Appendices

June 16, 2019

Table of Contents – Appendices

Appendix A – Burnsville System Statement

Appendix B – Sustainability Approaches & Matrix

Appendix C – Vacant/Underutilized Sites

Appendix D – Neighborhood Center Yield Plans

Appendix E – Satellite Center Yield Plans

Appendix F – Future Land Use Development & Redevelopment Phasing

Appendix G – Historic Sites in Burnsville

Appendix H – Natural Resources Master Plan

Appendix I – Wetland Protection and Management Plan

Appendix J – Water Resources Management Plan

Appendix K – MnDOT and Dakota County Access Management Guidelines

Appendix L – Burnsville Local Water Supply Plan DRAFT

Appendix M – 2013 Sanitary Sewer Lift Station Condition Assessment

Appendix N – 2018-2022 Capital Improvement Plan (CIP)

Appendix O – Community Engagement

Appendix P – Adjacent and Affected Jurisdiction Review & City Responses

Appendix Q – Metropolitan Council Preliminary Review and City Responses

Appendix R – Planning Commission & Public Hearings Staff Reports & Minutes

Appendix S – City Council Resolution, Packet, & Minutes

Appendix T – Metropolitan Council Review and City Response

City Of Burnsville

Appendix A – Burnsville System Statement

September 2015

2015 SYSTEM STATEMENT

City of Burnsville

System Statement Issue Date: September 17, 2015

METROPOLITAN COUNCIL

2015 SYSTEM STATEMENT FOR CITY OF BURNSVILLE

September 17, 2015

Regional Development Plan Adoption

In May 2014, the Metropolitan Council adopted *Thrive MSP 2040*. Following adoption of *Thrive*, the Council adopted the *2040 Transportation Policy Plan,* the *2040 Regional Parks Policy Plan*, the *2040 Water Resources Policy Plan*, and the *2040 Housing Policy Plan*. The Metropolitan Council is now issuing system statements pursuant to State statute.

Receipt of this system statement and the metropolitan system plans triggers a community's obligation to review and, as necessary, amend its comprehensive plan within the next three years, by the end of 2018. The complete text of *Thrive MSP 2040* as well as complete copies of the recently adopted metropolitan system and policy plans are available for viewing and downloading at *http://www.metrocouncil.org/Communities/Planning.aspx*. Paper copies are available by calling the Council's Data Center at 651-602-1140.

System Statement Definition

Metropolitan system plans are long-range comprehensive plans for the regional systems – transit, highways, and airports; wastewater services; and parks and open space – along with the capital budgets for metropolitan wastewater services, transportation, and regional recreation open space. System statements explain the implications of metropolitan system plans for each individual community in the metropolitan area. They are intended to help communities prepare or update their comprehensive plan, as required by the Metropolitan Land Planning Act:

> *Within nine months after receiving a system statement for an amendment to a metropolitan system plan, and within three years after receiving a system statement issued in conjunction with the decennial review required under section 473.864, subdivision 2, each affected local governmental unit shall review its comprehensive plan to determine if an amendment is necessary to ensure continued conformity with metropolitan system plans. If an amendment is necessary, the governmental unit shall prepare the amendment and submit it to the council for review.*

Local comprehensive plans, and amendments thereto, will be reviewed by the Council for conformance to metropolitan system plans, consistency with Council policies, and compatibility with adjacent and affected governmental units. Updated local comprehensive plans are due to the Council for review by December 31, 2018.

What is in this System Statement

The system statement includes information specific to your community, including:

- your community designation or designation(s);
- forecasted population, households, and employment through the year 2040;
- guidance on appropriate densities to ensure that regional services and costly regional infrastructure can be provided as efficiently as possible.
- affordable housing need allocation;

In the following sections, this system statement contains an overview of each of the system plan updates and specific system changes that affect your community. The sections are:

- Transportation, including metropolitan highways, aviation, and transit
- Water Resources, including wastewater, surface water, and water supply planning
- Regional parks and trails

Dispute Process

If your community disagrees with elements of this system statement, or has any questions about this system statement, please contact your Sector Representative, Patrick Boylan, at 651-602-1438, to review and discuss potential issues or concerns.

