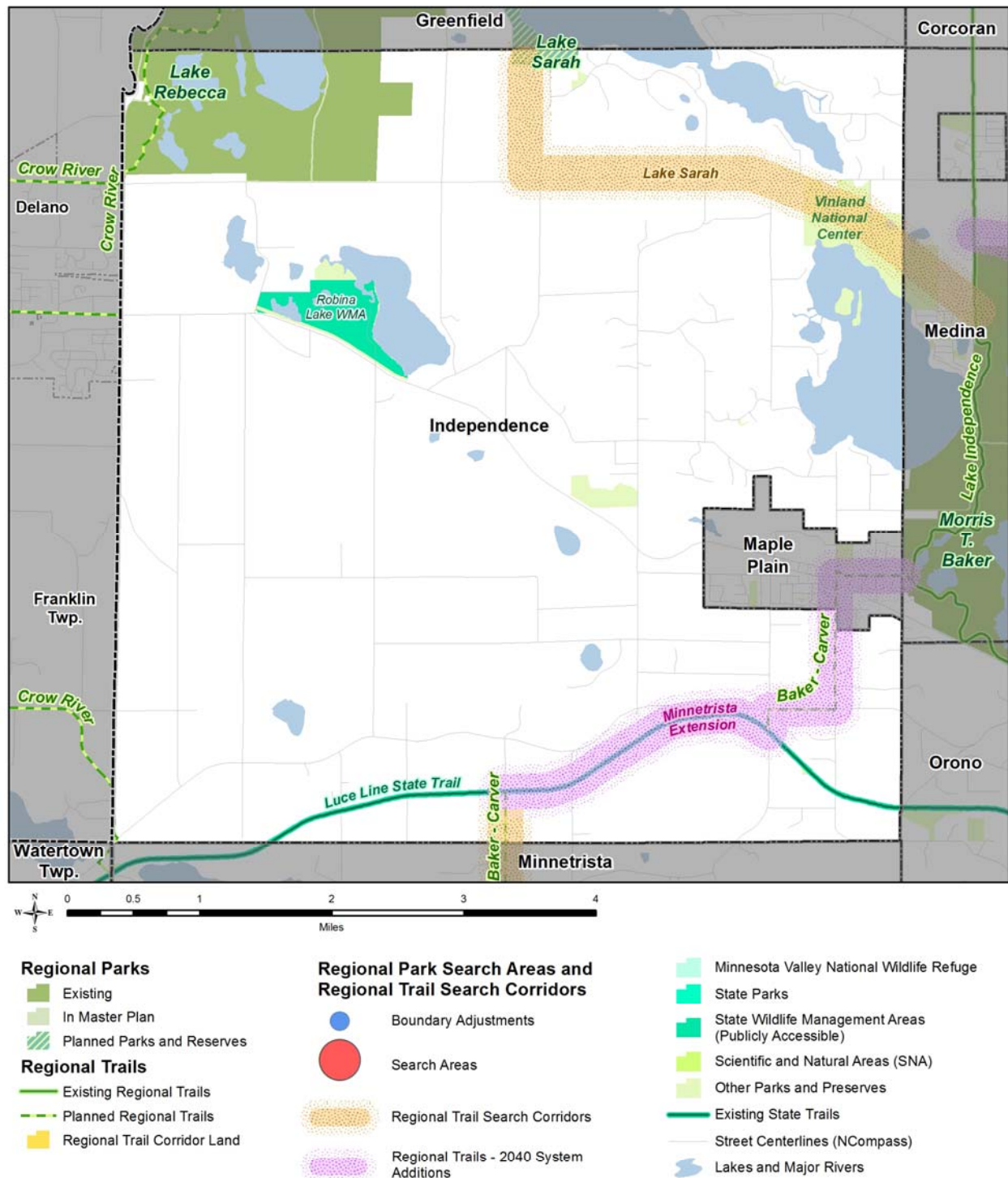
December 2018



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Figure 13: Regional Park System

Regional Parks System City of Independence, Hennepin County



Trails

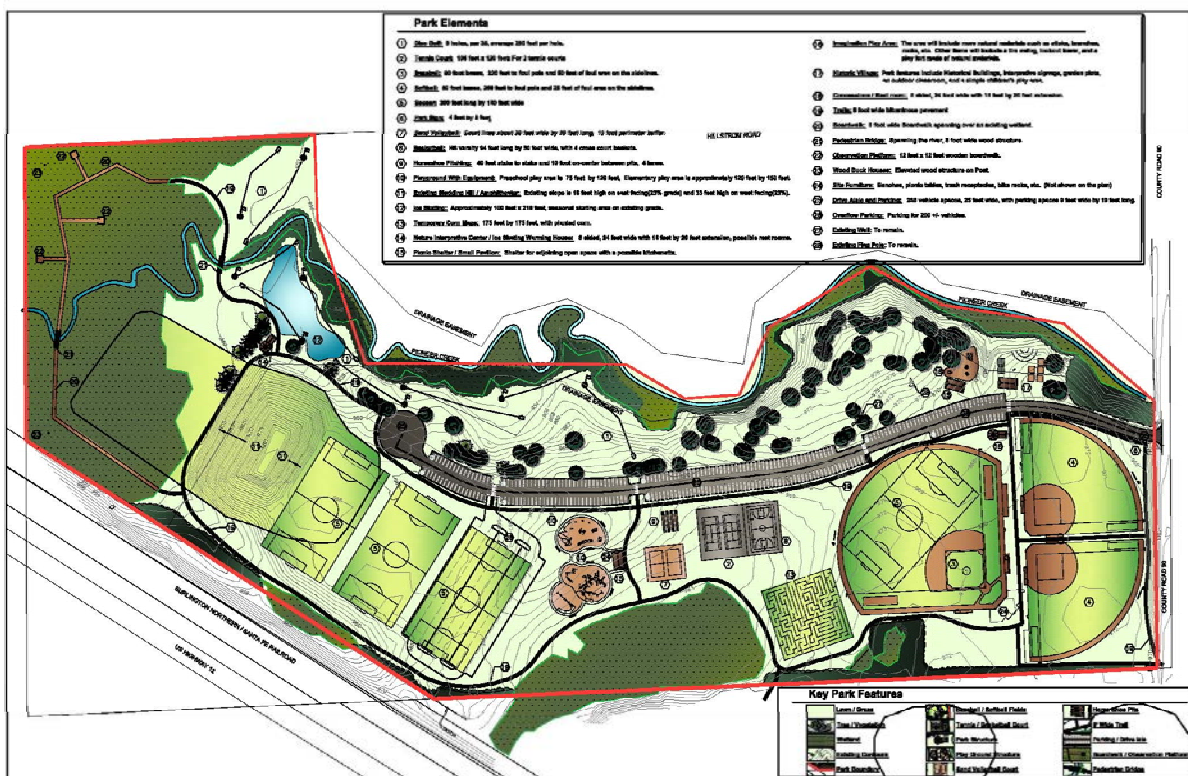
The Luce Line Trail, a regional multi-use trail, travels through the southern portion of the City approximately parallel to County Road 6. The trail begins in Plymouth and is developed 30 miles west to Winsted. The Luce Line Trail is a State Trail that is owned and operated by the Minnesota Department of Natural Resources. The Luce Line Trail is shown on Figure 13.

Figure 13 identifies several future regional trail connections that would link Independence to regional trails and park facilities in adjoining communities. The City of Independence is generally supportive of regional system connections. The City has not approved the Lake Sarah regional trail search corridor between Baker Park and Lake Sarah Regional Park. As this trail is further studied by Three Rivers Park District, the City will want to further review and identify potential trail alignments to ensure that Independence residents are not negatively impacted by its development.

Local Parks

Local parkland consists of Lyndale Park, a 1/3-acre park with play equipment located in the southwestern portion of the City, a 5-acre park also with play equipment on South Lake Sarah Drive and a Pioneer Creek Community Park. Independence residents also use three park areas in Maple Plain.

The Comprehensive Park and Trail System Plan adopted by the City in 1992 indicated that land for a centrally located community park should be acquired. Pioneer Creek Community Park a 50-acre park located on the west side of County Road 90 just north of the City Hall was acquired by the City to serve that need. A master plan for park was prepared in 2007 and initial improvements were made in 2010. The City is has been discussing further development of active athletic fields within the community park in order to serve more residents of the City. It is anticipated that the future development of the park will occur as the City has funding, can obtain grant funding and successfully partners with local athletic associations to develop and maintain the athletic facilities.



PIONEER PARK

MASTER SITE PLAN

City of Independence, Minnesota

2055 County Road 90

March 1st, 2007

3.6 Solar Access

It is now required that local governments in the Metropolitan Area include an element for protection and development of access to direct sunlight for solar energy systems in the Comprehensive Plan. The rationale for including a solar access protection element in the Comprehensive Plan is to assure the availability of direct sunlight to solar energy systems. According to the Metropolitan Council, “a majority share of energy consumed in Minnesota is used for purposes that solar energy could well serve such as space heating and cooling, domestic hot water heating and low-temperature industrial processes.” Independence is well-suited for solar energy utilization due to the vast expanse of undeveloped areas.

The City spent a significant amount of time during the last 5 years developing a solar energy ordinance for the City. The ordinance provides for both roof and ground mounted solar energy systems. During the development of the ordinance, the City evaluated potential solar energy relating to the existing power grid. It was determined that there are only a handful of areas within the City that currently have the infrastructure available to accommodate significant amounts of solar energy generation. The City will continue to monitor and evaluate solar energy potential and controls within the City.

Ensuring that all properties have equal access to sunlight is a priority for energy conservation. The protection of property and aesthetic values is a secondary purpose. Solar access protection is provided for by the uniform implementation of lot and structure standards adopted as part of the Independence Municipal Code. Requirements such as maximum building height and minimum setbacks are implemented for the purpose of creating separation between structures and allowing equal sunlight access so that a property is not in the shadow of an adjacent structure. The City can protect and encourage solar access on individual properties by:

- Providing homeowners and builders with educational materials and resources relating to the benefits of solar access and solar energy.
- Exempting solar collectors from height restrictions if necessary, provided that they do not block solar access to the adjacent building's roof.

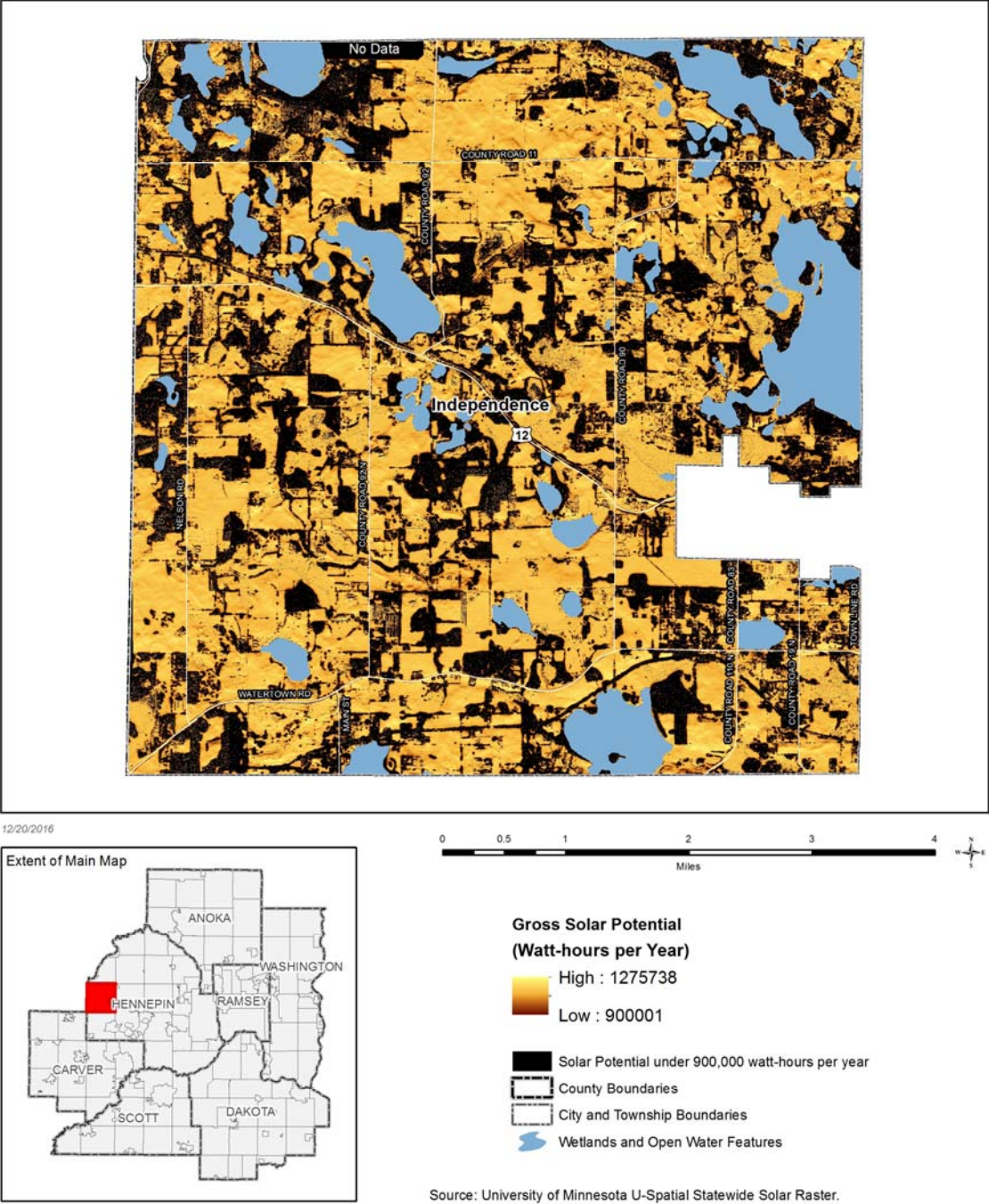
TABLE 18 GROSS AND ROOFTOP SOLAR RESOURCES

Community	Gross Potential (Mwh/yr)	Rooftop Potential (Mwh/yr)	Gross Generation (Mwh/yr)	Rooftop Generation Potential (Mwh/yr)
Independence	58,499,452	368,420	5,849,945	36,842

Source: Metropolitan Council

The gross and potentials in columns 1 and 2 are expressed in megawatt hours per year (Mwh/year) and represent the gross potential resource before removing areas unsuitable for solar development or factors relating to efficiency of conversion. They are not intended to demonstrate the amount of solar likely to develop in the City. The gross generation and rooftop generation potentials in columns 3 and 4 are estimates of how much electricity could be generated using existing technology and conversion factors; however, they do not consider building-specific structural limitations or other factors.

Gross Solar Potential City of Independence, Hennepin County



3.6 Goals, Policies and Implementation Strategies

GOALS	POLICIES	IMPLEMENTATION
1. Maintain and encourage high quality development by capitalizing on the geographic advantage of the City.	<ul style="list-style-type: none"> • Protect and enhance the natural environment (lakes, wetlands, parks and open space) and promote these elements to attract high-quality development to the City. • Maintain design standards for high quality development which will provide the highest possible tax base within the City of Independence. 	<ul style="list-style-type: none"> ▪ Require development to pay for all costs of improvements including any public facilities required to adequately sustain the development. ▪ Development shall be fiscally sound and shall enhance or complement the existing land uses, housing or business types, and respect the rural character of the community.
2. Maintain and enhance the rural quality and character of Independence	<ul style="list-style-type: none"> • Preserve and enhance Independence's natural amenities and resources and rural characteristics. • Concentrate rural residential development in areas where services can most economically be provided. 	<ul style="list-style-type: none"> ▪ Ensure that all new housing developments are provided with adequate open spaces and preservation of natural resources. ▪ Pursue funding such as grants and impact fees to enhance storefronts, building facades, and overall street presence in the downtown area.
3. Provide a high-quality place for people to live, work and play.	<ul style="list-style-type: none"> • Demand development that is innovative, sustainable and of the highest quality, so as to establish Independence as a premier community in Minnesota. • Ensure that the existing housing stock is maintained in a safe and aesthetically pleasing manner. • Provide for and develop housing so that there is a full continuum of types, prices and designs. 	<ul style="list-style-type: none"> ▪ Require new development to have quality materials and design. ▪ Require new development to be consistent with the comprehensive plan.



4.0 TRANSPORTATION

The Transportation Element of the Comprehensive Plan is a vital ingredient in the mix of components directing land use in the City. The transportation system of the City should meet the needs of local citizens without creating unnecessary negative impacts on the community. Transportation planning involves predicting future development, traffic analysis, safety considerations, maintenance and repair needs and interagency cooperation. The Transportation Plan is shown on Figure 8. Hennepin County is projecting 2040 traffic for many roadways in the County and, when completed, those projections will be shown on the plan. All the land area in the City of Independence is in the Metropolitan Council's Transportation Analysis Zone 638.

The Transportation Element of the Plan joins local, county and regional transportation planning efforts. It is interactive with proposed land use changes. There is recognition that the region is not planning any new major arterials and that state and federal monies are less readily available than in the past. Therefore, a primary component of the local plan is to remain respectful of in-place infrastructure and rely on the backbone system of County and State roads. To this end the transportation component minimizes any expansion of this local system and includes projected County plans.

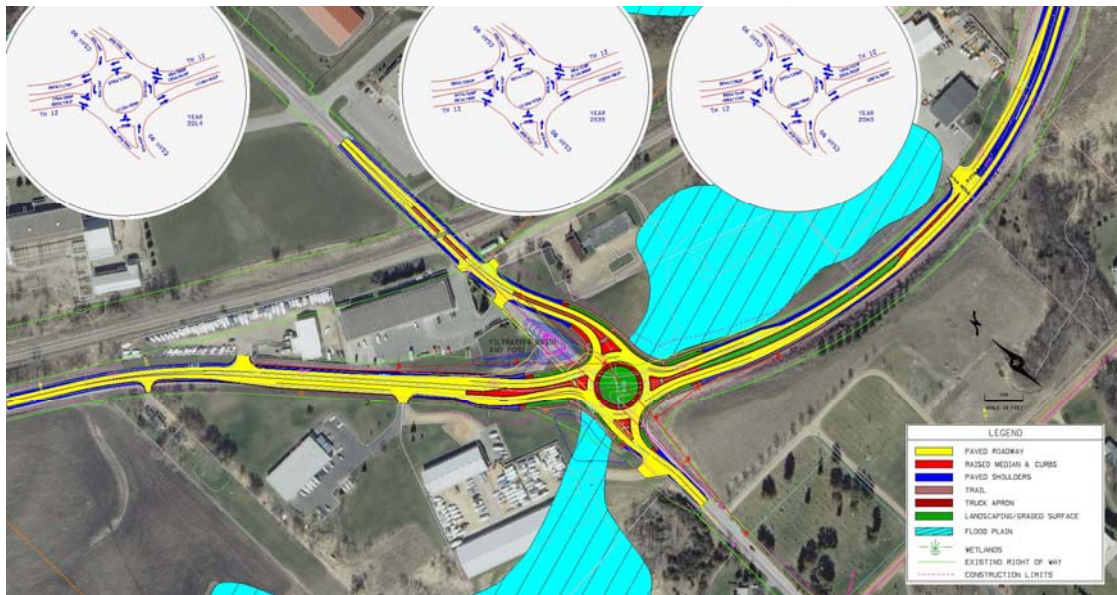
Current Projects

Since the adoption of the 2030 Comprehensive Plan, Independence has spent a considerable amount of time and resources to secure funding for improvements to the Highway 12 and CSAH 90 and CSAH 92 intersections. The City along with West Hennepin Public Safety has been instrumental in the development and ongoing coordination of the Highway 12 Safety Coalition. This coalition was formed to advocate for the enhanced safety of Highway 12 from 494 to Cokato. This stretch of Highway 12 has seen an increase in fatal or significant crashes over the last 10 years. Several significant crashes occurred within the City of Independence during this time period.

Two intersections as well as the extension of the existing concrete median were identified by the coalition as critical needs of the corridor. The coalition successfully secured approximately 11 million dollars in legislative funding during the 2017 legislative session to improve the two primary intersections in Independence. The City has been working with Hennepin County and MNDOT to prepare draft concept plans for the improvement to both intersections. It is anticipated that both intersections will be improved between 2020 and 2023.

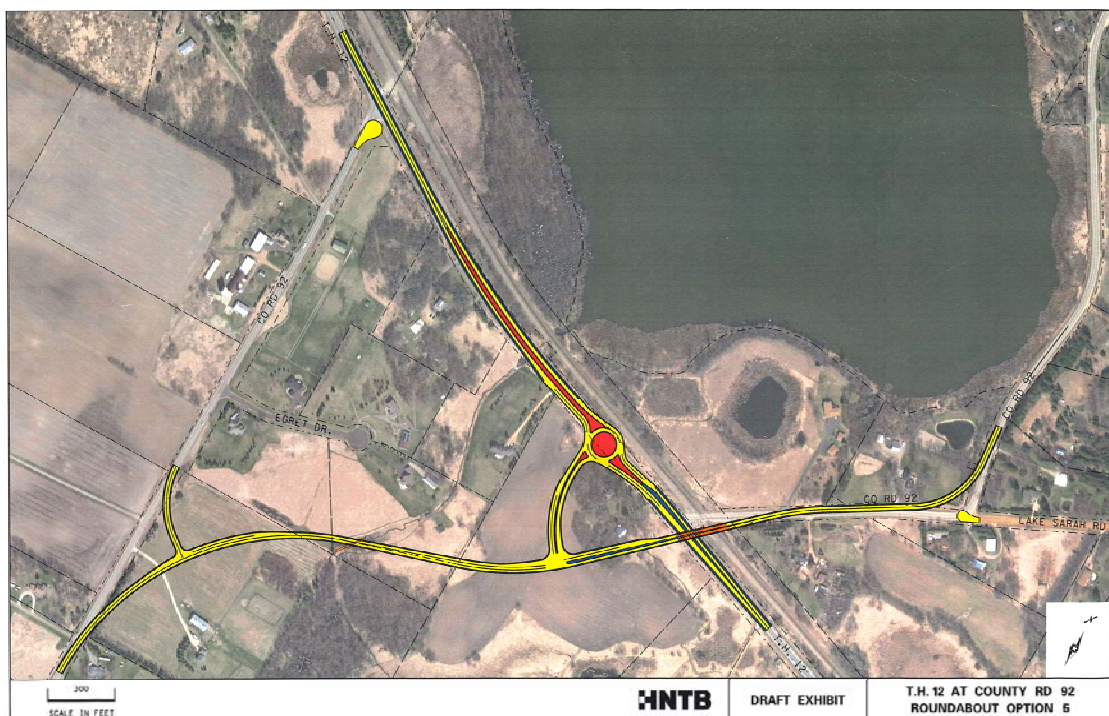
County Road 90/Highway 12 Intersection Improvements

The City, County and State have prepared a conceptual intersection improvement plan for this intersection. The plan proposes a roundabout intersection that will realign the intersection and provide a safe way for residents to gain access to Highway 12. The City is working to ensure that businesses have adequate turn lanes and access to the improved intersection.



County Road 92/Highway 12 Intersection Improvements

The City, County and State have prepared an initial concept alignment study for the redevelopment of both legs of this intersection. The City is strongly supporting the development of an aligned intersection that has a grade separated crossing of the adjacent BNSF railroad. The City believes that fully aligning the north and south legs of CSAH 92 will provide the City and region with a solution that will accommodate growth and development far into the future. In addition, the City believes that the fully aligned solution provides the highest level of safety for the Highway 12 corridor.



Functional Roadway Classification System

The Metropolitan Council functional classification system consists of five classes of roadways:

Principal Arterial

The principal arterial system is the foremost element in the roadway network. Principal arterials are used to connect the sub-regions in the Urban Service Area with each other as well as connect the Metro Area to outstate centers. Principal arterials should not connect to collectors or local streets. In all cases, they should be designed as fully controlled access facilities. Connections with other roadways within the Urban Service Area should be only at grade-separated interchanges and land access should not be provided between these points. Within the Rural Service Area, intersections may be controlled, with at grade intersections.

Minor Arterials

The minor arterial system complements and supports the principal and intermediate system, but is primarily oriented toward travel within and between adjacent subregions. Minor arterials are generally spaced from one half mile to two miles apart and typically are two to four lane streets with signals or stop signs at major intersections. Minor arterials are primarily oriented toward the provision of sub-metropolitan mobility and any land access should be oriented to public streets and major traffic generators. Single-family driveways onto minor arterials should be strongly discouraged. Minor arterials are generally not continuous across two or more sub regions. These roadways are classified into the following groups:

- **Relievers:** Minor arterials that provide direct relief for traffic on major metropolitan highways. These roads include the closest routes parallel to the principal arterials within the urban and transitional areas. These roadways are proposed to accommodate medium length trips (less than eight miles) as well as providing relief to congested principal arterials.
- **Expanders:** Routes that provide a way to make connections between developing areas outside the interstate ring or beltway. These routes are located circumferentially beyond those reasonably served by the beltway, usually medium to long suburb-to-suburb trips.
- **Connectors:** This subgroup of “A” minor arterials provide connections among the town centers in the transitional and rural areas within and near the seven counties.
- **Augmenters:** The fourth group of “A” minor arterials is those roads that augment principal arterials within the interstate ring or beltway. The principal arterial network in this area is in place but not in all cases sufficient relative to the density of development that network serves. In these situations, these key minor arterials serve many long-range trips. Improvements focus on providing additional capacity for through traffic.

Collector Streets

The collector system is to be deployed nearly entirely within sub regions to provide mobility between communities and neighborhoods. The collector system provides as much for land access as it does for vehicle mobility. The collector system also provides a "collection and distribution" system for the trips coming from or going to the metropolitan highway system. That is, the collector system provides access to commercial, industrial, and high-density residential development, while the metropolitan highway system is more oriented toward line-haul or the "non stop" portion of trips. Collectors are spaced between principal and minor arterials usually from one-quarter mile to one mile apart. Collectors are usually two or four lane streets with four way stop signs and traffic signals at intersections with other collectors and minor arterials. Collectors should not normally provide access to principal arterials.

Principal Arterials

The central transportation route to, from and through Independence is T.H. 12. Geometric improvements have been made to an at-grade intersection with County Road 6 about 3 miles east of Independence to make that intersection safer for the traveling public. No other improvements to T.H. 12 are programmed in the Mn/DOT's Transportation System Plan. Lack of improvement in carrying capacity on T.H. 12 will continue to place additional strain on CR 11 and CR 6 to move traffic west to east through the City.

TABLE 19 FUNCTIONAL CLASSIFICATION

Name	Function	Principal Orientation	Status
T.H. 12	Principal Arterial	E-W	2-lane paved
CR6	Minor Arterial	E-W	2-lane paved
CR11	Minor Arterial	E-W	2-lane paved
CR19	Minor Arterial	N-S	2-lane paved
CR90 n. of TH12	Minor Arterial	N-S	2-lane paved
CR92	Minor Arterial	N-S	2-lane paved
CR83/110N	Minor Arterial	N-S	2-lane paved
CR90 s. of TH12	Major Collector	N-S	2-lane paved

TABLE 20 FUNCTIONAL CLASSIFICATION SYSTEM CHARACTERISTICS

	Principal Arterial	Intermediate Arterial	Minor Arterial	Collector	Local
Land Access/Driveways	None	Limited	Limited	Direct Land Access	Direct
Right-of-Way	300'	100'-300'	66'-150'	66'-100'	50'-80'
Speed Limit	45-55	40-50	35-45	30-40	Max. 30
Large Trucks	No Restriction			Restricted as Necessary	Permitted
Parking	None	None		Restricted as Necessary	Restricted as Necessary
Max. Grade (%)	4	4	4	6	8

Minor Arterials

The east-west arterials include CR 11 from Medina to the western City limits and CR 6 from Town Line Road to the western City limits. North/South arterials include CR 19 from the southern City limits to Baker Park Road, CR 92 from CR 11 to the southern City limits, CR 90 from CR 6 to CR 11 and CR 83/110 from Maple Plain to the southern City limits. No plans exist for alterations of existing minor arterial roads in the City.

Collectors

The only street identified as a collector street is County Road 90 south of T.H.12. No plans exist for alterations of CR 90.

Local Streets

The local street system is deployed continuously through all developed areas to provide for local circulation and direct land access. The local street system is deployed within the grid of streets created by the collector and minor arterial system and comprises the largest percentage of total street mileage.

Total mileage by classification is:

Principal Arterial 6.5 miles
Minor Arterial 25.5 miles
Collector .9 miles
Local hard-surfaced 22.7 miles

Access Guidelines

Access guidelines along roadway corridors provide a means for balancing safety concerns and the need of property owners to access the circulation system. Standardized guidelines as those adopted by Hennepin County reflect Minnesota DOT best practices and can aid in the reduction of complaints and traffic incidents. As noted in the Hennepin County Transportation Plan for each functional classification category, these recommended guidelines should be used in the planning process for all new and existing roadway improvements.

TABLE 20 FUNCTIONAL CLASSIFICATION SYSTEM CHARACTERISTICS

Class	Function	Provide Access To	Access Spacing
Principal Arterial	Service to major centers of activity, provides continuity to rural arterial system	Principal arterial, minor arterial	1 mile = primary full movement intersection, 1/2 mile = conditional secondary intersection
Minor Arterial	Service of an intra-community nature, urban concentrations to rural collector roads	Principal arterial, Collector Streets, Land	½ mile = primary full movement intersection, 1/4 mile = conditional secondary intersection
Collector Street	Local collection and distribution between collector streets and arterial, land access in minor generations	Land Minor arterial Local streets	½ mile = primary full movement intersection, 1/4 mile = conditional secondary intersection
Local Streets	Service to abutting land	Land, Higher system elements	300-600 feet dependent upon block length

Source: Metropolitan Council

Railroads

Two railroads pass east west through the City. The Canadian Pacific passes through the northeast corner of the City and the Burlington Northern route runs through the center of Independence parallel to T.H. 12.

Airports

Maple Airport is an FAA-licensed grass runway airport located on County Road 83 approximately 1/4 mile south of the Maple Plain City Limits. The nearest minor airport is in Buffalo, 15 miles away. The following data indicates other proximate airports to the City:

MSP International	30 miles
Buffalo	15 miles
Crystal	21 miles
Flying Cloud	21 miles

Lake Independence and Lake Sarah are permitted use areas for seaplane operations under Man/DOT Rule 14 MCAR 1.3018.

The City has no existing structures of 200 feet or more in height. Any applicant who proposes to construct a facility taller than 200 feet is required to notify the City and the Commissioner of the Minnesota Department of Transportation at least 30 days in advance as required by Man/DOT Rule 14 MCAR 1.3015, Subdivision C and the Federal Aviation Administration using FAA Form 7460-1.

Heliports

No helicopter landing facilities currently exist or are planned in Independence. If a heliport facility is proposed in the City, the City will utilize the Metropolitan Councils model heliport ordinance to assist in responding to heliport proposal and to provide a basis for appropriate land use controls.

Public Transportation

The City of Independence is outside of the Metropolitan Transit Taxing district and therefore, no regular route transit service exists or is planned in the City. Independence is currently in Market Area IV. Transportation service options for Market Area IV include dial-a-ride, volunteer driver programs and ride sharing. Dial-a-ride service is provided by the Delano River Rider and Westonka Rides. The City will support regional park and ride facilities as they develop.

No light rail transit is planned for the City.

Figure 8: Transportation Plan and Projections

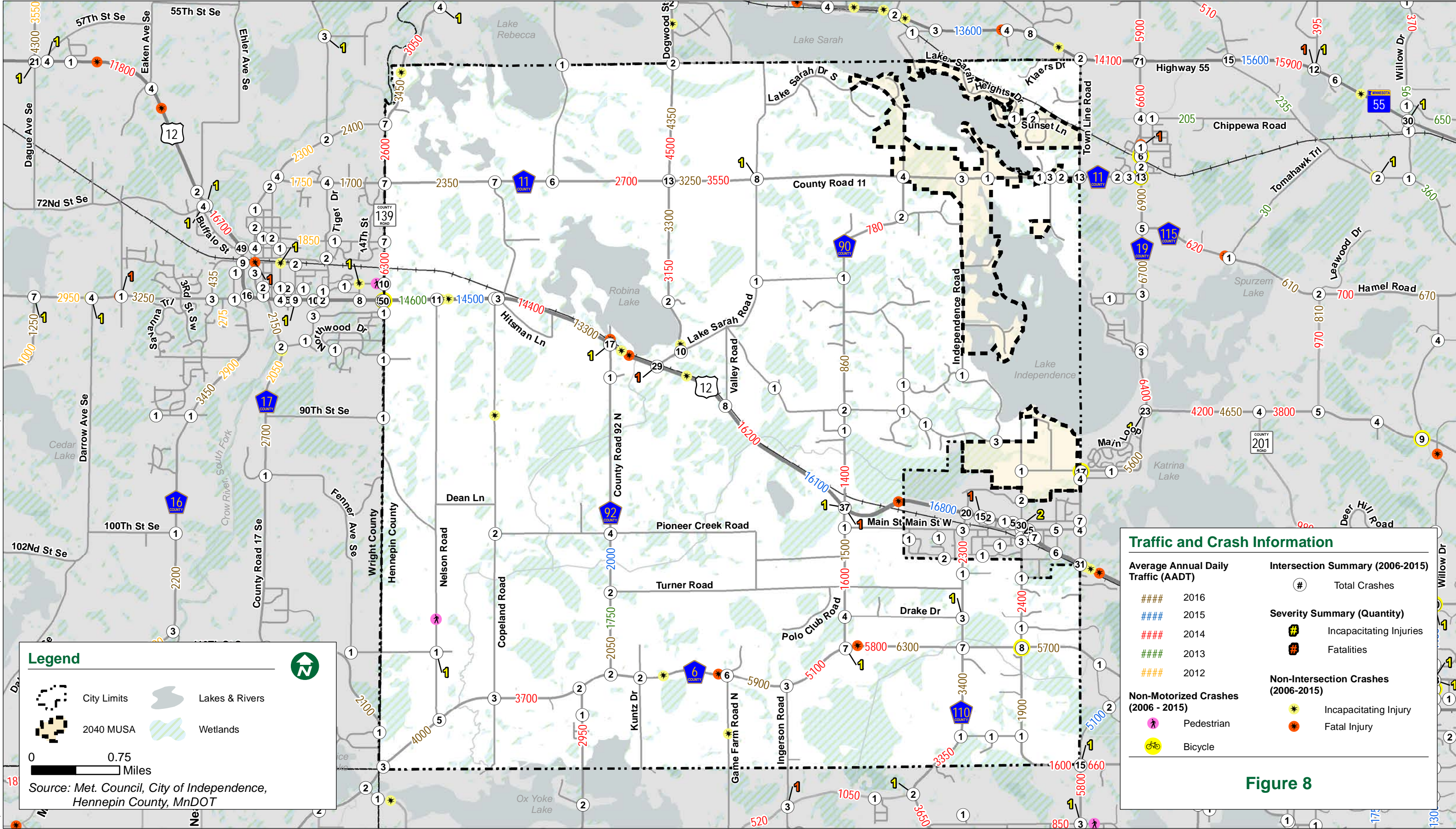


2040 Comprehensive Plan

Independence, MN

Existing Traffic Volume & Crash Data

December 2018



4.1 Goals, Policies and Implementation Strategies

GOALS	POLICIES	IMPLEMENTATION
1. Realize the completion of CSAH 90/92 and Highway 12 Intersections.	<ul style="list-style-type: none">• Work with agencies as necessary to promote the development of this infrastructure.	<ul style="list-style-type: none">▪ Help facilitate the planning, design and land acquisition for the necessary improvements.▪ Keep the public well informed relating to the status of the project and major decision points.
2. Maintain the existing infrastructure in a manner which extends its lifespan to maximize tax dollars.	<ul style="list-style-type: none">• Continue to add drain tile to gravel roads.• Continue seal coating and crack sealing of all paved roads.• Plan and budget for a second overlay project every 10 years.	<ul style="list-style-type: none">▪ Ensure that the City continues to follow the capital expenditure plan.▪ Develop a clear crack-sealing and seal coating plan.▪ Look for funding opportunities to continue tiling gravel roads.



5.0 WATER RESOURCES

Protection and preservation of Independence's ecological and environmental systems is vital to the City's long-term well-being. The City has large areas of land and water, which are especially sensitive to land alteration or changes in land use functions. Flood plains, wetlands, steep slopes and marginal soils should be protected so as to retain their primary ecological functions while permitting appropriate recreational use and development.

Lands within the City should be used and developed to preserve their open, scenic and natural characteristics as well as their primary ecological functions. Numerous considerations must be taken into account when any type of development is being proposed.

Soils and Topography

Soil condition is a prime determinant of the suitability of land for development. Limitations due to soil stability, permeability, and so on, should serve to regulate various development proposals. Soils analysis should be conducted at proposed development sites to determine land capability and capacity. Any development within environmentally sensitive areas should provide an analysis of the effect of the development and construction activities.

Flood plains

Lands classified as being within the floodplain are those soils subject to periodic inundation by floodwaters. The process of residential development typically includes draining wet soils, filling and grading of lowlands, and a substantial increase in the total impervious cover of an area (roofs, streets, driveways, etc.). These activities all contribute to an increase in flood potential, both seasonal and flash floods. The normal function of floodplain soils is to store excess water, runoff and channel drainage. Protection of this

function requires the prohibition of any development restricting the flow of floodwater or significantly retarding the floodplain soils capability to absorb and store runoff.

Floodplain lands are best suited for open space, parks and wildlife refuge areas. There is marginal potential for agricultural cultivation and pasture use, depending on soil condition. These activities do not constrain the primary function of the floodplain soils and do serve to preserve the scenic qualities and ecological needs of the land.

Appropriate restrictions of on-site disposal systems are necessary as are limitations on any new construction on floodplain soils. Urban mitigation measures include enforcement of Best Management Practices (BMPs), NURP ponds and vegetative buffer zones. The City updated its Floodplain Management ordinances in 2016 to coincide with the adoption of the updated FEMA FIRM Maps.

Wetland Management

Wetlands include marshes, bogs, lakes and rivers; many times those areas are adjacent or coterminous with floodplain/flood fringe areas. As such, they retain many of the same characteristics and restrictions as floodplain areas - prohibiting obstruction of floodwaters or decreasing overall water storage capability. These lands are also more susceptible to pollution. Wetland areas are extremely poor for development; shrink/swell soil characteristics produce poor foundation stability, periodic water inundation is a continual hazard, and pollution from on-site disposal presents potential pollution problems.

Wetland quality and character are determinants of the amount of environmental disruption the drainage area has sustained. The greater the disturbance from fertilizer loads, exposed soils on steep hillsides, faulty septic systems, pesticides, roads, etc., the lower the quality of the wetland.

Protection of wetlands requires regulations on grading and filling, on-site disposal, and generally any intensive type of development. The best use for the land surrounding wetlands is open space and wildlife habitat. Once again, marginal agricultural use/pasture land is possible depending on site-specific soil characteristics.

Vegetation

Land alteration requiring extensive removal of vegetation should be carefully regulated. Activities like clear-cutting of major stands of trees or massive cut-and-fill operations have substantial negative impact on surrounding vegetation, drainage patterns and runoff potential. Vegetation on unstable soils should be protected. The existing vegetation within the City serves a variety of functions. Protection of these assets and rectification of previously removed vegetation is important to the City in terms of community health, safety and aesthetics.

5.1 Waste Water

The need for a municipal wastewater collection system is often based on health and safety, and environmental concerns. The concentration of homes around Lake Sarah and Lake Independence caused a health and safety problem due to failing septic systems and the close proximity of private wells. The City recognized this problem in the late 1970's and entered into a contract with Medina and the Metropolitan Wastewater Commission in 1984 to serve 97 residents around Lake Sarah. Later, in response to concerns over surface water quality and failing systems, the City Council initiated a project to serve additional properties adjacent to the existing collection system. The City received approval from Medina and the Metropolitan Wastewater Commission to allow the additional connections.

While this resolved the immediate problem of failing systems, it became apparent that other septic systems were failing or not working effectively. This caused the City to request expansion of the 1984 system for 135 additional hook-ups. The wastewater collection system in place today was constructed in 1996, 2009, and 2012. This system provides a total of 288 sewer connections to local residents. Currently the City is using 241 of the 288 available connections. Figure 9 shows the current sewer service area.

As shown on Figure 9, the existing collection system serves an area around Lake Sarah and an area along the northwest side of Lake Independence. This collection systems flow through the City of Medina to Metropolitan Council Lift Station No. 63. Currently the City of Independence, the City of Greenfield and the City of Medina have an agreement to share their sewer infrastructure. An additional system serves an area along the south side of Lake Independence and north side of Maple Plain. This collection system flows to Met Council Lift Station No. 63.

The northern sewered area around Lake Sarah and northwest Lake Independence has 212 homes connected and 38 services available for connection. The sewer from this area is collected at Townline Road and County Road 11 and then flows into the City of Medina at the intersection of County Road 11 and County Road 19.

The southern sewered area around Lake Independence is smaller and includes 29 homes currently with 9 services available for connection. This area flows into the City of Medina at Perkinsville Road and County Road 19. Future serviceable parcels are shown in Figure 11 and could include 14 new short term and 20 new long term connections based on the capacity and location of the existing four-inch forcemain. In a review of the downstream capacity, it was estimated that there is sufficient capacity to accommodate all of the additional connections generated by the future serviceable parcels. This would likely require the replacement of several pumps located in existing lift station to be able to hand the future head conditions. Currently one parcel within the City of Independence is served by the Maple Plain sanitary sewer system.

An additional future sanitary sewer service area that the City Independence is evaluating is located south of Maple Plain City limits and includes several parcels zoned for residential and rural residential. The area would be served via a gravity truck line that begins at the Met Council lift station No. 63 located at the intersection of Poplar Ave and Willow St. The gravity line would extent west and approach County Road 90 and could serve approximately 496 acres of rural residential and residential. The area west of County Road 90 would be

served by a future lift station that could potentially serve an additional 1595 acres of rural residential, commercial/light industrial, and some agricultural property post 2040. The future service area is shown in Figure 12.

The following table shows the population, households, and employment forecasts for the areas with municipal connections.