The Council and local government units and districts have usually resolved issues relating to the system statement through discussion.

Request for Hearing

If a local governmental unit and the Council are unable to resolve disagreements over the content of a system statement, the unit or district may, by resolution, request that a hearing be conducted by the Council's Land Use Advisory Committee or by the State Office of Administrative Hearings for the purpose of considering amendments to the system statement. According to Minnesota Statutes section 473.857, the request shall be made by the local governmental unit or school district within 60 days after receipt of the system statement. If no request for a hearing is received by the Council within 60 days, the statement becomes final.

Regional Development Guide

The Council adopted *Thrive MSP 2040* as the new regional development guide on May 28, 2014. *Thrive* identifies five outcomes that set the policy direction for the region's system and policy plans. Building on our region's history of effective **stewardship** of our resources, *Thrive* envisions a **prosperous**, **equitable**, and **livable** region that is **sustainable** for today and generations to come. The Council is directing its operations, plans, policies, programs, and resources toward achieving this shared long-term vision.

Three principles define the Council's approach to implementing regional policy: **integration**, **collaboration**, and **accountability**. These principles reflect the Council's roles in integrating policy areas, supporting local governments and regional partners, and promoting and implementing the regional vision. The principles define the Council's approach to policy implementation and set expectations for how the Council interacts with local governments.

Thrive also outlines seven land use policies and community designations important for local comprehensive planning updates. The land use policies establish a series of commitments from the Council for local governments and uses community designations to shape development policies for communities. Community designations group jurisdictions with similar characteristics based on Urban or Rural character for the application of regional policies. Together, the land use policies and community designations help to implement the region's vision by setting expectations for development density and the character of development throughout the region.

Community Designation

Community designations group jurisdictions with similar characteristics for the application of regional policies. The Council uses community designations to guide regional growth and development; establish land use expectations including overall development densities and patterns; and outline the respective roles of the Council and individual communities, along with strategies for planning for forecasted growth. If there are discrepancies between the *Thrive MSP 2040* Community Designations Map and the Community Designation map contained herein because of adjustments and refinements that occurred subsequent to the adoption of *Thrive*, communities should follow the specific guidance contained in this System Statement.

Thrive identifies Burnsville with the community designation of Suburban (Figure 1). Suburban communities experienced continued growth and expansion during the 1980s and early 1990s, and typically have automobile-oriented development patterns at significantly lower densities than in previous eras. Suburban communities are expected to plan for forecasted population and household growth at average densities of at least 5 units per acre for new development and redevelopment. In addition, Suburban communities are expected to target opportunities for more intensive development near regional transit investments at densities and in a manner articulated in the *2040 Transportation Policy Plan*.

Specific strategies for Suburban communities can be found on Burnsville's *Community Page* in the *Local Planning Handbook*.

Forecasts

The Council uses the forecasts developed as part of *Thrive* to plan for regional systems. Communities should base their planning work on these forecasts. Given the nature of long-range forecasts and the planning timeline undertaken by most communities, the Council will maintain on-going dialogue with communities to consider any changes in growth trends or community expectations about growth that may have an impact on regional systems.

The *Thrive* forecasts for population, households, and employment for your community are:

	2010 (actual)	2014 (est.)	2020	2030	2040
Population	60,306	61,747	63,500	66,000	68,500
Households	24,283	24,960	25,900	26,800	27,600
Employment	31,593	34,256	36,700	39,400	41,900

Housing Policy

The Council adopted the *Housing Policy Plan* on December 10, 2014, and amended the plan on July 8, 2015. The purpose of the plan is to provide leadership and guidance on regional housing needs and challenges and to support *Thrive MSP 2040*. The *Housing Policy Plan* provides an integrated policy framework to address housing challenges greater than any one city or county can tackle alone.

Consistent with state statute (Minn. Stat. 473.859, subd. 2(c) and subd. 4), communities must include a housing element and implementation program in their local comprehensive plans that address existing and projected housing needs.

The Council has also determined the regional need for low and moderate income housing for the decade of 2021-2030 (see Part III and Appendix B in the Housing Policy Plan).

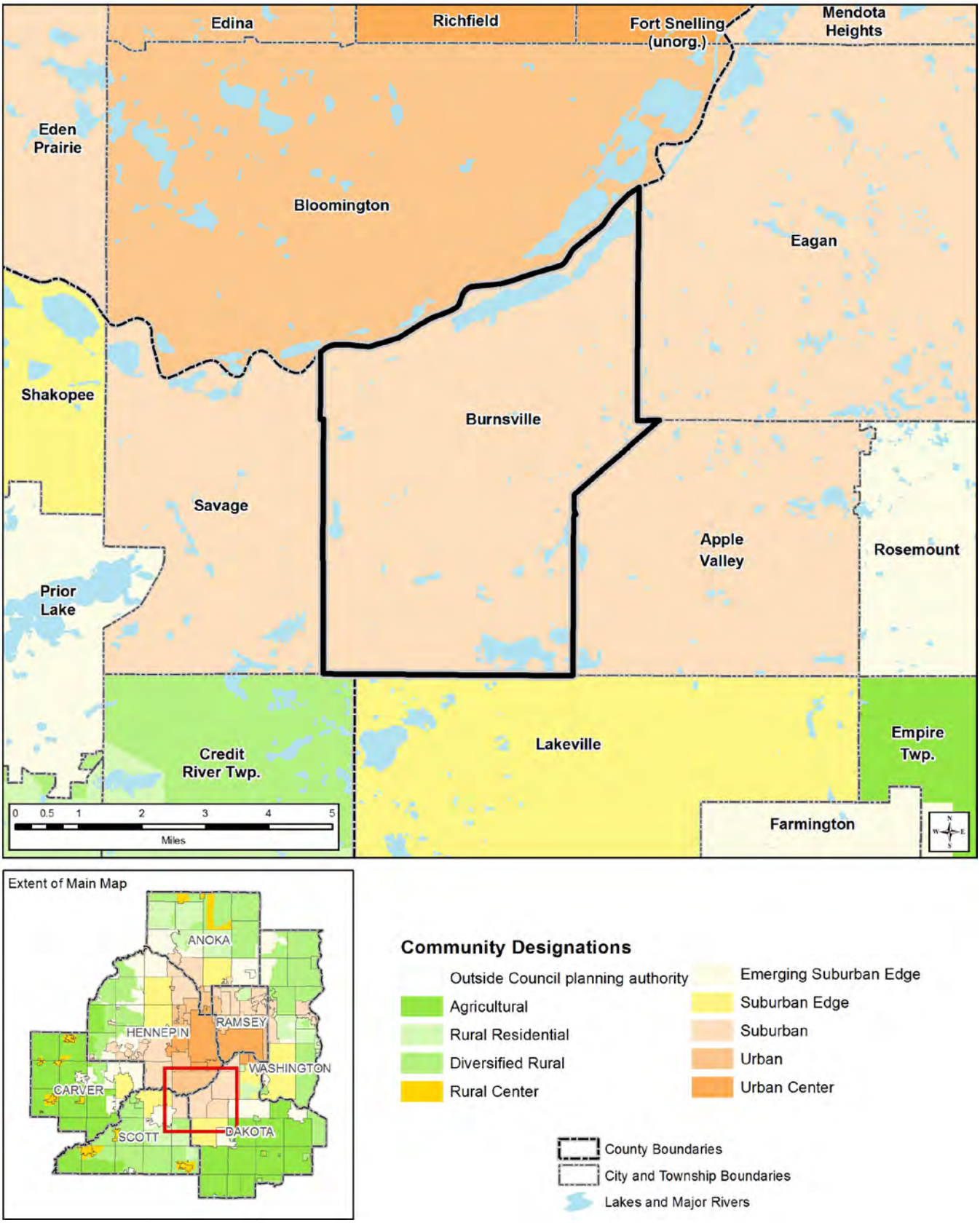
Burnsville's share of the region's need for low and moderate income housing is 266 new units affordable to households earning 80% of area median income (AMI) or below. Of these new units, the need is for 127 affordable to households earning at or below 30% of AMI, 69 affordable to households earning 31% to 50% of AMI, and 70 affordable to households earning 51% to 80% of AMI.