TABLE 21 POPULATION, HOUSEHOLD AND EMPLOYMENT FORECASTS

	2020	2025	2030	2035	2040
Sewered Population	489	809	1121	1358	1799
Sewered Households	188	289	374	513	782
Sewered Employment	0	0	0	0	0

Source: City of Independence

Figure 9: Sanitary Sewer Map

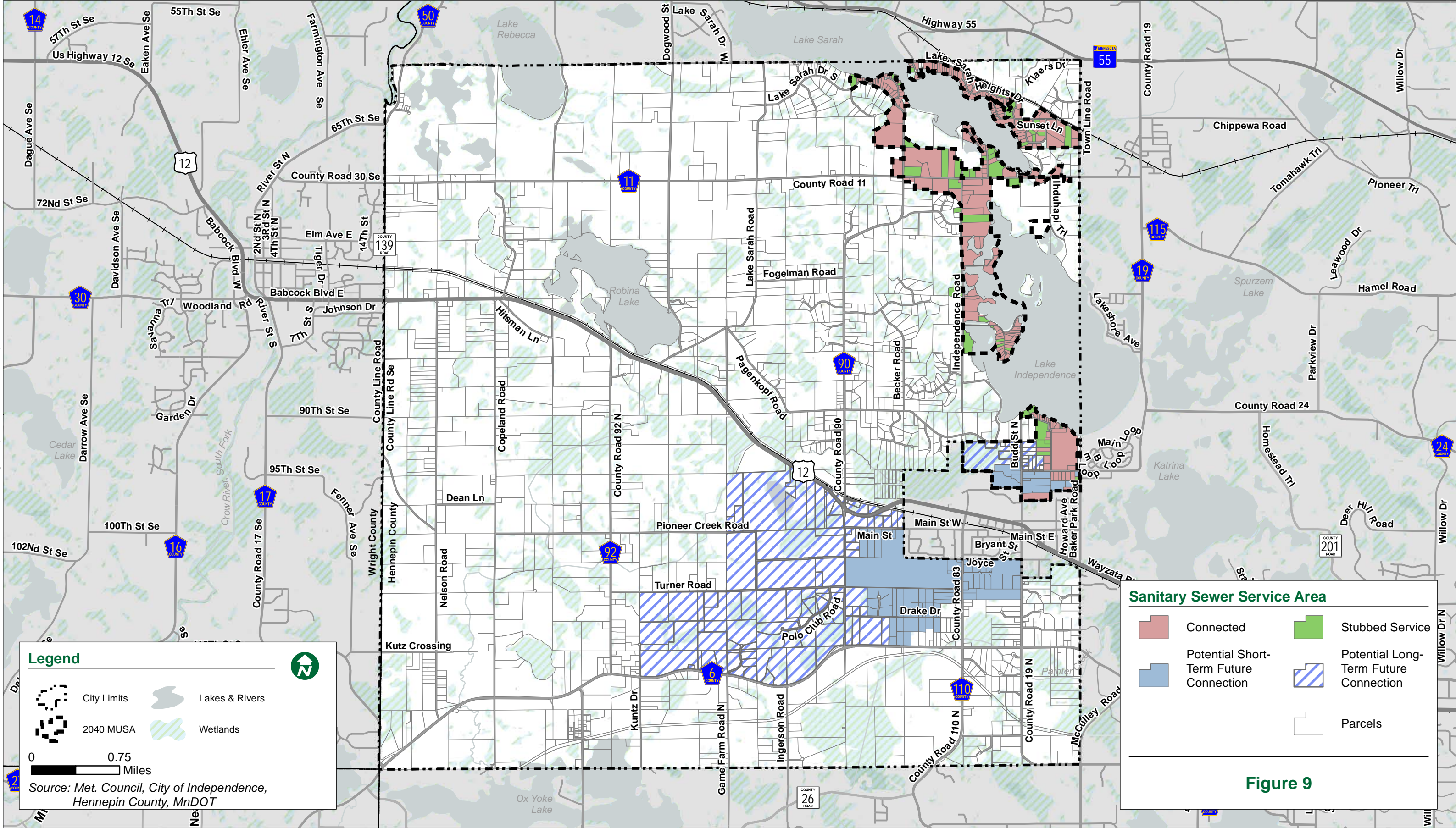


2040 Comprehensive Plan

Independence, MN

Existing Sanitary Sewer Service Area

December 2018



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Figure 10: Lake Sarah Sanitary Sewer

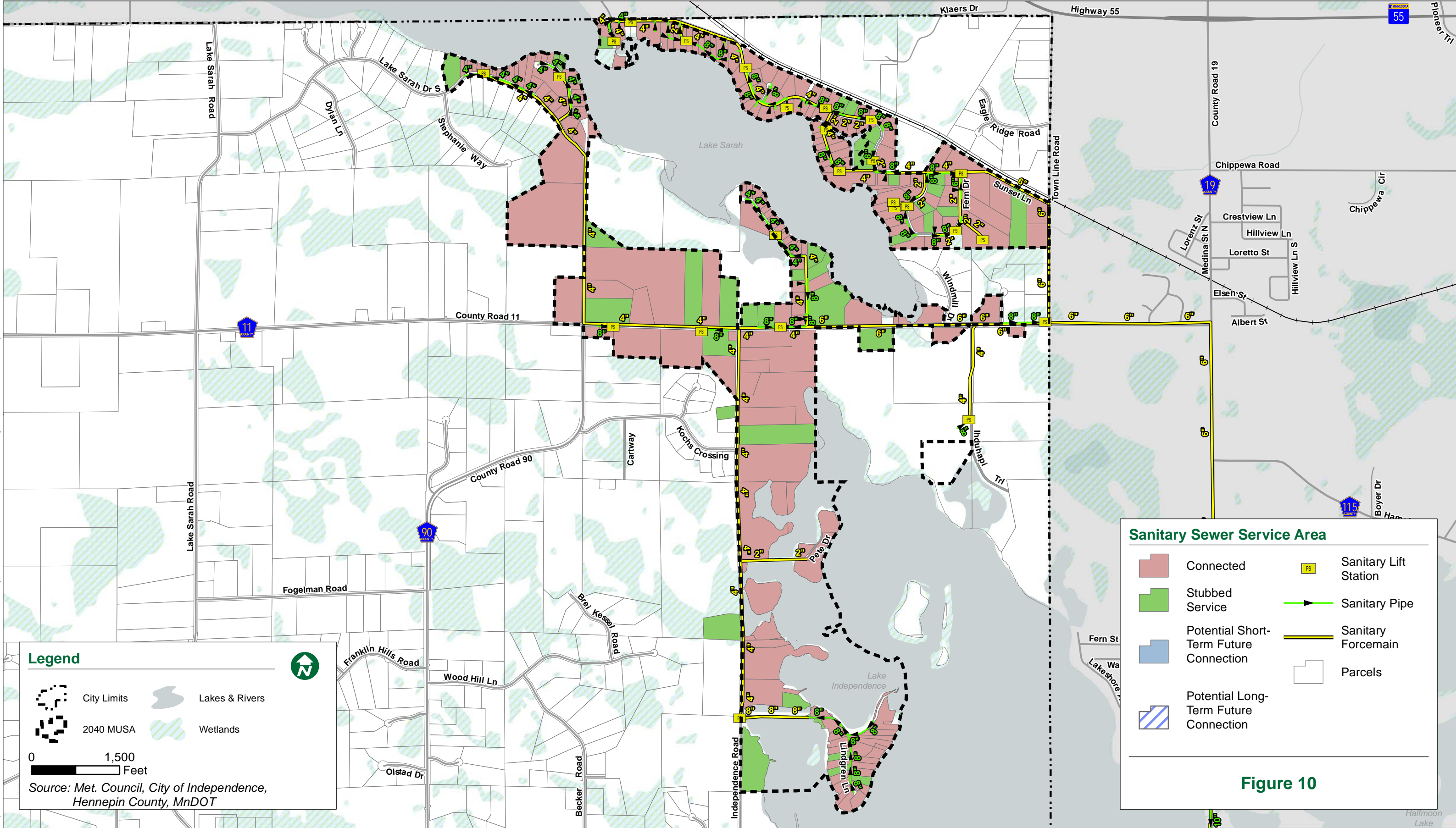


Figure 11: Lake Independence Sanitary Sewer



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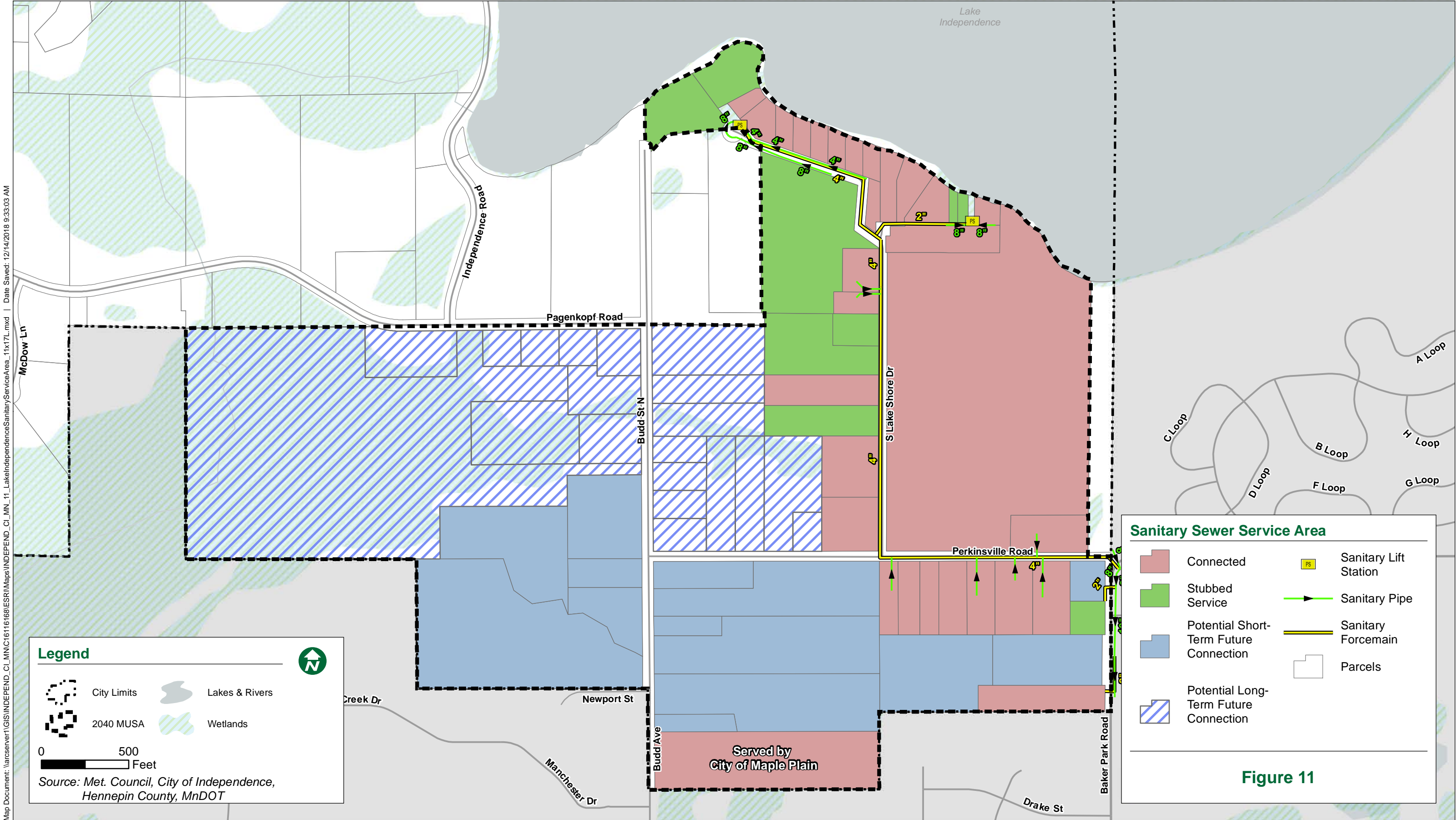
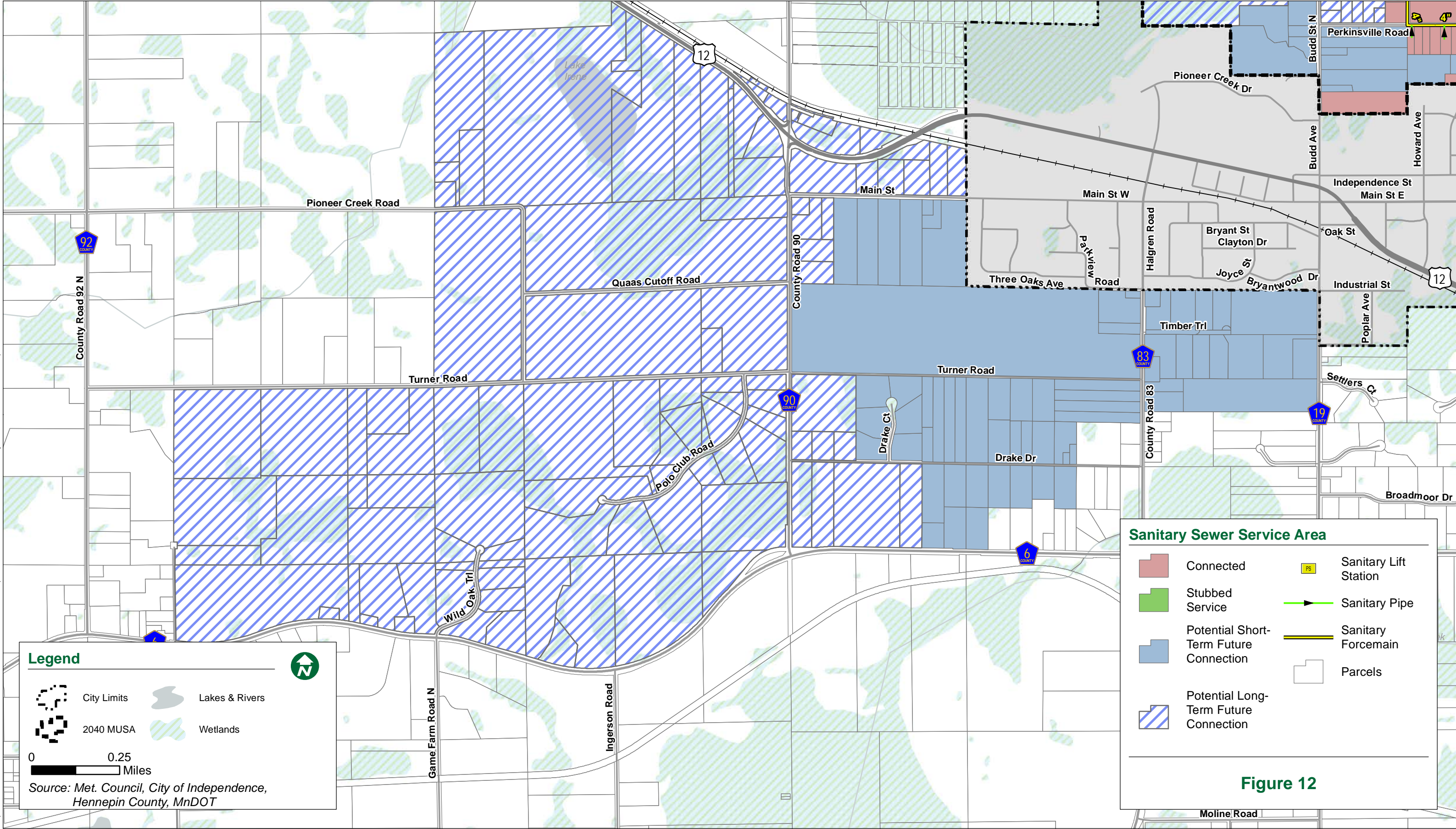


Figure 11

Figure 12: Future South Area Sewer



The area identified on Figure 7 as Urban Commercial is also planned for municipal sewer. This area will be served by the City of Delano or a Community Sewage Treatment Systems (CSTS). The City has prepared a scoping study to determine the utility needs of the Urban Commercial area. Various options existed for servicing this Urban Commercial area with water/wastewater services. The City has previously explored the possibility of an interconnection to the City of Delano and found it to be a physically viable alternative. Independence has explored two additional alternatives to servicing this area through a prepared Scoping Study, Commercial Area Utilities. The Scoping Study Commercial Area Utilities, September 2009, is attached to this plan in the appendix. This study explored the possibility of an interconnection with the City of Greenfield and servicing this area with an on-site or local system. It was ultimately determined to serve the area through the City of Delano as the connection to the City of Greenfield should not be considered due to the potential impact on Lake Rebecca Park Preserve, and the on-site system is not preferred at this time.

For a detailed evaluation of the projected service demands and alternative ways to accommodate those demands, please refer to the Scoping Study Commercial Area Utilities, September 2009 included as an appendix to this plan.

Wastewater Land Use and Population

The sizing of wastewater collection facilities is dependent on the hydraulic capacity required for each part of the system. Municipal wastewater is generally a mixture of domestic sewage, commercial and industrial wastes, ground water infiltration and surface water inflow. With proper design and construction, ground water infiltration is reduced to a minor percentage of the total flow and surface water inflow is eliminated, leading to hydraulic discharges that depend predominantly on land use.

Since properly designed and constructed sanitary sewer pipes have long life expectancies, it is reasonable to assume that the full development population will be reached before pipe facility replacement becomes necessary. The existing and proposed sewer collection systems are shown on Figure 10, Figure 11, and Figure 12. The facilities shown will support full development of the study area.

The proposed land uses receiving municipal sewer are shown on Figure 7 as “Residential”, “Rural Residential”, “Commercial/Light Industrial”, or “Agricultural”. The sewer connections in the Rural Residential area are already available (not all connected at this time) and were previously granted through past intercommunity flow agreements with Medina and Greenfield. The proposed Residential area will require a new agreement, most likely with Median and Met Council. The flows for both the new Urban Residential connections and existing Rural Residential connections are shown in the following table.

TABLE 22 SUMMARY OF CONNECTIONS AND FLOW RATES

	2020	2025	2030	2035	2040
Rural Residential Connections	241	261	282	301	321
Residential Connections	8	40	252	302	410
Commercial/Light Industrial	0	0	0	0	20
Urban Residential	0	0	36	72	72
Agricultural	0	0	0	0	0
Average Annual Daily Wastewater Flow (MGD)	0.068	0.083	0.156	0.185	0.226
Peak Hourly Flow (MG)	0.011	0.013	0.024	0.028	0.034
Allowable Peak Hourly Flow (MGD)	0.12	0.16	0.2	0.24	0.28

Source: City of Independence

Wastewater Design Criteria

Wastewater flows were calculated by determining the number of residential equivalent connections (RECs) within the wastewater study area and associated densities. Each REC was assumed to contribute 274 gallons of wastewater per day. The table above shows each land use and the potential number of RECs at full build out. The table above also shows the total flow for the proposed RECs.

Inflow and Infiltration (I&I)

Inflow and infiltration is clear water that enters the sanitary sewer system. I&I can enter the sanitary sewer through many sources: pipes, manholes, sump pumps, and foundation drains.

The design and construction of new sewers and the connection of new and existing buildings to the sewer system in the City of Independence will meet the industry standards for tightness and minimize the entry of Infiltration and Inflow into the collection system.

The City of Independence standards will meet the state of Minnesota requirements. All new sewers will be designed and installed so leakage into the sewer is less than 100 gallons per day per inch-diameter per mile of sewer. To ensure compliance with this standard the City of Independence will require onsite construction observation during construction and verification testing prior to acceptance of the public improvements. Certification by a professional engineer that new facilities are installed in accordance with all specifications will also be required. Records of these certifications will be maintained by the City of Independence.

To ensure that all municipal utilities are properly constructed and will meet all state, federal, and local requirements, the City of Independence prepared an Engineering Manual that addresses the material and workmanship that will be required for all municipal improvements. The Engineering Manual requires all wastewater facilities be designed to conform to the “10 State Standards” and be constructed in accordance with City Engineers Association of Minnesota Standard Specification except as modified by specific City of Independence requirements.

The connection of building laterals to the trunk sewer system will be permitted by the building department. A licensed plumber shall certify that the connection was made in accordance with the building code.

Maintenance Program

The City of Independence has developed an aggressive Inflow and Infiltration (I & I) program. To bolster the effectiveness of the City’s program, a new sewer line inspection camera was purchased in 2017. This camera allows the City to quickly respond and identify to potential I & I entering the system during rain fall events. The City has corrected many of the problems identified by the program such as: raising lift station covers, inspecting homes for sump pump and foundation drain connections to sanitary sewers, and televising sanitary sewer lines for leaks. The City has an ongoing sewer cleaning and inspection program as part of the routine maintenance of the collection system. I&I sources are evaluated regularly and, when identified, are corrected in a timely manner.

Peak Wastewater System Design

The wastewater system must be capable of handling not only the average flows, but also anticipated flows. These peak flows are obtained by multiplying average flows by a variable factor. This factor, called the Peak Flow Factor, generally decreases with increasing average flows. The Peak Flow Factor used in preparing this report was taken from the “10 State Standards” manual. These values are considered conservative and are widely used for planning purposes.

Metropolitan Facilities

The wastewater from the City of Independence is treated at the Blue Lake Plant. The Blue Lake plant is located in Shakopee. The plant treats wastewater from 27 different communities and accommodates approximately 285,000 people. The plant treats an average of 29 million gallons of wastewater daily, and discharges to the Minnesota River.

Individual Sewage Treatment Systems

The majority of the City of Independence is not served by a public sewer system. The estimated number of existing ISTS systems is 1,180. It is anticipated that Individual Sewage Treatment Systems (ISTS) will remain the principal waste disposal method within the City of Independence. ISTS treat and disperse sewage for individual lots not served by publicly

owned facilities. At full build out, it is estimated that there will be 1,511 Individual Sewage Treatment Systems in the City of Independence.

The City currently has provisions in its City Code regulating the use of on-site sewage treatment. While it is the homeowner's responsibility to keep their ISTS operational, the Metropolitan Council expects all communities to have an ISTS management program which ensures that ISTS are properly installed, maintained, and managed. The City implemented a maintenance tracking and notification database to effectively manage its ISTS. The database identifies the year the system was built, the date each was inspected, the condition of the system, the volume and date of pumping, and whether the system was compliant with MPCA Rule 7080.

Community Sewage Treatment Systems

Currently there is one Community Sewage Treatment Systems (CSTS) in the City of Independence as shown on Figure 13. CSTS are basically large scale ISTS. They are systems that provide treatment for two or more dwellings on separate lots. CSTS provide open space and allow for more sensible use of land which would minimize future costs for the extension of municipal services.

The City maintains the one CSTS within the City and charges the residents and businesses a user fee. Since 2010, three of the previous four CSTS in the City were converted to sanitary sewer as they were located in environmental protection area on the land use plan and sanitary service was provided nearby. The City provides the inspection, monitoring, operating and maintenance services for the CSTS to ensure their compliance with Minnesota Pollution Control Agency's Rule 7080. The City has established an ordinance that controls how the homeowners are allowed to use the system.

Figure 13: Community Sewage Treatment Systems

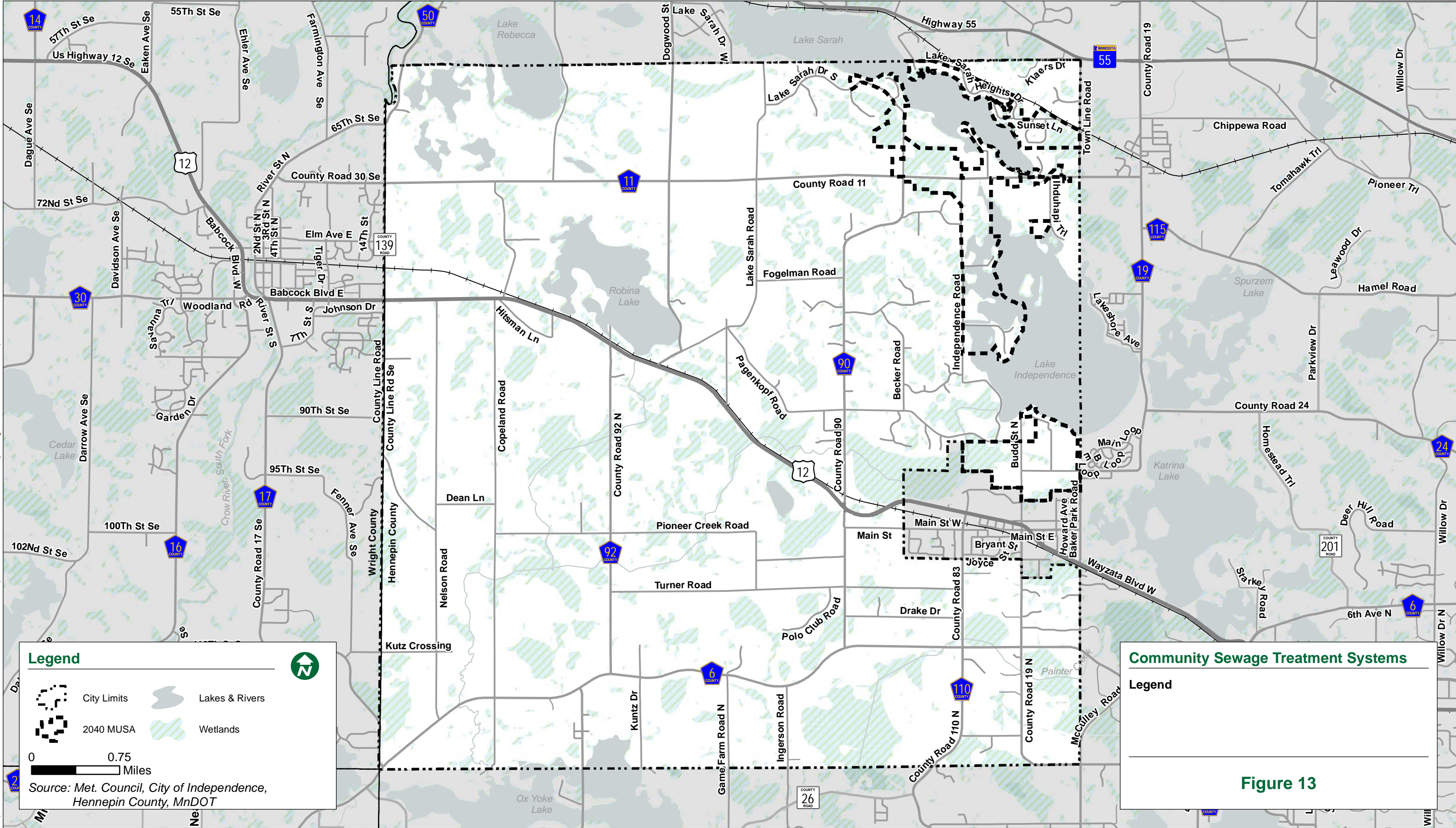


2040 Comprehensive Plan

Independence, MN

Community Sewage Treatment Systems

December 2018



5.2 Local Water Management

The City of Independence has developed a Local Water Management Plan (LWMP) to protect water resources, which include numerous wetlands, several large lakes and recreational lands. The LWMP provides the framework to be followed to preserve these resources as the city develops. The LWMP is incorporated by reference and is found in the Appendix.

The LWMP was prepared to fulfill the legal requirements of the Metropolitan Surface Water Planning Rules (Chapter 8410). The plan also meets the policies and requirements of the Pioneer-Sarah Creek Watershed Management Commission and the Minnehaha Creek Watershed District and other local, state, and federal agencies.

The general approach to water resource planning focuses on wetland protection, water quality, and flood control; each are described below.

5.3 Water Supply Plan

The City of Independence does not have a public water supply or distribution system. All residential and non-residential properties are served by private individual wells. Each homeowner is responsible for the care and maintenance of the individual well, storage and distribution within their own property. The Minnesota Department of Health is the permitting authority for wells and the City will continue to cooperate with the Department of Health in ensuring a healthy water supply through inspections and, if necessary, treatment.

In the future, the City may work with surrounding jurisdictions to secure municipal water for property developed as sewer residential.

5.4 Goals, Policies and Implementation Strategies

GOALS	POLICIES	IMPLEMENTATION
1. TBD	<ul style="list-style-type: none">• TBD• TBD	<ul style="list-style-type: none">▪ TBD▪ TBD
2. TBD	<ul style="list-style-type: none">• TBD TBD	<ul style="list-style-type: none">▪ TBD▪ TBD
3. TBD	<ul style="list-style-type: none">• TBD TBD	<ul style="list-style-type: none">▪ TBD TBD



6.0 ECONOMIC DEVELOPMENT, COMPETITIVENESS, RESILIENCE

6.1 Economic Development, Competitiveness

The local business sector has been exclusively the product of private initiative. Independence has been supportive of the local business community. The City has experienced limited commercial growth during the past decade. While there is ample room available for new development within the land guided for commercial/light industrial, the lack of municipal sewer and water facilities and other infrastructure improvements preclude the likelihood of rapid development. The land guided for future commercial development is clustered near the center of the City at the intersection of CSAH 90 and Highway 12. The geographic advantage of this area positions the City to be well served in the future when utilities become available.

Independence has been purposeful in limiting commercial development along Highway 12. The City has historically been asked to allow “spot” commercial development along the Highway 12 corridor. The City has long recognized the importance of this corridor as the gateway to the City. Development of this corridor will need to correspond with the availability of adequate public facilities which include sanitary sewer, water and road capacity. It is anticipated that the City will continue to protect the Highway 12 corridor until such time as adequate facilities become available.

The City has preserved an approximately 60-acre area at the western edge of the City for future Urban Commercial development. Again, this area would require the availability of adequate public facilities in order to develop. The City understands the importance of having adequate opportunities for the future development of commercial, retail and business land uses.

Independence will continue to support the development of commercial, retail and employment-based development within adjacent communities. Independence residents associate with different local centers based on school district and geographic location. As a result, there is not one commercial area that residents solely identify with or frequent. Loretto, Maple Plain, Rockford and Delano all provide independence residents with commercial and retail services as well as employment opportunities. Independence will continue to support the development of the surrounding communities as well as their business development and promotion organizations.

6.2 Resilience

Independence has historically been at the forefront of innovative planning relating to the protection and enhancement of the many natural resources within the City. The City has aggressively sought funding to reduce on-site sanitary sewers near its lakes, developed cluster development subdivision standards to promote the preservation of open space, establishment of large infiltration areas, worked to reduce nutrient run-off into local water resources and recently adopted a unique manure management policy to proactively address the significant horse industry in the community. These are a few examples of how Independence is working to preserve and enhance natural resources. The aforementioned practices combined with the vast expanse of open space within the community, help to position Independence to be able to adapt to issues arising from climate change. Independence will continue to look for opportunities to utilize best management practices, innovative planning principles and other similar measures to establish its resilience to unforeseen changes to our region.

6.3 Goals, Policies and Implementation Strategies

GOALS	POLICIES	IMPLEMENTATION
1. Seek opportunities to implement best management strategies into development within the City.	<ul style="list-style-type: none">• Protect and enhance the natural environment (lakes, wetlands, parks and open space).	<ul style="list-style-type: none">▪ Continue to innovate the City's standards and policies relating to development to enhance and protect natural resources.



7.0 IMPLEMENTATION

The comprehensive plan will not have an influence on development of the City unless its goals and policies are implemented. The implementation chapter is both a planning and budgeting tool. Programs and projects are initially identified and defined by the comprehensive plan. The initial task of the implementation is to establish a detailed listing of projects and activities that are needed to realize the opportunities set forth in the comprehensive plan.

It is necessary to emphasize that the implementation plan is an ongoing, annual effort that Independence should utilize as part of its management and budget process. The implementation plan should be reviewed and updated as part of the City's yearly financial planning. The City will then be able to recognize opportunities outlined by the comprehensive plan within the available resources. Outside factors such as growth, development, redevelopment, and the economic market drive important improvements that may be necessary. These must be monitored to ensure the plan reflects any important changes or events.

Throughout the Comprehensive Plan, each chapter articulates goals, policies and implementation strategies that outline how the City intends to implement the goals of the Comprehensive Plan.

Public Participation

Public input in the decision-making and planning process is vital to ensuring community support, buy in and ultimate implementation of the plan goals and policies. Public participation in planning for the City of Independence will continue to stay at the forefront of the City's processes.

Interjurisdictional Coordination

In addition to working from within the City with its staff and citizen advisory boards, the City of Independence will work with surrounding municipalities and jurisdictions to coordinate its plans for growth, in order to best meet broader regional planning goals. Areas where collaboration with regional jurisdictions and surrounding communities are most fitting are identified in this plan.

Plan Adoption

The Comprehensive Plan should be preliminarily approved by the City Council and submitted for review and approval by the Metropolitan Council. Upon final approval and completion of the plan, any subsequent changes should be processed as an amendment and officially adopted through the same procedure. All land use or zoning decisions determined by the City to be inconsistent with the Comprehensive Plan should require an amendment to the plan prior to final approval of such action.

Official Mapping

Official mapping is a technique by which a municipality can define an area for future improvements, such as roads, utilities, or parks and trails. Once adopted, the official map allows the City an opportunity to negotiate the purchase of land before it is developed. The City will amend its official map to reflect the new Comprehensive Plan once the Plan is approved and adopted. It will be updated periodically to reflect approved changes either initiated by the City or by private resident petition.

7.1 Land Use

The first Independence Comprehensive Plan, written and adopted in 1972, designated one unit per five-acre rural residential interspersed with agriculture land uses across the entire City. The City revised the Plan in 1980, designating 3,520 acres for rural residential at one unit per five acres and 10,250 acres for Agriculture at one unit per 40 acres, for an overall density of one unit per 14 acres. With the 2020 (adopted in 2000) plan the rural residential area at one unit per five acres was expanded to about 6,400 acres to achieve an overall projected density of one unit per 11 acres. This area was increased in the 2030 (adopted in 2010) by 750 gross acres. No material expansion of this area is proposed in the 2040 plan. As a result, the City anticipates that it will maintain an overall density of 1 unit per 10 acres through 2040.

This Plan projects a population of approximately 4,290 by 2040. This increase in population can be projected to represent an increase of approximately 400 new residential units over the next 20 years (20 new residential units per on average). The majority of this increase will come as a result of the development of the newly created sewer residential land use area. The compact footprint of the sewer residential development areas will allow the remainder of the City to remain highly undeveloped and rural in character. In addition, the development of land directly adjacent to similar development in Maple Plain will establish a compatible transition between land uses.

Regulation of the comprehensive plan will occur through continued enforcement of City Ordinances and Policies. Planning activities will include maintenance of the data bases; thorough review, direction and innovation relating to development proposals, including petitions for modifications of the Land Use Guide Plan; submittal of proposed amendments to the Land Use Guide plan to the Metropolitan Council pursuant to adopted amendment regulations; and the coordination with other municipal and metropolitan agencies.

This process will: allow flexibility in determining the most feasible and viable areas for proposed growth; provide thoughtful guidance for new development; and establish an effective means of control over the municipal and metropolitan systems.

7.2 Official Controls

Implementation of the Land Use Guide Plan will be accomplished through the City's development regulations, primarily the zoning and subdivision ordinances. The current City Code will be analyzed for modifications or revisions. The City should consider instituting changes to the zoning map to insure consistency with the adopted Land Use Plan. Specific areas may be considered for further revision.

New zoning districts will need to be created to implement the following new or updated land use designations identified in this plan:

Urban Residential – The City has adopted zoning regulations relating to urban residential development. The City has updated the prescribed density and location of this zoning area in the 2040 plan. As a result, the City will need to update the zoning ordinance to accommodate the proposed urban residential development. Consideration will need to be given to the intent of the zoning district and the types of standards that will help the City achieve its vision for this land use category.

Sewered Residential – The City will need to develop new zoning regulations and development standards pertaining to the sewered residential land use category. The City has not historically considered development of this nature and will need to thoughtfully create standards that will allow for this area to be developed in a manner that is complimentary to the rural character of the community while also establishing a supportable transition between the existing and proposed properties. Consideration will need to be given to the intent of the zoning district and the types of standards that will help the City achieve its vision for this land use category.

Timeline

The City will be working on the preparation, adoption, and administration of their officials controls once the Comprehensive Plan has been approved and shall implement them no later than nine (9) months after the date of approval.

7.3 Capital Planning

In order to achieve objectives of the Guide Plan, planning efforts involving expenditure of public funds needs to be projected a number of years in advance. These capital expenses may include land acquisition, street construction, park development, maintenance equipment and so on. The City's Capital Improvements Program (CIP) is intended to outline capital expenditures the City will make over the next five-year period. This program sets forth the schedule, timing, and detail of specific improvements by year along with estimated costs and financial resources. The CIP is ongoing and reviewed annually. This program, when adopted by the City Council, is made a part of the public record.

The City annually adopts a Capital Improvement Plan which projects expenditures for the next 10 years.

10 – YEAR CAPITAL IMPROVEMENT PLAN



City of
Independence
**WATERSHED
MANAGEMENT PLAN**

December 2018

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- B Ordinance No. 2003-04 – Establishing Pioneer-Sarah Creek Watershed Tax District

1.0 Introduction and Executive Summary

1.1 Purpose of the Plan

The City of Independence is located in western Hennepin County. The City has an abundance of water resources which include numerous wetlands, several large lakes, and wooded areas, parks, and recreational lands. This plan provides the framework to be followed to preserve these resources as the City develops.

This plan was prepared to fulfill the legal requirements of the Metropolitan Surface Water Planning Rules (Chapter 8410). This plan also meets the policies and requirements of the Pioneer-Sarah Creek Watershed Management Commission (PSCWMC) and the Minnehaha Creek Watershed District (MCWD) and other local, state, and federal agencies.



1.2 General Approach to Planning

The general approach to water resource planning focuses on wetland protection, water quality, and flood control; each are described below.

1.2.1 Wetland Protection

Stormwater runoff carries soil particles, nutrients, and contaminants, which can change the ecological balance of the receiving water body. Changes in the volume or rate of stormwater entering or discharging from the water body can also change the ecological balance. Change in the ecological balance of a wetland often results in changes in the water quality, changes in animal and fish habitat, replacement of native vegetation with invasive and tolerant plant species, and/or other impacts to the wetland's functions and values.

The State of Minnesota has published a guidance document which develops a methodology for determining the susceptibility of wetlands to degradation by stormwater input. This methodology relates wetland type to a level of susceptibility as shown in Table 3-1. Wetlands such as bogs and fens can be easily degraded by changes in the stormwater inflows and are designated as



highly susceptible. On the other hand, floodplain forests can tolerate relatively significant changes in the chemical and physical characteristics of stormwater inflow without degradation and are therefore slightly susceptible. Commonly observed shallow marshes and wet meadows dominated by cattail and reed canary grass (respectively) have a moderate susceptibility to stormwater fluctuations.

Wetland management standards were developed to determine how and when stormwater should be routed through a wetland to minimize potential impacts. These standards, shown in Table 3-2, were largely based on the state guidance document. These standards determine tolerable hydrologic change in terms of bounce (difference between the peak flood elevation and the wetland elevation), inundation period (time that flood waters temporarily stored in the wetland exceed the wetland elevation), and runout control (elevation of the outlet).

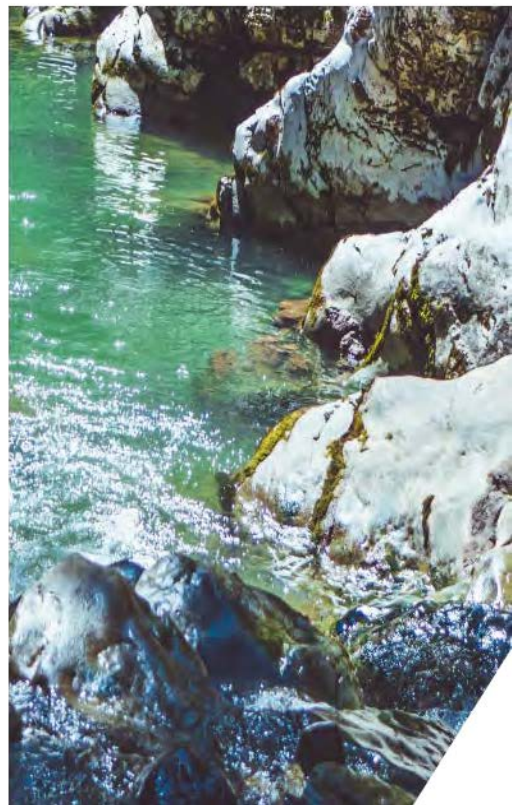
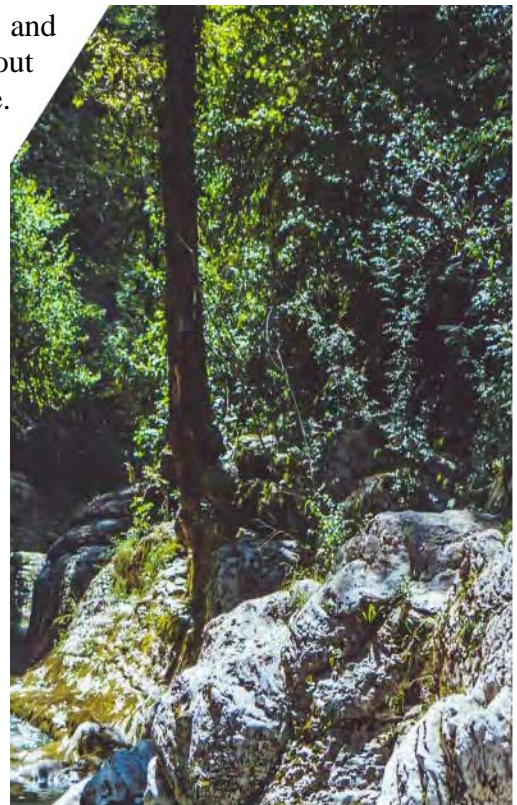
These standards provide guidance for the management of stormwater to minimize wetland impacts. It is assumed that wetland impacts will be minimized, and existing wetland functions and values will be maintained if the proposed management system and criteria meet the management standards shown in Table 3-2.

1.2.2 Water Quality Protection

Within the City of Independence, there are hundreds of water bodies ranging in size from lakes to small stormwater detention basins. Nonpoint pollution associated with stormwater runoff creates adverse impacts; the degree of impact depends on the water body's natural ability to remove, absorb, or process the pollutants through chemical, physical, or biological processes. Poor water quality usually indicates a situation where the resource receives more nutrients, or other pollutants, than can be processed naturally. Planning for water quality protection is necessary to preserve the beneficial uses of existing water bodies, as well as to evaluate wetland impacts as described above.

1.2.3 Flood Control

The flood and rate control portion of the planning consisted of estimating the 100-year flood elevation and discharge rate for each watershed. Independence has vast amounts of



stormwater storage available in its wetlands and lakes. This storage was used in the development of the ultimate conditions hydrologic model for the City. The ultimate pipes were designed to take advantage of the large storage areas while maintaining the overall discharge rate leaving the City borders.

1.2.4 Stormwater Pollution Prevention Program

As required by the Clean Water Act, the City of Independence has prepared a Stormwater Pollution Prevention Program (SWPPP). The SWPPP is a requirement of the NPDES General Permit No. MNR040000, which authorizes Municipal Separate Storm Sewer System (MS4) operators to discharge stormwater. The goal of the Stormwater Pollution Prevention Program, when implemented, is to reduce the discharge of pollutants into receiving waters to the Maximum Extent Practicable. The Stormwater Pollution Prevention Program has been established in the City ordinance in Sections 508, 509, and 725.

There are six minimum control measures outlined below that are required to be included in the Stormwater Pollution Prevention Program under the requirements of the permit. Within each of the six minimum control measures, there are a number of Best Management Practices (BMPs) that are used to meet the requirements for each minimum control measure. The six minimum control measures are as follows:

1. **Public Education and Outreach**

Public education and outreach is a major component of the SWPPP. Through education and outreach programs the operator of a MS4 can reduce the impacts on the receiving waters. The City has an implementation plan, which is included in Appendix A, outlining their process to reach out to residents regarding illicit discharge and other pertinent stormwater issues.

2. **Public Participation/Involvement**

Public participation is encouraged to receive input from the public on the SWPPP. Public



input may be used as a gauge to determine the effectiveness of the SWPPP and associated BMP's. Based on public input, the City of Independence may modify components of the SWPPP if deemed beneficial. A public hearing is held once per year during the City's council meetings.

3. Illicit Discharge Detection and Elimination

City Ordinance Section 725 – Stormwater Utilities outlines the regulatory mechanism for illicit discharge. The City of Independence is required to prohibit non-stormwater discharges into the MS4. Annual inspections looking for illicit discharge indicators are conducted on all outfalls, structural BMPs, and one-fifth of stormwater ponds. If any possible illicit discharge is detected, the City implements its Emergency Response Procedure (ERP), which can be found in Appendix B.