Affordable Housing Need Allocation for Burnsville

At or below 30% AMI	127
31 to 50% AMI	69
51 to 80% AMI	70
Total Units	**266**

Specific requirements for the housing element and housing implementation programs of local comprehensive plans can be found in the *Local Planning Handbook*.

Figure 1. Burnsville Community Designation



TRANSPORTATION SYSTEM STATEMENT

City of Burnsville

The *2040 Transportation Policy Plan (TPP)* is the metropolitan system plan for highways, transit, and aviation to which local comprehensive plans must conform. This system statement summarizes significant changes to these three systems, as well as other changes made to the *Transportation Policy Plan* since the last *2030 TPP* was adopted in 2010, and highlights those elements of the system plan that apply specifically to your community. The *TPP* incorporates the policy direction and the new 2040 socio economic forecasts adopted by the Metropolitan Council in the *Thrive MSP 2040*, and extends the planning horizon from 2030 to 2040.

Federal Requirements

The *TPP* must respond to requirements outlined in state statute, as well as federal law, such as some new requirements included in the federal law known as the Moving Ahead for Progress in the 21st Century Act (MAP-21). For instance, metropolitan transportation plans must now be performance based, so the *TPP* now includes goals, objectives, and strategies outlined in chapter 2. In previous versions of the *TPP* the strategies were known as policies; while some are new, the wording of many strategies are similar to the wording of policies in previous plans. Performance measurements for this plan are also discussed in Chapter 12, Federal Requirements.

Federal law requires the long range plan to identify regionally significant transportation investments expected to be made over the next two decades, and to demonstrate that these planned investments can be afforded under the plan's financial assumptions. Both costs and available revenues have changed since the last plan was adopted in 2010, resulting in many changes in the plan. Federal law does allow the plan to provide a vision for how an increased level of transportation revenue might be spent if more resources become available, but the programs or projects identified in this scenario are not considered part of the approved plan.

The *TPP* includes two funding scenarios for the metropolitan highway and transit systems: the "Current Revenue Scenario" and the "Increased Revenue Scenario."

- The **Current Revenue Scenario** represents the fiscally constrained regional transportation plan, which assumes revenues that the region can reasonably expect to be available based on past experience and current laws and allocation formulas.
- The **Increased Revenue Scenario** represents an illustration of what be achieved with a reasonable increase in revenues for transportation.

Under the Metropolitan Land Planning Act, local comprehensive plans are expected to conform to the Current Revenue Scenario, which is the official metropolitan system plan. Potential improvements in the Increased Revenue Scenario can be identified separately in local plans as unfunded proposals. A more detailed description of how to handle the various improvements in this category is included under Other Plan Considerations.

In addition to reviewing this system statement, your community should consult the entire *2040 Transportation Policy Plan* to ensure that your community's local comprehensive plan and plan amendments conform to the metropolitan transportation system plan. Chapter 3, Land Use and Local Planning, has been expanded and all communities should carefully review this chapter. A PDF file of

the entire *2040 Transportation Policy Plan* can be found at the Metropolitan Council's website: *http://www.metrocouncil.org/Transportation/Planning-2/Key-Transportation-Planning-Documents/Transportation-Policy-Plan-(1)/The-Adopted-2040-TPP-(1).aspx*. The format of the plan is slightly different than past *Transportation Policy Plans*. An introductory Overview, Chapter 1: Existing System and Chapter 10: Equity and Environmental Justice have been added to this version of the *TPP*, in addition to the changes noted in the first paragraph. Please note some modifications have been made to the appendices as well.