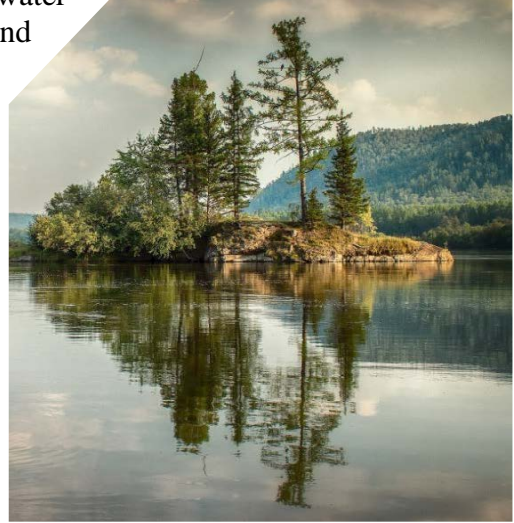
4. Construction Site Stormwater Runoff Control

All construction activities which disturb greater than one acre of land, and construction activities which disturb less than one acre but are part of a larger common plan of development or sale is regulated by City Ordinance Section 508 – Erosion and Sediment Control to limit the amount of sediment from entering into downstream waters. The City conducts inspections on these developments to ensure compliance.

5. Post-Construction Stormwater Management in New Development and Redevelopment

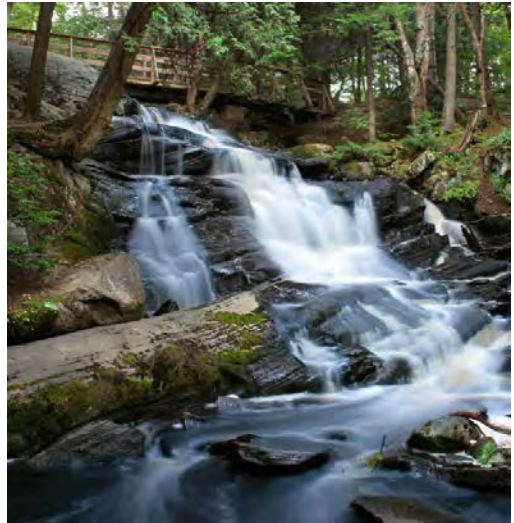


City ordinance section 509 – Stormwater Management regulates development and redevelopment to ensure there is no increase or a net decrease in runoff volume, total phosphorus, and total suspended solids. All projects disturbing one or more acres of land or where the volume of soil moved is 100 or more cubic yards are required to be reviewed. The City evaluates these projects for compliance and analyzes all potential water resource related impacts before issuing a permit.



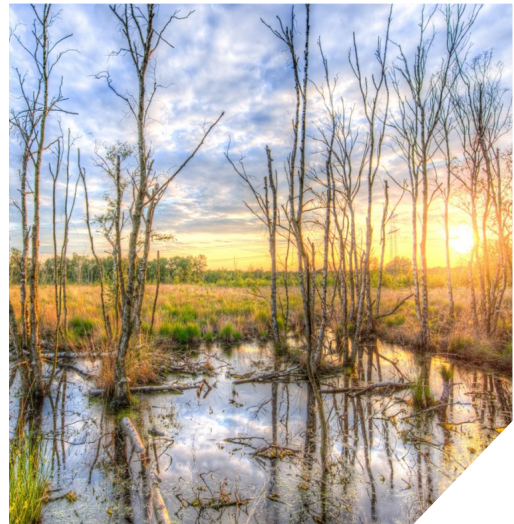
6. Pollution Prevention/Good Housekeeping

The City of Independence operates and maintains the storm sewer system in a manner so as to reduce the discharge of pollutants to the maximum extent practicable. Key components for good housekeeping are: inspecting the MS4 outfalls, stormwater ponds, all exposed stockpiles, and material handling and storage areas, as well as ensuring all field staff are trained in recognizing and responding to stormwater issues. Records of the inspections are retained, including the date of the completion of repairs and major additional protection measures.



1.3 Management Goals and Policies

As part of the planning process, goals and policies were developed for the management of resources within Independence. Goals propose the desired end, and policies provide the means to achieve the goals. Goals and policies are provided for wetlands, water quality, water quantity, erosion control, groundwater, public ditch systems, recreation, fish and wildlife, enhancement of public participation, information and education, floodplains, abstraction/filtration, ecological integrity, shorelines and streambanks, navigation, best management practices, public health, and regulation. The goals and policies of this plan are presented in Section 4, and Section 5 – Plan Implementation provides more



specific details on how the goals and policies will be achieved.

1.4 Plan Organization

The Plan is organized as follows:

- **Section 1** presents the Introduction and Executive Summary.
- **Section 2** presents the City's physical and resource-related information
- **Section 3** presents the wetland, water quality, and water quantity management strategies and problem areas.
- **Section 4** presents the City's water resource goals and policies.
- **Section 5** presents the implementation strategies to accomplish the goals and policies.
- **Section 6** presents inventory data and management information for each of the four major watersheds within the City.
- **Section 7** outlines the procedures for amending this Plan.
- **Section 8** presents the required submittals for a development.
- **Section 9** presents a description of the Hydrology Model used for the plan.
- **Section 10** presents the glossary of terms.

2.0 Physical Environment Inventory

2.1 Climate

Independence and the Twin Cities area have a temperate climate, characterized by wide variations in temperature, ample rainfall, and moderate snowfall. Table 2-1 shows the historical average monthly temperature, precipitation, and snowfall data.

In an average year, the freeze-free period for the area is long enough that the stable crops of the area reach maturity without much danger from frost. The 50% probability of temperatures of 32° or lower can be expected between September 27 and May 12.

Precipitation patterns are influenced by two well-defined systems. Strong southerly winds from the Gulf of Mexico are the main source of moisture. A diffuse secondary system from the Pacific Ocean also adds to annual rain and snowfall. Precipitation occurs as rain, freezing rain, hail, and snow. Tornadoes, severe thunderstorms, and hailstorms occur occasionally and are of short duration. Measurable precipitation of 0.01-inch occurs on about 117 days per year, 6 of which have one-inch or more. Annual normal precipitation is approximately 31 inches, of which approximately two-thirds occurs during the summer months of May through September.

The annual snowfall in Independence averages approximately 54 inches. Runoff from snowmelt can occur any time during the winter. The most severe snowmelt runoff conditions usually occur in March and early April, especially when rain falls on top of the snowpack.

Table 2-1
Average Monthly Temperature, Precipitation, and Snowfall Data for
Minneapolis/St. Paul Metropolitan Area (1981-2010)

<u>Month</u>	<u>Average Temp F°</u>	<u>Precip. Inches</u>	<u>Snowfall Inches</u>
January	15.6	0.90	12.2
February	20.8	0.77	7.7
March	32.8	1.89	10.3
April	47.5	2.66	2.4
May	59.1	3.36	0.0
June	68.8	4.25	0.0
July	73.8	4.04	0.0
August	71.2	4.30	0.0
September	62.0	3.08	0.0
October	48.9	2.43	0.6
November	33.7	1.77	9.3
December	19.7	1.16	11.9
Annual Average:	46.2	Total: 30.61	Total: 54.4

Source: State Climatology Office for the Minneapolis/St. Paul Airport (1981-2010)

2.2 Precipitation Measurement Station

The State Climatology Office has a long-term precipitation station at the Minneapolis/St. Paul International Airport. This station was selected to be used as a reference for any entity conducting future water quality or quantity studies in Independence. The current thirty-year normal (1981-2010) for annual precipitation at the station is 30.61 inches.

2.3 Topography and Landforms

The topography in Independence is a result of glaciations that ended approximately 10,000 to 12,000 years ago. The topography has been influenced by two major glacial events: the Superior Lobe and the Grantsburg Lobe. These two events resulted in two general landscape units within Independence. The west central portion of the City, west of County Road 92, is part of the Corcoran Till Plain and is the best farmland in the community. The land is gently rolling with wet basins, low knolls, and ridges. Many of the soils in the area have a high seasonal water table and are unsuitable for dense residential developments utilizing conventional on-site sewage treatment systems.

The balance of the City is in the Loretto Highlands, which is a landscape with more relief containing soils with more clay content. Steep slopes, deep marshes, and poorly drained upland flats dominate the landscape. More details about area geology can be found in the Hennepin County Geologic Atlas from the Minnesota Geological Society. A topographic map of Independence is shown on Figure 2-1.

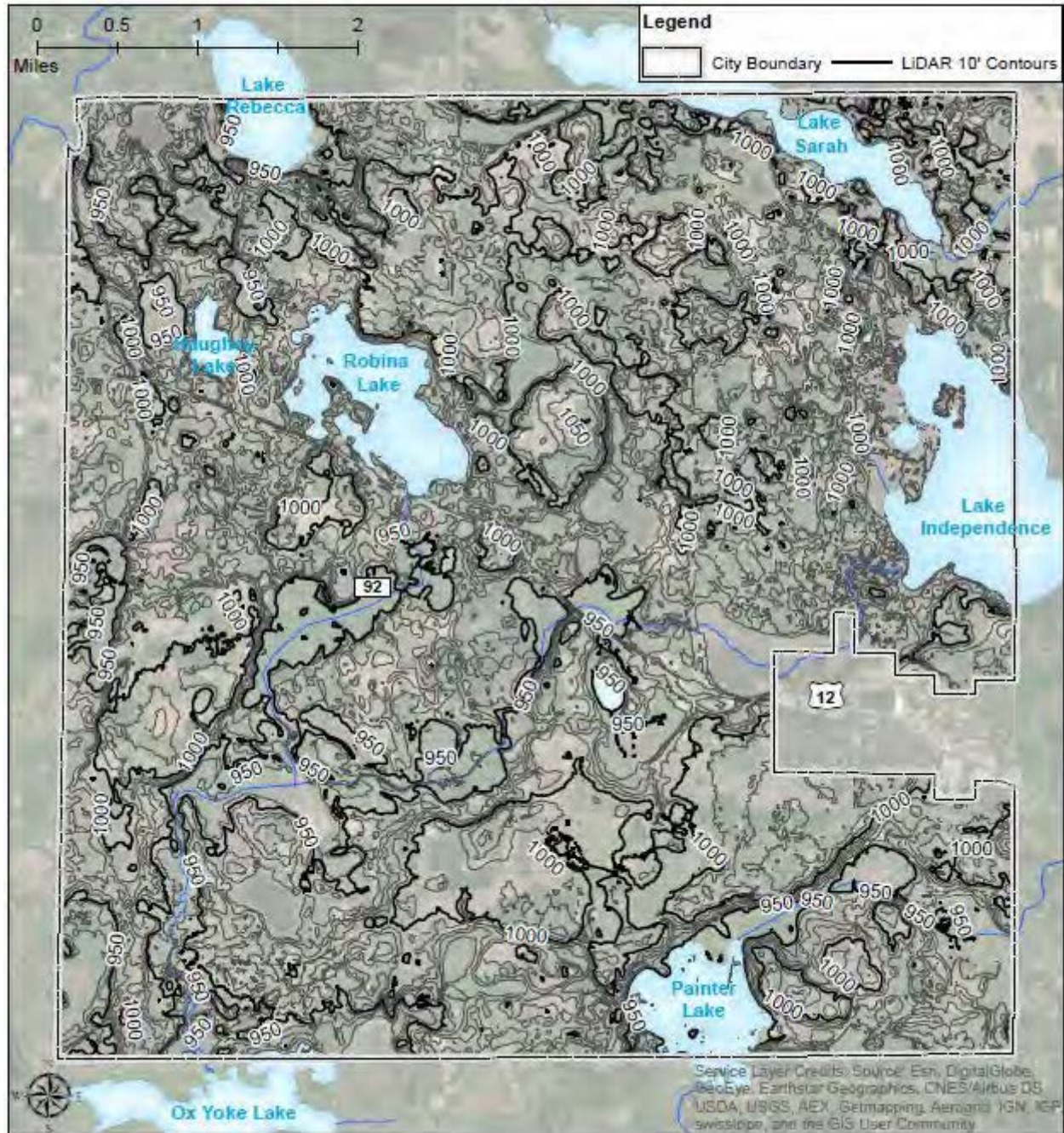


Figure 2-1. Topographic Map for the City of Independence

2.4 Watersheds and Drainage Patterns

The City of Independence is within the jurisdiction of the Pioneer-Sarah Creek Watershed Management Commission (PSCWMC) and the Minnehaha Creek Watershed District (MCWD), as shown in Figure 2-2. In general, water from the PSCWMC drains west to the Crow River then north to the Mississippi River and water from the MCWD drains to Lake Minnetonka and Minnehaha Creek then east to the Mississippi River.

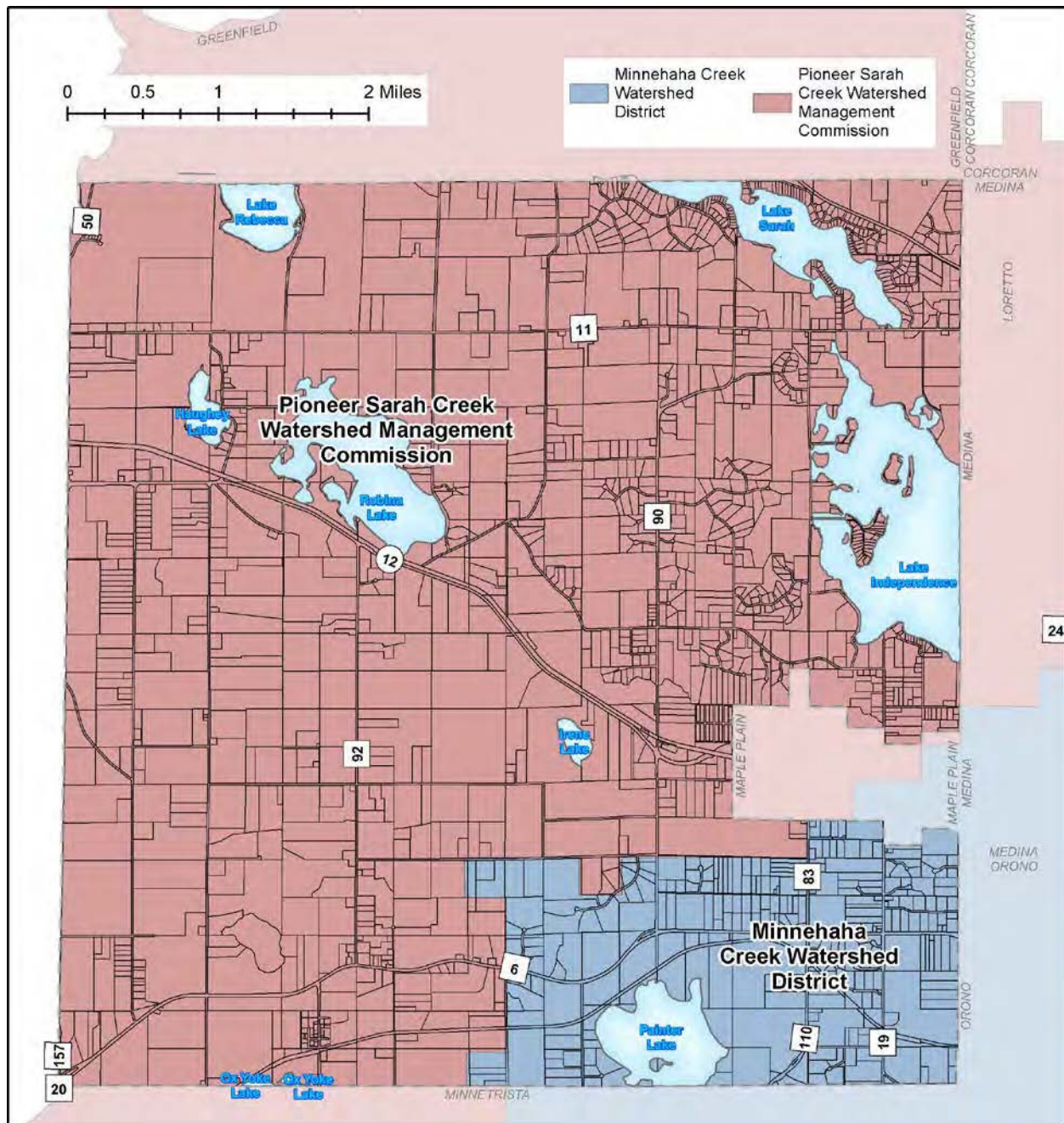


Figure 2-2. Watershed Jurisdictions

With the existing creeks and ditches in place, the drainage patterns for the City of Independence are fairly well defined. This plan divides the City into four major watersheds; they include Painter Creek, Pioneer Creek, Sarah Creek and South Fork Crow River, as shown on Figure 2-3. Each of these four major watersheds is further divided into subwatersheds. Each subwatershed is designated by a number that corresponds to the subwatershed and the outlet. The subwatersheds are summarized in Section 6.

The Painter Creek Watershed is located in the southeast corner of Independence. This is the only watershed in Independence under the jurisdiction of the MCWD. The drainage area includes

parts of Independence, Medina, Orono, Maple Plain, and Minnetrista. The drainage flows from Katrina Lake in Medina to the west and south to Jennings Bay in Lake Minnetonka.

The Pioneer Creek Watershed is located in central Independence. It drains from Lake Independence to the west and south to Ox Yoke Lake in Minnetrista. The drainage area includes parts of Independence and Medina. Approximately 65% of the City drains to Pioneer Creek. Major water bodies in the watershed include Lake Independence and Lake Robina.

The Sarah Creek Watershed is located in northeastern Independence and includes drainage from Greenfield, Corcoran, Medina, and Independence. The general flow is from east to west through Lake Sarah to the Crow River. Lake Sarah is the only major water body in this watershed.

The South Fork Crow River Watershed is located in western and northwestern Independence. The drainage flows from east to west to the Crow River. Major water bodies in this watershed include Lake Rebecca and Haughey Lake.

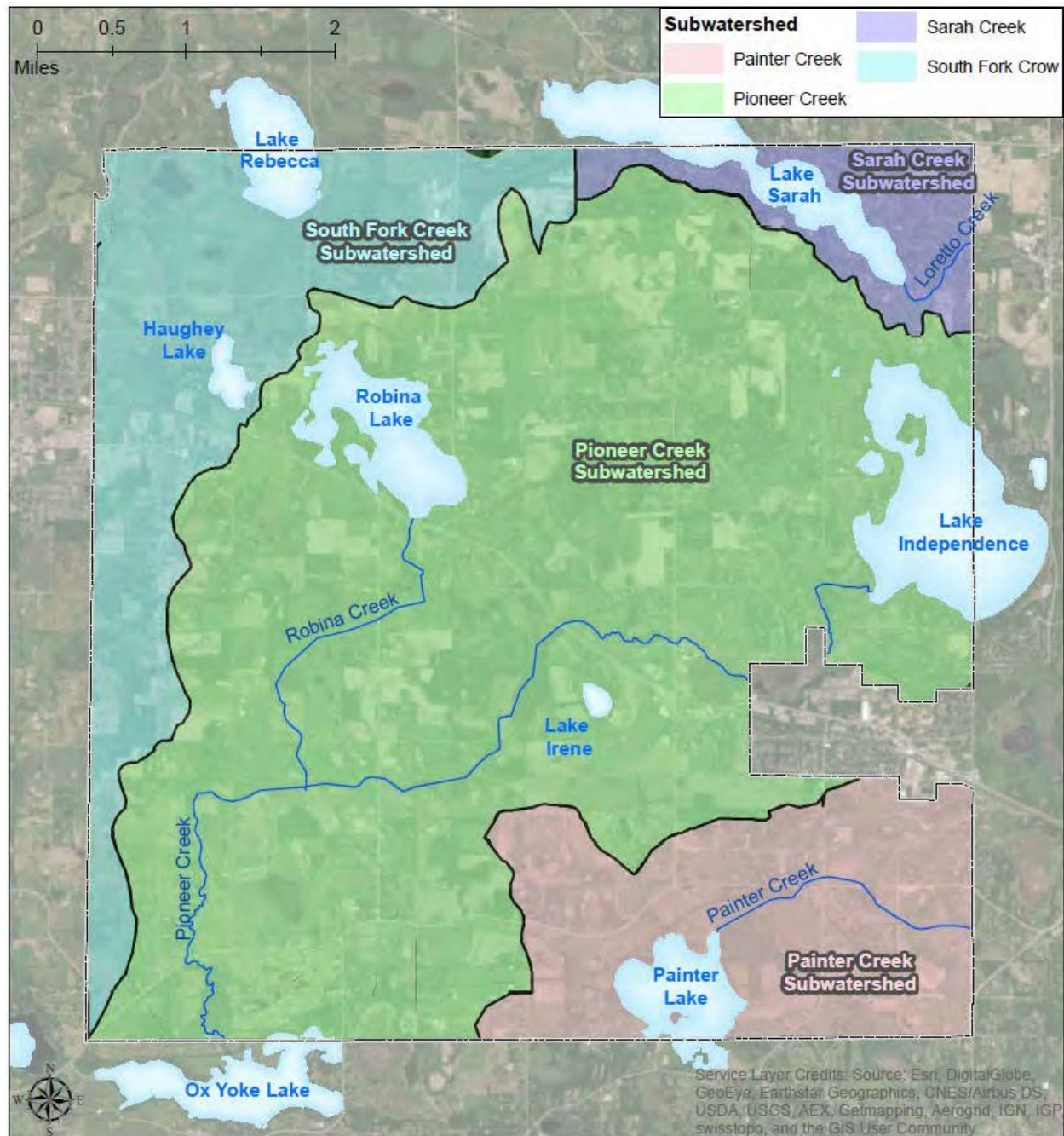


Figure 2-3. City’s four subwatersheds

2.5 MnDNR Protected Waters: Lakes, Wetlands, and Water Courses

The Minnesota Department of Natural Resources (MnDNR) has designated certain waters of the state as public waters (M.S. Section 103G.005, subdivision 15). MnDNR “Protected Waters and Wetlands” maps show public waters within the City. A MnDNR permit is required for work within a designated public water.

Figure 2-4 shows the protected waters, which includes lakes, wetlands, and water courses located in the City. Sections 2.5.1, 2.5.2, and 2.5.3 summarize the protected lakes, wetlands, and watercourses in Independence.

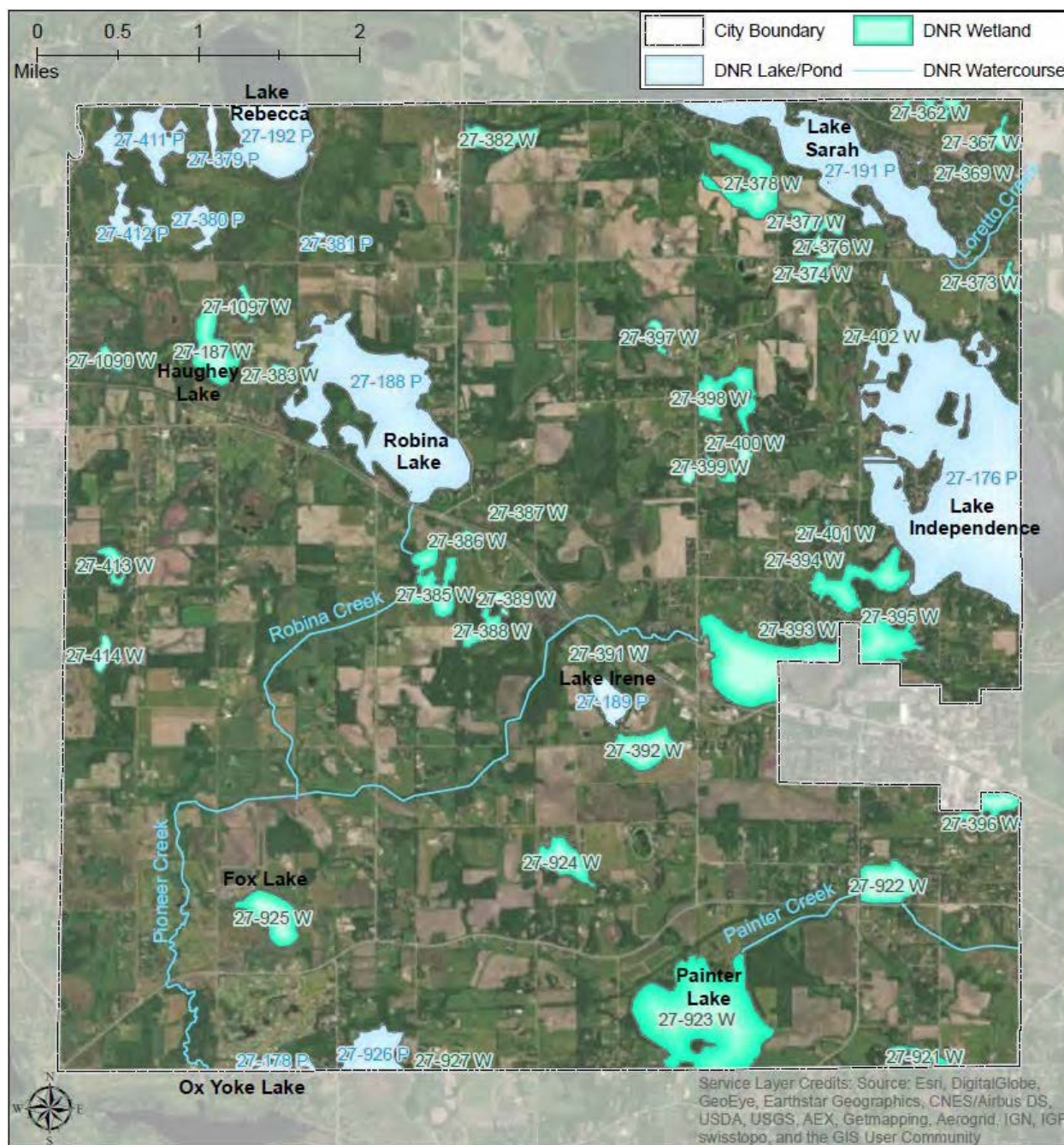


Figure 2-4. DNR Protected Waters

2.5.1 Protected Lakes

There are 12 protected lakes in the City of Independence. The lakes can range in size but are typically deeper than six feet. Table 2-2 lists the protected lakes within Independence. Existing

water quality data is available for Lake Independence, Lake Irene, Lake Rebecca, Lake Robina, and Lake Sarah through the MPCA Environmental Access Data website.

**Table 2-2
Independence Protected Lakes**

I.D. No.	Name	Twp./Range	Section(s)	Local Government Unit	Area (acres)	DNR Shoreland Classification¹	OHW
27-176P	Lake Independence	118/23,24	7,12,13,18,19,24	PSCWMC	851	RD	956.8
27-178P	Ox Yoke lake	117,118/24	5,6,31,32	PSCWMC	325	NE	915.4
27-188P	Lake Robina	118/24	8,9,16,17	PSCWMC	395	RD	N/A
27-189P	Lake Irene	118/24	22	PSCWMC	27	RD	N/A
27-191P	Lake Sarah	118,119/24	1,2,3,34,35	PSCWMC	635	RD	979.9
27-192P	Lake Rebecca	118,119/24	5,31,32	PSCWMC	260	NE	N/A
27-379P	Unnamed	118,119/24	6/31	PSCWMC	15	NR	N/A
27-380P	Unnamed	118/24	6	PSCWMC	24	NR	N/A
27-381P	Unnamed	118/24	5	PSCWMC	9	NR	N/A
27-411P	Unnamed	118,119/24	6,31	PSCWMC	81	NR	N/A
27-412P	Unnamed	118/24	6	PSCWMC	32	NR	N/A
27-926P	Unnamed	117,118/24	4,5,32,33	PSCWMC	245	NR	N/A

¹ NE = Natural Environment, RD = Recreational Development, GD = General Development, NR = Not regulated by DNR shoreland rules.

2.5.2 Protected Wetlands

In addition to the 12 protected lakes, there are 40 other wetlands within the City of Independence that have been inventoried by the MnDNR. All of these wetlands are known as protected waters wetlands (M.S., Section 103G.005, subdivision 15), and therefore their beds along with the lakes are subject to regulatory authority of the MnDNR.

Protected waters wetlands mean all Types, 1 through 8 as defined in United States Fish and Wildlife Service Circular 39 (USDI, 1971), not included within the definition of protected waters, that are typically ten or more acres in size in unincorporated areas, or 2.5 acres in incorporated areas. Table 2-3 lists the protected waters wetlands subject to MnDNR jurisdiction.

**Table 2-3
Independence Protected Wetlands**

I.D. No.	Name	Twp./Range	Section(s)	Local Government Unit	Area (acres)	DNR Shoreland¹ Classification	OHW
27-187W	Haughey Lake	118/24	7,8	PSCWMC	51	NE	953.2
27-362W	Unnamed	118,119/24	1,36	PSCWMC	17	NR	N/A
27-367W	Unnamed	118/24	1	PSCWMC	12	NR	N/A
27-368W	Unnamed	118/24	1	PSCWMC	7	NR	N/A
27-369W	Unnamed	118/24	1	PSCWMC	5	NR	N/A
27-373W	Unnamed	118/24	12	PSCWMC	11	NR	N/A
27-374W	Unnamed	118/24	2,11	PSCWMC	20	NR	N/A
27-375W	Unnamed	118/24	2	PSCWMC	3	NR	N/A
27-376W	Unnamed	118/24	2	PSCWMC	10	NR	N/A
27-377W	Unnamed	118/24	2	PSCWMC	10	NR	N/A
27-378W	Unnamed	118/24	2	PSCWMC	68	NR	N/A
27-382W	Unnamed	118/24	4	PSCWMC	30	NR	N/A
27-383W	Unnamed	118/24	8	PSCWMC	7	NR	N/A
27-385W	Unnamed	118/24	16,21	PSCWMC	47	NR	N/A
27-386W	Unnamed	118/24	16	PSCWMC	6	NR	N/A
27-387W	Unnamed	118/24	16	PSCWMC	3	NR	N/A
27-388W	Unnamed	118/24	21	PSCWMC	18	NR	N/A
27-389W	Unnamed	118/24	21	PSCWMC	5	NR	N/A
27-391W	Unnamed	118/24	22	PSCWMC	4	NR	N/A
27-392W	Unnamed	118/24	22,27	PSCWMC	43	NR	N/A
27-393W	Unnamed	118/24	23,24	PSCWMC	278	NR	N/A
27-394W	Unnamed	118/24	13,14,23,24	PSCWMC	63	NR	N/A
27-395W	Unnamed	118/24	24	PSCWMC	4	NR	N/A
27-396W	Unnamed	118/24	25	MCWD	29	NR	N/A
27-397W	Unnamed	118/24	10	PSCWMC	8	NR	N/A
27-398W	Unnamed	118/24	11,14	PSCWMC	47	NR	N/A
27-399W	Unnamed	118/24	14,15	PSCWMC	15	NR	N/A
27-400W	Unnamed	118/24	14	PSCWMC	5	NR	N/A
27-401W	Unnamed	118/24	14	PSCWMC	4	NR	N/A
27-402W	Unnamed	118/24	12	PSCWMC	3	NR	N/A
27-413W	Unnamed	118/24	18	PSCWMC	12	NR	N/A
27-414W	Unnamed	118/24	19	PSCWMC	10	NR	N/A
27-921W	Unnamed	117,118/24	1,36	MCWD	88	NR	N/A
27-922W	Unnamed	118/24	25	MCWD	52	NR	N/A
27-923W	Painter Lake	117,118/24	2,3,34,35	MCWD	292	NR	938.4
27-924W	Unnamed	118/24	27	MCWD	36	NR	N/A
27-925W	Fox Lake	118/24	29,32	PSCWMC	49	NR	N/A
27-927W	Unnamed	117,118/24	4,33	PSCWMC	7	NR	N/A

27-1090W	Unnamed	118/24	7	PSCWMC	7	NR	N/A
27-1097W	Unnamed	118/24	8	PSCWMC	10	NR	N/A

¹ NE = Natural Environment, NR = Not regulated by DNR shoreland rules.

2.5.3 Protected Watercourses

Protected waters also include all natural and altered watercourses with a total drainage area greater than two square miles. Crow River South Fork, Painter Creek, Pioneer Creek, Robina Creek, and Loretto Creek are the five protected watercourses in Independence. The five watercourses are discussed below.

2.5.3.1 Crow River South Fork

Crow River South Fork runs adjacent to the northwestern most corner of the City. This stretch of the river, section 508, reaches almost to the McLeod and Carver county border and is considered impaired for nutrients, turbidity, and fecal coliform. The [2018 South Fork Crow River Watershed TMDL](#), which is still under EPA review at the time of this publication, has more detailed information on the water quality.

2.5.3.2 Painter Creek

Painter Creek is located in the southeast corner of Independence. The creek is the outlet of Katrina Lake and flows south to Jennings Bay on Lake Minnetonka. Painter Creek is considered an impaired water, with a stretch of the stream within Independence having high amounts of *E.coli*. The [2010 Feasibility Report and Environmental Assessment](#) has more detailed information on the water quality.

2.5.3.3 Pioneer Creek

Pioneer Creek is located in central Independence. The creek is the outlet of Lake Independence and flows west to south to Ox Yoke Lake in Minnetrista. Ox Yoke Lake eventually discharges to the South Fork Crow River. Pioneer Creek is also an impaired water with high amounts of *E. coli* and deficient levels of dissolved oxygen. More information on Pioneer Creek water quality can be found in the [2017 Pioneer-Sarah Creek Subwatershed Total Maximum Daily Load](#).

2.5.3.4 Robina Creek

Robina Creek is a tributary of Pioneer Creek and is located in central Independence. The Creek is the outlet of Robina Lake and flows from north to south to Pioneer Creek. It is not considered to be impaired.

2.5.3.5 Loretto Creek

A portion of Loretto Creek is located in the northeast corner of Independence. The creek flows from east to west and discharges to Lake Sarah. Lake Sarah then discharges through Sarah Creek to the west to the South Fork Crow River. Loretto Creek is not considered to be impaired.

2.6 Other Regulated Wetlands

In addition to the MnDNR waters discussed in Section 2.5, many additional wetlands within the City are included on the National Wetland Inventory (NWI) maps but are not MnDNR water bodies. These wetlands are shown on Figure 2-5; however, the NWI does not definitively determine the accurate boundaries of a wetland. The following three characteristics make these water bodies exclusive from the MnDNR public waters and public waters wetlands.

- First, an individual basin may be dominated by wetland habitat (Types 1, 2, 6, and 7 [USDI, 1971] not statutorily covered by MnDNR and yet is immediately adjacent to an inventoried MnDNR basin or watercourse.
- Second, an individual isolated wetland basin may be smaller than the minimum MnDNR size (2.5 or 10 acres) as discussed previously.
- Third, an individual isolated wetland basin may be dominated by habitat types (Types 1, 2, 6, and 7) not statutorily covered by MnDNR.

Excavation, filling, grading, and/or development actions which may adversely affect these resources may be subject to federal permitting authority under Sections 401 and 404 of the Clean Water Act, (33 USC 125 et. seq.) and City approval under the 1991 Wetland Conservation Act (WCA), as amended. The City is the local governmental unit that administers the WCA in the PSCWMC, and MCWD administers WCA within their jurisdiction.



Figure 2-5. National Wetland Inventory (NWI)

2.7 Groundwater Resources

Two major aquifers are located within the City of Independence: the Franconia-Ironton-Galesville Aquifer and the Mt. Simon-Hinckley Aquifer. The lowest aquifer is the Mt. Simon-Hinckley. The average elevation of the aquifer is 850 feet above sea level and is characterized by Mt. Simon and Hinckley Sandstones. The Eau Claire Formation confines the aquifer from above. Above this, the Franconia-Ironton-Galesville Aquifer is at approximately 900 feet above

sea level. It is composed of the Franconia Formation and Ironston and Galesville Sandstones. The St. Lawrence Formation confines this aquifer in most areas.

Groundwater quality can be affected by a variety of land use types. The identification of areas susceptible to groundwater contamination is difficult due to the character (permeability and thickness) of the surficial material, depth to the piezometric surface, precipitation amount and duration, and other components of aquifer recharge. See section 2.14 for further discussion on groundwater contamination.

A DNR Water Appropriation Permit is required for all users withdrawing more than 10,000 gallons of water per day or 1 million gallons per year. There are active DNR Water Appropriation Permits in the City of Independence. The permittees and the locations of the appropriations are shown on Figure 2-6

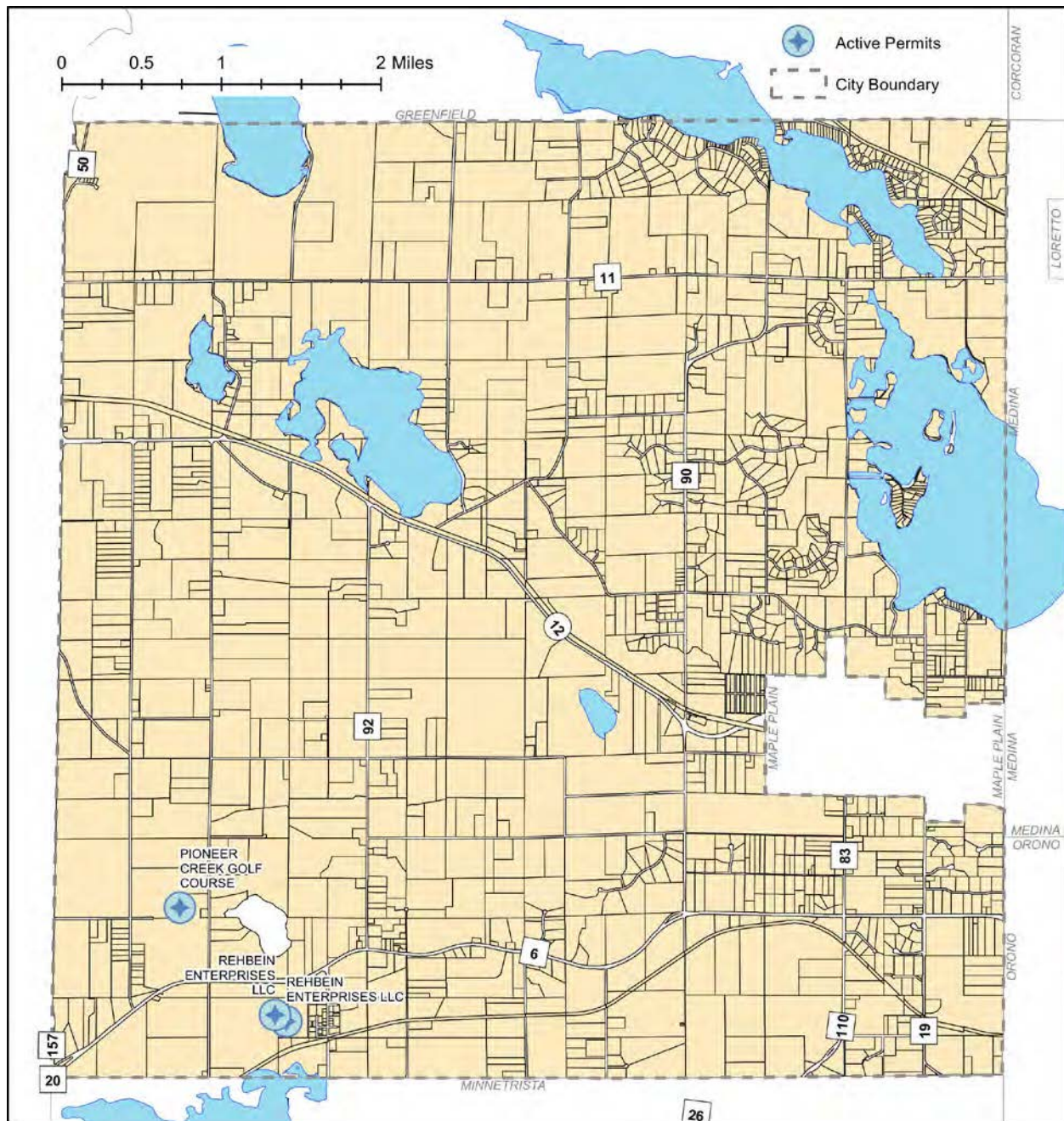


Figure 2-6. DNR Water Appropriation Active Permits

2.8 Soils

The United States Department of Agriculture, Soil Conservation Service published the Soil Survey of Hennepin County in 1974, and the Natural Resources Conservation Service regularly updates the Web Soil Survey website. The survey lists soils found in Hennepin County along with their general characteristics and limitations on land use and development. The Web Soil Survey should be referenced for soils identifications and associated limitations on specific development sites. Figure 2-7 shows the soil hydrologic groupings occupying the City.

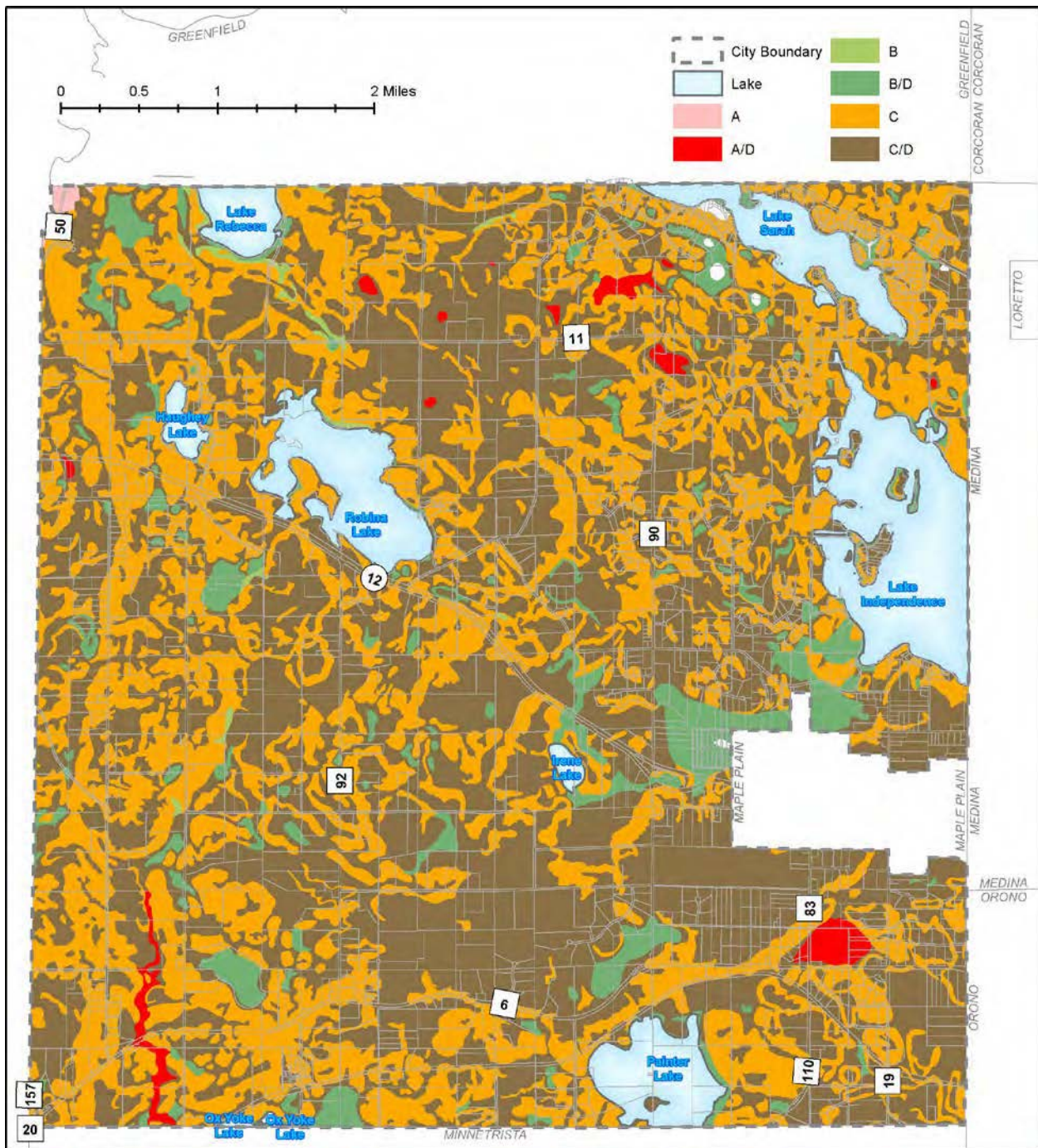


Figure 2-7. Hydrologic Soil Group

The City contains three soil associations. The Erin-Kilkenny-Peaty Muck Association is located in the central and northeast portion of the City and occupies the largest area of the three associations. This association is characterized by rolling to hilly relief with major soil conditions consisting of clay loam, heavy clay, and peat. The clay soils are found on gentle to steep slopes, are well drained, and generally suited for urban development. Heavy clay is, for the most part, a subsoil condition and is also conducive for development. Peat soils located in low-lying areas

have high moisture capacity and are generally poorly drained. Peat soils are a limiting factor for development.