Key Changes in the *2040 Transportation Policy Plan*

Adopted by the Metropolitan Council in January 2015, the revised *2040 Transportation Policy Plan* incorporates the following changes:

Metropolitan Highway System - Chapter 5

The Metropolitan Highway System is made up of principal arterials, shown in Fig 1-1 of the *TPP* and also attached to this system statement. Although no new highways have been added to this system in the *2040 TPP*, the last incomplete segment of this system, TH 610, is now under construction in Maple Grove.

- The *TPP* acknowledges that congestion cannot be eliminated or greatly reduced. The region's mobility efforts will need to focus on managing congestion and working to provide alternatives. The majority of resources available between now and 2040 will be needed for preservation, management and operation of the existing highway system.

- Due to increased costs and decreased revenue expectations, many long-planned major projects to add general purpose highway lanes are not in this fiscally constrained plan. While the preservation, safety, and mobility needs of these corridors are recognized, investments in these corridors will be focused on implementing traffic management strategies, lower cost-high benefit spot mobility improvements, and implementing MnPASS lanes. Some specific projects have been identified in this plan, but funding has primarily been allocated into various investment categories rather than specific projects. The highway projects specifically identified in the Current Revenue Scenario are shown in Figure 5-8 of the *TPP* which is also attached to this system statement.

- Modifications were made to *Appendix D - Functional Classification Criteria*, and Appe*ndix F – Highway Interchange Requests*. *Appendix C – Project List* is new and contains all of the transit and highway projects that have been identified between 2014 and 2023.

Transit System - Chapter 6

The transit system plan provides an overview of the basic components of transit planning, including demographic factors, transit route and network design factors and urban design factors that support transit usage. Local governments have the primary responsibility for planning transit-supportive land use, through their comprehensive planning, and subdivision and zoning ordinances.

- The *TPP* includes updated Transit Market Areas (shown in *TPP* Figure 6-3, also attached) which reflect 2010 Census information and an updated methodology that better aligns types and levels of transit service to expected demand. These market areas identify the types of transit services that are provided within each area.

- The *TPP* includes limited capital funding for transit expansion and modernization. Opportunities primarily exist through competitive grant programs such as the regional solicitation for US DOT

funding. These opportunities are guided by the strategies in the *TPP* and the various elements of the Transit Investment Plan.

- The *TPP* includes an updated transitway system plan that more clearly articulates which projects can be funded within reasonable revenue expectations through year 2040 (Current Revenue Scenario as shown in *TPP* Figure 6-8, which is also attached). The plan includes five new or expanded METRO lines, three new arterial bus rapid transit lines, and three corridors under study for mode and alignment but identified in the Counties Transit Improvement Board's (CTIB) Phase I Program of Projects. This system was developed in collaboration with CTIB, a major partner in regional transitway expansion.

- The *TPP* does not include operating funding for transit service expansion beyond the existing network of regular route bus, general public dial-a-ride, and Metro Vanpool.

- The Increased Revenue Scenario (shown *TPP* Figure 6-9, which is also attached) illustrates the level of expansion for the bus and support system and transitway system that might be reasonable if additional revenues were made available to accelerate construction of the transitway vision for the region.

- The plan includes updated requirements and considerations for land use planning around the region's transit system. This includes new residential density standards for areas near major regional transit investments and an increased emphasis on proactive land use planning in coordination with the planning of the transit system.