The Lester-Peaty Muck Association, located in the southern and southwestern portions of Independence, is characterized by undulating relief with major soil conditions consisting of black loam, clay loam, and peat. The black and clay loams are suited for urban development.

The third association, Hayden-Cordova Peaty Muck, is located in the northwest part of the City and is the smallest in area of the three groups. The terrain is basically undulating to rolling. The soil conditions generally consist of brown loam, clay loam, and light clay loam. Many of the soils in this association are poorly drained, and wet areas are often intermingled closely with better-drained soils. The sporadic wetness and poor drainage of the soil must be a consideration for any development. Peat soils severely restrict development because of their wetness and location.

2.9 Native Vegetation

Independence is in the central deciduous forest region. Oak woodland and maple-basswood forests were the most common vegetation types in the area. The maple-basswood forest included a mix of elm, basswood, sugar maple, bur oak, ironwood, northern red oak, and aspen. The oak woodland was dominated by a mix of aspen, red oak, bur oak, and white oak.

The woodland that has not been cleared for crops is similar to what existed before settlement and occurs as scattered small tracts. Wooded areas are now very much in demand for home sites.

2.10 Land Use

The City of Independence is part of the Twin Cities Metropolitan area. The population growth trends for Independence and the surrounding communities are shown in the table below.

**Table 2-4
Population and Growth Trends**

Local Government	1990^a	2000^a	2010^a	2020^b	2030^b	2040^b
Independence	2,822	3,236	3,504	3,830	4,040	4,290
Greenfield	1,450	2,544	2,777	3,030	3,460	3,880
Medina	3,096	4,005	4,892	6,600	7,700	8,900
Maple Plain	2,005	2,088	1,768	1,870	2,090	2,320
Orono	7,285	7,538	7,437	8,100	8,800	9,500
Minnetrasta	3,439	4,358	6,389	8,000	9,800	12,000

- a. U.S. Census Bureau, 2010 Census of Population and Housing, *Population and Housing Unit Counts* PHC-3-25, Minnesota, Washington, DC, 2003.
- b. Metropolitan Council. Thrive MSP 2040. January 1, 2018. www.metrocouncil.org/Data-and-Maps/Data.aspx

2.10.1 Existing Land Use

Independence has assembled a Comprehensive Plan to coordinate future development. Land use in the City is a mixture of agriculture, residential, and commercial uses. There is a large area in the northwest corner of the City, around Lake Rebecca, that is used for parks and recreation. Existing land use is discussed further in the Comprehensive Plan.

2.10.2 Future Land Use

The Comprehensive Plan identifies limited future rural residential development with the intent of protecting valued open space and rural character. The Comprehensive Plan will function to define the relationship of natural resources and land use development decisions as well as coordinate with zoning laws and other regulations to provide logical, efficient, and effective decision-making. The Comprehensive Plan is also an intergovernmental document, coordinating the City's plans with regional, county, and adjacent municipal planning activities. Much of the City is either permanent agricultural or permanent rural with small areas included within the Metropolitan Urban Service Areas (MUSA).

2.11 Parks and Open Spaces

The most significant open space in Independence is the Lake Rebecca Park Reserve. The Park Reserve has an area of approximately 2,200 acres, of which approximately 1,300 acres are within Independence. The park reserve offers outdoor activities and opportunities for glimpses of wildlife. Lake Rebecca Park Reserve's gently rolling Big Woods landscape, with numerous wetland areas, provides a haven for wildlife. Facilities and amenities include a swimming beach, a boat launch, a fishing pier, picnic areas, hiking and biking trails, and horse and dog trails.

Lake Independence is also a water-based recreation lake. The Baker Park Reserve is located on the east side of the lake in Medina and offers many of the same activities as the Lake Rebecca Park Reserve.

2.12 Fish and Wildlife Habitat

The water bodies and open spaces throughout the City provide habitat for fish and wildlife species including birds, mammals, and reptiles. Ducks and geese are present in large numbers at lakes, wetlands, and open water areas. Vegetative cover in the undeveloped open areas support many mammalian species such as deer, raccoon, squirrels, chipmunks, and rabbits. The numerous wetlands in Independence provide habitat for a variety of aquatic species including snakes, turtles, and frogs. Figure 2-8 shows the land cover types within Independence as classified by the Minnesota Land Cover Classification System (MLCCS).

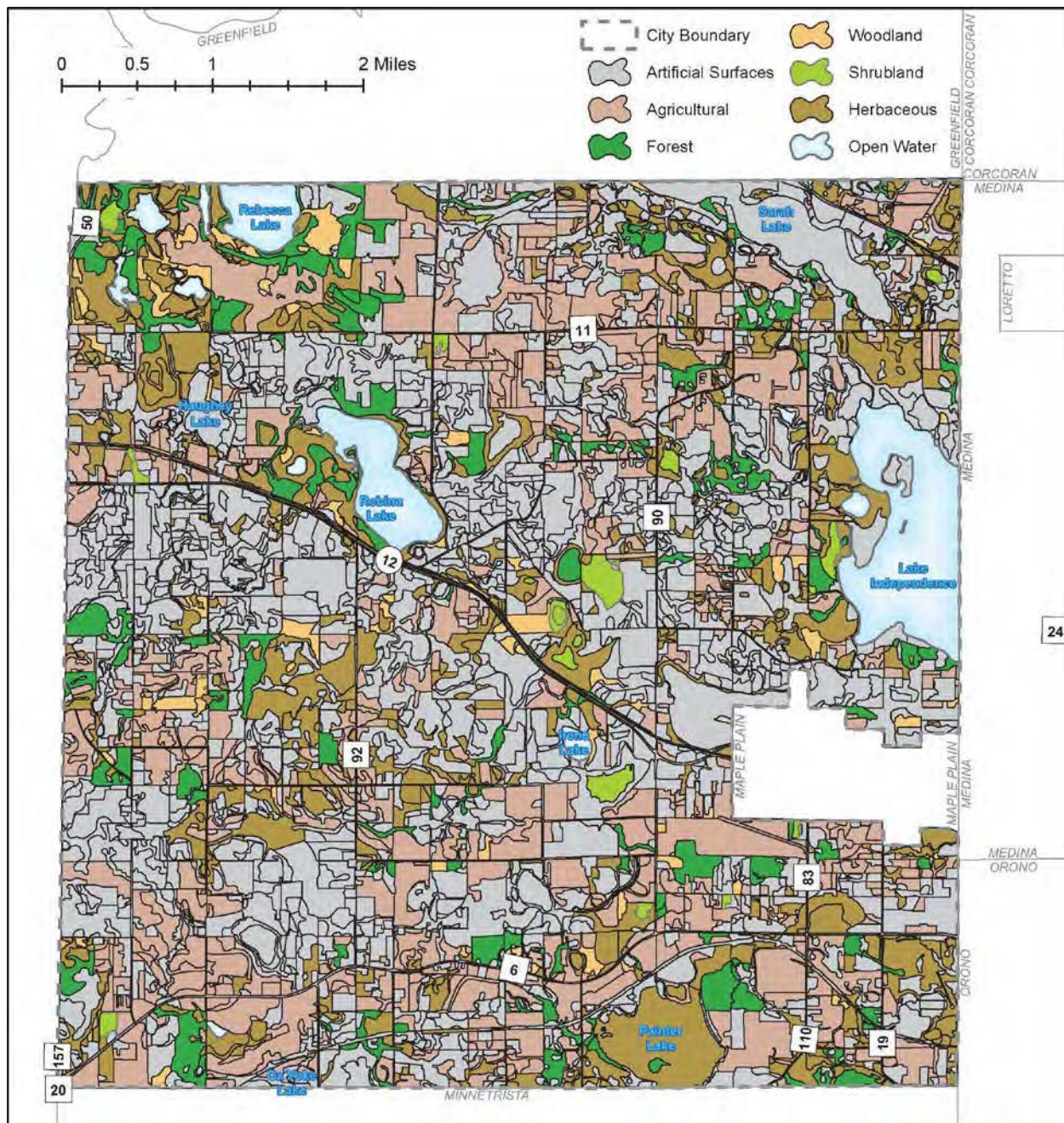


Figure 2-8. Minnesota Land Cover Classification System

2.13 Unique Features and Scenic Areas

The MnDNR Natural Heritage and Nongame Wildlife Program maintains a database of rare plant and animal species and significant natural features. Figure 2-9 includes the natural communities and regional parks within Independence. Additional information can be found in the MCWD and PSCWMC Plans.

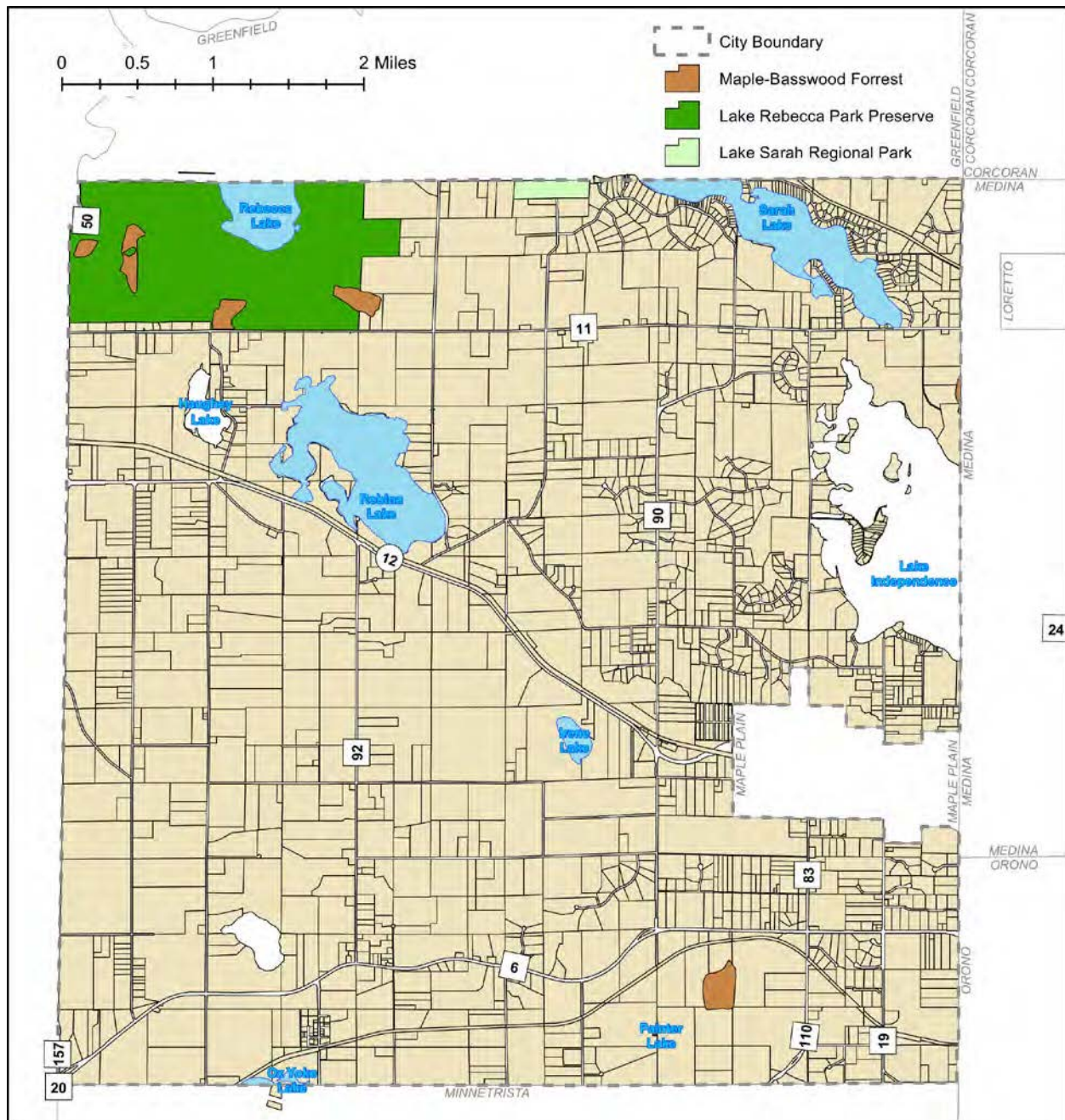


Figure 2-9. Unique Features and Scenic Areas

2.14 Pollutant Sources

The Minnesota Pollution Control Agency maintains up-to-date data on potential sources of groundwater contamination including: sanitary landfills, dumps, hazardous waste sites, registered underground and above ground storage tank sites, feedlots, abandoned wells, and permitted wastewater discharges. This information is available through the Minnesota Geospatial Information Office. The MPCA Pollutant sites are shown on Figure 2-10.

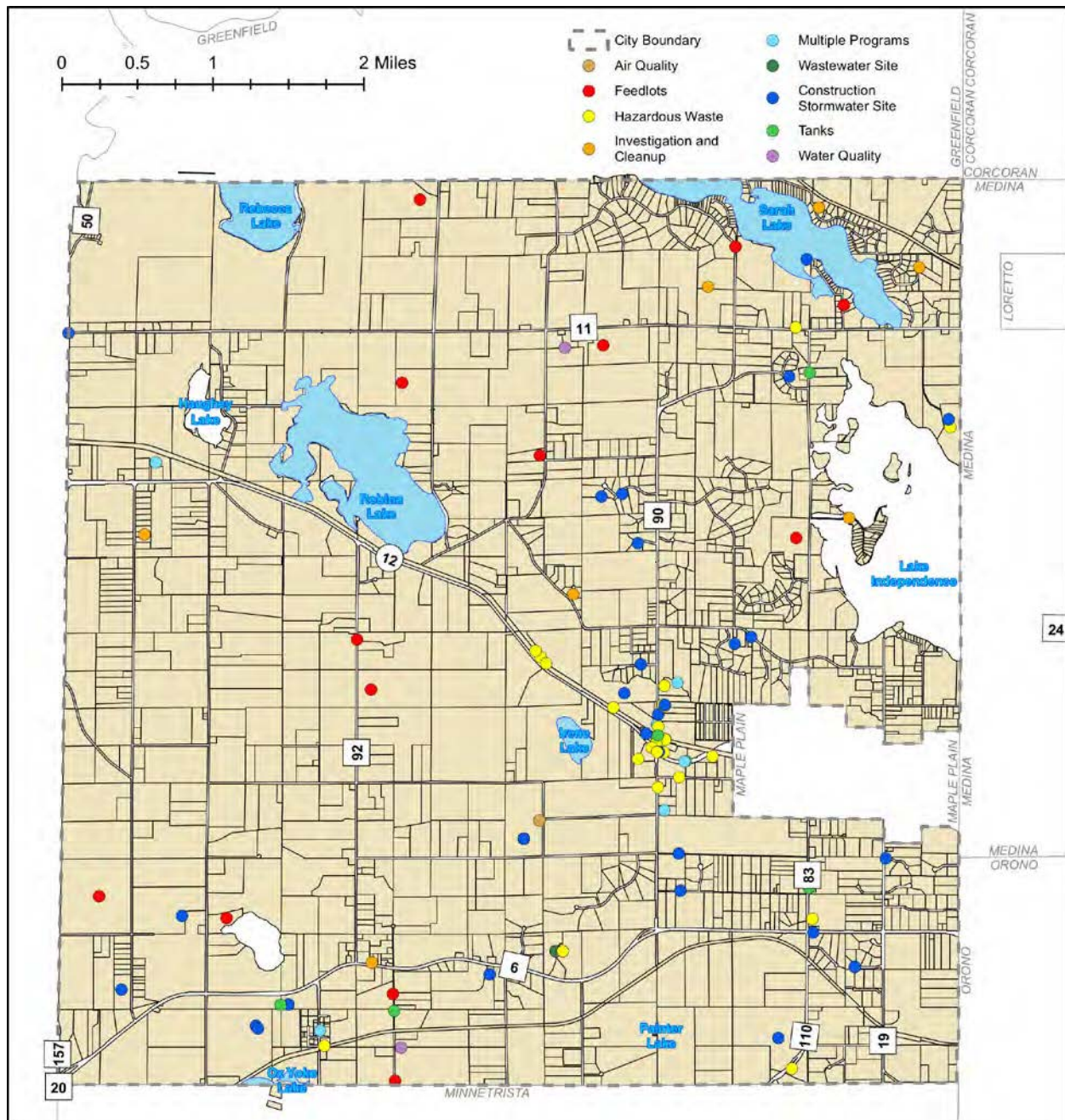


Figure 2-10. MPCA Agency Pollutant Sites

The County Atlas-Regional Assessment Program exists to develop County Geologic Atlases and Hydrogeologic Assessments. It is a joint program of the MnDNR-Division of Waters and the Minnesota Geological Survey. The County Atlas-Regional Assessment Program prepares map-based reports of counties and multicounty regions to convey geologic and hydrogeologic information and interpretations to governmental units at all levels, but particularly to local governments. This information and these interpretations contribute to sound planning and management of the state's land and water resources.

The program created a “Sensitivity of Ground Water Systems to Pollution” map for Hennepin County in 1989. Susceptibility of the water table was rated based on the depth of the water table and the vertical conductivity of geologic materials. Rating groundwater susceptibility can be based on the ability of geologic material to 1) absorb and hold contaminants; 2) transform contaminants into benign substances; 3) dilute contaminants to levels below some standard; and 4) control the rate that contaminated water flows to or through aquifers. High susceptibility does not indicate that water quality has been or will become degraded; low susceptibility does not guarantee that groundwater will remain pristine. Rather, it indicates the areas at a greater risk of contamination due to high soil permeability and shallow groundwater.

A majority of the water table in Independence has a low susceptibility to pollution, but the areas near Pioneer, Painter, and Robina Creeks and the South Fork Crow River have a medium to very high susceptibility.

The City of Independence does not have a municipal water supply system; therefore, the City has no need for a Well Head Protection Plan.

2.15 Water Resources Related Agreements

The City is a member of the Pioneer-Sarah Creek Watershed Commission. The Pioneer-Sarah Creek Watershed Commission is an involved partner in the City’s water resources matters. The watershed commission covers an area of about 70.5 square miles and member cities include Greenfield, Independence, Loretto, Maple Plain, Medina, and Minnetrista.

The commission has adopted an education and outreach plan that targets the following audiences:

- All property owners
- Lakeshore property owners
- Government: elected and appointed officials, staff, board and commission members
- Educators and students
- Agriculture and animal operators

In addition, the commission has adopted Rules and Standards for which all projects must adhere to. The rules and standards are applicable to stormwater management, erosion and sediment control, floodplain alteration, and wetland alteration.

The commission has enacted a permit program. In general, all projects that disturb one acre or more of land must apply for and obtain a permit.

A copy of the Joint Powers Agreement is included in Appendix A.

2.16 Comprehensive Plan

The City is preparing the 2040 Comprehensive Plan concurrent with the preparation of this plan. Required plan elements are Land Use, Transportation, Water Resources, Parks & Trails, Housing, and Plan implementation.

3.0 Management Strategies and Problem Areas

This section presents the process and information used to develop the management plan strategies for wetlands, water quality, and water quantity. Section 3.4 discusses the known problem areas within the City.

3.1 Wetland Protection

This section describes the process that was used to develop a wetland management strategy. The objective of this process is to provide no net loss of wetland functions and values. Impacts to wetlands include not only direct impacts such as filling and drainage, but also indirect impacts from stormwater inputs. This process is based largely on the state guidance document “Stormwater and Wetlands: Planning and Evaluation Guidelines for Addressing Potential Impacts of Urban Stormwater and Snowmelt Runoff on Wetlands” (State of Minnesota, Stormwater Advisory Group, June 1997).

3.1.1 Wetland Susceptibility to Stormwater Input

Stormwater runoff carries soil particles, nutrients, and contaminants, which can change the ecological balance of the receiving water body. Changes in the volume or rate of stormwater entering or discharging from the water body can also change the ecological balance. Change in the ecological balance of a wetland often results in changes in the water quality, changes in animal and fish habitat, replacement of native vegetation with invasive and tolerant plant species, and/or other impacts to the wetland’s functions and values.

The state guidance document developed a methodology for determining the susceptibility of wetlands to degradation by stormwater input. This methodology relates wetland type to a level of susceptibility as shown in Table 3-1. Wetlands such as bogs and fens can be easily degraded by changes in the stormwater inflows and are designated as highly susceptible. On the other hand, floodplain forests can tolerate relatively significant changes in the chemical and physical characteristics of stormwater inflow without degradation and are therefore slightly susceptible. Commonly observed shallow marshes and wet meadows dominated by cattail and reed canary grass (respectively) have a moderate susceptibility to stormwater fluctuations.

3.1.2 Wetland Management Standards

Wetland management standards were developed to determine how and when stormwater should be routed through a wetland to minimize potential impacts. These standards, shown in Table 3-2, were largely based on the state guidance document. These standards determine tolerable hydrologic change in terms of bounce (difference between the peak flood elevation and the wetland elevation), inundation period (time that floodwaters temporarily stored in the wetland exceed the wetland elevation), and runout control (elevation of the outlet).

These standards provide guidance for the management of stormwater to minimize wetland impacts. It is assumed that wetland impacts will be minimized and existing wetland functions

and values will be maintained if the proposed management system and criteria meet the management standards shown in Table 3-1. Specific requirements designed to implement the City's wetland management strategies and buffer widths are outlined in Section 5.1.

Table 3-1
Susceptibility of Wetlands to Degradation by Stormwater Impacts

Exceptionally Susceptible Wetland	Highly Susceptible Wetland Types:²	Moderately Susceptible Wetland	Least Susceptible Wetland Types:⁴
Sedge Meadows	Shrub-carrs ^a	Floodplain Forests ^a	Gravel Pits
Open Bogs	Alder Thickets ^b	Fresh (Wet) Meadows ^b	Cultivated Hydric Soils
Coniferous Bogs	Fresh (Wet) Meadows ^{c,e}	Shallow Marshes ^c	Dredged Material/Fill Material Disposal Sites
Calcareous Fens	Shallow Marshes ^{d,c}	Deep Marshes ^c	
Low Prairies	Deep Marshes ^{d,c}		
Lowland Hardwood Swamps			
Seasonally Flooded Basins			

1. Special consideration must be given to avoid altering these wetland types. Inundation must be avoided. Water chemistry changes due to alteration by stormwater impacts can also cause adverse impacts. Note: All scientific and natural areas and pristine wetland should be considered in this category regardless of wetland type.
2. a., b., c. Can tolerate inundation from 6 inches to 12 inches for short periods of time. May be completely dry in drought or late summer conditions. d. Can tolerate +12 inches inundation, but adversely impacted by sediment and/or nutrient loading and prolonged high water levels. e. Some exceptions.
3. a. Can tolerate annual inundation of 1 to 6 feet or more, possibly more than once/year. b. Fresh meadows that are dominated by reed canary grass. c. Shallow marshes dominated by reed canary grass, cattail, giant reed, or purple loosestrife.
4. These wetlands are usually so degraded that input of urban stormwater may not have adverse impacts.

Notes: There will always be exceptions of the general categories listed above. Use best professional judgment. Appendix A of the State Guidance Document contains a more complete description of wetland characteristics under each category. Pristine wetlands are those that show little disturbance from human activity.

Source: "Planning and Evaluation Guideline for Addressing Potential Impacts of Urban Stormwater and Snowmelt Runoff on Wetlands" State of Minnesota, Stormwater Advisory Group, June 1997.

**Table 3-2
Wetland Management Standards
According to Management Class**

Standard	Management Class			
	Preserve	Manage 1	Manage 2	Manage 3
Bounce (10-year)	Existing	Existing plus 0.5 feet	Existing plus 1 feet	No limit
Inundation Period ² (1 & 2-year)	Existing	Existing plus 1 day	Existing plus 2 days	Existing plus 7 days
Inundation Period ² (10-year)	Existing	Existing plus 7 days	Existing plus 14 days	Existing plus 21 days
Runout Control ¹	No change, maintain existing hydrology	No change, maintain existing hydrology	0 to 1 feet above existing outlet	0 to 4 feet above existing runout
Stormwater Treatment	Upstream sediment and nutrient pretreatment required to maintain background loading rates	Upstream sediment and nutrient pretreatment required to maintain background loading rates	Remove sediment from new inflows	Remove sediment from new inflows
Pioneer-Sarah Creek Buffer Width ³	Average 25 feet Minimum 10 feet	Average 25 feet Minimum 10 feet	Average 25 feet Minimum 10 feet	Average 25 feet Minimum 10 feet
Minnehaha Creek Buffer Width	Base 75 feet Minimum 67 feet	Base 40 feet Minimum 34 feet	Base 30 feet Minimum 24 feet	Base 20 feet Minimum 16 feet

¹ If currently landlocked, new outlet should be above delineated wetland elevation.

² Inundation period is defined as the proposed peak storage divided by the average discharge (S/Q).

³ Buffers are unmowed, naturalized strips of vegetation around the wetland perimeter. Buffers shall be provided during development or redevelopment. Buffer averaging is allowed provided that a minimum buffer width of 10 feet is provided

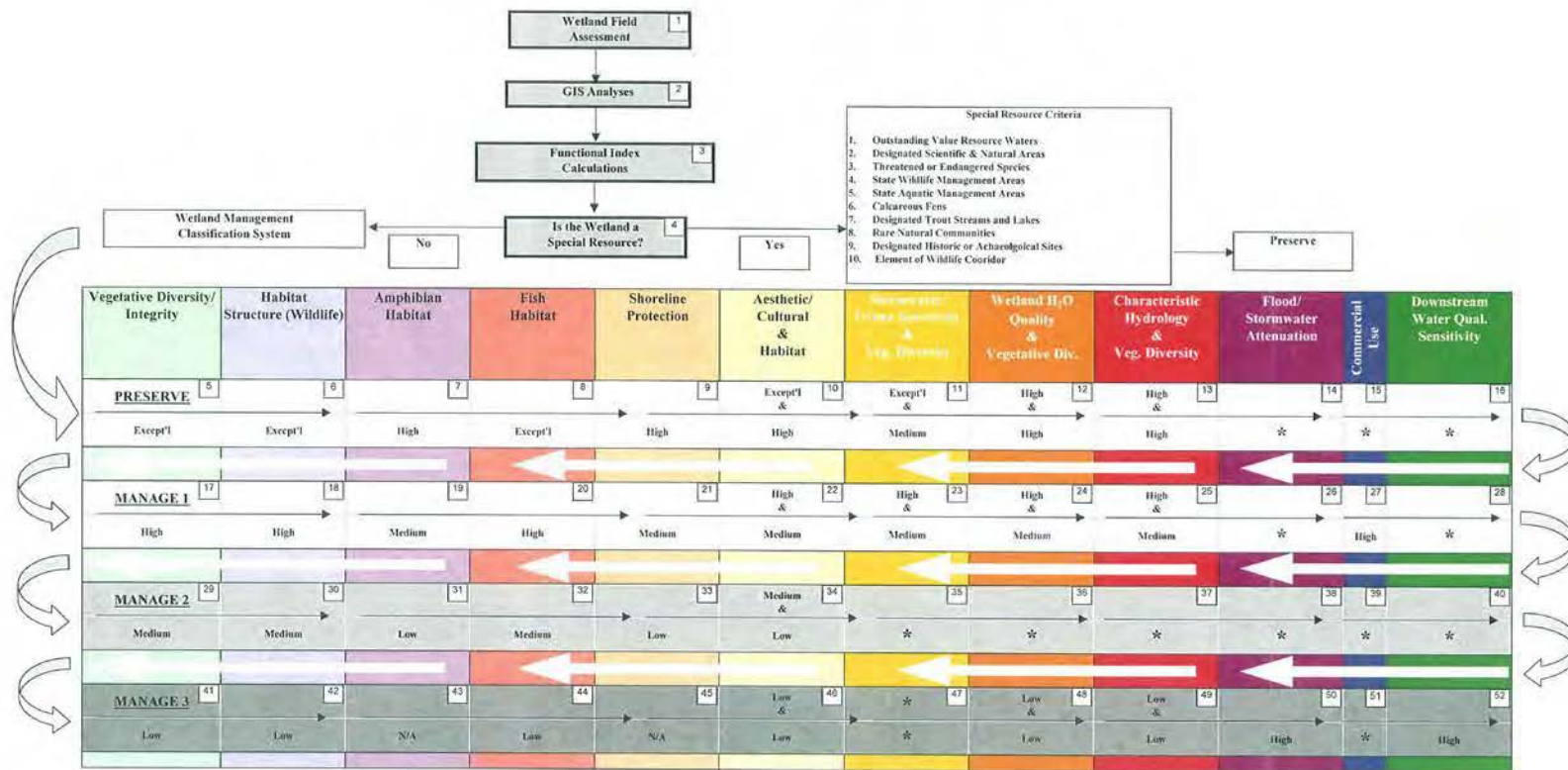
3.1.3 Wetland Management Classification

A wetland functions and values assessment will be required for all waters proposed to receive new stormwater discharges from private development or City initiated projects unless a management class has already been designated for the receiving water. The latest version of the “Minnesota Routine Assessment Method for Evaluating Wetland Functions” shall be used to assess receiving waters. The City may require, not only the water body directly receiving the discharge, but all downstream water bodies to be assessed. The assessment shall be completed by qualified wetland personnel who specialize in such work. Developers will be responsible for submitting the assessment for private projects. The assessments will be subjected to review and approval by the City’s water resource staff

The function and value assessment will be used to assign the wetlands into one of four categories – Preserve, Manage 1, 2, or 3. The flowchart shown on Figure 3-1 will be used with the function and value assessment to assign the wetlands into one of the four categories. The City’s water resource staff will be responsible for assigning the wetlands into categories.

Figure 3-1
Wetland Management Classification Process Flowchart

Each wetland will be ranked into a Wetland Management group by the highest rated function for the wetland.
Follow the arrows through numbered boxes in progression through the tables; classify wetlands into the first group that applies.



* This rating does not apply here.

3.2 Water Quality

Within the four major watersheds of the City of Independence, there are hundreds of water bodies ranging in size from lakes to small stormwater detention basins. Nonpoint pollution associated with stormwater runoff creates adverse impacts; the degree of impact depends on the water body's natural ability to remove, absorb, or process the pollutants through chemical, physical, or biological processes. Poor water quality usually indicates a situation where the resource receives more nutrients, or other pollutants, than can be processed naturally. Planning for water quality protection is necessary to preserve the beneficial uses of existing water bodies, as well as to evaluate wetland impacts as described in Section 3.1. Improved water quality will be achieved with new development and redevelopment projects by the load reduction achieved by abstracting 1.1 inches of stormwater runoff from the net new impervious or no net increase in total phosphorus or total suspended solids, whichever is lower.

Water quality protection will also be achieved through implementation of the City's Stormwater Pollution Prevention Program (SWPPP) as discussed in Section 1.2.4.

3.3 Water Quantity

The flood and rate control portion of the planning consisted of estimating the 100-year flood elevation and discharge rate for each watershed. This section discusses the flood insurance study and the City's flood and rate control process.

3.3.1 Flood Insurance Study

A Flood Insurance Study (FIS) of the City of Independence was completed in November 2016 by the Federal Emergency Management Agency (FEMA). The FIS maps indicate the boundaries for 100-year levels. The study determined flood elevations for Lake Independence, Lake Robina, Lake Sarah, South Fork Crow River, Robina Creek, Pioneer Creek, and Painter Creek. The 100-year flood elevations reported were used in the plan.

3.3.2 Flood Protection Level

Storm drainage systems are typically designed to pass a flood of a designated magnitude called the design flood. The design flood generally balances the cost of flood damages with the cost of the storm drainage system to achieve an overall minimum public cost. Watersheds in Independence are classified as requiring protection for either the 1 or 10 percent chance flood, based on expected flood damages. Storm drainage systems that serve as the outlet for areas where flood damage is likely to occur must safely pass the critical-duration 1 percent chance flood. Storm drainage systems for areas where no significant flood damage or disruption of infrastructure is likely to occur must safely pass the critical-duration 10 percent chance flood.

3.3.3 Hydrologic Model

Simulating the stormwater system using a hydrologic model is important in determining the adequacy of the existing system and to provide guidance in designing systems to handle surface runoff for

ultimate development conditions. A hydrologic model simulates the rainfall-runoff process so that runoff rates and volumes from design storms can be estimated for different stormwater configurations and land use conditions.

As rain falls on the watershed, several different processes move the water from the ground surface to one of three ultimate destinations. Initially water is stored in depressions and on the surface of the ground, and begins to infiltrate into the soil. As rainfall continues, the storage capacity of these depressions is exceeded, and the excess water begins to runoff into gutters, swales, ditches, and storm sewers. In Independence, these conveyance paths lead to county and public ditches or creeks or to one of the many lakes, ponds, and wetlands in the City.

The amount of rain and the time over which the rain occurs influences the amount of runoff and the rate at which the runoff travels from the watershed. In addition to the rainfall conditions, the physical characteristics of the watershed also determine the volume of water that leaves the watershed as runoff, and the resulting flood levels in the ponds, wetlands, and lakes in the watershed.

The storm drainage system for Independence was analyzed for the 1 percent chance flood for existing and proposed (ultimate development) conditions. The 1 percent chance flood is used to design storm drainage systems that serve as the outlet for areas where significant flood damage is likely to occur.

The drainage divides within the PSCWMC were determined using:

- Four USGS Maps: Delano – 1981, Mound – 1993, Rockford – 1981, Watertown – 1993
- Field Surveyed pipes and water levels
- LiDAR data

The drainage divides within the MCWD were obtained from the MCWD Comprehensive Water Resources Management Plan.

HydroCAD was used as the hydrologic model to simulate flow through the storm drainage systems in Independence. This computer model creates a hydrograph for each watershed. The model then routes these hydrographs through storage areas (such as wetlands, lakes, and detention ponds) and conveyance systems (storm sewers and ditches) and combines them with hydrographs from other subwatersheds. The hydrologic model estimates both the peak rate of runoff and the volume of runoff. The peak rate of runoff is the primary factor in determining storm sewer sizes. The volume of runoff is the primary factor in the design and evaluation of stormwater storage areas and in the assessment of hydrologic impacts to wetlands. A more detailed discussion about the HydroCAD Model is given in Section 9.0.

3.3.4 Rate Control and Flood Storage

Independence has vast amounts of stormwater storage available in its wetlands and lakes. This storage was used in the development of the ultimate conditions hydrologic model for the City. The storage areas were estimated from the USGS topographic maps and the elevations were based on field surveys of existing water levels and pipe inverts.

The ultimate pipes were designed to take advantage of the large storage areas while maintaining the overall discharge rate leaving the City borders.

3.3.5 Flood Control

Flood control has been directed primarily at the management of flood levels which include the protection of structures and the safety of the residents of the City.

3.3.5.1 Flood Protection Standards

It is common practice in stormwater management to provide a safety factor against flooding. This factor of safety is typically represented as a vertical separation distance between the peak flood elevation and the flood damage elevation. This vertical separation is called the “freeboard.” Section 5.2 presents the freeboard values that will be used for the City.

3.3.5.2 Flood Control System

The flood control system in Independence consists of the wetlands, ponds, and lakes for storage of runoff, the roadways, storm sewers, ditches and streams for conveyance of water from the watershed, and the management of the water in the system. Normal levels, flood levels, flood storage, peak discharges, and proposed storm sewer pipe sizes for each watershed are tabulated in the tables in Section 6.

3.4 Problem Areas

An assessment of the known problem areas and concerns is presented in this section.

3.4.1. Lake and Stream Water Quality Concerns

The water quality of Lake Independence, Lake Rebecca, Lake Sarah, Lake Irene, Crow River South Fork, and Pioneer Creek has been identified as a concern. A phosphorus Total Maximum Daily Load (TMDL) study for Lake Independence was approved in 2007. A phosphorus TMDL study was also approved for Lake Sarah in 2011, and a bacteria TMDL was approved for Pioneer Creek in 2017. A summary of the TMDL information for the impaired waters is shown on Table 3-3. Study areas of approved TMDLs are shown in Figure 3-3, 3-5, and 3-6.

**Table 3-3
TMDL Information**

Reach	Lake or River ID	Year ID	Affected Use	Pollutant or Stressor	TMDL Target Completion Date	Year TMDL Plan Approved
Crow River, South Fork	07010205-508	2002	Aquatic Life	Fish Bioassessments	2027	n/a
		2004	Aquatic Life	Turbidity	2017	n/a
		2006	Aquatic Recreation	Fecal Coliform	2017	n/a
		2016	Aquatic Life	Aquatic macroinvertebrate bioassessments	2027	n/a
		2016	Aquatic Life	Nutrient/Eutrophication Biological Indicators	2027	n/a
Lake Independence	27-0176-00	2002	Aquatic Recreation	Nutrient/Eutrophication Biological Indicators	n/a	2007
Lake Irene	27-0189-00	2016	Aquatic Recreation	Nutrient/Eutrophication Biological Indicators	2027	n/a
Lake Rebecca	27-0192-00	2008	Aquatic Recreation	Nutrient/Eutrophication Biological Indicators	2017	Delisted 2018
Lake Sarah (West Bay)	27-0191-01	2006	Aquatic Recreation	Nutrient/Eutrophication Biological Indicators	2012	2011
Lake Sarah (East Bay)	27-0191-02	2006	Aquatic Recreation	Nutrient/Eutrophication Biological Indicators	2012	2011
Pioneer Creek	07010205-653	2016	Aquatic Life	Dissolved Oxygen	2027	n/a
		2016	Aquatic Recreation	<i>Escherichia coli</i>	n/a	2017
Pioneer Creek	07010205-654	2016	Aquatic Life	Aquatic macroinvertebrate bioassessments	2027	n/a
		2016	Aquatic Life	Fishes bioassessments	2027	n/a

Note: Information obtained from the proposed 2018 Impaired Waters List

3.4.1.1 Lake Independence TMDL

Lake Independence is 851 acres in size and is classified as a Class 2 recreational water. The primary uses include swimming, fishing, and boating. The contributing watershed is 7,631 acres and is predominately agricultural and residential uses. There are several single family hobby farms located within the watershed.

The TMDL was approved in 2007. In 2007, the average phosphorous concentration was 47 ug/L, which exceeds the state standard of 40 ug/L for deep, recreational waters. Lake Independence phosphorus data has been collected by the Three Rivers Park District throughout the growing season since 1995 and can be found on the MPCA Environmental Data Access System. The average total phosphorus concentration for each year between 1995-2017 is shown on the graph in Figure 3-2.

The total load, as reported in the 2007 TMDL report, from all sources is 2,381 pounds per year. A map of the Lake Independence subwatershed used in the TMDL is shown in Figure 3-3. While the phosphorus standard is 40 ug/L, the TMDL states the desire to achieve a water quality goal of 36 ug/L. Achieving the desired water quality will require a phosphorous reduction of 1,081 pounds per year.

Approximately 18% of the 1,081 pounds per year load comes from internal loading, which is 209 pounds per year. The communities within the watershed (Independence, Medina, and Loretto) have agreed to work together to eliminate the 209 pounds per year of internal loading. Additionally, the TMDL allocates phosphorous load reductions to each municipality in the watershed, as follows:

Independence	-535 lbs/yr
Medina	-284 lbs/yr
Loretto	-53 lbs/yr

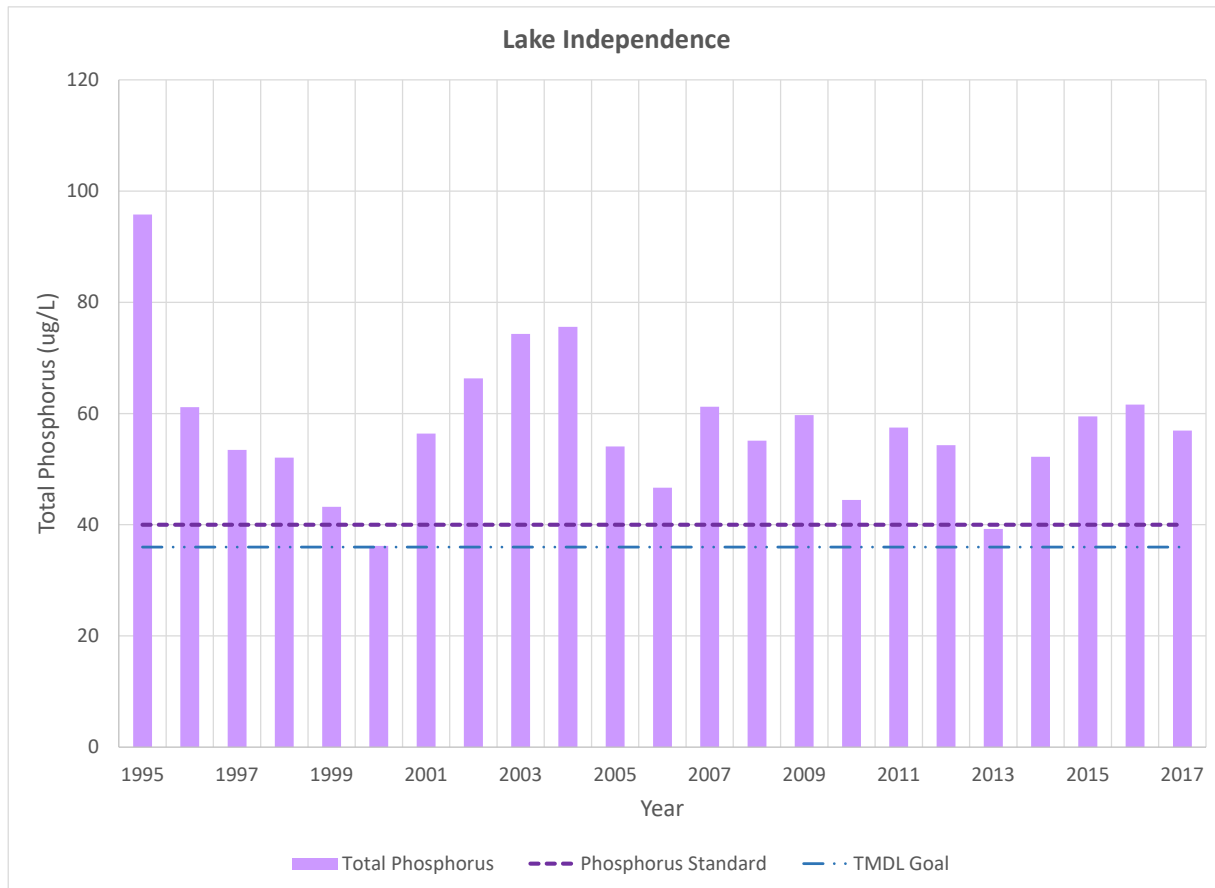


Figure 3-2. Total phosphorus in Lake Independence. Results shown are average values. Detailed results can be obtained through the MPCA Environmental Data Access System.

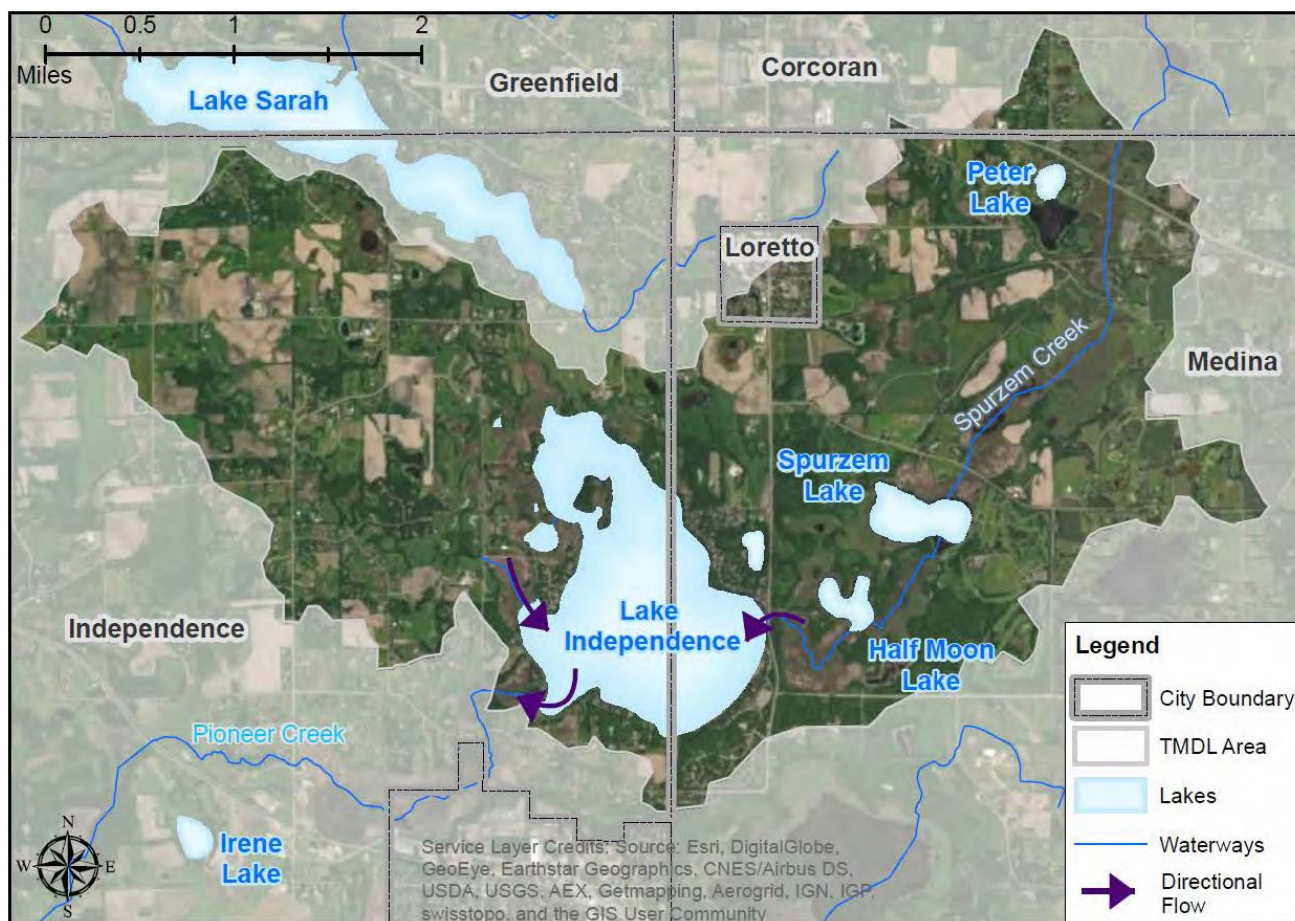


Figure 3-3. Lake Independence TMDL study area

Corrective Actions:

In order to achieve the desired load reductions, it will be necessary for the City of Independence to implement structural and non-structural BMPs. The City has already implemented several BMPs, as shown in Tables 3-4 and 3-5:

Table 3-4
Lake Independence TMDL Structural BMPs

Project	Year
Filter strip/buffer	2009
Filter strip/buffer	2009
Filter strip/buffer	2009
Rain Garden	2014
Wet Detention Pond	2015
Wet Detention Pond	2015

Table 3-5
Lake Independence TMDL Non-structural BMPs

Project	Year Implemented
BMP improvement	2009
BMP improvement	2009
Rooftop disconnection	2009
Increased implementation of illicit discharge detection and elimination ordinance	2009
Updated ordinance	2012
Erosion repairs	2014
Supplemental Public Education Outreach	2014
Supplemental Public Education Outreach	2014
BMP improvement	2014
Increased implementation of illicit discharge detection and elimination ordinance	2014
BMP improvement	2014
Increased implementation of illicit discharge detection and elimination ordinance	2015
Increased publications	2015

The City of Independence has achieved a load reduction of 91.2 lbs of phosphorous to date. The load reduction is a good start, and the City must continue to implement additional structural and non-structural BMPs in order to achieve the ultimate goal reduction of 535 lbs per year.

3.4.1.2 Lake Sarah TMDL

Lake Sarah is classified as a Class 2B recreational water, and the primary uses include swimming, fishing, and boating. Lake Sarah is 553 acres in size and the contributing watershed is 4,454 acres and is predominately agricultural and residential uses. Only a small portion of the contributing watershed is within the City of Independence and primarily consists of residential development along the south side of the lake.

The TMDL was approved in 2010. In 2010, the average phosphorous concentration was 101 ug/L, which exceeds the state standard of 40 ug/L for deep, recreational waters. Lake Sarah phosphorus data has been collected by the Three Rivers Park District throughout the growing season since 2006 and can be found on the MPCA Environmental Data Access System. The average total phosphorus concentration for each year between 2006-2017 is shown on the graph in Figure 3-3.

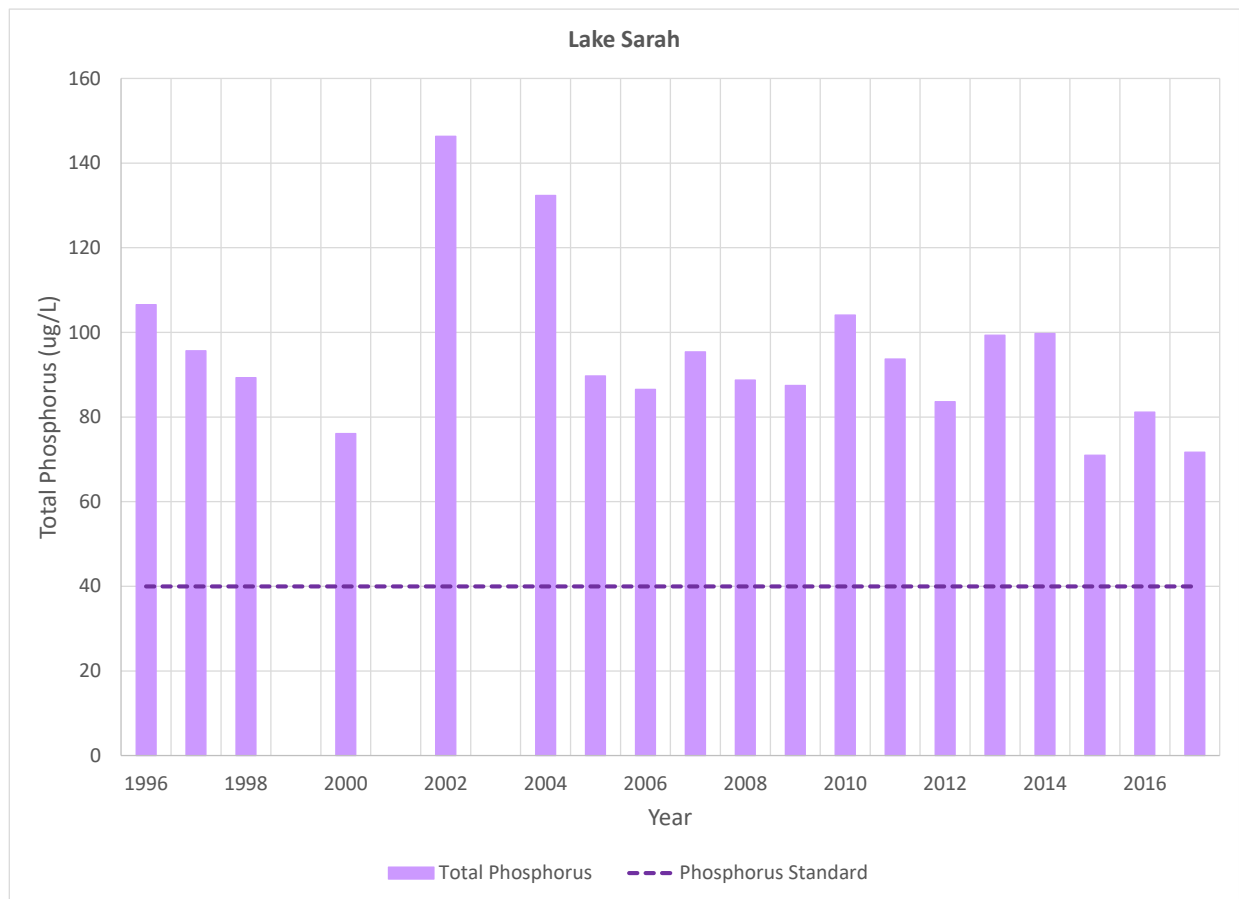


Figure 3-4. Total phosphorus for Lake Sarah. Results shown are average values. Detailed results can be obtained through the MPCA Environmental Data Access System.

The total load, as reported in the 2010 TMDL report, from all landscape/watershed sources was 2,108 pounds per year. A map of the Lake Sarah subwatershed used in the TMDL report is shown in Figure 3-5. Additionally, an internal load of 2,763 pounds per year is estimated. The internal loading is likely due to curlyleaf pondweed. The Lake Sarah watershed, therefore, contributes 38% of the total annual phosphorous load to the lake, and the internal loading accounts for 59% of the phosphorous loading to the lake.

In order to achieve the desired water quality, the internal loading will have to be controlled to background levels, and the watershed load will have to be reduced to a total phosphorous load of 1,238 pounds per year.

The TMDL Implementation plan allocates phosphorous load reductions to each municipality in the watershed, as follows:

Independence	-143 lbs/yr
Corcoran	-109 lbs/yr

Medina	-249 lbs/yr
Loretto	-37 lbs/yr

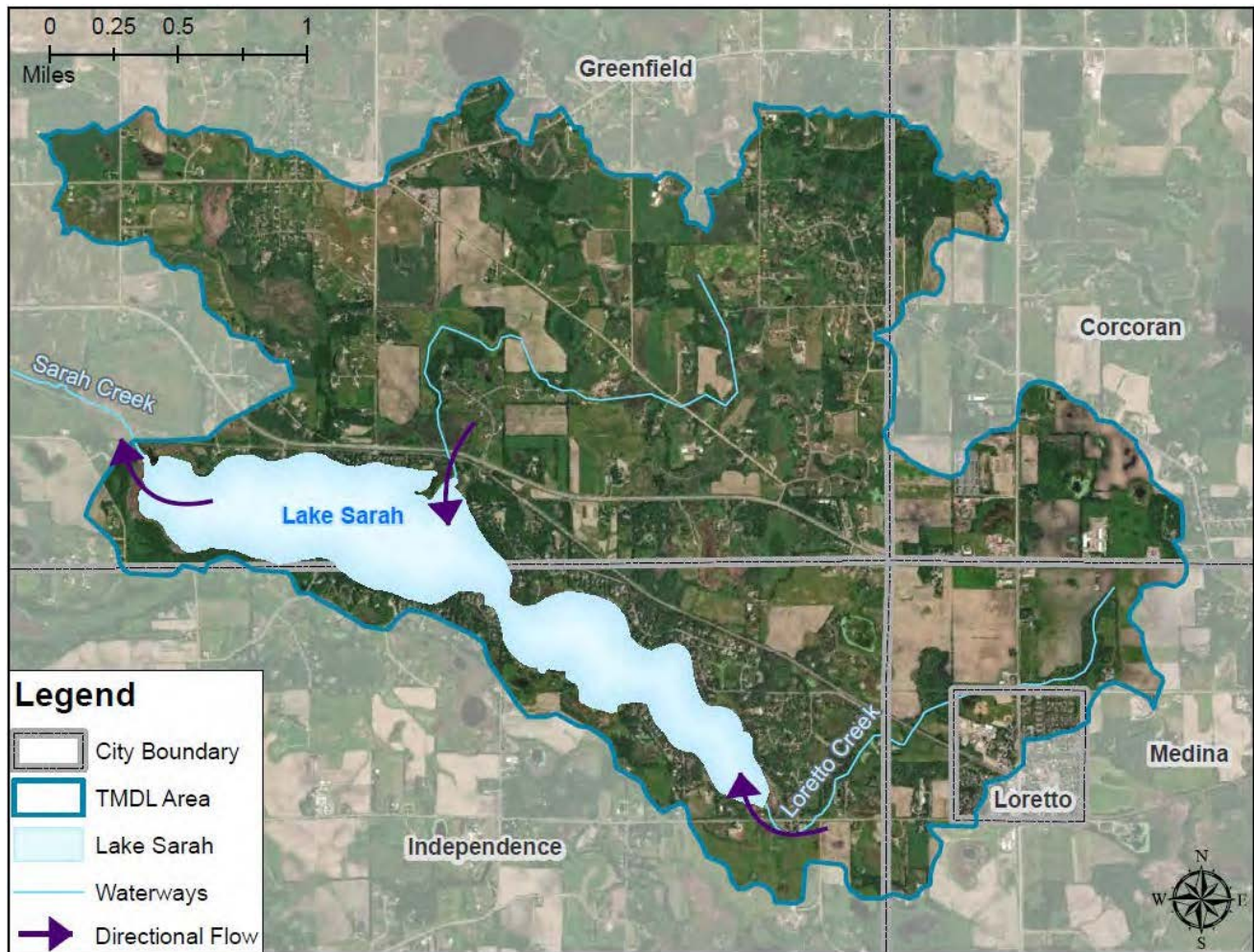


Figure 3-5. Lake Sarah TMDL study area

Corrective Actions:

In order to achieve the desired load reductions, it will be necessary for the City of Independence to implement structural and non-structural BMPs. Curlyleaf pondweed treatments have been applied over the past several years, which will target the internal loading source. Curlyleaf pondweed treatments were applied in 2015, 2016, 2017, and 2018. In accordance with the Lake Sarah Nutrient TMDL Implementation Plan, a load reduction of 3,222 pounds per year is targeted by curlyleaf pondweed management. Several rain gardens, hydraulic restorations, and one sediment pond was identified in the Lake Sarah and Lake Independence Stormwater Retrofit Analysis prepared in 2014 by the Anoka Conservation District as further discussed in Section 5.

3.4.1.3 Pioneer Creek TMDL

The Pioneer-Sarah Creek TMDL was approved in 2017. While Lake Sarah and Lake Independence are included in this subwatershed, they were not a part of this TMDL since they were already covered in their own TMDL reports, which are mentioned in the previous sections. A map of the TMDL area is shown in Figure 3-5. Pioneer Creek is impaired for *E. coli*, which is a bacteria that may be considered harmful in high enough concentrations. However, the entire length of Pioneer Creek within the City of Independence is not considered impaired for *E. coli*. The impaired reach (593) extends from Lake Independence for 7.1 miles to just after the creek turns sharply south. This reach has a direct watershed area of 9,178 acres, and a total watershed area, which includes areas upstream, of 17,573 acres. The majority of the surrounding land use is agricultural or undeveloped.

The Pioneer Creek is classified as a 2B surface water. The numeric standard for *E. coli* for Class 2B for *E. coli* is:

Not to exceed 126 organisms per 100 milliliters (cfu/100mL) as a geometric mean of not less than five samples representative of conditions within any given calendar month, nor shall more than 10% of all samples taken during any calendar month individually exceed 1,260 cfu/100mL. The standard applies only between April 1 and October 31.

The monthly *E. coli* samples taken in the 593 reach of Pioneer Creek between 2009 and 2011 are shown in Table 3-6. During this time, Pioneer Creek was above the geomean standard of 126 cfu/mL for five of the seven applicable months.

**Table 3-6
Pioneer Creek *E.coli* Summary**

May			June			July			August			September			October		
n	Geo	%n > 1,260	n	Geo	%n > 1,260	n	Geo	%n > 1,260	n	Geo	%n > 1,260	n	Geo	%n > 1,260	n	Geo	%n > 1,260
13	135	0	45	75	0	41	127	7	49	247	6	13	258	23	5	161	0

Notes: Red values mean the monthly geomean values are greater than 126 cfu/100mL standard.

n = number of samples

Geo = Geometric mean in cfu/100mL

%n > 1,260 = percent of samples greater than 1,260 cfu/100mL

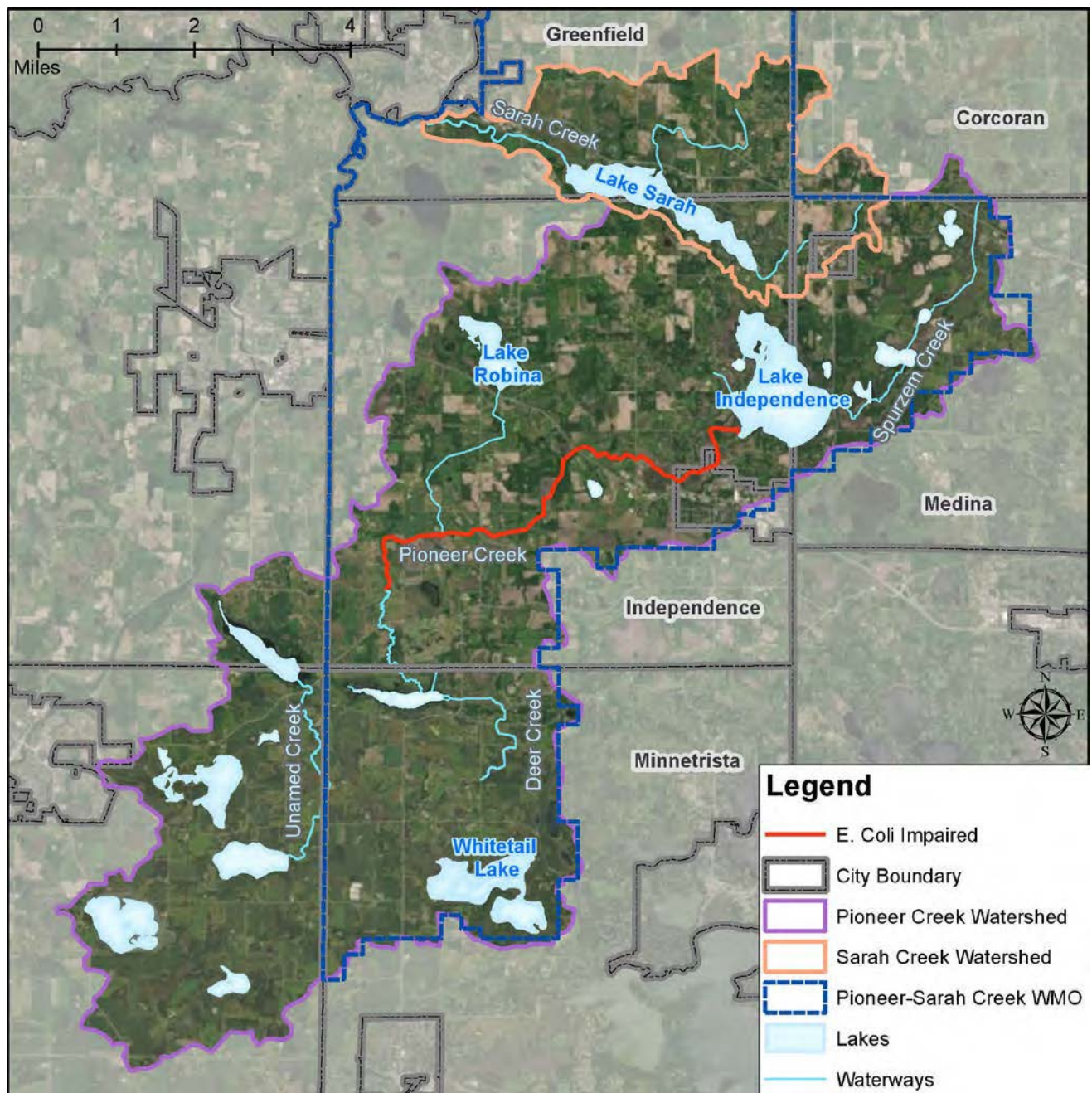


Figure 3-6. Pioneer-Sarah Creek TMDL study area

3.4.1.4 Lake Rebecca

Lake Rebecca was identified as impaired for nutrients in 2008. Average total phosphorus concentrations in 2007 were over 100 ug/L, which is well over the 40 ug/L standard for deep, recreation lakes.

Two alum treatments were applied, one in the fall of 2010 and one in the spring of 2011. Since that time, the total phosphorus has dropped below the standard. Lake Rebecca phosphorus data has been collected by the Three Rivers Park District throughout the growing season since 1994 and can be found on the MPCA Environmental Data Access System. The average total phosphorus concentration for each year between 1994-2017 is shown on the graph in Figure 3-7. The proposed 2018 impaired waters list plans to delist Lake Rebecca, so it will no longer be considered an impaired water.

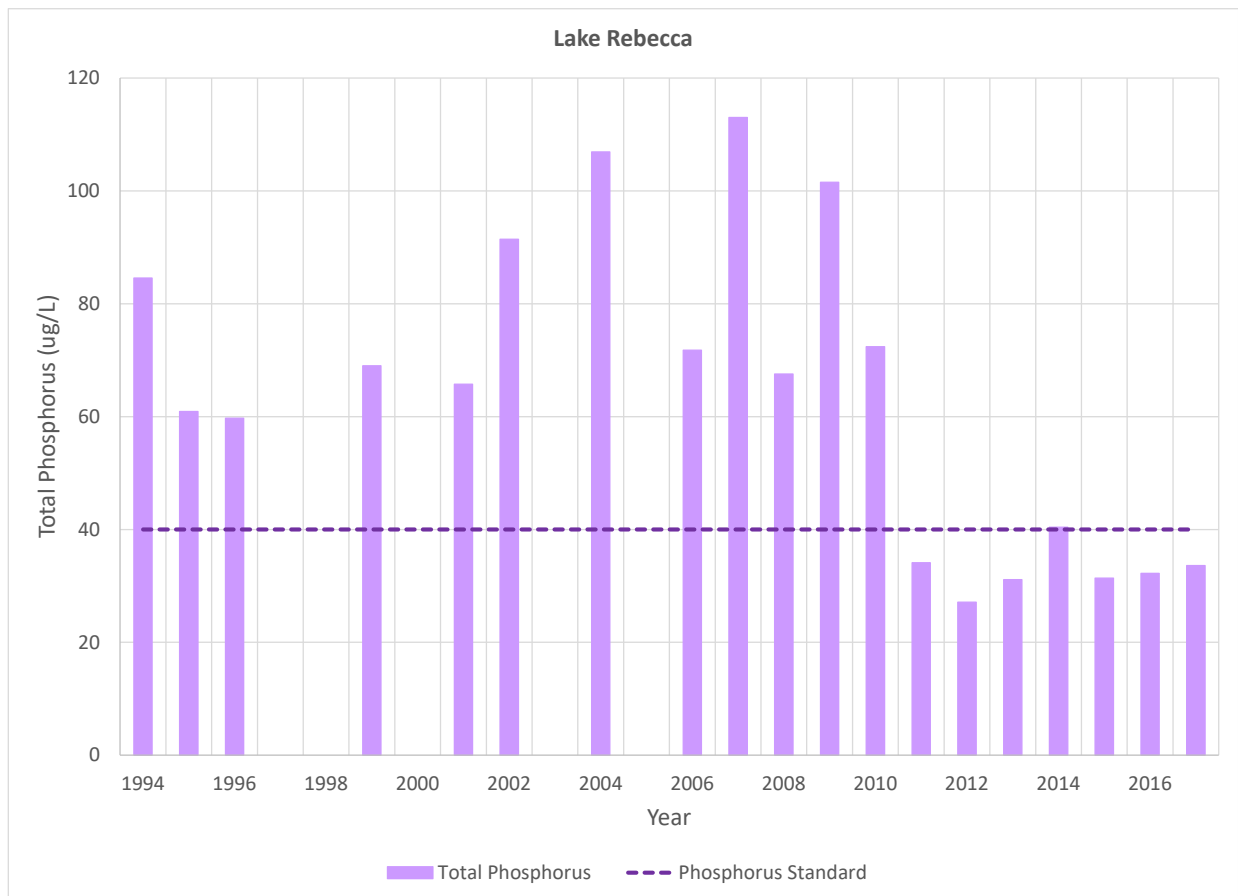


Figure 3-7. Total phosphorus for Lake Rebecca. Results shown are average values. Detailed results can be obtained through the MPCA Environmental Data Access System.

3.4.1.5 Lake Irene

Lake Irene was added to the 2016 proposed impaired waters list for nutrient impairment. There are only two years of data for the total phosphorus for Lake Irene, which can be viewed in Figure 3-8. The phosphorus standards for Lake Irene is 60 ug/L instead of the 40 ug/L due to it being a shallow lake. The average phosphorus concentrations were 179 ug/L and 136 ug/L for 2010 and 2011, respectively. Lake Irene has more than double the standard concentration for phosphorus. There is no TMDL specifically for this lake, but Lake Irene is included in the Pioneer-Sarah Creek subwatershed TMDL area.

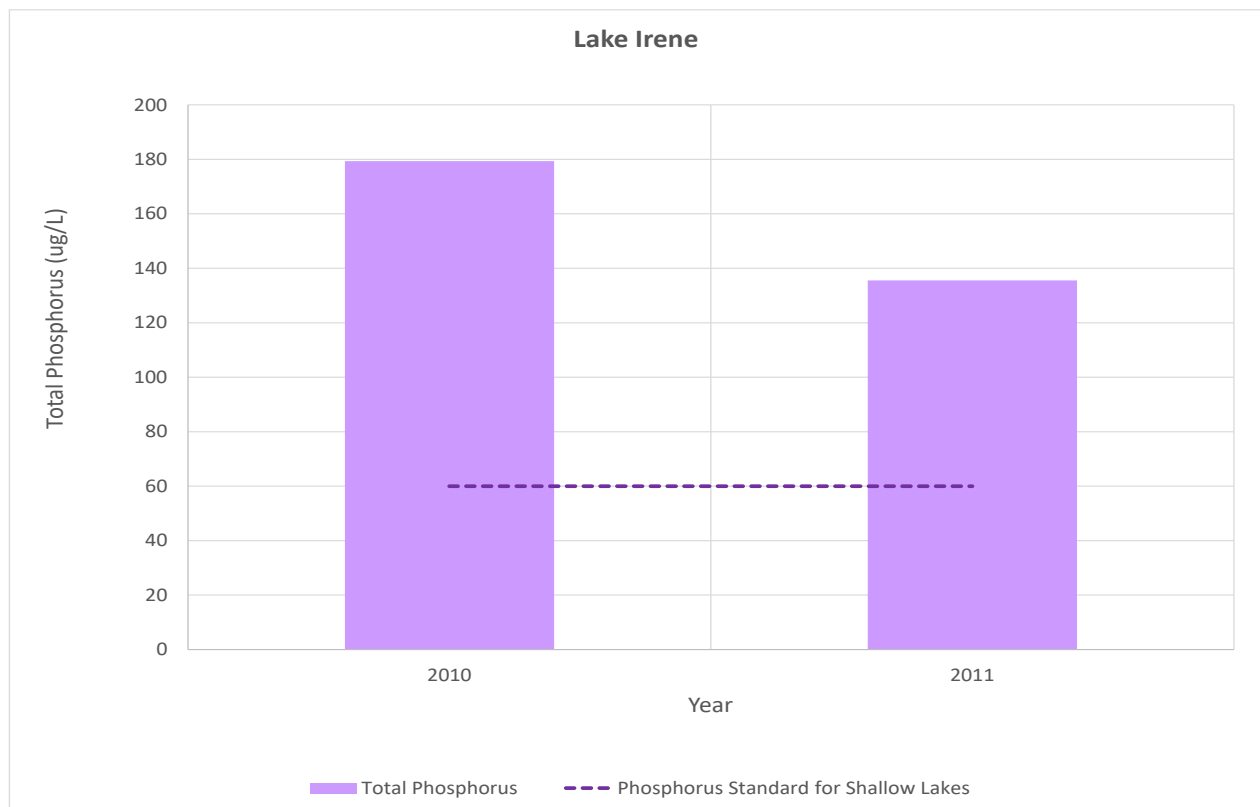


Figure 3-8. Total phosphorus for Lake Irene. Results shown are average values. Detailed results can be obtained through the MPCA Environmental Data Access System.

3.4.1.6 Crow River, South Fork

The South Fork Crow River is listed as impaired for multiple pollutants and stressors, including turbidity or total suspended solids (TSS), nutrients, and fecal coliform (see Table 3-3). The reach bordering the northwest boundary of Independence is part of section 508, which extends 31 miles from just north of Independence to almost the Carver and McLeod county border.

The South Fork Crow River TMDL Report was completed in October 2018 and is still being reviewed by the EPA at the time of this publication. TSS and *E. coli* data from the TMDL report is summarized Figure 3-8 and Table 3-7 below. For the TSS, five sections within the 508 reach were sampled for varying timeframes between 2006-2013. Between the five sections sampled, 10 to 50

percent of the samples were over the 65 mg/L TSS standard. The *E. coli* data shows the geomean frequently surpassed the standard of 126 cfu/100mL.

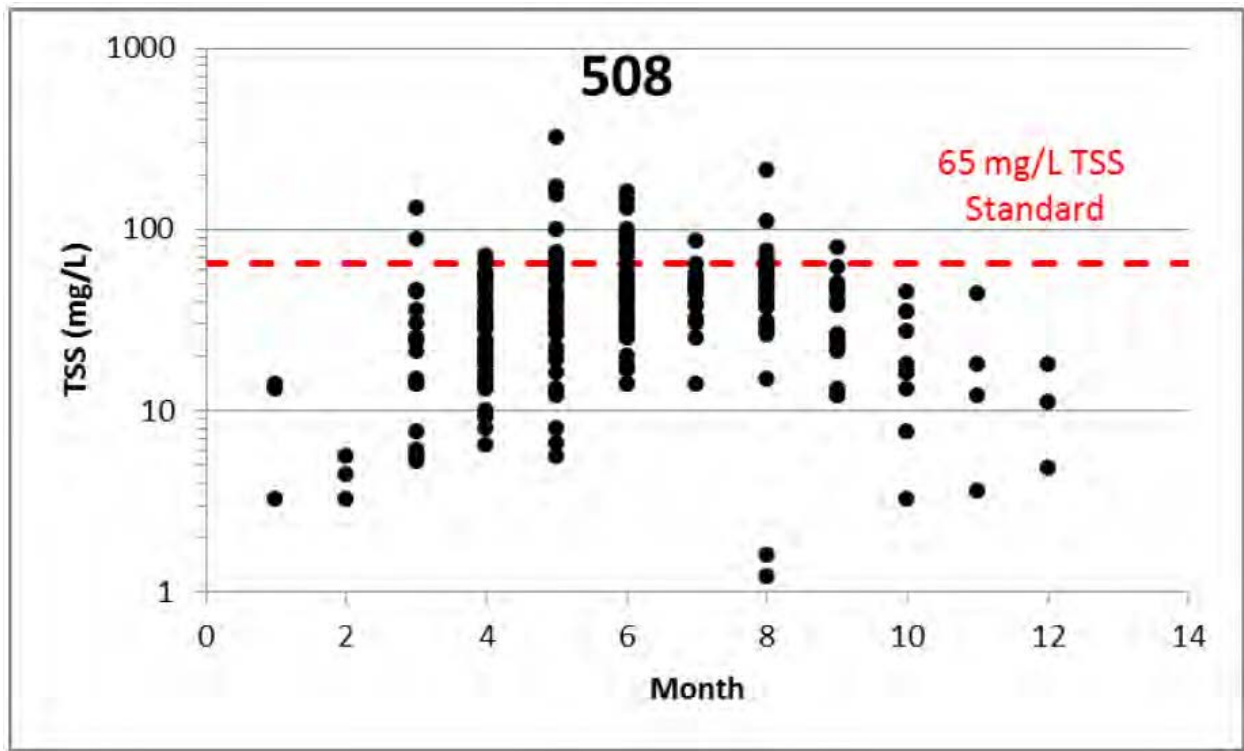


Figure 3-8. TSS seasonal variation of the Crow River South Fork, section 508. Red dashed line indicates the South River Nutrient Region 65 mg/L TSS standard. Graph taken from Figure 3-6 in the [South Fork Crow River TMDL](#) report.

Table 3-7
South Fork Crow River (508) *E. coli* Summary

Data Years	All months (April – October)		
	n	Geo	%n > 1,260
2001-2013	63	90	5
2003-2013	97	172	8
2010-2013	43	290	16

Notes: Data from South Fork Crow River TMDL. Red values mean the monthly geomean values are greater than 126 cfu/100mL standard.

n = number of samples

Geo = Geometric mean in cfu/100mL

%n > 1,260 = percent of samples greater than 1,260 cfu/100mL

3.4.1.7 Painter Creek

Painter Creek traverses from Katrina Lake to Painter Lake, which is more of a wetland, and continues on into Jennings Bay of Lake Minnetonka. The segment of Painter Creek within the boundaries of Independence is not listed as an impaired water. However, Jennings Bay is considered impaired for nutrients. MCWD's [Painter Creek Subwatershed Plan](#) states Painter Creek contributes between one-third to one-half of Jennings Bay's total annual phosphorus load. MCWD allocated Independence a 79 pounds per year of total phosphorus reduction for Painter Creek.

MCWD has identified two potential regional ponds within Independence. The regional ponds will help reduce the phosphorus loading and peak flows to Painter Creek. The potential regional pond locations are shown on Figure 3-9.

Corrective Action:

As required by MCWD, Independence must reduce phosphorus loads to Painter Creek by 79 pounds per year. The City shall implement the policies and standards outlined in this plan through plan review in an effort to address water quality concerns within the Painter Creek Subwatershed. The City will also work cooperatively with the MCWD on proposed district projects and will implement the strategies outlined in Section 5.2.5.3.

There are potential wetland restoration areas within Independence. Wetland restoration may help reduce the phosphorus loading and peak flows to Painter Creek. Three potential wetland restoration areas are shown on Figure 3-9. These wetland restorations are proposed projects by the MCWD. The City will cooperate with the MCWD during the implementation stage of these projects.

3.4.2 Flooding, Stormwater Rate Control, and Water Quantity Concerns

3.4.2.1 High Lake Levels

The high water elevations of Lake Independence, Lake Sarah, and Lake Haughey were identified as a concern in the second generation water management plan. A contributing factor to the high water levels is from increased rates and volumes of stormwater runoff as a result of an increase in impervious surface area due to development.

Corrective Actions:

A Lake Independence outlet project was completed in 2013 and has successfully lowered the lake level to an acceptable elevation. The outlet project consisted of rebuilding the weir that controls the lake elevation at Independence Road and dredging the outlet channel from weir to Pagenkopf Road.

The City shall implement the water quantity policies and standards outlined within this plan through development plan review in an effort to address flooding and increased flow rate and volume concerns within the City.

3.4.2.1 Culvert Crossing Concerns

Rates and volumes of stormwater runoff associated with the culverts north and south of the railroad at County Line Road between the Cities of Delano and Independence has been identified as a concern. The location of these culverts is shown on Figure 3-9 as issues 1 and 2.

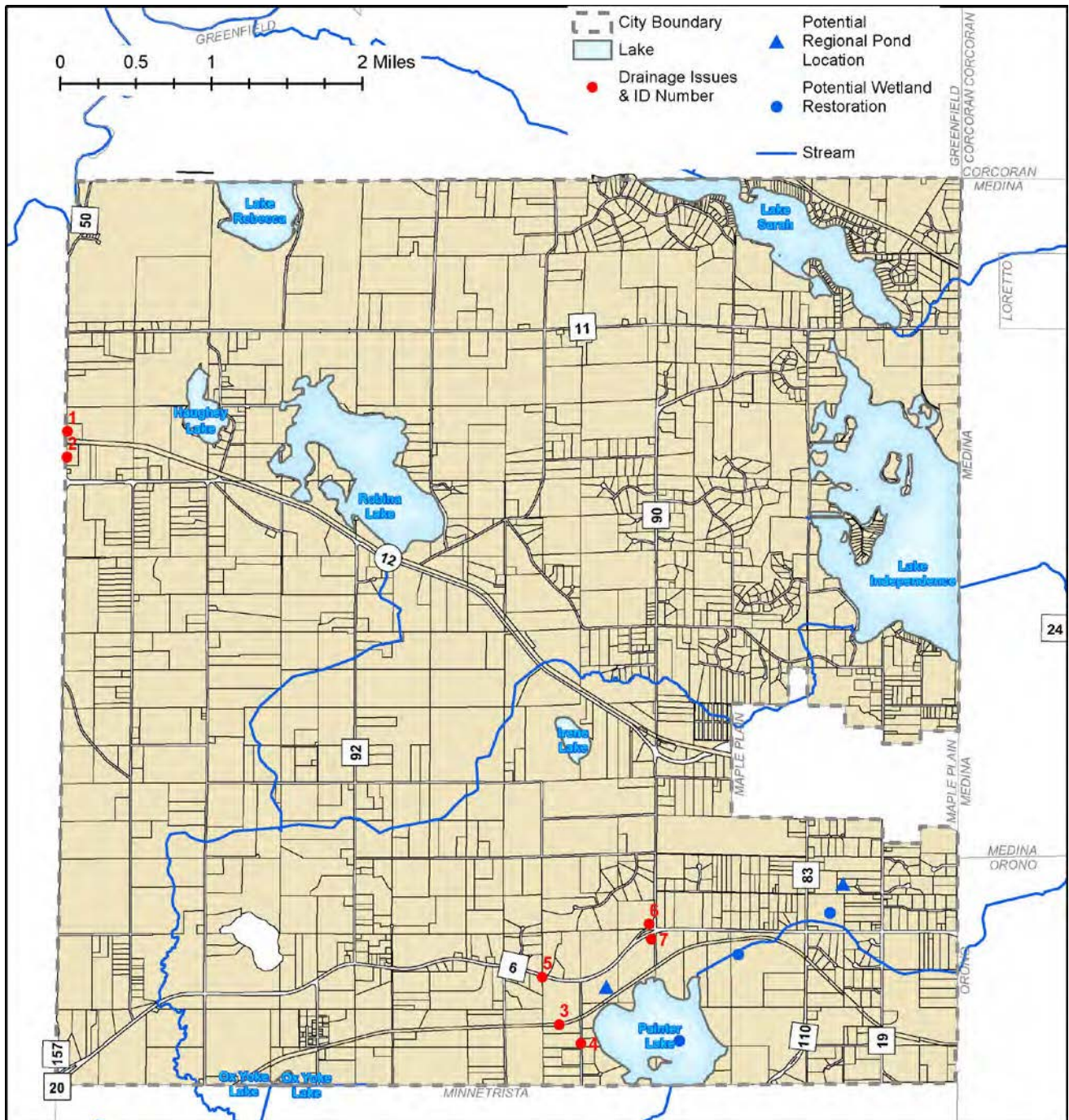


Figure 3-9. Drainage Issues and Concerns

There are two locations within the City that are predicted to overtop during a 100-year storm event. The two locations are one private driveway off of Ingerson Road and the low spot south of County Road 6 on Ingerson Road. These two locations are shown on Figure 3-9 as issues 3 and 4.

MCWD has identified three culvert crossings within the City that have higher velocities than desired which may result in erosion at the outlet. The crossings are on County Road 6. The locations are shown on Figure 3-9 as issues 5, 6 and 7.

Corrective Actions:

The City will cooperate with the City of Delano and the PSCWMC to study the rate and volume control issue associated with the railroad culverts at County Line Road. The City completed a preliminary drainage study of the Urban Commercial Area and presented the results in the second generation water management plan.

As the results show, by requiring restrictions of the outlets from subwatersheds 2 and 3, the hydrologic conditions of the watersheds in Delano will not only be maintained, but will be improved. The XP-SWMM results are included in Appendix D of the second generation water management plan.

A detailed drainage review will be required prior to approval of any preliminary plats within the Urban Commercial area.

The flooding issues were discussed with City Staff, and they were not identified as a threat to life or property; therefore, they were not examined any further. If projects occur in these areas, the flood potential will be reviewed at that time.

There are some slight to moderate erosion issues at the outlet of the Ingerson Road culvert. The City also reviewed the culvert crossings on County Road 6. These crossings have minor to no erosion issues. It is assumed that these crossings will be inspected on a routine basis by the City and the County as part of their MS4 permit requirements, and maintenance will be performed at such time that it is warranted.

3.4.3 Impacts of Stormwater Quality on Fish and Wildlife Resources

Impacts to fish and wildlife resources have been identified, including decreased floristic diversity and impacted wildlife habitat, as a result of stormwater.

Corrective Actions:

The City shall implement the water quality standards outlined within this plan through development plan review in an effort to address water quality impacts on fish and wildlife resources.

3.4.4 Impacts of Soil Erosion on Water Quality and Water Quantity

Construction site erosion has been identified as a concern.

Erosion along the banks of Lake Independence, Pioneer Creek, and Lake Sarah has been identified as a concern.

Erosion caused by commercial, hobby farm, and agricultural/farming activities has been identified as a concern.

Corrective Actions:

The City shall implement the standards outlined within this plan through development plan review to address erosion issues within the City.

The City shall develop erosion and sedimentation ordinances that conform to this plan's policies and standards.

The City will be responsible for enforcement of these ordinances.

The City shall create developer's guidelines based on the goals, policies, and standards outlined in this plan.

3.4.5 Groundwater Susceptibility

As discussed in Section 2.14, the MnDNR and the Minnesota Geological Survey have developed a map that identifies the susceptibility of the water table to pollution. There are a number of areas in the City that have been identified as highly or very highly susceptible to aquifer impacts.

Corrective Action:

The City shall implement the groundwater policies and standards outlined within this plan through development plan review in an effort to protect existing groundwater quality. Given the proposed low density development planned for Independence, the potential for groundwater impacts is considered low.

4.0 Goals and Policies

This section presents the goals and policies developed for the management of water resources within Independence. Goals and policies are provided for wetlands, water quality, water quantity, erosion control, groundwater, public ditch system, recreation, fish and wildlife management, enhancement of public participation, information and education, floodplains, abstraction/filtration, shorelines and streambanks. Goals propose the desired end and policies provide the means to achieve the goals. Section 5.0 provides more specific detail on how the goals and policies will be implemented.

4.1 Wetlands

Goal: Preserve, create, and restore wetland resources, and maximize the benefits and functionality of wetlands to the City.

Policy 1:

Act as the Local Government Unit responsible for administration of the Wetland Conservation Act within the boundaries of the Pioneer-Sarah Creek Watershed Management Organization.

Policy 2:

The Minnehaha Creek Watershed District will act as the Local Government Unit responsible for administration of the Wetland Conservation Act within their District boundaries.

Policy 3:

Manage wetlands consistent with this plan and state and federal wetland regulations.

Policy 4:

Encourage restoration of degraded wetlands in Key Conservation Areas to improve vegetative diversity and ecological integrity, with priority given to wetlands where restoration could improve management classification to at least a Manage 1. Restore other wetlands as opportunities arise.

Policy 5:

Regulate wetland impacts commensurate with the quality of the wetland as determined by the management classifications identified in the function and value assessment.

Policy 6:

Encourage establishment and maintenance of buffer areas around wetlands, lakes, and streambanks.

Policy 7:

Require submittal of a functions and values assessment for all proposed wetland impacts requiring a permit, unless a management class has already been designated for the impacted wetland; mitigation of all fill in Preserve category wetlands; and specifying by management classification stormwater discharge pretreatment, buffer, inundation period, and other wetland standards.

Policy 8:

Maintain a current inventory of wetland location, size, function and value, and management classification.

4.2 Water Quality

Goal 1: Preserve, maintain, and improve aesthetic, physical, chemical, and biological composition of surface waters and groundwater within the City.

Goal 2: Achieve an annual load reduction of 79 pounds of phosphorus in the Painter Creek Watershed.

Goal 3: Achieve an annual load reduction of 541 pounds of phosphorus in the Lake Independence Watershed.

Policy 1:

Manage stormwater consistent with the water quality standards outlined in this plan. In all cases, stormwater will be managed to meet or exceed MCWD and WMC standards. The MCWD will continue to implement and permit their rules within their District boundaries.

Policy 2:

The City will continue to educate Independence residents about household BMPs to protect the City's water resources.

Policy 3:

Maintain, operate, and clean structural BMPs such as sedimentation and detention structures as needed to preserve the initial intended performance.

Policy 4:

The City shall review the progress and policies related to TMDL's as they become available.

Policy 5:

The City will amend this surface water management plan to incorporate completed TMDL studies.

Policy 6:

The City will use the findings of the TMDL studies to guide development review.

Policy 7:

The City will provide the MCWD and WMC annual reports regarding TMDL implementation progress.

Policy 8:

Promote the general application of BMP's across the City.

Policy 9:

All individual developments shall be designed so as to preserve and enhance existing topography, water bodies, natural vegetation, permanent wetlands, wildlife areas and other natural amenities.

Policy 10:

The City's natural drainage network of wetlands and streams shall be maintained and protected to provide a natural stormwater system for runoff storage, filtration and maximum groundwater recharge.

4.3 Water Quantity

Goal 1: Maintain or reduce existing flows from drainage within the City to decrease the negative effects of stormwater runoff and bounce from existing and proposed development as well as provide low flow augmentation to surface waters.

Goal 2: Reduce volume of stormwater runoff from new development and redevelopment and maintain or reduce existing water volumes discharged in the Painter Creek Watershed.

Policy 1:

The City will promote preservation of the retention capacities of the lakes, streams, wetlands and ditches of the present drainage system in order to control rates of runoff and potential flooding.

Policy 2:

The City will encourage infiltration of precipitation and runoff where feasible and practical.

Policy 3:

Detention facility design will include access for maintenance of the outlet structure and to the facility in general.

Policy 4:

Provide a positive overflow from all stormwater ponds and wetlands for landlocked basins. Outlets will be installed under the 100-year flood elevation only if there is a demonstrated threat to public structures or safety.

Policy 5:

Require low floors of new structures to be built to have 2 feet of freeboard protection for the critical duration 1 percent chance flood. Low floors of new structures adjacent to landlocked basins shall be elevated a minimum of 2 feet above the elevation of two consecutive 1 percent chance storms and low openings shall be 1 foot above the 10-day snowmelt as outlined in this plan.

Policy 6:

Review development and redevelopment proposals for consistency with this plan.

Policy 7:

Correct existing flooding problems within available funding constraints by upgrading the storm drainage system or implementing flood protection improvements.

Policy 8:

Trunk storm drainage systems that serve as the outlet for areas where flooding of structures or where significant flood damage is likely to occur will typically be designed to meet freeboard protection standards for the critical duration 1 percent chance flood. The design shall be based on a hydrograph method for appropriate rainfall and snowmelt events. The design shall be based on proposed ultimate land use. The design shall consider potential flood, wetland, and water quality impacts to upstream and downstream areas.

Policy 9:

Trunk storm drainage systems for areas where no significant flood damage or disruption of infrastructure is to occur shall be designed to safely convey the critical duration 10 percent chance flood. The design shall be based on proposed ultimate land use. The design shall consider potential flood, wetland, and water quality impacts to upstream and downstream areas.

Policy 10:

Manage the rate and volume of runoff in general accordance with the stormwater management criteria presented in this plan.

Policy 11:

Provide emergency overflows for storm drainage systems where possible.

Policy 12:

Maintain, clean, and replace storm drainage systems as needed to preserve the initial design capacity.

Policy 13:

Promote regional stormwater retention systems for stormwater rate control when it is reasonable and practical to do so. The City supports on-site retention systems when regional systems are not reasonable and practical.

Policy 14:

Encourage the development and maintenance of depressional storage within the City.

Policy 15:

Encourage abstraction of the first one inch of rainfall on new permitted development and redevelopment.

Policy 16:

Development shall not decrease the runoff time for a 100-year event of the critical duration for a subwatershed.

4.4 Erosion Control

Goal: Control temporary sources of sediment resulting from land disturbance and identify, minimize and correct the effects of sedimentation from erosion-prone and sediment source areas.

Policy 1:

Require development and redevelopment to implement construction site erosion and sediment control practices consistent with the City's Sediment and Erosion Control Ordinance, the NPDES General Construction Permit, the Minnesota Stormwater Manual and the MCWD Rule B: Erosion Control. The MCWD will continue to implement and permit their rules within their District boundaries.

Policy 2:

Inspect construction sites and provide enforcement for conformance to the site's approved erosion and sediment control plans.

Policy 3:

The City will encourage the preservation of natural vegetation.

Policy 4:

Evaluate the need to provide erosion control or energy dissipation measures at culverts with high velocities to prevent erosion and downstream sediment transport.

Policy 5:

Work cooperatively with adjacent property owners to prevent erosion and sediment transport and stabilize streambanks as necessary.

Policy 6:

Diversion, retention, and treatment of wastes from feed lots and stables shall be required to conform to Minnesota Pollution Control Agency's regulations for agricultural waters.

4.5 Groundwater

Goal: Protect and maintain existing groundwater flow, promote groundwater recharge and improve groundwater quality and aquifer protection.

Policy 1:

Cooperate with the Minnesota Department of Health to ensure that abandoned wells are properly sealed.

Policy 2:

Encourage pretreatment of stormwater discharge to wetlands or infiltration areas in the areas of high aquifer sensitivity.

Policy 3:

Encourage the use of low impact development techniques that minimize new impervious surfaces and provides for increased infiltration.

Policy 4:

Encourage groundwater infiltration and recharge where feasible and practical.

Policy 5:

Require developers to identify existing drain tile lines on property proposed for development.

Policy 6:

Encourage abstraction of the first one inch of rainfall on new permitted development and redevelopment in Type A and B soils.

Policy 7:

Require an additional level of analysis and review of permitted development and redevelopment where there is a potential to adversely impact groundwater connected to a surface water feature.

4.6 Public Ditch System

Goal: Maintain public ditch systems within the City as required under statutory jurisdiction.

Policy 1:

The City shall maintain public water management structures between waters and wetlands, and regional detention basins.

Policy 2:

Except for Painter Creek, the public ditch systems within the City shall be managed by Hennepin County, which is the public ditch authority. Painter Creek will be managed by the Minnehaha Creek Watershed District.

4.7 Recreation, Fish, and Wildlife Management

Goal 1: To protect and enhance fish and wildlife habitat areas, significant open spaces, and natural areas.

Goal 2: Promote the recreational use, where appropriate, of surface waters within the City by providing recreation opportunities for residents by promoting the use and enjoyment of water resources with the intent of increasing the livability and quality of life within the City.

Policy 1:

The City shall encourage fish and wildlife habitat protection and enhancement opportunities as part of surface water management practices.

Policy 2:

The City will work with and support to the maximum extent practical the efforts of the MCWD and WMC in promoting public enjoyment and protecting fish, wildlife, and recreational resource values in the City.

4.8 Enhancement of Public Participation, Information, and Education

Goal 1: Educate and inform the public on pertinent water resource management issues, and increase public participation in water management activities.

Goal 2: Solicit input from the general public with the intent that policies, projects, and programs will address local community values and goals, as well as protect historic and cultural values regarding water resources; strive to manage expectations; and base decisions on an educated public.

Policy 1:

Implement the Stormwater Pollution Prevention Program adopted May 2006, amended July 2008 to include TMDL requirements.

Policy 2:

Develop and distribute targeted written material to stakeholder groups (e.g., residents, agricultural property owners, developers) explaining the need for natural resource conservation and low impact development approaches to reduce phosphorus and other pollutant loading and providing strategies that each stakeholder group can employ to assist in meeting the City's goals.

4.9 Floodplains

Goal: Reduce the severity and frequency of flooding and high water by preserving and increasing the existing water storage capacity below 100-year flood elevations on all water bodies within the City.

Policy 1:

Manage activities within the floodplain in accordance with the City's ordinance and state and federal regulations.

Policy 2:

The City shall discourage encroachment into the floodplain/fringe that will reduce storage capacity unless the storage volume is mitigated.

Policy 3:

The City shall prohibit encroachment into the floodway.

4.10 Low Impact Development

Goal: Promote low impact development strategies where feasible for the purpose of improving water quality, increasing groundwater recharge, and decreasing runoff volumes throughout the City.

Policy 1:

Encourage abstraction of the first 1.1 inches of rainfall on new permitted development and redevelopment.

Policy 2:

Promote reforestation and revegetation with native plants to increase infiltration.

Policy 3:

Encourage the use of low impact development techniques that minimize new impervious surface and provides for increased infiltration.

Policy 4:

Enforce buffer requirements outlined in this plan.

4.11 Shorelines and Streambanks

Goal: Preserves the natural appearance of shoreline areas and minimize degradation of surface water quality, which can result from dredging operations.

Policy 1:

Manage activities within the shoreland districts in accordance with the City ordinance and state and federal regulations.

Policy 2:

Promote native vegetation over structural stabilization in City policies, regulations, and programs.

Policy 3:

Work cooperatively with adjacent property owners to prevent erosion and sediment transport and stabilize streambanks as necessary.

5.0 Plan Implementation

To uphold the goals and policies of this Plan, the City will review all proposed developments and improvements. Approvals for BMPs relating to water quality, wetland protection, erosion and sediment control, and water quantity will be required for all developments, land disturbances, and other applications that require permitting by City Ordinance.

The City has established the following regulatory controls and criteria relating to its policies. These controls and criteria apply to the management of: wetlands, water quantity and quality, floodplains, shorelands, recreation, open space and wildlife, groundwater, soil erosion and sedimentation control, education, and municipal operations. While these controls and criteria relate to one of the policy areas, it should be noted that they are interrelated and may serve multiple purposes.

The criteria, as a minimum, establish the degree of performance necessary to achieve improvements in water quantity and quality management. These criteria are not intended to dictate or preempt the design process, but rather provide a guide to proper development. Section 8 outlines the development submittals required for the City to complete the engineering review for proposed developments.

5.1 Wetlands

As discussed in Section 3.0, the City's strategy for managing wetlands will be guided by designating wetlands into management classes.

5.1.1 Wetland Alterations

Wetland alteration will continue to be permitted and enforced through state and federal agencies. These regulatory programs are well established, and agency personnel are trained to make qualitative judgments regarding wetland values. The City will continue to administer the Wetland Conservation Act within the boundaries of the Pioneer-Sarah Creek Watershed Management Organization. The Minnehaha Creek Watershed District will administer the Wetland Conservation Act within their District boundary.

5.1.2 Field Delineation

Any proposed development will require a field delineation by a qualified individual using accepted methodology. The functions and values of identified wetlands shall also be analyzed according to Section 3.1.3. The City's water resources staff will use the information described in Section 3.1.3 to determine the wetland's management class.

5.1.3 Wetland Excavation

Wetland excavation shall be in accordance with the requirements of the Wetland Conservation Act and all other local, state and federal agencies.

5.1.4 Wetland Fill

Any filling shall not cause the total natural flood storage capacity of the wetland to fall below the projected volume that the wetland would hold following a 24-hour duration, 1 percent (100-year) frequency rainfall over the fully developed drainage area.

Fill material shall not be placed below the Ordinary High Water (OHW) level of state public waters and public waters wetlands without obtaining appropriate permits from the Army Corps of Engineers, Minnesota Department of Natural Resources, and the City as required. Fill material may only be placed within the wetland limit if there are not conflicts with floodplain management policies and, if federal, state, and City permits as may be required are obtained.

5.1.5 Stormwater Runoff

Stormwater runoff into wetlands shall conform to the requirements listed in Table 3-2.

5.1.6 Sequencing Procedures

When a proposed wetland alteration(s) involves excavation, filling, or stormwater runoff, the City will determine the applicability of the 1991 Minnesota Wetland Conservation Act, as amended. Project proposers must follow the sequencing procedures described in Minnesota Rules, Chapter 8420 – Wetland Conservation.

5.1.7 Wetland Buffers

Wetland buffers are unmowed areas adjacent to wetlands, lakes, and streams that contain non-invasive vegetation, preferably dense native vegetation. Buffers filter pollutants before they can enter the water body, reduce erosion, protect vegetation diversity and wildlife habitat, and minimize human impacts to the water body. Buffers are required around all wetlands, lakes, and streams for all new development, with the width dependent on the watershed. The Minnehaha Creek Watershed District (MCWD) and Pioneer-Sarah Creek Watershed Management Commission (PSCWMC) each have their own requirements.

MWCD determines the buffer width by the management class of the wetland, which is further described in Section 3.1.3. Table 5-1 outlines the buffer width requirements based on the wetland management class. The base buffer width can be reduced by beneficial slope or soil conditions as stated in their Buffer Width section of their [Wetland Protection Rule](#).

**Table 5-1
Minnehaha Creek Watershed District Buffer Requirements**

Management Class	Base Buffer Width	Minimum Applied Buffer Width
Manage 3	20 feet	16 feet
Manage 2	30 feet	24 feet
Manage 1	40 feet	34 feet
Preserve	75 feet	67 feet

PSCWMC requires all buffers to be an average of 25 feet wide and a minimum of 10 feet wide. [Appendix C Rules and Standards](#) of their Third Generation Watershed Management Plan provides more details on the buffer requirements.

5.1.7.1 Buffer Easements

A conservation easement (preferred), or functional equivalent such as a drainage and utility easement or outlot, is encouraged on the wetland and buffer.

5.1.7.2 Use of Existing Vegetation as the Buffer

The existing vegetation is acceptable for a buffer and must not be disturbed if:

1. It is continuous, dense perennials (can be trees and shrubs with 60% canopy cover), and
2. <30% invasive plant species, and
3. Not disturbed or mowed within the last 5 years, and
4. Topography does not channelize runoff.

5.1.7.3 Creation of New Buffers

If the required buffer is non-existing or will be disturbed during grading activities, a Buffer Establishment Plan must be provided. At a minimum, the Buffer Establishment Plan must consist of:

1. The area of buffer to be created must be clearly depicted on the plans with a hatch or shading, and
2. The proposed native seed mix must be clearly labeled on the plans, and
3. The seeding rate for the proposed seed mix must be specified, and
4. Weed free mulch must be specified

5.1.7.4 Buffer Monuments

Buffers shall be adequately marked with signage at maximum 200 foot spacing. Signs should be erected before occupation of new developments. Signs can be waived where the City deems they would serve no practical purpose.

5.1.7.5 Buffer Requirements for Mitigation Wetlands

Mitigation wetlands must have equal or better functions and values than the wetlands they replace. Buffers are required around mitigation wetlands. The buffer width must be the larger of the buffer required for:

1. the impacted wetland being replaced, or
2. if mitigation is an expansion of an existing wetland with higher classifications then meet that wetland's buffer requirement.

5.1.7.6 Buffer Maintenance

The functionality and aesthetic qualities of the buffer depend on maintenance. The following summarizes the buffer maintenance requirements:

- During the first two full growing seasons the applicant must replant any vegetation that does not survive.
- After the first two full growing seasons the buffer must be reseeded if the buffer changes at any time through human intervention and activities.
- The City may require an escrow for buffer establishment and maintenance.
- A legally binding and enforceable maintenance plan clarifying responsible parties is required for all buffer areas.

5.2 Water Quantity and Quality Management

The following prescribe the design criteria for water quality and quantity assessment.

5.2.1 General Hydrology

Hydrologic analysis of stormwater runoff for the planning and design of flows in storm sewers, ditches, streams and channels to lakes, detention basins, and wetlands shall be made using generally accepted hydrograph methods.

Determination of total runoff volume should follow the USDA-SCS curve number method which incorporates land use and hydrologic soil groups. Specific step-by-step process can be found in the Soil Conservation Service (SCS) publication National Engineering Handbook: Chapter 4, SCS Hydrology (1972), and Hydrology Guide for Minnesota (1992). Peak runoff rates should be determined through the use of the SCS method incorporating "time of concentration" for both pre and post development conditions.

The developed runoff hydrograph should then be routed through the drainage area, that is, mathematically the peaks and volumes are followed as they move in a wave progressively downstream.

“Design Storms” or storm volumes for hydrologic analyses shall be based upon Atlas 14, Volume 8 or most recent updated, as published by NOAA with Durations of 30 minutes to 24 hours and Return Periods from 1 to 100 years.

The rational method may be used to determine peak runoff rates for primary systems. Construction of a hydrograph should be undertaken which characterizes the movement of surface water as a function of time and precipitation.

5.2.2 Rainfall

Usually the standard 24-hour SCS rainfall distribution will be used to calculate the peak discharge rates and levels from developments. The following minimum rainfall and snowmelt values shall be used in calculations for the City of Independence:

<u>Event</u>	<u>Rainfall (inches)</u>
1 year, 24 hour	2.48
2 year, 24 hour	2.86
10 year, 24 hour	4.24
25 year, 24 hour	5.29
50 year, 24 hour	6.20
100 year, 24 hour	7.20
100 year, 2 day	7.61
100 year, 4 day	8.39
100 year, 10 day snowmelt	7.2 inches of runoff

5.2.3 Curve Numbers

Table 8-1 in Section 8 lists the minimum allowable Curve Numbers (CN) which shall be used for design. Hydrologic soil groups shall be determined based upon the Soil Survey for Hennepin County, Minnesota as published by the United States Department of Agriculture Soil Conservation Service in Cooperation with Minnesota Agricultural Experiment Station.

5.2.4 Flood Protection

Consistent with state and federal regulations, Independence requires that the level of flood protection along all ditches, detention basins, lakes, streams and wetlands be established based upon the 1 percent (100-year frequency) flood. Land use within floodplains shall be regulated in accordance with City ordinance and state floodplain zoning regulations.

The following freeboard values are required for the City of Independence:

- Landlocked Basins (no outlet) 2.0 feet (Established high water, see 5.2.5.9)

- Non-Landlocked Basins 2.0 feet (100-year frequency)

5.2.5 Stormwater Basin Design

It is the policy of the City of Independence to require development to control urban stormwater quantity and quality through a management approach of detention and filtration/infiltration basins. Detention and filtration/infiltration basins, whether on-site or regional in nature, shall be designed to incorporate all requirements of the National Pollution Discharge Elimination System Application for General Stormwater Permits for Construction Activity (MN R100001) and the following:

5.2.5.1 Infiltration Required

A stormwater runoff volume equal to 1.1 inches from the new impervious surface must be infiltrated or abstracted, unless infeasible due to site conditions. Infiltration techniques will not be allowed in stormwater hotspots. Potential stormwater hotspots are defined as a land use or activity that produces higher concentrations of trace metals, hydrocarbons, or pollutants not normally found in stormwater. Examples include fueling stations, vehicle service or washing areas, vehicle fleet storage areas, and facilities that generate or store hazardous materials. Infiltration basins shall be constructed and designed in accordance with the Minnesota Stormwater Manual, with the following additional requirements:

1. Construction of an approved pre-treatment system shall be required prior to discharging to the infiltration basin. Pre-treatment is defined as any Best Management Practice that (a) removes settleable or particulate matter and (b) removes oil and grease to a level that they do not interfere with infiltration performance.
2. Exit velocities from the pre-treatment system shall be less than 3 feet per second for the 100-year storm event and flows shall be evenly distributed across the width of the outlet.
3. Infiltration rates must be determined by double-ring infiltrometer test(s) conducted to the requirements of ASTM standard D3385 at or near the proposed bottom elevation of the infiltration BMP. The test results shall be provided to the City in a geotechnical report and shall be certified by qualified geotechnical professional.
4. The bottom of the infiltration practice must be at least three feet from the seasonal high ground water table.
5. Infiltration practices shall not have standing water longer than 48 hours following each storm event.

5.2.5.2 Infiltration Prohibited or Infeasible

Where infiltration basins are infeasible due to site conditions, biofiltration must be provided for that part of the abstraction volume that is not abstracted by other BMPs. Where biofiltration is

infeasible, at a minimum filtration through a medium that incorporated organic material, iron filings, or other material to reduce soluble phosphorous must be provided.

5.2.5.3 Phosphorus Loading Reduction

Facilities shall be designed to reduce phosphorus loading at down gradient site boundaries such that there is no net increase in Total Phosphorous (TP) or Total Suspended Solids (TSS) as a result of development.

These standards can be achieved through the use of ponding, Low Impact Development techniques, reduction in impervious surfaces, or other Best Management Practices deemed reasonable by the City. The City will consider a variance or flexibility to this standard if impacts to other natural resources are demonstrated. Independence will consider the implementation of this standard on regional/drainage area basis if this standard is deemed impractical on a site-by-site basis.

As required by the Minnehaha Creek Watershed District Independence is required to reduce phosphorus loads in its discharge to Painter Creek. Independence's phosphorus reduction strategy consists of the following components:

- Pasture Management
- Implementation of Post Construction Stormwater Management
- Street Sweeping
- Painter Creek Stormwater Improvement Projects

5.2.5.4 Street Sweeping

The City of Independence has a total of 8.25 miles of street within the Painter Creek Subwatershed. The City will sweep these streets once per year after snowmelt. This will remove organic debris and sediment prior to reaching water bodies and further reduce phosphorus loadings.

5.2.5.5 Painter Creek Stormwater Improvement Projects

The MCWD has identified 7 potential stormwater improvement projects within the Painter Creek Watershed. The City will work cooperatively with the MCWD to identify project partners and other funding sources during the feasibility study stage of these projects. The City may contribute financially toward these projects to meet their phosphorus load reduction obligations for Painter Creek.

5.2.5.6 Emergency Spillway

An emergency spillway (emergency outlet) adequate to control the critical one percent frequency/duration rainfall event (usually 100-year, 24-hour) shall be provided.

5.2.5.7 Basin Side Slopes

Basin side slopes above the normal water level should be no steeper than 4:1 and preferably flatter. Provide a basin shelf with a minimum width of 10 feet and a slope of 10:1 starting at the normal water level. Side slopes below the basin shelf shall be no steeper than 3:1 and preferably flatter.

5.2.5.8 Length to Width Ratio

To prevent short-circuiting, the distance between major inlets and the normal outlet shall be maximized.

5.2.5.9 Flood Storage

To protect downstream channels and structures the following flood control criteria are required for basin design:

1. A flood pool (“live storage”) volume above the normal elevation shall be adequate so that the peak discharge rates from the 2-year, 10-year, and 100-year frequency, critical duration storms (usually the 24-hour) are no greater than predevelopment basin watershed conditions.
2. Dead storage volume may not be utilized as live storage.

5.2.5.10 Skimming Structures

Skimming structures shall be utilized to remove floating debris for a 2-year storm event for each basin. Skimming structures shall be shown on the plans.

5.2.5.11 For Areas without Formal Outlets (i.e. Landlocked Areas)

Landlocked depressions that presently do not have a defined outlet and do not typically overflow may only be allowed a positive outlet provided downstream impacts are addressed and the plan is approved by the City. Where a positive outlet is not constructed the following shall apply:

The minimum building elevation (low floor) shall be set two (2) feet above the level resulting from two concurrent 100-year rainfall events. The starting elevation of the pond/water body prior to the runoff event shall be established by one of the following:

1. Existing Ordinary High Water level established by the Minnesota Department of Natural Resources;
2. Local observation well records, as approved by the City; or
3. Mottled soil.

All areas below the established high water level shall be contained within a drainage and utility easement.

Landlocked areas shall also be analyzed for the 100 year 10 day snowmelt event. The analysis shall consider a minimum of 7.2 inches of runoff. The minimum building opening shall be set a minimum of 1 foot above the 100 year 10 day snowmelt elevation.

Outletting landlocked areas below the 100-year flood elevations is only permitted in cases of demonstrated threat to public structures or safety.

5.2.5.12 Stormwater Discharge

Discharge must be made to a receiving stream, a ditch, another pond or an approved discharge route as shown in this Water Management Plan. All outlet structures shall have outlet erosion control devices.

5.2.5.13 Storm Sewer

- A. Storm sewer sizing shall be based upon the 10 year storm event. Inlet capacities and roadway spread at each inlet shall be determined. Storm sewer inlets shall be spaced to insure that not more than half the travel lane is inundated during the 10 year storm event. Manning's equation shall be utilized to determine the flow in the street at each catchbasin for verification of actual spread. Additionally, grate inlet capacities shall be verified at the maximum allowable depth of flow (low point) to verify that the proposed grates will pass the 10 year flows. When appropriate, by-pass flows shall be considered in calculations.
- B. Storm sewer systems shall also meet the following requirements:
 - 1. Maintain a minimum velocity of 3 fps for 10-year storm event.
 - 2. Maintain a minimum cover of 2 feet from top of pipe to top of casting or flow line elevation.
 - 3. Maintain a minimum of 3 feet of final cover over corrugated high density polyethylene (HDPE) pipe.
 - 4. Maintain a minimum of 1.5 feet of final cover over RCP in areas not used for vehicle traffic.
 - 5. Storm sewer inverts, which outlet to detention basins, shall be placed at the normal level of the basin. Storm sewers may be submerged a maximum of half the pipe diameter below the basin normal level if approved by the City Engineer.

5.2.5.14 Stormwater Facility Easements

The City will require that all stormwater facilities be within a drainage and utility easement or outlot.

5.2.6 Lake Sarah and Lake Independence Phosphorus Total Maximum Daily Load (TMDL)

Lake Independence is an 851-acre lake located in the Pioneer-Sarah Creek Watershed on the east side of the City of Independence. Lake Independence and its surrounding drainage area contains portions of three municipalities; Independence, Medina, and Loretto. As with many lakes in the Twin Cities metropolitan area, Lake Independence is used heavily for recreation and is prized for its aesthetic value by homeowners. Over the past several decades, the lake has experienced degraded water quality that has reduced the lake's recreational and aesthetic value. In 2002, the lake was added to the Minnesota 303(d) impaired waters list for impaired aquatic recreation as a result of mean summer phosphorus values that exceeded the 40 ppb phosphorus standard for Class 2 recreation waters. A total maximum daily load (TMDL) study for Lake Independence was approved on February 23, 2007. The requirements of the study are incorporated into the Water Management Plan by reference.

The current estimated phosphorus load to Lake Independence based upon field monitoring and computer model results is 2,381 pounds per year assuming normal annual precipitation. To reach the goal of 36 ppb for in-lake phosphorus concentration, the model predicts that the annual phosphorus load to the lake would need to be reduced to 1,300 lbs/year. This translates to a total reduction of 1,081 lbs/year, or a 45% reduction from the current total annual phosphorus load estimate of 2,381 lbs/year.

5.2.6.1 TMDL Implementation Plan

In 2014, the Anoka Conservation District prepared a Stormwater Retrofit Analysis for Lake Sarah and Lake Independence. A primary goal of the analysis was to identify projects in the City of Independence to improve water quality in Lake Sarah and Lake Independence such that waste load reduction goals as identified in the TMDL implementation plans can be achieved. The analysis identified several projects with merit. The City should continue to seek landowner support for the identified projects as well as funding. The project name listed in Table 5-2 corresponds to the location as depicted in Figure 5-1.

Table 5-2
Lake Sarah and Lake Independence Stormwater Retrofit Potential Projects for Independence

Project Type	Project Name	TP Decrease (lbs/yr)	Cost-Benefit (\$/lb TP)
Filter Strip	FS89	1.25	\$433
	FS93	34.27	\$48
	FS94	10.95	\$121
Gully Stabilization	GS45	2.1	\$1,019
	GS46	15.6	\$279
Hydrologic Restoration	HR13	2.49	\$727
	HR14	0.86	\$2,047

	HR29	5.98	\$771
	HR31	3.77	\$978
	HR33	9.19	\$825
	HR38	2.56	\$2,680
	HR44	0.6	\$4,761
	HR65	6.25	\$1,226
	HR67 & HR 68	15.32	\$232
	HR79	5.87	\$1,194
	HR95	9.64	\$317
Iron Enhanced Sand Filter	IESF113	105.34	\$275
	IESF114	72.66	\$480
	IESF115	145.34	\$318
Lakeshore Restoration	LR51	4.37	\$638
	LR52	0.42	\$1,137
	LR53	4.8	\$428
	LR58	2.15	\$717
	LR59	12.52	\$445
	LR60	4.26	\$611
	LR62	2.07	\$740
	LR99	1.05	\$1,398
	LR100	2.58	\$566
New Pond	NP47	4.49	\$1,152
Rain Garden	RG11	1.11	\$1,196
	RG69	0.54	\$1,533
	RG72	0.71	\$1,166
	RG74	0.62	\$1,335
	RG111	0.13	\$1,175
Regional Pond	RP108	89.09	\$1,325
	RP109	72.02	\$1,639
	RP110	108.62	\$1,014
Sediment Basin	SB2	1.5	\$1,065
	SB3	2.21	\$715
	SB63	1.15	\$1,310
Seasonal Ponding	SP77	2.85	\$365
Wetland Restoration	WR1	8.39	\$549
	WR4	22.09	\$325
	WR5	4.71	\$915
	WR6	5.11	\$726
	WR12	25.64	\$381
	WR18	39.54	\$707
	WR22	2.24	\$1,857
	WR24	3.41	\$876
	WR75	9.34	\$392
	WR76	4.63	\$796
	WR82	15.65	\$667
	WR83	5.57	\$1,335
	WR86	4.07	\$740
	WR91	18.29	\$791

	WR97	2.53	\$1,338
	WR105	32.13	\$845

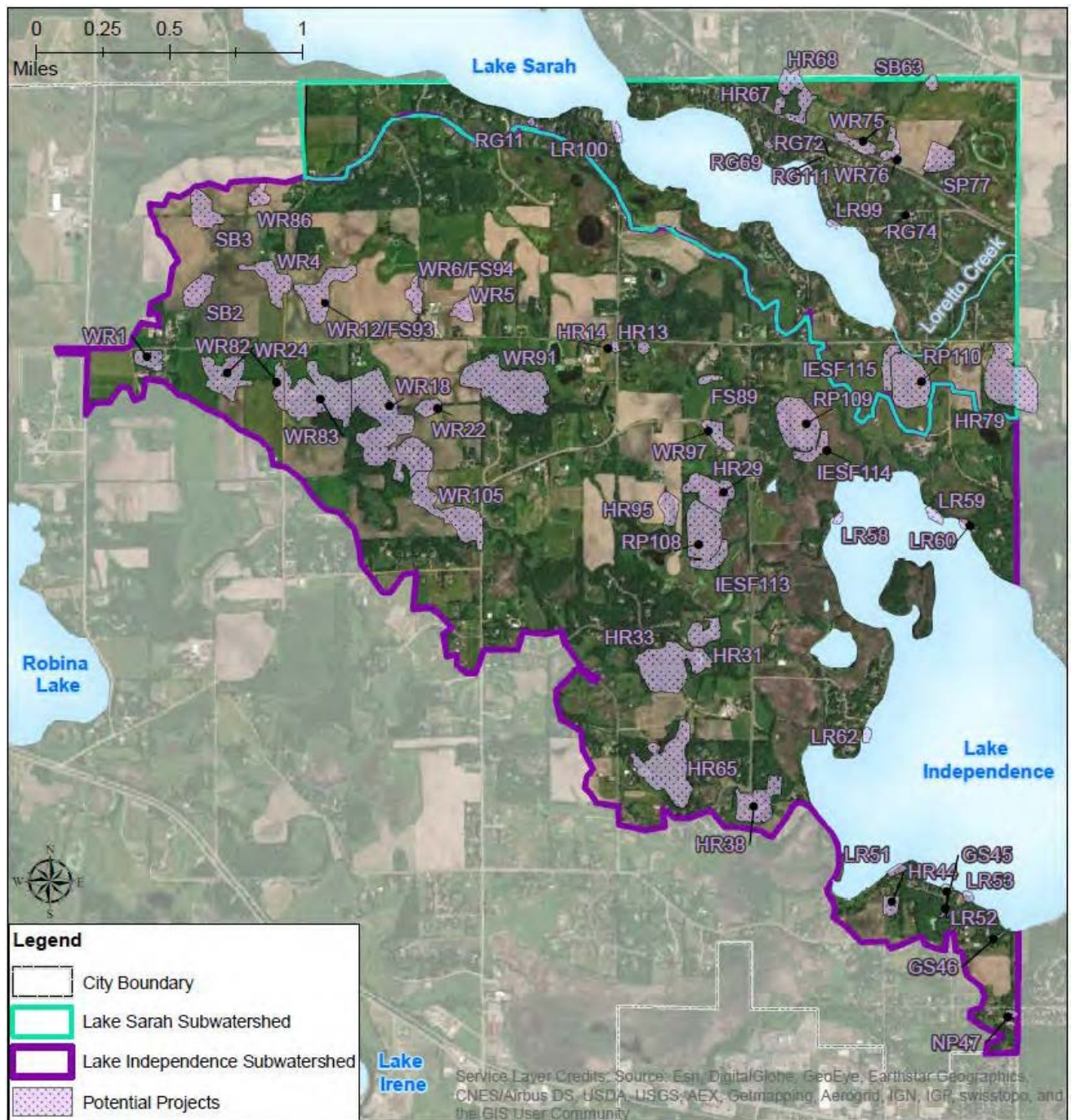


Figure 5-1. Potential Stormwater Projects

5.2.6.2 Adaptive Management

The City recognizes that there is much uncertainty in the physical and social processes that result in achieving the desired water quality. As such, the City embraces an adaptive management strategy in which the City continues to learn from past and present practices and implements an iterative decision making process. In this practice, the City will evaluate results from past actions to inform on future actions based on the results observed. Adaptive management techniques apply not only to the scientific methods applied, but also to the social techniques.

For example, the physical practice known as bio-retention basins or rain gardens are a relatively new practice. The City will monitor the rain gardens that have been installed during this plan period to inform future decisions on whether or not the rain garden produced the desired water quality benefits.

On the social side, the City will continue to adapt to its experiences and outcomes. For example, the City has learned that implementation of agricultural BMPs may be challenging. The City therefore will continue to explore new ways to educate its residents and agricultural producers about the water quality benefits of certain actions. Through adaptive management strategies, the City will over time seek landowner understanding and support for water quality improvement and promote good stewardship of the land.

5.2.7 Restoration Strategies for Pioneer Creek

The [Pioneer-Sarah Creek Subwatershed Watershed Restoration and Protection Strategy Report \(WRAPS\)](#) provides some strategies to restore water bodies that have deficiencies. Below is a table of suggested goals for the City of Independence pulled from the WRAPS to help decrease *E. coli* concentrations, increase dissolved oxygen, restore eroded channels, and reestablish healthy wetlands. The table establishes which suggestions are the primary or secondary role for the City.

Table 5-3

Strategies	Strategy Type	Current Strategy Adoption Level	Interim 10-year Milestone	Suggested Goal
<i>E. coli</i> Improve riparian vegetation	Achieve minimum of 50' buffer as necessary to comply with law, enforce buffers on 100% of affected streams and ditches	Unknown	Complete 5,000' not currently in wetland or regional park	5,000'
DO* Improve quality of upstream lakes	Achieve phosphorus load reduction goals for Lake Independence to reduce algae and oxygen demand loads to Pioneer Creek	Ongoing	See Lake Independence strategies	Complete
In-channel restorations	Channel restorations, where possible, through development of low-flow channel to decrease width and increase velocity, meandering,	Unknown	Complete 2,500' not currently in wetland	2,500'

	riffles, and aeration throughout Unnamed and Deer Creek**			
Wetland restorations	Improve hydrology and water quality flow-through wetland system to decrease sediment oxygen demand and improve overall water quality	Unknown	Perform monitoring, 1-2 BMPs	3-5 wetland outlet BMPs

Table pulled from the Pioneer-Sarah WRAPS.

* DO allocations were not developed as part of this TMDL since sources were primarily natural background

**Deer Creek flows from Ox Yoke Lake, and Unnamed Creek flows from Rice Lake

Blue – primary role of City, Gray – secondary role of City, pulled from Table 3.5

Table 5-4

Strategies	Strategy Type	Current Strategy Adoption Level	Interim 10-year Milestone	Suggested Goal
Improve fertilizer and manure application management, eliminate livestock traffic through waterways	Promote/educate hobby and production livestock owners on appropriate livestock and manure management practices (rotational grazing, manure storage, land application based on soil conditions and soil and manure nutrient testing, precautions to take if spreading in sensitive areas, etc.) and eliminating livestock traffic through water ways, as per University of Minnesota guidelines, MDA guidelines, and Minnesota rules. In particular, see MDA's MN Ag Water Quality Certification Program	As needed	Hold workshops as needed, work with willing landowners as opportunities arise	As needed
	Implement non-production animal operation siting and management ordinance as per 2015 approved watershed plan	PSCWMC has developed guidance for cities	Cities adopt ordinance	Ongoing
Address failing septic systems	Identify and upgrade 100% of SSTS systems in shoreland areas	None	Upgrade 50% of failing SSTS	100%
Improve riparian vegetation	Evaluate compliance with state stream buffer requirements of all DNR streams and public ditches	In progress	Complete	Complete
	Achieve minimum of 50' buffer as necessary to comply with law, enforce buffers on 100% of affected streams and ditches	Unknown	Complete – Buffers in place on public waters by July 2017, on public ditches by Dec. 2018	100%
Improve urban/suburban	Implement updated Commission standards for runoff volume and rate	New standards in	Ongoing	Ongoing

stormwater management	control for new development projects throughout watershed	2005 as part of PSCWMC's 3 rd gen plan		
Implement/review policies and rules	Ongoing review of policies and procedures to meet WLA goals	Ongoing	Ongoing	Ongoing
Road Salt Management	Promote and adopt strategies in the TCMA Chloride Management Plan (website)	Ongoing	Ongoing	Ongoing

Blue – primary role of City, Gray – secondary role of City, pulled from Table 3.2

5.2.8 Protection Strategies for Lake Rebecca

Since Lake Rebecca is being removed from the impaired waters list, strategies should be in place to protect the Lake from converting back into an impaired water. The Pioneer-Sarah Creek WRAPS specifies a protection strategy shown in Table 5-6.

**Table 5-6
Pioneer-Sarah Creek Subwatershed Protection Strategy**

Strategies	Strategy Type	Current Strategy Adoption Level	Interim 10-year Milestone	Suggested Goal
Continue to reduce watershed pollutant loadings	Work with Shriners Horse Farm and City of Independence to continue improvements in horse farm operations to minimize off-site export of phosphorus, bacteria, and other pollutants to tributary that discharges to Lake Rebecca	Improvements made in manure management in 2009, livestock grazing densities continue to be above recommended levels	Ongoing	Ongoing

From Table 3.4 in the Pioneer-Sarah Creek Subwatershed WRAPS; Blue – Primary/lead role for City

5.3 Water Quality Monitoring Program

The City will continue to cooperate with the MCWD and WMC with regards to water quality monitoring, modeling, and planning to protect priority resources. The PSCWMC has developed the following water quality goals for streams within Independence

**Table 5-5
Water Quality Goals**

Stream	Total Nitrogen (g/m ³)	Total Suspended Solids (g/m ³)	Total Phosphorus (mg/m ³)
Pioneer Creek	3	25	500

Robina Creek	3	25	500
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Goals are flow-weighted annual average concentrations.

5.4 Floodplains and Shoreland Management

Various levels of government are involved in regulation of surface water, wetlands and floodplain. As previously discussed, the MnDNR has inventoried and classified water bodies and wetlands in the State of Minnesota. The “protected waters and wetlands” program identifies water bodies and wetlands that require DNR permits for activities like draining, filling, dredging, and diverting of water. The MnDNR *Shoreland Management Program* has also established a classification system for lakes greater than 10 acres in size and rivers with a drainage area two square miles or greater. Floodplain and shoreland areas are governed by the City’s floodplain and shoreland ordinance, which regulate activities adjacent to water bodies classified by the Minnesota DNR. A plan review is required for development or redevelopment if any part of the development is within or affects a 100-year floodplain.

5.5 Recreation, Open Space and Wildlife Management

Through development review the City shall encourage protection and/or preservation of wetlands and uplands that provide habitat for fish and wildlife.

5.6 Groundwater Management

The City of Independence contains natural characteristics which result in low to very high sensitivity for groundwater contamination. This Plan contains policies and criteria which will guide land use development to protect existing groundwater quality.

5.6.1 Well Abandonment

The City will continue to, in cooperation with Hennepin County, educate residents regarding the land use control practices and proper well abandonment procedures in accordance with Minnesota Rules, Section 4725.2700.

5.6.2 Individual Sewage Treatment Systems

A principal risk of direct contamination of groundwater comes from sewage from individual sewage treatment systems. Independence will insure protection of local groundwater through implementation of its ordinances regarding private on-site sewer systems. Wetlands, floodplain and shoreland areas also serve as important areas of groundwater recharge. Strategies to protect these areas were described in the previous sections.

5.7 Soil Erosion and Sediment Control

The control of erosion and sedimentation remains important to maintaining water quality in the City. Of paramount importance to the maintenance of water quality in the City is the proper

enforcement of erosion and sediment controls. Enforcement will involve indirect and direct approaches.

5.7.1 Indirect Approach

The indirect approach includes incentives within the ordinance such as the requirement for a performance bond equal to or greater than the estimated cost of the work to be performed and civil penalties.

5.7.2 Direct Approach

The direct approach involves the inspection and enforcement of the sediment control elements in this Plan to insure compliance with the principles and standards. The inspection and enforcement will be undertaken by the City or its representative.

5.7.3 Conservation Principles

For applicable urban land disturbance activities, the developer shall prepare and implement an erosion and sediment control plan. The Plan shall include the necessary erosion and sediment control practices, implementation schedule and other necessary items to conform to the General Stormwater Permit for Construction Activity (MN R100001) and City ordinance.

5.8 Low Impact Development

A majority of the City of Independence's proposed zoning is Rural Residential. The nature of this land use will likely reduce impacts of stormwater, as development occurs, given that much of Independence is currently farmed.

Low impact development techniques that Independence will focus on as outlined in this plan include:

- Wetland Buffers – Section 5.1.7
- Infiltration Basins – Section 5.2.5.1
- Recreation, Open Space and Wildlife Management – Section 5.5
- Land Conservation – Section 5.9

5.9 Manure Management Policy

The City has determined that it is in the best interest of the residents of Independence to protect the valuable water resources of our region. Management of surface water runoff relating to the storage and land application of manure generated by commercial riding stables has been identified as an important measure to protect water quality. The City has found that the

consistent application of standards relating to manure management is important and warrants the establishment of this manure management policy.

In order to ensure that best management practices are being followed, Independence has identified a need for all commercial riding stables to prepare and maintain a manure management plan and adhere to established manure management standards. The required plan will provide detailed information pertaining to the management of manure generated from commercial riding stables.

5.9.1 Manure Management Best Practices

The City has developed the following best management practices that shall be used in the preparation of the manure management plan:

- a. Animal unit density should be based on the buildable, upland acres of a property. Existing and proposed building areas, parking areas as well as wetlands, steep slopes and other natural impediments should be subtracted from the total acreage.
- b. Each animal unit shall have 1/3 of an acre of grazable pasture. If the grazable pasture area restricts the number of animal units, the lesser number should be used to determine the maximum number of animal units permitted.
 - i. The applicant shall manage the pasture areas by rotating their use during the growing months. A minimum of 70 percent vegetative cover shall be maintained on the pasture areas during the growing season. The City shall determine the 70% coverage by using a dimensional transect method.
- c. Manure management shall be addressed using one of the following methods:
 - i. Contain manure on-site and remove manure from the property by taking off-site.
 - ii. Contain manure on-site and compost by using an approved compost system.
 - iii. Contain manure on-site and land apply manure.
- d. Land application of manure shall consider the following best practices:
 - i. Time of year – manure shall not be land applied to frozen ground.
 - ii. Setbacks from wetlands, steep slopes, drainage ditches/creeks/other water resources – a minimum of a twenty-five (25) foot setback (buffer) shall be maintained for all land applications.

- iii. Shoreland Overlay – no land application of manure shall be permitted in the shoreland overlay zoning district.
- iv. Manure Containment - detailed plans for the manure containment area, including the type of surface and or structure to be used for manure storage. Manure containment areas shall be impervious and located in an area which avoids direct run-off into wetlands, drainage swales and other similar water resource areas.
- v. Soil Testing – the City will review the plan and may require that prior to land application of manure, the soil will be tested to determine the existing level of nutrients. The City will review the site and determine the best locations for testing. Test samples should be taken at a rate of three samples for each twenty acres. The soil test samples taken shall be analyzed using the University of Minnesota recommended maximum nutrient levels for in-situ phosphorous concentration (the phosphorous uptake from the vegetation). Based on the findings of the analysis and at the discretion of the City, the applicant may not be permitted to land apply the manure until such time as the phosphorus levels decrease.

5.9.2 Site Plan Requirements

The manure management plan shall address and provide information relating to the following:

- a. Site Plan – Provide a scaled site plan indicating the location of the manure containment area, existing natural resources (wetlands, drainage swales, wooded areas, etc.), two-foot contours, pasture areas, and existing and proposed structures.
- b. Manure Containment - Detailed plans for the manure containment area, including the type of surface and or structure to be used for manure storage.
- c. Buffer Areas – Indicate on the plan the twenty-five-foot buffer setback from wetlands and drainage swales.

5.10 Stormwater System Maintenance Plan

The Stormwater System Maintenance Plan has been developed to assure that the system of stormwater retention/treatment basins and stormwater conveyance systems are adequately inspected and maintained to assure that they meet their design functions. Outlined below are the inspection and maintenance activities the City intends to implement:

- 1. All City stormwater retention, infiltration, and treatment basins and outlets will be inspected, in accordance with BMP 6b-3 of the SWPPP, to determine if the basin's retention and treatment characteristics are adequate.

2. Portions of the City's storm sewer system will be inspected on a rotating basis in accordance with BMP 6b-7 of the SWPPP.
3. Urban streets will be swept once annually in all areas and twice annually in priority areas. Priority areas are those that drain directly to high public use water bodies and/or high quality wetlands without pretreatment of stormwater runoff.
4. All public sump catch basins, sump manholes, skimmer structures and other settling or filter devices will be cleaned and inspected every year.

The City is currently evaluating and will further refine the maintenance plan in accordance with the SWPPP. This item is specifically outlined in BMP Nos. 6a-1 to 6b-7.

5.11 Land Conservation

Key Conservation Areas, including high-value wetlands and uplands. The conservation of these areas will improve the characteristics of the aquatic ecosystem and the water quality within the watershed as well as areas downstream. Strategies to protect the ecological and hydrological values of these areas may include land use regulation; acquisition and management; and property owner education regarding land management strategies to maintain ecological integrity.

5.12 Stormwater Pollution Prevention Program

In addition to design guidelines and strategies previously presented the City will implement its SWPPP. Implementation of the SWPPP will assist in maintaining or improving existing water quality through implementation of public and employee education and participation programs, illicit discharge and detection programs and improved municipal operations.

5.13 Program Financing

5.13.1 Capital Improvements Program and Stormwater Maintenance

Several water quality capital improvement projects have been identified by the City of Independence and PSCWMC. Table 5-6 provides an estimate of expenses and funding sources to implement the strategies outlined in this plan. The table also identifies potential funding sources.

**Table 5-6
Capital Improvement Program**

Year	Project	Project Name	Total Cost	Priority	Cost Per lb.	Potential Funding Source(s)
2019	2017 IN-4	Wetland Restoration 18	\$559,205	Medium	\$707/lb	PSC, Independence, County Grant, NRCS, EQUIP
2020	IN-8	Sediment sampling in Lake Sarah	\$12,000			PSC, Independence, Greenfield
2020	2017 IN-1	JB Gully Stabalization	\$75,000	High	\$300/lb	PSC, Ind, County, MPCA, Lake

						Assn
2020	2017 IN-2	Hydrologic restoration 95 Koch property	\$61,205	High	\$317-\$481/lb	PSC, Independence, County Grant, NRCS, EQUIP
2020	2017 IN-5	Wetland Restoration 91	\$529,205	Low	\$1,447/lb	PSC, Independence, County Grant, NRCS, EQUIP
2020	2017 IN-6	Wetland Restoration 105	\$543,205	Medium	\$845/lb	PSC, Independence, County Grant, NRCS, EQUIP
2020	2017 IN-7	Seasonal Pond 77	\$10,420	High	\$366/lb	PSC, Independence, County Grant
2023	2018 IN-03	Lake Independence Alum Treatment	\$1,390,468			PSC

Note: PSC = Pioneer-Sarah WMC

5.13.2 Funding Sources

The City currently has a Tax District established for Pioneer-Sarah Creek Watershed area. The district was established by Ordinance 2003-04. A copy of the Ordinance is included as Appendix B of this plan. Over 85 percent of Independence is within the Pioneer-Sarah Creek Watershed; therefore, this district will fund a majority of the proposed stormwater improvements and maintenance activities. At this time the City does not plan to establish any other Tax Districts or stormwater utility fees. Routine maintenance items such as culvert repair and street sweeping, which are performed by the City's public works department has been and will remain part of the general fund budget.

The City will actively pursue grant opportunities to fund proposed projects. Some of the grant programs the City will track are as follows:

1. Clean Water Revolving Fund

The Clean Water Revolving Fund (CWRP) is a low interest loan program that is administered by the Public Facilities Authority (PFA). To be eligible, the City must first apply for placement on the Project Priority List (PPL) and then on the Intended Use Plan (IUP). This involves preparation of a preliminary plan siting the needs and benefits of the project(s) in a feasibility report. The project(s) are then rated and ranked based on points assigned through the rating process. Following the ranking process to get the project onto the PPL, a letter from the City is required to move the project(s) forward to the IUP. Generally, only the higher-ranking projects are funded through this process

Over the past two annual funding cycles, federal law has required that a portion of the CWRP financing be reserved for green infrastructure. This program, titled "Green Project Reserve" includes loan forgiveness for qualifying projects. These projects would include those projects that provide for a definable environmental benefit and/or reduced maintenance activities or costs.

2. Clean Water Fund

The 2008 amendment to the state constitution increased the sales tax rate by three-eighths of one percent, and, approximately 33% of that is dedicated to the Clean Water Fund

(CWF). Local Government Units (LGUs) are eligible to apply for competitive grants from the Board of Soil and Water Resources (BWSR) and receive up to 75% of project costs in grant dollars for eligible projects. BWSR has created several programs to disperse the Clean Water Funds appropriated. Cities are only eligible to apply for the BWSR Shoreland Improvement Grants and BWSR Restoration Technical Assistance Grants. The City will need to work cooperatively with the Watershed Organizations when making application for the BWSR grants.

3. Clean Water Partnership / Section 319 Grants

Clean Water Partnership / Section 319 grants are eligible to projects that address nonpoint-source pollution. Eligible implementation projects are those that are identified by a comprehensive assessment and planning process in the watershed or around the water body of concern. The projects must be categorized as either protection or restoration. Protection projects focus on protecting a water body that is currently meeting state water quality standards for a particular pollutant.

5.13.3 Levy Limit Constraints

Current State Statutes do not provide for levy limits therefore levy limit constraints will not be an issue in regards to financing stormwater activities.

5.13.4 Effect on Other City Funds and Households

As previously discussed, the City has an established Taxing District that covers the Pioneer-Sarah Creek Watershed area. The City also already has established budget items that are financed through the general fund for routine maintenance items. It is anticipated that the City will continue to levy \$65,000 - \$80,000 per year to the Pioneer-Sarah Creek Watershed Taxing District. These funds will be used for annual expenses and capital projects. With these funds and others as identified on Table 5-5 the City does not anticipate that this program will have a significant impact on other City Funds in the next 5 years.

The City of Independence has approximately 1,300 households. Over the next 5 years the City will spend approximately \$85,000 per year on the activities outlined in Table 5-5. In the next 5 years it is anticipated that this program will cost each household within the City approximately \$65 per year.

5.14 Ordinance Updates

The City will need to revise and expand their existing ordinances to enforce the goals and policies of this plan. The Ordinance will be needed to enforce rate control, volume control, and water quality provisions through the techniques outlined in this plan.

6.0 Watershed Data Tables

As discussed, the City of Independence has been divided into four watersheds. South Fork Crow River, Sarah Creek, Pioneer Creek and Painter Creek. This section contains data tables that present pertinent information to each subwatershed. The tables are as follows:

Table 6-1: South Fork Crow River and Sarah Creek Watershed Data

Table 6-2: Pioneer Creek Watershed Data

Table 6-3: Painter Creek Watershed Data

Figure 6-1: Subwatershed Map

Table Abbreviations

OC = Open Channel

CMP = Corrugated Metal Pipe

RCP = Reinforced Concrete Pipe

INA = Information Not Available

NA = Not Applicable

**TABLE 6-1
EXISTING WATERSHED DATA
SOUTH FORK CROW RIVER AND SARAH CREEK**

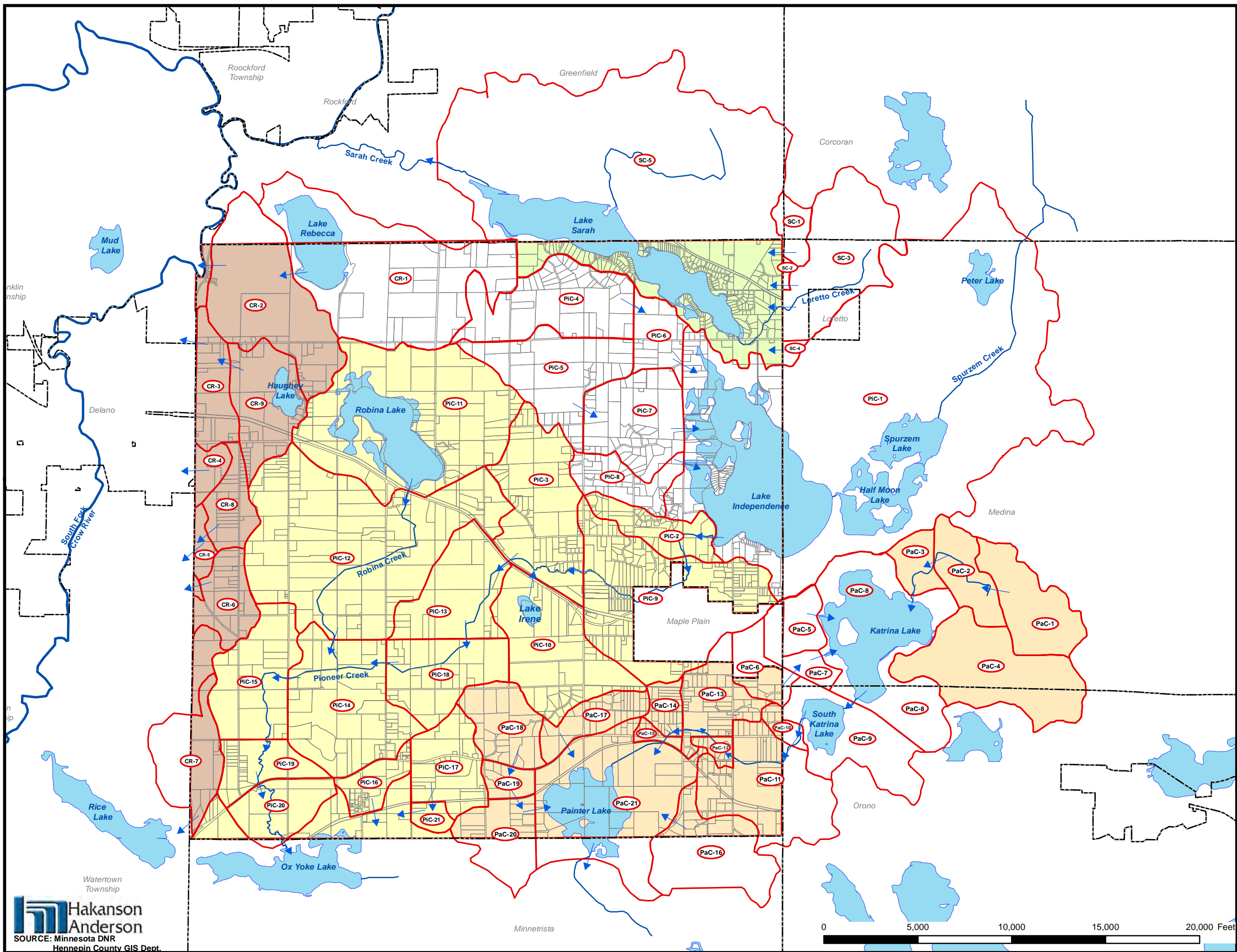
SUBWATERSHED ID NUMBER	SUBWATERSHED AREA (acres)	DOWNSTREAM SUBWATERSHED	OUTLET DATA				WATER ELEV. (feet)	OVERFLOW ELEV. (feet)	MnDNR NUMBER	OHWL (feet)	100-YEAR STORM EVENT SUMMARY				REMARKS
			ELEV. (feet)	SIZE (inches)	TYPE	LENGTH (feet)					NORMAL ELEV. (feet)	FLOOD ELEV. (feet)	STORAGE (ac-ft)	PEAK DISCHARGE (cfs)	
SOUTH FORK CROW RIVER															
CR-1	1,538.6	CR-2	920.6	36	CMP	13	920.4	920.4	192P, 381P, 382W	NA	920.6	921.9	354	8	
CR-2	993.5	CROW RIVER	908.0	36	CMP	INA	INA	INA	379P, 380P, 412P, 411W, 1097W	NA	908.0	911.2	227	29	OUTLET DATA IS ASSUMED. FIELD VERIFICATION IS NECESSARY
CR-3	294.6	NA	932.6	36	RCP	65	933.1	939.2	1090W	NA	932.6	936.3	19	50	
CR-4	115.3	NA	952.5	15	CMP	78	NA	956.6	NA	NA	952.5	956.4	18	6	
CR-5	85.4	NA	931.0	24	CMP	32	NA	934.4	NA	NA	931.0	934.2	17	18	
CR-6	274.0	NA	940.5	50 X 70	CUSTOM CMP ARCH	28	941.4	948.2	414W	NA	940.5	942.9	44	31	
CR-7	612.0	NA	920.1	36	RCP	140	922.8	932.7	NA	NA	920.1	923.8	396	38	
CR-8	179.3	CR-5	941.0	NA	OC	NA	INA	NA	413W	NA	940.0	942.5	18	25	OUTLET DATA IS ASSUMED. FIELD VERIFICATION IS NECESSARY.
CR-9	441.1	CR-3	951.0	NA	OC	NA	INA	NA	187W	953.2	950.0	951.6	94	6	OUTLET DATA IS ASSUMED. FIELD VERIFICATION IS NECESSARY.
SARAH CREEK															
SC-1	123	SC-5	INA	30	RCP	100	INA	INA	NA	NA	INA	INA	22	35	INFORMATION IS FROM THE CITY OF MEDINA LOCAL SURFACE WATER MANAGEMENT PLAN.
SC-2	13	SC-5	INA	18	RCP	100	INA	INA	NA	NA	INA	INA	2	12	INFORMATION IS FROM THE CITY OF MEDINA LOCAL SURFACE WATER MANAGEMENT PLAN.
SC-3	667	SC-5	INA	30	RCP	100	INA	INA	NA	NA	INA	INA	12	39	INFORMATION IS FROM THE CITY OF MEDINA LOCAL SURFACE WATER MANAGEMENT PLAN.
SC-4	30	SC-5	INA	15	RCP	100	INA	INA	NA	NA	INA	INA	2	9	INFORMATION IS FROM THE CITY OF MEDINA LOCAL SURFACE WATER MANAGEMENT PLAN.
SC-5	4,404	NA	973.8	48	RCP	95	974.7	985.4	191P, 362W, 367W, 368W, 369W, 373W	979.9	973.8	977.9	980	88	OUTLET MODELED IS UNDER COUNTY ROAD 92

**TABLE 6-2
EXISTING WATERSHED DATA
PIONEER CREEK**

SUBWATERSHED ID NUMBER	SUBWATERSHED AREA (acres)	DOWNSTREAM SUBWATERSHED	OUTLET DATA				WATER ELEV. (feet)	OVERFLOW ELEV. (feet)	MnDNR NUMBER	OHWL (feet)	100-YEAR STORM EVENT SUMMARY				REMARKS
			ELEV. (feet)	SIZE (inches)	TYPE	LENGTH (feet)					NORMAL ELEV. (feet)	FLOOD ELEV. (feet)	STORAGE (ac-ft)	PEAK DISCHARGE (cfs)	
PIONEER CREEK															
PIC-1	5,960.9	PIC-2	953.8	6' X 25'	CONCRETE BOX	36	956.4	962.1	176P, 401W, 402W	956.8	956.3	960.0	3,258	136	REPORTED FLOOD ELEVATION IS BASED ON THE FLOOD INSURANCE RATE MAP. CONTROL WEIR ELEV = 956.3
PIC-2	273.3	PIC-9	953.9	17 X 122	CONCRETE ARCH	68	955.5	964.6	394W	NA	953.9	958.0	167	135	REPORTED FLOOD ELEVATION IS BASED ON THE FLOOD INSURANCE RATE MAP.
PIC-3	802.8	PIC-13	943.9	7.2' x 6'	CONC. BOX	85	945.1	971.6	NA	NA	943.94	949.0	274	212	REPORTED FLOOD ELEVATION IS BASED ON THE FLOOD INSURANCE RATE MAP. CULVERT MODELED IS UNDER THE RAILROAD TRACKS.
			943.9	5' x 10'	CONC. BOX	70	945.1	960.3							
PIC-4	667.5	PIC-6	970.2	36	CMP	61	970.2	975.6	378W	NA	970.2	974.1	79	38	
PIC-5	671.8	PIC-7	973.3	48	RCP	82	973.9	983.7	397W	NA	973.3	977.7	73	87	
PIC-6	213.5	PIC-1	963.9	48	CMP	120	963.7	982.4	374W, 375W, 376W, 377W	NA	963.9	967.3	40	48	
PIC-7	563.6	PIC-1	954.5	36	CMP	71	956.9	961.1	398W	NA	954.5	961.4	176	92	
PIC-8	253.4	PIC-1	958.9	24	CMP	62	NA	963.7	399W, 400W	NA	958.9	964.3	26	38	
PIC-9	1,308.0	PIC-3	951.8	7' X 10'	CONCRETE BOX	49	955.9	965.5	393W, 395W	NA	951.8	957.9	417	175	REPORTED FLOOD ELEVATION IS BASED ON THE FLOOD INSURANCE RATE MAP.
PIC-10	706.0	PIC-3	948.1	36	CMP	71	948.6	958.4	189P, 391W, 392W	NA	948.1	950.7	134	25	CULVERT MODELED IS UNDER HIGHWAY 12.
PIC-11	1,641.1	PIC-12	954.1	4.5' X 4.5'	CONC. BOX	63	955.0	966.7	188P, 383W	NA	954.1	956.0	564	17	REPORTED FLOOD ELEVATION IS BASED ON THE FLOOD INSURANCE RATE MAP. CULVERT MODELED IS UNDER HIGHWAY 12.
			953.9	48	CMP	78	954.5	966.0							
PIC-12	1,988.4	PIC-14	936.6	60	CMP	50	937.8	942.3	385W, 386W, 387W	NA	936.6	944.0	177	226	REPORTED FLOOD ELEVATION IS BASED ON THE FLOOD INSURANCE RATE MAP.
PIC-13	553.7	PIC-18	938.9	77 X 122	CONCRETE ARCH	53	940.0	951.0	388W, 389W	NA	938.9	944.0	58	241	REPORTED FLOOD ELEVATION IS BASED ON THE FLOOD INSURANCE RATE MAP.
PIC-14	872.5	PIC-15	931.2	77 X 122	CONCRETE ARCH	63	932.8	940.3	925W	NA	931.2	939.0	594	480	REPORTED FLOOD ELEVATION IS BASED ON THE FLOOD INSURANCE RATE MAP.
PIC-15	502.4	PIC-19	929.8	77 X 122	CONC. ARCH	40	931.0	939.5	NA	NA	929.75	935.8	172	528	REPORTED FLOOD ELEVATION IS BASED ON THE FLOOD INSURANCE RATE MAP.
			930.0	77 X 122	CONC. ARCH	40									
PIC-16	152.3	NA	931.6	24	CMP	60	932.7	944.9	NA	NA	931.6	943.2	8	39	
PIC-17	385.7	PIC-21	945.0	36	CMP	INA	INA	INA	NA	NA	945.0	954.2	32	82	OUTLET DATA IS ASSUMED. FIELD VERIFICATION IS NECESSARY.
PIC-18	518.1	PIC-14	934.9	6.8' X 7.7'	CONC. BOX	32	936.7	945.4	NA	NA	934.9	9400.3	92	354	REPORTED FLOOD ELEVATION IS BASED ON THE FLOOD INSURANCE RATE MAP.
			934.9	6.8' X 7.7'	CONC. BOX	32									
PIC-19	227.7	PIC-20	925.5	97 X 154	CONCRETE ARCH	113	927.0	940.4	NA	NA	925.5	932.4	192	563	REPORTED FLOOD ELEVATION IS BASED ON THE FLOOD INSURANCE RATE MAP.
PIC-20	351.6	NA	918.6	25' WIDE	BRIDGE	14	919.7	925.9	NA	NA	918.6	927.0	23	665	REPORTED FLOOD ELEVATION IS BASED ON THE FLOOD INSURANCE RATE MAP.
PIC-21	68.3	NA	930.3	36	CMP	58	929.7	940.0	NA	NA	930.3	938.3	9	87	

**TABLE 6-3
EXISTING WATERSHED DATA
PAINTER CREEK**

SUBWATERSHED ID NUMBER	SUBWATERSHED AREA (acres)	DOWNSTREAM SUBWATERSHED	OUTLET DATA				WATER ELEV. (feet)	OVERFLOW ELEV. (feet)	MnDNR NUMBER	OHWL (feet)	100-YEAR STORM EVENT SUMMARY				REMARKS
			ELEV. (feet)	SIZE (inches)	TYPE	LENGTH (feet)					NORMAL ELEV. (feet)	FLOOD ELEV. (feet)	STORAGE (ac-ft)	PEAK DISCHARGE (cfs)	
PAINTER CREEK															
PaC-1	449.0	PaC-2	NA	NA	OC	NA	INA	NA	NA	NA	988.0	989.2	INA	41	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY. PEAK DISCHARGE AND FLOOD ELEVATION ARE FROM A 10-DAY SNOWMELT.
PaC-2	261.0	PaC-3	971.5	48	ROUND	55	INA	977.3	NA	NA	971.5	975.1	INA	46	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY (NODE PC-2 FN1). FLOOD ELEVATION IS FROM A 10-DAY SNOWMELT.
PaC-3	151.0	PaC-8	NA	NA	OC	NA	INA	NA	NA	NA	970.6	972.9	INA	66	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY (NODE PC-3 FN1).
PaC-4	758.0	PaC-8	NA	NA	OC	NA	INA	NA	NA	NA	960.5	962.9	INA	142	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY. FLOOD ELEVATION IS FROM A 10-DAY SNOWMELT.
PaC-5	157.0	PaC-8	NA	NA	OC	NA	INA	NA	NA	NA	965.0	966.2	INA	45	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY.
PaC-6	197.0	PaC-7	981.7	15	ROUND	60	INA	983.9	396W	NA	977.8	982.3	INA	3.7	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY. PEAK DISCHARGE AND FLOOD ELEVATION ARE FROM A 10-DAY SNOWMELT.
			977.8	10	ROUND	64									
PaC-7	155.0	PaC-8	NA	NA	OC	NA	INA	NA	NA	NA	977.0	980.3	INA	162	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY.
PaC-8	1,068.0	PaC-9	959.2	23 X 36	ARCH	48	INA	964.0	NA	NA	959.2	962.9	INA	27	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY (NODE PC-8 FN4). PEAK DISCHARGE AND FLOOD ELEVATION ARE FROM A 10-DAY SNOWMELT.
PaC-9	583.0	PaC-10	NA	NA	OC	NA	INA	NA	NA	NA	956.5	962.4	INA	28	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY (NODE PC-9 FN5). PEAK DISCHARGE AND FLOOD ELEVATION ARE FROM A 10-DAY SNOWMELT.
PaC-10	64.0	PaC-11	955.1	40 X 65	ARCH	150	INA	968.5	NA	NA	955.1	958.8	INA	86	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY (NODE PC-10 FN1).
			955.1	40 X 65	ARCH	150									
PaC-11	706.0	PaC-12	945.4	48 X 48	BOX	46	INA	953.5	NA	NA	945.4	951.5	INA	257	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY (NODE PC-11).
PaC-12	56.0	PaC-13	944.3	54 X 88	ARCH	128	INA	952.6	NA	NA	944.3	949.1	INA	270	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY (NODE PC-12 FN6).
PaC-13	338.0	PaC-14	941.0	62 X 102	ARCH	78	INA	948.9	922W	NA	941.0	947.9	INA	276	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY.
PaC-14	100.0	PaC-15	940.3	62 X 102	ARCH	120	INA	954.2	NA	NA	940.3	947.4	INA	283	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY (NODE PC-14 FN3).
PaC-15	51.0	PaC-21	940.9	120	ROUND	100	INA	965.0	NA	NA	940.9	947.0	INA	284	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY (NODE PC-15 FN1).
			947.7	72	ROUND	71									
PaC-16	578.0	PaC-21	953.9	27	ROUND	55	INA	961.3	921W	NA	953.9	959.5	INA	30	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY.
PaC-17	284.0	PaC-21	989.6	72 X 72	BOX	39	INA	997.8	NA	NA	989.6	991	INA	91.5	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY (NODE PC-17).
PaC-18	344.0	PaC-19	975.8	24	ROUND	150	INA	995.9	924W	NA	975.8	992.7	INA	56.2	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY.
PaC-19	106.0	PaC-20	960.6	72	ROUND	78	INA	975.7	NA	NA	957.3	962.5	INA	196.7	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY.
			957.3	72	ROUND	84									
PaC-20	357.0	PaC-21	942.7	42	ROUND	58	INA	944.6	NA	NA	938.9	945.5	INA	173.4	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY (NODE PC-20).
			938.9	36	ROUND	58									
PaC-21	1,176.0	PaC-22	935.3	96 X 96	BOX	46	INA	948.2	923W	938.4	935.3	943.1	INA	286.7	INFORMATION IS FROM THE MCWD H/H AND POLLUTANT LOADING STUDY (NODE PC-21 FN1). PEAK DISCHARGE AND FLOOD ELEVATION ARE FROM A 10-DAY SNOWMELT.



Legend

- Painter Creek Watershed
- Pioneer Creek Watershed
- Sarah Creek Watershed
- South Fork Crow River Watershed
- Parcels
- Municipal Boundary
- Subwatershed ID Number
- Subwatershed Discharge Point
- Subwatershed Divide

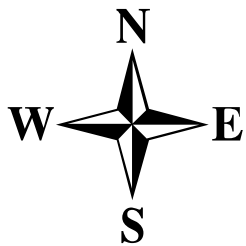


FIGURE 6-1

SUBWATERSHED AREA MAP

7.0 Plan Amendments

This plan will be reviewed at five to ten-year intervals to determine whether updates are required to meet changing legal or physical conditions. Amendments may be either minor or major.

Minor amendments are amendments that do not change the goals, policies, management strategies, and management processes. Minor amendments include, but are not limited to the following:

- Updates to the storm drainage system based on construction or to correct errors or omissions.
- Changes to watershed divides provided they do not affect major watershed divides.
- Minor amendments as defined by Minn. Rules 8410.0020, Subp. 10 which reads as follows:
“... items such as recodification of the plan, revision of a procedure meant to streamline administration of the plan, clarification of the intent of a policy, the inclusion of additional data not requiring interpretation, or any other action that will not adversely affect a local unit of government or diminish a water management organizations’ ability to achieve the plan’s goals or implementation program.”

Minor amendments will be submitted to the affected WD or WMC as required by respective WD or WMC policy.

Major amendments will include:

- Modifications to the watershed divides or storm drainage system that change the projected rates and volume of flow.
- Modifications to the goals and policies.
- Major amendments, when required, will involve the same steps as approval of the original document.

Amendments will also be required within two years of the adoption of a watershed plan by a Watershed District or Watershed Management Organization, consistent with Minn. Rules 8410-0160.

8.0 Development Submittal Requirements

8.1 Purpose and Intent

This section of the plan is intended to provide Developer's Engineers with a standardized format for submittal of drainage plans and calculations and wetland delineation and mitigation reports to the City for review. A standardized format will provide the following:

- Reduce preparation time for submittals by providing direct guidelines for Developer's Engineers to follow.
- Reduce review time required by the City by insuring that a complete and comprehensive drainage plan and calculations are submitted.
- Insure that the City will receive the best possible protection of its resources, which could be adversely affected by inadequate stormwater management planning.

8.2 General Requirements – Grading, Drainage, and Erosion Control Plan

Grading, Drainage, and Erosion Control Plans shall be provided by the Developer in accordance with the City Code. Several items critical to the review of the drainage system must be adequately depicted on the plan by the Developer's Engineer. The following key elements must be depicted on the plan:

8.2.1 Topography

Existing and proposed contours at a minimum of 2-foot intervals. A 1-foot contour interval or proposed spot elevations shall be used where conditions dictate. The determination of contour interval shall be made based upon clarity and readability of the plans.

8.2.2 Stormwater Basins

Basin locations as depicted by the proposed contours. Normal level and 100 year flood water levels shall be depicted on the plan for each basin. Detention basins are required at each outfall point from the proposed plat. Perimeter berm elevation and width shall be clearly labeled on plan sheets.

Permanent detention basins may be utilized as construction detention basins, provided they are cleaned after permanent erosion control measures are established. Design features of the detention ponds shall be as described in this Plan.

8.2.3 Erosion Control Features

Locations of silt fence, bale barriers, wood fiber blanket, rock construction entrances, storm drain inlet protection, outlet projection, riprap, temporary seeding, permanent seeding, sod, mulch, or other erosion control features proposed to be implemented for the project.

8.2.4 Wetland Delineation

Show the field delineated boundaries of all public waters and wetlands.

8.2.5 Storm Sewer Facilities

Storm sewer facilities, when utilized, shall be adequately depicted on the drawings. At a minimum, the following must be shown on the plan:

1. Storm sewer pipe size, length, grade and type of material between each structure.
2. Catchbasin and manhole structural data including size, flow line or rim elevations and invert elevations. A typical section depicting each different type of catchbasin or manhole used shall be shown on the drawing. Type of casting utilized shall be referenced for each catchbasin or manhole.
3. A typical curb section for urban design streets shall be shown on the drawing.
4. If ditch sections are used, a typical section shall be shown on the drawing depicting bottom width and side slopes of the ditch.
5. Details of skimming structures proposed.

8.2.6 Maintenance Access Routes and Easements

Suitable access routes must be provided to all outlet structures, emergency overflows, and constructed stormwater basins and devices. Maintenance Access Routes shall adhere to the following standards:

1. Shall be clearly depicted on the plans
2. Minimum 10' in width
3. Cross slope of 10:1 or less
4. Longitudinal slope of 10% or less
5. Shall be within a drainage and utility easement, minimum 20' wide

8.3 Storm Drainage System Submittal Requirements

The stormwater drainage report shall be comprised of the following sections to provide the City Engineer with adequate base information for which to review the report. The following data must be included in the report:

Title Page. The title page shall list the project name, project location, date prepared, and preparer's name, title, and company.

Table of Contents. The table of contents must provide a description of the major categories of the report and also list each hydrograph and reservoir report presented in the report.

Summary. The summary must provide descriptions of items critical to the review of the entire report. Assumptions and results of the calculations shall be included in the summary:

- A. Pre-Development Site Conditions (Existing)
 - 1. Total site area
 - 2. Delineation of sub-drainage areas, as appropriate.
 - 3. For each drainage area, or sub-drainage area, provide the following information:
 - a. Area in acres.
 - b. Curve number (with justification per City approved CN's)
 - c. Time of Concentration (with justification)
 - d. Runoff rate and runoff volume
- B. Post-Development Site Conditions (Proposed)
 - 1. Total site area
 - 2. Delineation of sub-drainage areas, as appropriate.
 - 3. For each drainage area, or sub-drainage area, provide the following information:
 - a. Area in acres
 - b. Curve number (with justification)
 - c. Time of Concentration (with justification)
 - d. Runoff rate and runoff volume
- C. Comparison of pre-development to post-development runoff rates and volumes.
- D. Total of existing and new impervious area
- E. Calculations to determine the Water Quality Volume (1.1" over the new impervious surface)
- F. Calculations to determine that the Water Quality Volume will be infiltrated in 48 hours or less
- G. Geotechnical and Double Ring Infiltrometer test results certified by a Geotechnical Engineer
- H. If infiltration is infeasible, it must be documented in the report with references to supporting data
- I. Summary of nutrient removal on site.
- J. A discussion of the storm sewer system, if applicable, to include a summary of flows to each catchbasin and the depth of water over each catchbasin during the ten year event.

Drainage maps: Drainage maps depicting pre-development and post-development conditions. The maps may be 22"x34" plans, but shall also be provided on 11"x17" reductions. The plans shall delineate drainage area and sub-drainage area boundaries. All areas shall be labeled and referenced to those presented in the report.

Computer Printouts: Drainage maps of all hydrograph and reservoir files shall be included at the back of the report for reference.

8.4 Wetland Delineation and Replacement

8.4.1 Wetland Delineation

When a regulated use or activity is proposed on a property which is within a wetland or wetland buffer area, a wetland delineation and report is required. The applicant shall provide a wetland report prepared by a qualified Wetland Specialist. The wetland report shall include the following:

1. Vicinity map;
2. A copy of a National Wetland Inventory Map identifying the wetlands on or adjacent to the site;
3. A site map setting forth all of the following:
 - a. Surveyed wetland boundaries based upon delineation;
 - b. Site boundary property lines and roads;
 - c. Internal property lines, rights-of-way, easements, etc.;
 - d. Existing physical features of the site including buildings, fences, and other structures, roads, parking lots, utilities, water bodies, etc.;
 - e. Contours at the smallest readily available intervals, preferably at 2-foot intervals;
 - f. Hydrologic mapping showing patterns of surface water movement and know subsurface water movement into, through, and out of the site area.
 - g. Location of all test holes and vegetation sample sites, numbered to correspond with flagging in the field and field data sheets.
4. A report which discusses the following:
 - a. Location information (legal description, parcel number and address);
 - b. Delineation. The wetland boundaries on the site established by the delineation shall be staked and flagged in the field. If the wetland extends outside the site, the delineation report shall discuss all wetland areas within 150 feet of the site, but need only delineate those wetland boundaries within the site;
 - c. General site conditions including topography, acreage, and surface areas of all wetlands identified;
 - d. Hydrological analysis, including topography, of existing surface and known significant sub-surface flows into and out of the subject wetland(s);
 - e. Analysis of functional values of existing wetlands, including vegetative, faunal, and hydrologic conditions;

8.4.2 Wetland Replacement

When wetland impacts cannot be avoided, the applicant shall prepare a Wetland Replacement Plan. The Wetland Replacement Plan components shall conform to the requirements of Minnesota Rules 8420.0530.

8.4.3 Wetland Functions and Values Assessment

A wetland functions and values assessment shall be provided in accordance with Section 3.1.3.

8.5 Wetland Review

The applicant must submit copies of all required information including the preliminary plat to the appropriate Watershed Organization for review and approval. The two Watershed Organizations within the City include Minnehaha Creek Watershed District and the Pioneer-Sarah Watershed Management Organization.

Table 8-1
City of Independence Minimum Runoff Curve Numbers

Cover Description	Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	A	B	C	D
Fully developed urban areas (vegetation established)				
Open space (lawns, parks, golf courses, cemeteries, etc.)				
Grass Cover > 75%	39	61	74	80
Grass Cover < 75%	49	65	77	82
Impervious areas:				
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)	98	98	98	98
Streets and roads:				
Paved; curbs and storm sewers (excluding right-of-way)	98	98	98	98
Paved; open ditches (including right-of-way)	83	89	92	93
Gravel (including right-of-way)	76	85	89	91
Dirt (including right-of-way)	72	82	87	89
Water Surface:	100	100	100	100
Urban Districts:				
Commercial and business	NA ¹	92	94	95
Industrial	NA ¹	88	91	93
Residential districts by average lot size:				
1/8 acre or less (town houses)	NA ¹	85	90	92
1/4 acre	NA ¹	75	83	87
1/3 acre	NA ¹	72	81	86
1/2 acre	NA ¹	70	80	85
1 acre	59	68	79	84
2 acres and greater	55	65	77	82
Developing Urban Areas				
Newly graded areas (pervious areas only, no vegetation)	77	86	91	94
Undeveloped areas				
Agricultural land (all current uses)	55	65	77	82
Pasture, grassland, or range – continuous forage for grazing	49	65	77	82
Meadow – continuous grass, protected from grazing and generally mowed for hay	30	58	71	78
Brush – brush-weed-grass mixture with brush the major element	35	56	70	77
Woods – grass combination (orchard or tree farm)	43	65	76	82
Woods	36	60	73	79

¹Use of Type A soil is not allowed for this hydrologic condition.

9.0 Hydrologic/Hydraulic Models

9.1 General Overview

The need for stormwater modeling has increased as new construction changes the usage of the surrounding land. For example, replacing a stand of trees with a parking lot has a dramatic effect on runoff, greatly increasing its total volume and the rate of runoff. The potential for erosion and flooding is increased in areas downstream of construction. To prevent such damage, the runoff must be predicted before construction so that suitable steps can be taken to handle the runoff in a safe and effective manner.

HydroCAD, a hydrologic computer modeling program, was used for this management plan. Hydraulic evaluations of pipes, ditches, and other structures were performed using standard engineering procedures and are not discussed. The Flood Insurance Study for Pioneer and Robina Creeks was adopted by this plan and was not restudied.

To determine the critical flood levels for each subwatershed, runoff volumes from pervious and impervious areas were determined for storms with durations varying between one and four days and a snowmelt runoff event with a duration of ten days.

9.2 Hydrologic Model (HydroCAD)

Stormwater modeling and drainage design techniques can be divided into two basic groups:

- 1) Steady-state (constant flow) methods, such as the Rational Method as applied to storm sewer pipe networks.
- 2) Hydrograph generation and routing procedures designed to simulate the time varying nature of actual runoff.

Although HydroCAD can be used for steady-state designs, it is designed primarily as a hydrograph generation and routing program. It is based primarily on hydrology techniques developed by the Soil Conservation Service (SCS) combined with standard hydraulics calculations. For any given storm these techniques are used to generate hydrographs throughout a watershed.

9.2.1 Runoff Volumes

The volume and rate of runoff from a subwatershed are affected by the runoff curve number (CN). The soil group classification and antecedent soil moisture condition have an effect on the CN.

The soil group classification used for this study is Group B. Soil Group B contains shallow, sandy loams. The antecedent soil moisture condition (AMC) is a measure of how much rain falls five days before a 24-hour storm. For this study, AMC II was used. The total 5 day antecedent

rainfall, for AMC II, is 0.5-1.1” during the dormant season and 1.4 – 2.1” during the growing season. From this information a CN, which indicates the percentage of runoff from a subwatershed, can be determined. For this study, the CN’s range from 50-100. With the CN and the rainfall distribution and duration information, the runoff from each subwatershed can be determined using the SCS TR-20 method.

9.2.2 Rainfall Distribution and Duration

Design storm characteristics must be determined for the model. This requires determining both the amount of precipitation and the intensity distribution of the precipitation. NOAA Atlas 14, Volume 8 as published by the National Weather Service are used to determine the amount of precipitation.

9.2.3 Flood Elevations

After the hydrographs are created for each subwatershed, they are routed through storage areas (wetlands, lakes, detention ponds, etc.) and conveyance systems (storm sewers and ditches) and combined with other hydrographs at junctions with other subwatersheds. Specific characteristics of the water body and its outlet are input into the elevation-flood storage-discharge relationship used in the routing through each water body.

The storm duration that is critical for a watershed is dependent on the watershed size and slope, the volume of storage available in the system, and the outlet capacity. The critical duration is determined by routing several different duration storms of a given frequency and determining which duration produces the greatest peak discharge or flood elevation. A small watershed with little available storage will have a critical storm of shorter duration than a large watershed with abundant storage.

The elevations reported in this plan have been derived using limited topographic information and shall not be used for the purpose of establishing flood protection standards of new or existing structures. As development/building applications are submitted, the applicants will be required to further investigate the drainage patterns in accordance with Section 8.0 to more accurately determine flood elevations.

10.0 Glossary

1 Percent Chance Flood: The flood event that has an annual probability of being equaled or exceeded in any given year of 1 percent. This flood is the result of the critical duration 1 percent chance storm falling on the watershed. This is also commonly called the “100-year” flood.

10 Percent Chance Flood: The flood event that has an annual probability of being equaled or exceeded in any given year of 10 percent. This flood is the result of the critical duration 10 percent chance storm falling on the watershed. This is also commonly called the “10-year” flood.

100-Year Storms: Rainstorms of varying duration (e.g. 2-, 6-, 24-hour) and intensities (inches per hour) expected to recur on the average of once every one hundred years (1% frequency probability).

Abstraction: Retention on site through infiltration, evapotranspiration, or capture and reuse.

Acre-Foot: A measurement of water volume that is equal to 1 foot of water covering an area of 1 acre.

Algae: Simple rootless plants that grow in bodies of water in relative proportion to the amount of nutrients available. Algal blooms, or sudden growth spurts, can affect water quality adversely.

Aquifer: Saturated permeable geologic unit(s) that can transmit significant quantities of water under ordinary hydraulic gradients.

Bedrock Aquifer: One or more saturated geologic units composed of sedimentary, metamorphic, or igneous rock that can transmit significant quantities of water under ordinary hydraulic gradients.

Best Management Practices (BMPs): Practices that can be used to control urban nonpoint source pollution.

BMP Fingerprinting: A series of techniques used to manage stormwater to minimize impacts to wetlands, forest, and sensitive stream reaches. Techniques include bypassing flow around a wetland and discharge of stormwater to a pretreatment pond around or adjacent to the wetland.

Bounce: The vertical elevation difference between the peak flood elevation and the wetland elevation.

Buffer: An upland area adjacent to a wetland, lake, or stream that is covered with natural vegetation that experiences little to no human impact such as mowing. The buffer begins at the delineated wetland edge or top of bank of a stream.

County Ditch: An open channel to conduct the flow of water. (Minnesota Statutes, section 103E.005, Subd. 8).

Design Storm: A rainfall event of specific return frequency and duration (e.g., a storm with a 2-year frequency of occurrence and 24-hour duration) that is used to calculate the runoff volume and peak discharge rate.

Detention: The temporary storage of storm runoff used to control the peak discharge rates, and which provides gravity settling of pollutants.

Detention Pond: An impoundment that is normally dry but is used to store water runoff until it is released from the structure. Used to reduce the peak discharge from stormwater runoff.

Detention Time: The amount of time a parcel of water actually is present. Theoretical detention time for a runoff event is the average time parcels of water reside in the basin over the period of release.

Ditch Repair: To restore all or part of a drainage system, as nearly as practicable, to the same condition as when originally constructed and subsequently improved.

- Resloping of ditches, leveling and reseeding of waste banks, if necessary, to prevent further deterioration;
- Realignment of original construction, if necessary, and to restore the effectiveness of the system or prevent the drainage of a wetland;
- Routine operations that may be required to remove obstructions and maintain the efficiency of the drainage system;
- Restoration or enhancement of wetlands; and
- Wetland replacement under Minnesota Statutes, section 103G.222.

Erosion: Wearing away of the lands or structures by running water, glaciers, wind, and waves.

Eutrophication: The natural or artificial process of nutrient enrichment whereby a water body becomes filled with aquatic plants and low in oxygen content.

Evapotranspiration: Water evaporated and transpired from soil and plant surfaces.

Feedlot: An area where livestock are fattened for market.

Flood Fringe: The portion of the floodplain outside of the floodway.

Flood Profile: A graph of a longitudinal plot of water surface elevations of a flood event along a reach of a stream or river.

Floodplain: Lowland area adjoining water bodies which are susceptible to inundation of water during a flood.

Floodway: The channel of a watercourse and those portions of the adjoining floodplain which are reasonably required to carry and discharge the 100-year flood.

Freeboard: A factor of safety above a certain flood level. This typically is defined as the vertical separation (feet) between the design flood level (e.g., 1 percent chance flood elevation) and the lowest floor of a structure or the top of an embankment. Freeboard compensates for the many unknown factors (e.g., waves, ice, debris, etc.) that may increase flood levels beyond the calculated level.

Geology: The science which treats the origin, history, and structure of the earth, as recorded in the rocks; together with the forces and processes now operating to modify rocks.

Glacial Drift: Material which was deposited by glaciers.

Greenway: A linear open space established along either a natural corridor such as a riverfront, stream, valley, or ridgeline, or overland along a railroad right-of-way converted to recreational use, a canal, scenic road or bicycle passage. An open space connector linking parks, nature

reserves, cultural features, or historic sites with each other and with populated areas. Locally certain strip or linear parks designated as parkway or greenbelt.

Groundwater: Water underneath the ground surface that is under positive pressure.

Hydric Soils: Soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part.

Hydrograph: A graph showing variation in the water depth or discharge in a stream or channel, over time, at a specified point of interest.

Hydrology: The applied science concerned with the waters of the earth in all its states – their occurrences, distribution, and circulation through the unending hydrologic cycle of: precipitation; consequent runoff, stream flow, infiltration, and storage; eventual evaporation; and reprecipitation.

Impervious Area: Impermeable surfaces, such as pavement or rooftops, which prevent the infiltration of water into the soil.

Infiltration: The entrance of water into the soil or other porous material through the interstices or pores of a soil or other porous medium.

Inundation Period: Time that flood waters temporarily stored in the wetland exceed the wetland elevation. Difference between the peak flood elevation and the wetland elevation.

Invert Elevation: The vertical elevation of a pipe or orifice in a pond which defines the water level.

Judicial Ditch: A public drainage system established under Chapter 106 of the Minnesota Statutes and under the jurisdiction of the district court or a watershed management organization.

Landlocked Lake or Basin: Area which has an outlet that is significantly higher than the normal water level of the lake, pond, or wetland.

Lateral Ditch: Any open channel or storm sewer drainage construction by branch or extension, or a system of branches and extensions, or a drain that connects or provides an outlet to property with an established drainage system (Minnesota Statutes, section 103E.005, subdivision 15). Lateral includes only those facilities which are connected to the Anoka County Ditch system as identified in the Anoka County Public Ditch Inventory dated January 1992.

Level of Protection: The amount of secondary stormwater runoff capacity required to avoid flood damage and provide for public safety.

Level of Service: The amount of primary stormwater runoff capacity required to avoid unusual hardship or significant interference with normal public activities (transportation, sanitary, or utilities).

Management Strategy: The specific physical, legal or administrative actions recommended or implemented based upon the established criteria and will achieve the policies and goals.

Nationwide Urban Runoff Program (NURP): A study initiated by the EPA in 1978 to develop a consistent database and set of recommendations to be used to make planning decisions about nonpoint pollution issues. This study included 28 projects across the United States that were completed independently under the direction of the EPA. This study has been used extensively in both the characterization of stormwater quality, and as a guide to implementation of management alternatives for stormwater treatment. The most often cited management option

derived from this study is a detention basin referred to as a NURP pond. The NURP study provided recommendations for the size and shape of detention ponds to provide pollutant removal efficiency.

No Net Loss: No reduction in the area and value of a wetland from existing conditions.

Nonpoint Source Pollution: Pollution from any source other than any discernible, confined and discrete conveyances, including but not limited to surface runoff from agricultural, silvicultural, mining, construction, subsurface disposal and urban activities.

Normal Level: For basins, that water elevation maintained by a natural or man-made outlet.

Nutrients: Fertilizer, particularly phosphorous and nitrogen (the two most common components that run off in sediment).

On-Site Detention: A method of temporarily storing stormwater runoff at a development site in the form of wet or dry basins. While the primary objective is water quality control, significant reduction in outflow conveyor overloading is accomplished for high intensity, short duration storm events. This method is employed on developments when the regional detention basin approach is not available, usually due to site location of either facility.

Ordinary High Water (OHW) Level: The boundary of public waters and wetlands, and shall be an elevation delineating the highest water level which has been maintained for a sufficient period of time to leave evidence upon the landscape, commonly that point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial. For watercourses, the ordinary high-water level is the elevation of the top of the bank of the channel. For reservoirs and flowages, the ordinary high-water level is the operating elevation of the normal summer pool.

Peak Discharge: The maximum instantaneous rate of flow during a storm, usually in reference to a specific design storm event.

Percolation: Movement of water through soil layers of material.

Permeability: A characteristic of soil that enables water to move downward through the profile. Measured in inches per hour.

Policies: The plans or course of action to be followed in achieving the goals.

Post-Disturbance Condition: The state of a site following crop or development establishment in which source and/or structural control measures have been implemented resulting in erosion and sedimentation control achieving soil loss limits.

Precipitation: The total measurable supply of water of all forms of falling moisture, including dew, rain, mist, snow, hail, and sleet; usually expressed as depth of liquid water on a horizontal surface in a day, month, or year, and designated as daily, monthly, or annual precipitation.

Primary Capacity: The volume and/or rate of stormwater runoff defined as that level of service provided by the primary system.

Primary System: The primary system conveys runoff from the more frequent events such as the 2 to 10-year events. In general, the system is composed of swales, ditches, gutters, and storm sewers.

Public Waters: Any waters as defined in Minnesota Statutes, section 105.37, subdivisions 14 and 15.

Reach: Longitudinal segments of a stream defined by natural or manmade restrictions. In an urban area the segments of the stream between two consecutive road crossings could typically constitute a reach.

Recharge: Replenishment of the groundwater system by natural or artificial means.

Recurrence Interval: The average interval of time, based on a statistical analysis of actual or representative stream flow records, which can be expected to elapse between floods equal to or greater than a specified stage or discharge. The recurrence interval is generally expressed in years.

Regional Detention Basin: A natural pond or wetland area, often modified by man, in which a minimum and permanent water level is maintained. During periods of stormwater runoff of various durations, the basin receives additional water, stores it temporarily, and releases it at a controlled rate(s). In addition to runoff flow equalization in reducing existing flooding problems, the basin serves pollutants from existing as well as planned development.

Retention: The holding of runoff in a basin without release except by means of evaporation, infiltration, or emergency bypass.

Retention Facility: A permanent natural or manmade structure that provides for the storage of stormwater runoff by means of a permanent pool of water.

Riparian: A relatively narrow strip of land that borders a stream or river, often coincides with the maximum water surface elevation of the 100-year storm.

Runoff: That portion of the precipitation which is not absorbed by the deep strata but finds its way into the surface water system after meeting the demands of evapotranspiration.

Secchi Disc: A circular plate, used to measure the transparency or clarity of water by noting the greatest depth at which it can be visually detected. Its primary use is in the study of lakes.

Secondary Capacity: The volume and/or rate of stormwater runoff in excess of the primary capacity and defined as that level of protection provided by the secondary system.

Secondary System: The system is composed of all the pathways that runoff takes when the capacity of the primary system is exceeded and in general is composed of streets, swales, ditches, storm sewers, detention basins, creeks, streams and rivers.

Sediment: Solid matter carried by water, sewage, or other liquids.

Shoreland: Land located within the following distances from public water: 1,000 feet from the ordinary high water level of a lake, pond, or flowage; and 300 feet from a river or stream, or the landward extent of a floodplain designated by ordinances on a river or stream, whichever is greater.

Soil Association: A group of soils geographically associated in a characteristic repeating pattern defined and delineated as a single map unit.

Source Control: The application of erosion techniques including but not limited to: mulching, seeding, sodding, and greenbelts.

Stormwater Runoff: The flow on the surface of the ground, resulting from precipitation in the form of rainfall or snowmelt.

Structural Control: The application of construction erosion techniques including but not limited to: sediment basins, silt fences, debris dams, dikes, terracing, riprap and diversions.

Swale: A natural depression or wide shallow ditch used to temporarily store, route, or filter runoff.

Time of Concentration: The time required for surface runoff from the most remote part of a drainage basin to reach the basin outlet.

Transpiration: The process by which plants dissipate water into the atmosphere from leaves and other surfaces.

Universal Soil Loss Equation: A method developed by the Agricultural Research Service, USDA, and used by Soil and Water Conservation Districts to estimate the average annual soil erosion based on rainfall, soil erodibility, slope of the land, length of slope, vegetative cover, and erosion control practices.

Water Bodies: Natural and man-made depressions and stormwater conveyance and storage facilities including wetlands, lakes, ponds, streams and rivers.

Watershed: A geographical area which collects precipitation and provides runoff to a particular collector such as a stream, lake, or marsh.

Wetland: Transitional land between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. Wetlands must have a predominance of hydric soils, be inundated or saturated with water at a frequency and duration to support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions, and under normal circumstances, supports a prevalence of hydrophytic vegetation.

Wetland Bank: System of identifying wetlands restored or created for replacement credit, providing for, and facilitating and tracking the exchange of wetland banking credits for projects that require replacement plans or wetland mitigation.

Worst-case Soil Loss Condition: The state of a site which is denuded and rough grade contours could create the greatest potential soil loss (e.g., a site in which all of the vegetative cover is removed, the existing or interim grades are not stabilized and could result in significant soil loss).

Appendix A

Joint Powers Agreement

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1 AMENDED AND RESTATED
2 JOINT POWERS AGREEMENT ESTABLISHING
3 THE PIONEER-SARAH CREEK WATERSHED MANAGEMENT COMMISSION
4

5 RECITALS

6 WHEREAS, on July 29, 1993, pursuant to statutory authority, the Cities of Corcoran,
7 Greenfield, Independence, Loretto, Maple Plain, Medina and Minnetrista, the Town of Watertown,
8 and the Hennepin Conservation District adopted a "Joint Powers Agreement to Protect and Manage the
9 Pioneer-Sarah Creek Watersheds" (the "Joint Powers Agreement"); and

10 WHEREAS, in 2000 the City of Corcoran withdrew from the Agreement; and

11 WHEREAS, in 2001 the Town of Watertown withdrew from the Agreement; and

12 WHEREAS, the Cities of Greenfield, Independence, Loretto, Maple Plain, Medina and
13 Minnetrista wish to amend and restate the Agreement's terms in this document.

14 NOW, THEREFORE, pursuant to the authority conferred upon the parties by Minn. Stat §§
15 471.59 and 103B.201, et seq., the parties to this Agreement do mutually agree as follows:

16 SECTION ONE
17 DEFINITIONS
18

19 For purposes of this Agreement, each of the following terms, when used herein with an initial
20 capital letter, will have the meaning ascribed to it as follows:

21 "Agreement" means the Joint Powers Agreement, as amended and restated in this document.

22 "Board" means the Board of Commissioners of the Commission.

23 "BWSR" means the Minnesota Board of Water and Soil Resources.

24 "Commissioner" means an individual appointed by a governmental unit to serve on the Board.

25 The term Commissioner shall include both the representative and alternate representative appointed to
26 serve on the Board.

27 "Pioneer-Sarah Creek Watershed" or "Watershed" means the area within the mapped area
28 delineated on the map filed with BWSR, as may be amended. A complete legal description defining
29 the boundary of the Pioneer-Sarah Creek Watershed is attached hereto and made apart hereof.

1 "Governmental Unit" means any signatory city or township,

2 "Member" means a governmental unit that enters into this Agreement.

3 "Watershed Management Organization ("WMO") means the organization created by this
4 Agreement, the full name of which is "Pioneer-Sarah Creek Watershed Management Commission." The
5 Commission shall be a public agency of its respective governmental units.

6 SECTION TWO
7 ESTABLISHMENT
8

9 The parties create and establish the Pioneer-Sarah Creek Watershed Management Commission.
10 The Commission membership shall include the Cities of Greenfield, Independence, Loretto, Maple Plain,
11 Medina and Minnetrista. In addition to other powers identified in this Agreement, the Commission shall
12 have all of the authority for a joint powers watershed management organization identified in Minn. Stat. §
13 103B.211.

14 SECTION THREE
15 PURPOSE STATEMENT
16

17 The purpose of this Agreement is to establish an organization within the Pioneer-Sarah Creek
18 Watershed to (a) protect, preserve, and use natural surface and groundwater storage and retention systems,
19 (b) minimize public capital expenditures needed to correct flooding and water quality problems, (c) identify
20 and plan for means to effectively protect and improve surface and groundwater quality, (d) establish more
21 uniform local policies and official controls for surface and groundwater management, (e) prevent erosion of
22 soil into surface water systems, (f) promote groundwater recharge, (g) protect and enhance fish and wildlife
23 habitat and water recreational facilities, and (h) secure the other benefits associated with the proper
24 management of surface and ground water, as identified in Minn. Stat. § 103B,201, including but not limited
25 to aesthetic values when owned by the public or constituting public resources, as defined in Minn. Stat. Ch.
26 116B.

27 The Commission's Members agree to (a) provide a forum for exchanging information in the
28 management of land use and land use techniques and control, (b) provide a forum for resolution of
29 intergovernmental disputes relating to management and protection of the Pioneer-Sarah Creek Watershed;

1 and (c) cooperate on a united basis on behalf of all units of government within the Pioneer-
2 Sarah Creek Watershed with all other levels of government for the purpose of facilitating natural
3 resource protection and management in the Watershed.

4 SECTION FOUR
5 BOARD OF COMMISSIONERS
6

7 4.1. Appointment. The governing body of the Commission shall be its Board. Each
8 Member shall be entitled to appoint one representative to serve on the Board and one alternate who
9 may sit when the representative is not in attendance, and said representative or alternative
10 representative shall be called a "Commissioner." It is expected that each Member ensure that its
11 Commissioner will attend each meeting of the Board.

12 4.2. Term. Each Member shall determine the term length for its Commissioner's
13 appointment to the Board. The representatives to the Commission shall serve at the pleasure of the
14 governing body of the Member appointing such representative to the Commission. The Commission
15 and its Members shall fill all Board vacancies pursuant to Minn. Stat. § 103B.227, subd. 1 and 2, as
16 may be amended from time to time.

17 4.3. Compensation. Commissioners shall serve without compensation from the
18 Commission, but this shall not prevent a Member from providing compensation to its Commissioner
19 for serving on the Board.

20 4.4. Officers. No later than the first meeting in February of each year, the Commission
21 shall elect from its membership a chairperson, a vice-chairperson, a treasurer and a secretary and such
22 other officers as it deems necessary to reasonably carry out the purposes of this Agreement. No
23 Commissioner may be elected to more than one office. All officers shall hold office for terms of one
24 year and until their successors have been elected by the Commission. An officer may be reelected to
25 the same office for unlimited terms. A vacancy in an office shall be filled from the Board membership
26 by election for the remainder of the unexpired term of such office. The officers' duties include the
27 following:

28 A. Chairperson. The Chairperson shall preside at all Board meetings and shall have
29 all the same privileges of discussion, making motions and voting, as do other

Commissioners. The Chairperson may delegate certain responsibilities to the Executive Secretary as necessary to carry out the duties of the office.

B. Vice-Chairperson. The Vice-Chairperson shall, in the absence or disability of the Chairperson, perform the duties and exercise the powers of the Chairperson.

C. Treasurer. The Treasurer shall have the custody of the funds and securities of the Commission and shall keep full and accurate accounts of receipts and disbursements in books belonging to the Commission and shall deposit all monies and other valuable effects in the name and to the credit of the Commission in such depository as may be designated by the Commission. He/she shall disburse funds of the Commission as approved by the Commission and shall render to the Commission at regular meetings, or as the Board may request, an account of all his/her transactions as Treasurer and of the financial condition of the Commission. The Treasurer may delegate certain duties to the Executive Secretary as necessary to carry out the duties of the office.

D. Secretary. The Secretary shall attend all Board meetings, shall act as clerk of such meetings, and shall record all votes and the minutes of all proceedings. He/she shall give notice of all Board meetings. The Secretary may delegate certain duties to the Executive Secretary as necessary to carry out the duties of the office.

4.5. Executive Secretary. The Commission may appoint an Executive Secretary to coordinate activities of the Commission, accept delegated duties by the Commission officers, and accept business duties not assigned to officers. All notices to the Commission shall be delivered or served at the office of the Executive Secretary.

4.6. Quorum and Voting. A majority of all Commissioners with voting privileges shall constitute a quorum. Once a quorum is present, a majority vote is required for approval on an action, unless as provided otherwise in this Agreement.

4.7. Meetings. The Board shall schedule meetings at least quarterly (every three months) on a uniform day and place selected by the Commission. Written notice of the location and time of all Commission meetings shall be sent to all Commission representatives and alternate representatives and to the Clerk of each Member. Special meetings may be held at the call of the Chairperson or by any three Commissioners by giving not less than 72 hours written notice of the time, place and purpose of such meeting.

SECTION FIVE
COMMISSION POWERS AND DUTIES

5.1. Watershed Management Plan. The Commission shall develop a watershed management plan including a capital improvement program in conformance with Minn. Stat. § 103B.231. The Commission shall adopt the plan within 120 days after BWSR's approval of the plan. After adoption, the Commission shall implement the watershed management plan and enforce the regulations set out in the plan. A copy of the adopted plan shall be filed with the clerk of each Member governmental unit.

5.2. Local Water Management Plans. The Commission shall review Members' local water management plans as required by Minn, Stat. § 103B.235, subd. 3.

5.3. Review Services.

A. Where the Commission is authorized or requested to review and make recommendations on any matter, the Commission may charge a reasonable fee for such review services. The Commission's standard fee schedule, as amended from time to time, will be a part of the Commission's Rules.

B. The Commission may charge an additional fee when it determines that a particular project will require extraordinary and substantial review services. Before undertaking such review services, the Commission shall provide the party to be charged the additional fee with written notice of the services to be performed and the additional fee therefor. Unless said party objects within 5 business days of receipt of such written notice to the amount of the additional fee to be charged, such review services shall be performed and the party shall be responsible for the cost thereof. If said party objects to the proposed additional fee for such services within 5 business days and the party and the Commission are unable to agree on a reasonable alternative amount for review services, such extraordinary and substantial review services shall not be undertaken by the Commission.

The Members recognize that from time to time the Commission provides review services regarding a violation under the Minnesota Wetland Conservation Act, and that there currently is no statutory mechanism in place that allows the Commission to recover its costs from the wetland violator

1 for these review services. Therefore, when the Commission provides review services regarding a violation
2 under the Minnesota Wetland Conservation Act, the Commission may seek reimbursement for these
3 services from the Member where the subject property is located.

4 C. Upon request of any Member, the Commission shall review and evaluate any
5 dispute between the Member and other unit(s) of government regarding land use and natural resource
6 protection and management.

7 5.4 Public Participation.

8 A. Technical Advisory Committee. A Technical Advisory Committee ("TAC") to
9 the Commission is hereby created. TAC members and one or more alternate members shall be appointed by
10 the governing body of each Member. TAC members may be, but need not be, Commissioners. TAC
11 members shall serve at the pleasure of the governing body of each Member that appoints them and are
12 not required to meet statutory qualifications for Commissioners. TAC members will undertake
13 projects/tasks as requested or assigned to the TAC by the Commission and may participate in meetings
14 of the Commission pertaining to those assigned projects/tasks.

15 B. Citizen Advisory Committee. If a need is determined by the Commission, the
16 Commission will establish a Citizen Advisory Committee to the Commission, particularly to review and
17 comment on specific projects undertaken by the Commission pursuant to the Watershed Management
18 Plan.

19 5.5. Rules. The Commission shall adopt rules for (a) conducting its business, including but
20 not limited to additional duties of the Commission's officers, (b) the scope of responsibilities of the
21 Technical Advisory Committee and the Citizen Advisory Committee, if one is established, and (c)
22 preparing the annual work plan.

23 5.6. Contracts. The Commission may make such contracts, and enter into any such
24 agreements, as it deems necessary to make effective any power granted to it by this Agreement. No
25 Commissioner shall receive a direct financial benefit from any contract made by the Commission. Every
26 contract for the purchase or sale of merchandise, materials or equipment by the Commission shall be let
27 in

1 accordance with the Uniform Municipal Contracting Law (Minn. Stat. § 47L345) and the Joint Exercise of
2 Powers statute (Minn. Stat. § 47L59). In accordance with Minn. Stat. § 471.59, subd. 3, contracts let and
3 purchases made under this Agreement shall conform to the statutory requirements applicable to the
4 Member cities with a population over 2,500.

5 5.7. Employment. The Commission may contract for services, may use staff of other
6 governmental agencies, may use staff of the Members and may employ such other persons as it deems
7 necessary. Where staff services of a Member are utilized, such services shall not reduce the financial
8 contribution of such Member to the Commission's operating fund unless utilization of staff service is
9 substantial and the Commission so authorizes.

10 5.8. Public/Private Organizations. The Commission may cooperate or contract with the State
11 of Minnesota or any subdivision thereof or federal agency or private or public organization to
12 accomplish the purposes for which it is organized.

13 5.9. Annual Financial, Activity and Audit Reports; Newsletter. The Commission shall submit
14 to its Members and BWSR a financial report, an activity report and an audit report for the preceding
15 fiscal year, in compliance with state law. The Commission shall publish and distribute an annual
16 newsletter in compliance with state law. The Commission shall transmit to the clerk of each Member
17 copies of the reports/newsletter in a format ready for publication. Each Member shall
18 publish/distribute the reports/newsletter as it deems necessary. All of the Commission's books, reports
19 and records shall be available for and open to examination by any Member at all reasonable times.

20 5.10. Gifts, Grant, Loans. The Commission may, within the scope of this Agreement, accept
21 gifts, apply for and use grants or loans of money or other property from the United States, the State of
22 Minnesota, a unit of government or other governmental unit or organization, or any person or entity for the
23 purposes described herein; may enter into any reasonable agreement required in connection therewith;
24 may comply with any laws or regulations applicable thereto; and may hold, use and dispose of such
25 money or property in accordance with the terms of the gift, grant, loan or agreement relating thereto.

1 5.11. Boundary Change in the Pioneer-Sarah Creek Watershed.

2 A. Enlargement. Proceedings for the enlargement of the Pioneer-Sarah Creek
3 Watershed shall be initiated by a request from affected Member(s) to the Commission, or as mandated by
4 law. Such request should include a map and legal description of the affected area. In reviewing such a
5 request, the Commission should consider, among other things, (a) whether the affected area is
6 contiguous to the existing Pioneer-Sarah Creek Watershed, (b) whether the affected area can be feasibly
7 administered by the Commission; and (c) the reasons why it would be conducive to the public health and
8 welfare to add the area to the existing Pioneer-Sarah Creek Watershed. Upon deliberation, if it appears to
9 the Commission that the enlargement of the Watershed as requested would be for the public welfare and
10 public interest and the purpose of resource management would be served, or that in fact the enlargement
11 is mandated by law, the Commission shall by its findings and order enlarge the Pioneer-Sarah Creek
12 Watershed and file a copy of said findings and order with the appropriate governmental offices.

13 B. Transfer of Territory. Proceedings to transfer territory that is within the
14 Pioneer-Sarah Creek Watershed to the jurisdiction of another watershed management organization or a
15 watershed district shall be initiated by a request from affected Member(s) to the Commission, or as
16 mandated by law. Such request should include a map and legal description of the affected area. Upon
17 deliberation, if it appears to the Commission that the transfer of territory as requested would be for the
18 public welfare and public interest and the purpose of resource management would be served, the
19 Commission shall by its findings and order change the Pioneer-Sarah Creek Watershed boundaries
20 accordingly and file a copy of said findings and order with the appropriate governmental offices.

21 5.12. Subdistricts. The Commission may define and designate drainage subdistricts within the
22 Watershed and shall have authority to separate the Watershed into such different subdistricts and to
23 allocate capital improvement costs to a subdistrict area if that subdistrict is the only area that materially
24 benefits from the capital improvement.

25 5.13. Monitor Water Quality. In connection with its water management plan, the Commission
26 will establish a comprehensive water quality-monitoring plan for lakes and streams within the Watershed.

1 The Commission will also establish goals for judging the adequacy of its water quality protection
2 programs.

3 5.14 Ratification. The Commission may, and where required by this Agreement shall, refer
4 matters to the governing bodies of the Members for ratification. Within 60 days, the governing bodies of
5 the Members shall take action upon any matter referred for ratification.

6 5.15. Statutory Powers. The Commission may exercise all other powers necessary and
7 incidental to the implementation of the purposes and powers set forth herein and as outlined and authorized
8 by Minn. Stat. §§ 103B.201, et seq,

9 SECTION SIX
10 FINANCIAL MATTERS
11

12 6.1. Depositories/Disbursements. The Commission may collect and receive money and
13 services subject to the provisions of this Agreement from the parties and from any other sources approved
14 by the Commission and it may incur expenses and make expenditures and disbursements necessary
15 and incidental to the effectuation of the purposes of this Agreement. The Board shall designate a
16 national, state, or private bank or banks as a depository of Commission funds, Funds may be expended
17 by the Commission in accordance with procedures established herein. Orders, checks and drafts shall
18 be signed by two officers.

19 6.2. General Administration. Each voting Member agrees to contribute each year to a general
20 fund to be used for general administration purposes including, but not limited to, salaries, rent, supplies,
21 development on an overall plan, insurance, bonds, and to purchase and maintain devices to measure
22 hydrological and water quality data. The funds may also be used for normal maintenance of facilities
23 and capital improvements. The annual contribution by each voting Member shall be based on its share
24 of the taxable market value of all real property within the Watershed.

25 6.3. Budget Approval and Appeal Process. On or before July 1 of each year, the Board shall
26 adopt a budget for the following calendar year for the purpose of providing funds to conduct the
27 Commission's business in accordance with its annual work plan, Budget approval shall require a

1 majority vote of all Commissioners eligible to vote. At least 45 days before each Member governmental
2 unit must certify its levy to Hennepin County, the Commission shall certify the budget to the clerk of each
3 Member governmental unit together with a statement of the proportion of the budget to be provided by
4 each Member. The schedule of payments by the Members shall be determined by the Board in such a
5 manner as to provide for an orderly collection of the funds needed.

6 The governing body of each Member agrees to review the budget, and the Board shall upon notice
7 from any Member received prior to August 15, hear objections to the budget, and may amend the budget
8 (except the fee due cannot be increased), and then give notice to the Members of any and all
9 modifications or amendments.

10 SECTION SEVEN
11 CAPITAL IMPROVEMENT PROGRAM
12

13 7.1. Assessments. If a capital improvement ordered by the Commission may result in payment
14 from any Member, or if a capital improvement ordered by the Commission may result in a levy by a
15 Member against privately or publicly owned land within the Watershed, said capital improvement
16 shall follow the statutory procedure outlined in Minn. Stat. Ch. 429, except as herein modified.

17 7.2. Preliminary Reports/Public Hearings. For those improvements initiated by the
18 Commission or so designated in the Commission's watershed management plan to be constructed by the
19 Board, the Board shall secure from its engineers or some other competent person a preliminary report
20 advising it whether the proposed improvement is feasible and as to whether it shall best be made as
21 proposed or in connection with some other improvement and the estimated cost of the improvement as
22 recommended.

23 The Board shall then hold a public hearing on the proposed improvement after mailed notice to the
24 clerk of each Member governmental unit within the Watershed. The Commission shall not be required to
25 mail or publish notice except by said notice to the clerk, Said notice shall be mailed not less than 45
26 days before the hearing, shall state the time and place of the hearing, the general nature of the
27 improvement, the estimated total cost and the estimated cost to each Member governmental unit. The

1 Board may adjourn said hearing to obtain further information, may continue said hearing pending
2 action of the Member governmental units or may take such other action as it deems necessary to carry out
3 the purpose of this Commission.

4 A resolution setting forth the order for a capital improvement project shall require a favorable vote
5 by (a) at least two-thirds of all Commissioners eligible to vote, and (b) all Commissioners representing
6 Members who will directly benefit from the project. In all cases other than to order a capital improvement
7 project, a majority vote of all Commissioners eligible to vote shall be sufficient to adopt an action. The
8 order shall describe the improvement, shall allocate in percentages the cost between the Member
9 governmental units, shall designate the engineers to prepare plans and specifications, and shall designate
10 the Member who will contract for the improvement.

11 After the Board has ordered the improvement or if the hearing is continued while the Member
12 governmental units act on said proposal, it shall forward said preliminary report to all Member
13 governmental units with an estimated time schedule for the construction of said improvement. The Board
14 shall allow an adequate amount of time, and in no event less than 45 days, for each Member
15 governmental unit to conduct hearings, in accordance with the provisions of the aforesaid Chapter 429 or
16 the charter requirements of any Member city, or to ascertain the method of financing which said Member
17 governmental unit will utilize to pay its proportionate share of the costs of the improvement. Each Member
18 governmental unit shall ascertain within a period of 90 days the method it shall use to pay its proportionate
19 share of the costs.

20 If the Commission proposes to use Hennepin County's bonding authority as set forth in Minn. Stat.
21 § 103B.251, or if the Commission proposes to certify all or any part of a capital improvement to Hennepin
22 County for payment, then and in that event all proceedings shall be carried out in accordance with the
23 provisions set forth in said Section 103B,251.

24 The Board shall not order and no engineer shall prepare plans and specifications before the Board
25 has adopted a resolution ordering the improvement. The Board may direct one of its Members to prepare
26 plans and specifications and order the advertising for bids upon receipt of notice from each Member

1 governmental unit who will be assessed that it has completed its hearing or determined its method of
2 payment or upon expiration of 90 days after the mailing of the preliminary report to the Members.

3 7.3. Appeals/Arbitration. Any Member governmental unit being aggrieved by the Board's
4 determination as to the cost allocation of said capital improvement shall have 30 days after the Commission
5 resolution ordering the improvement to appeal said determination. Said appeal shall be in writing and shall
6 be addressed to the Board asking for arbitration, The determination of the Member's appeal shall be
7 referred to a Board of Arbitration. The Board of Arbitration shall consist of three persons; one to be
8 appointed by the Board of Commissioners, one to be appointed by the appealing Member governmental
9 unit, and the third to be appointed by the two so selected. In the event the two persons so selected do not
10 appoint the third person within 15 days after their appointment, then the Chief Judge of the Hennepin
11 County District Court shall have jurisdiction to appoint, upon application of either or both of the two earlier
12 selected, the third person to the Board of Arbitration. The third person selected shall not be a resident of
13 any Member governmental unit and if appointed by the Chief Judge said person shall be a person
14 knowledgeable in the subject matter. The arbitrators' expenses and fees, together with the other expenses,
15 not including attorney fees, incurred in the conduct of the arbitration shall be divided equally between the
16 Commission and the appealing Member, Arbitration shall be conducted in accordance with the Uniform
17 Arbitration Act, Minn. Stat. Ch. 572,

18 7.4. Contracts for Capital Improvements. All contracts which are to be let as a result of the
19 Board ordering a capital improvement, and for which two or more Member governmental units shall be
20 responsible for the costs, shall be let in accordance with the provisions of Minn. Stat, § 429.041. The
21 bidding and contracting of said work shall be let by any one of the Member governmental units, as ordered
22 by the Board, after compliance with the statutory requirements. Contracts and bidding procedures shall
23 comply with the legal requirements applicable to statutory cities.

24 The Commission shall not have the authority to contract in its own name for any improvement
25 work for which a special assessment will be levied against any private or public property under the
26 provisions of Chapter 429 or under the provisions of any Member city charter. These contracts shall be

1 awarded by action of the governing body of a Member and shall be in the name of a Member
2 governmental unit. This section does not preclude the Commission from proceeding under Minn. Stat. §
3 103B.251.

4 7.5. Contracts with Other Governmental Bodies. The Commission may exercise the powers
5 set forth in Section 7.4 but said contracts for a capital improvement shall require a majority vote of all
6 Commissioners eligible to vote.

7 7.6. Supervision. All improvement contracts shall be supervised by the entity awarding the
8 contract. The Commission staff shall also be authorized to observe and review the work in progress and the
9 Members agree to cooperate with the Commission staff in accomplishing its purposes. Representatives of
10 the WMO shall have the right to enter upon the place or places where the improvement work is in
11 progress for the purpose of making reasonable tests and inspections, The Commission staff shall report and
12 advise and recommend to the Board on the progress of the work,

13 7.7. Land Acquisition. The Commission shall not have the power of eminent domain and shall
14 not own any interest in real property. All interests in lands shall be held in the name of the Member wherein
15 said lands are located.

16 7.8. Capital Improvement Fund. The Commission shall establish an improvement fund or
17 funding mechanism for each capital improvement project. The Commission may fund all or part of the cost
18 of a capital improvement contained in the capital improvement program of the plan in accordance with
19 Minn. Stat. § 103B.251, The Commission and Hennepin County may establish a maintenance fund to be
20 used for normal and routine maintenance of an improvement constructed in whole or in part with money
21 provided by Hennepin County pursuant to Minn, Stat, § 103B.251. The levy and collection of an ad
22 valorem tax levy for an improvement, payment of bonds, or maintenance shall be by Hennepin County
23 based upon a tax levy resolution adopted by a majority vote of all eligible Members of the Board and
24 remitted to the County on or before the date prescribed by law each year. If it is determined to levy for
25 maintenance, the Commission shall be required to follow the hearing process established by Minn. Stat.

Ch. 103D. Mailed notice shall also be sent to the clerk of each Member governmental unit at least 30 days before the hearing.

7.9. Capital Improvement Cost Allocation.

A. All costs of improvements designated in the Board's adopted watershed management plan for construction by the Board, which the Board determines will benefit only one Member, shall be paid for entirely by that Member.

B. All costs of improvements designated in the Board's adopted watershed management plan for construction by the Board, which the Board determines benefit more than one Member, shall be apportioned by the Board by the following bases:

- (1) A negotiated amount to be arrived at by the Members who have lands in the subdistrict responsible for the capital improvement; or
- (2) On the basis of each Member's share of the taxable market value of all real property within the Watershed; or
- (3) Capital costs allocated under option (2) above may be varied by the Commission by a favorable vote by (a) at least two-thirds of all Commissioners eligible to vote and (b) all Commissioners representing Members who will directly benefit from the project, if (i) any Member community receives a direct benefit from the capital improvement which benefit can be defined as a lateral as well as a trunk benefit, or (ii) the capital improvement provides a direct benefit to one or more Members which benefit is so disproportionate as to require in a sense of fairness a modification in the formula.

C. If the project is constructed and financed pursuant to Minnesota Statutes 103B.251, the Members understand and agree that said costs will be levied on all taxable property in the watershed as set forth in the statute.

SECTION EIGHT
WITHDRAWAL FROM AGREEMENT

Withdrawal of any Member may be accomplished by filing written notice with the Commission and the other Members 60 days before the effective date of withdrawal. No Member may withdraw from this Agreement until the withdrawing Member has met its full financial obligations for the year of withdrawal and prior years.

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SECTION NINE
DISSOLUTION OF COMMISSION

9.1. This Agreement may be terminated upon the unanimous consent of the parties. If the Agreement is to be terminated, a notice of the intent to dissolve the Commission shall be sent to Hennepin County and BWSR at least 90 days before the date of dissolution.

9.2. In addition to the manner provided in Section 9.1 for termination, any Member may petition the Commission's Board to dissolve the Commission. Upon 90 days notice in writing to the clerk of each member governmental unit and to Hennepin County and BWSR, the Board shall hold a hearing and upon a majority vote of all Commissioners eligible to vote, the Board may by Resolution recommend that the Commission be dissolved. Said Resolution shall be submitted to each Member governmental unit and if ratified by three-fourths of the governing bodies of all eligible Members within 60 days, said Board shall dissolve the Commission allowing a reasonable time to complete work in progress and to dispose of personal property owned by the Commission.

9.3. Winding Up. Upon dissolution, all personal property of the Commission shall be sold and the proceeds thereof, together with monies on hand after payment of all obligations, shall be distributed to the Members. Such distribution of Commission assets shall be made in approximate proportion to the total contributions to the Commission for such costs made by each Member, All payments due and owing for operating costs under Section 6.2, or other unfilled financial obligations, shall continue to be the lawful obligation of the Members. In no event may this Agreement be terminated until all of the planning and plan implementation provisions of the Act, which are required of a watershed management organization, have been completed.

SECTION TEN
MISCELLANEOUS PROVISIONS

10.1. Special Assessments. The Commission shall not have the power to levy a special assessment upon any privately or publicly owned land. All such assessments shall be levied by the Member wherein said lands are located. The Commission shall have the power to require any Member to contribute the costs allocated or assessed according to the other provisions of this agreement.

1 10.2. Member's Construction Projects that Will Affect Pioneer-Sarah Creek. Each Member
2 agrees that it will not directly or indirectly collect or divert any additional surface water to or from Pioneer-
3 Sarah Creek or its tributaries without approval from the Commission. Such approval may be granted
4 by the Commission for a Member to proceed with the construction or reconstruction of improvements
5 within the individual corporate Member's boundaries and at said Member's sole cost upon a finding (a)
6 that there is an adequate outlet, (b) that said construction is in conformance with the overall plan, and
7 (c) that the construction will not adversely affect other Members.

8 10.3. Member Vote Suspension for Failure to Contribute. Any Member who is more than 60
9 days in default in contributing its proportionate share to the general fund shall have the vote of its Board
10 representative suspended pending the payment of its proportionate share. Any Member who is more
11 than 60 days in default in contributing its proportionate share of the cost of any improvement to the
12 contracting Member shall upon request of the contracting Member have the vote of its Board
13 representative suspended, pending the payment of its proportionate share, Any Member whose Board
14 representative vote is under suspension shall not be considered as an eligible Member as such
15 membership affects the number of votes required to proceed on any matter under consideration by the
16 Board.

17 10.4. Amendment. The Commission may recommend changes and amendments to this
18 Agreement to the Members. Amendments shall be acted upon by the Members within 90 days of referral.
19 Amendments shall be evidenced by appropriate resolutions of the Members filed with the Commission and
20 shall, if no effective date is contained in the amendment, become effective as of the date all such
21 filings have been completed.

22 10.5. Termination of Prior Agreement. By executing this document, the parties hereby agree to
23 terminate the prior joint powers agreement, adopted July 29, 1993.

24 10.6. Counterparts. This Agreement and any amendment may be executed in several
25 counterparts and all so executed shall constitute one Agreement or amendment, binding on all of the parties
26 hereto notwithstanding that all of the parties are not signatory to the original or the same counterpart.

1 10.7. Effective Date. This Agreement shall be in full force and effect when all governmental
2 units delineated in Section 2 have executed this Agreement. All Members need not sign the same copy.

3 10.8. Duration. This Agreement shall have an unlimited duration.

4 10.9. Statutory References. All statutory references include all future amendments.
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11 Dated: 8/17/04
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CITY OF GREENFIELD

By: Thomas G. Swann
Its Mayor

Attest: Christa Okerman
Its City Clerk

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22 Dated: 2-24-04
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CITY OF INDEPENDENCE

By: Lewis D. John
Its Mayor

Attest: Loi Huser
Its City Clerk

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32 Dated: 3/9/2004
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CITY OF LORETTO

By: Kent C. Torce
Its Mayor

Attest: Kelly Bruninell
Its City Clerk

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42 Dated: 3/23/04
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CITY OF MAPLE PLAIN

By: Jack Vigoren
Its Mayor

Attest: Debbie Hudson
Its City Clerk

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Dated: 3-16-04

CITY OF MEDINA

By:

Its Mayor

Attest:

Its City Clerk

Dated: 3/15/04

CITY OF MINNETRISTA

By:

Its Mayor

Attest:

Its City Clerk

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CITY OF
Independence
HENNEPIN COUNTY

CITY OF INDEPENDENCE

ORDINANCE NO. 2003-04

AN ORDINANCE ADDING SECTION 720 TO THE
INDEPENDENCE CITY CODE; ESTABLISHING PIONEER-
SARAH CREEK WATERSHED TAX DISTRICT

THE CITY OF INDEPENDENCE DOES ORDAIN:

Section 1. Chapter VII of the Independence City Code is amended by adding a section to read as follows:

Section 702 – Pioneer-Sarah Creek Watershed Tax District Established

720.01 Tax District. Subdivision 1. Purpose. A tax district is established for purposes of paying the costs of planning for water management as required by law, for paying capital costs of the water management facilities described in a capital improvement program, and for paying for normal and routine maintenance of such facilities.

Subd. 2. District Territory. The tax district is established in that portion of the City of Independence located within the Pioneer-Sarah Creek watershed. The territory or area is more particularly described in a schedule on file with the City Administrator.

Subd. 3. Levy. The tax shall be levied annually on all taxable property in the district at a rate equal to 0.02418 percent of the market value of such taxable property.

Subd. 4. Proceeds. The proceeds of the tax shall be paid into a fund reserved for the purposes described herein, or disbursed in support of activities of the Pioneer-Sarah Creek Watershed Management District consistent with the purposes described herein. Any proceeds remaining in the reserve fund at the time the tax is terminated or the district is dissolved shall be transferred and irrevocably pledged to the debt service fund of the local unit to be used solely to reduce tax levies for bonded indebtedness of taxable property in the district.


Sec. 2. This ordinance shall be filed with the county auditor and county recorder.

Sec. 3. This ordinance shall be effective the day following its publication.

RJV-236562v1
ND115-75

Adopted this 26th day of August, 2003.


Marvin D. Johnson, Mayor

ATTEST: 
Toni Hirsch, City Clerk-Administrator