Aviation System - Chapter 9

The Metropolitan Aviation System is comprised of nine airports (shown in Figure 1-9 of the *TPP* and also attached to this system statement) and off-airport navigational aids. There are no new airports or navigational aids that have been added to the system in the *2040 TPP*.

- The *TPP* discusses the regional airport classification system as well as providing an overview of roles and responsibilities in aviation for our regional and national partners. The investment plan in includes an overview of funding sources for projects, and an overview of projects proposed for the local airports that will maintain and enhance the regional airport system.

- Modifications were made to *Appendix I – Regional Airspace, Appendix J – Metropolitan Airports Commission Capital Investment Review Process, Appendix K – Airport Long Term Comprehensive Plans and Appendix L – Aviation Land Use Compatibility.*

Other Plan Changes

Regional Bicycle Transportation Network - Chapter 7

The *2040 TPP* encourages the use of bicycles as a mode of transportation. To that end, the *TPP* establishes for the first time a Regional Bicycle Transportation Network (RBTN). The goal of the RBTN is to establish an integrated seamless network of on-street bikeways and off-road trails that complement each other to most effectively improve conditions for bicycle transportation at the regional level. Cities, counties, and parks agencies are encouraged to plan for and implement future bikeways within and along these designated corridors and alignments to support the RBTN vision.

Freight - Chapter 8

Most aspects of freight movement are controlled by the private sector, so unlike other sections of the *TPP*, there is not a specific plan adopted for future public sector investment in freight facilities. However, the discussion of the need for a safe and efficient multimodal freight system has been updated and expanded in the *TPP* to recognize challenges and opportunities for freight movement as well as the future direction of freight by mode. It acknowledges the closure of the Minneapolis Upper Harbor in 2015, leaving St Paul and Shakopee as the region's major barge terminal areas in the future. The plan also acknowledges the increase of trains since 2010 carrying oil from North Dakota on BNSF and CP rail tracks, which is expected to continue into the future. Although railroad trackage in the region was significantly decreased over the last 20 years to "right size" the system after federal deregulation, communities should not expect much additional rail abandonment. Many tracks that appear to be seldom used are owned by the smaller Class III railroads that serve local businesses by providing direct rail connections from manufacturing and warehousing/distribution facilities to the major national railroads. The major Class I railroads are approaching capacity and actually adding tracks in some locations.

System Plan Considerations Affecting Your Community

Burnsville should consult the complete *2040 Transportation Policy Plan* in preparing its local comprehensive plan. In addition, Burnsville should consult *Thrive MSP 2040* and the current version of the Metropolitan Council's *Local Planning Handbook* for specific information needed in its comprehensive plan. Specific system plan considerations affecting Burnsville are detailed below.

Metropolitan Highways

There are five principal arterials located within Burnsville: I-35, I-35E, I-35W, TH 13, and CR 42. The *TPP* does not identify any specific regional mobility improvements on these highways, although maintenance and preservation investments will be made on all highways.

Transit System

Burnsville includes the following Transit Market Areas:

Transit Market Area	Market Area Description and Typical Transit Services
Market Area III	Transit Market Area III has moderate density but tends to have a less traditional street grid that can limit the effectiveness of transit. It is typically Urban with large portions of Suburban and Suburban Edge communities. Transit service in this area is primarily commuter express bus service with some fixed-route local service providing basic coverage. General public dial-a-ride services are available where fixed-route service is not viable.
Emerging Market Areas II or III	The Emerging Market Overlay identifies locations within Transit Market Areas III and IV that have a higher potential for transit usage than the rest of the market areas surrounding them. These areas are currently too small or non-contiguous to support a higher level of transit service. Focusing growth in and around these areas to connect to other areas of higher potential transit use will present good opportunities for future transit improvement.

Burnsville should identify and map existing transit services and facilities in the local comprehensive plan. Burnsville should also work with transit providers serving their community to identify potential future transit service options and facilities that are consistent with the *TPP* and the applicable Transit

Market Areas. Communities can find further maps and guidance for transit planning in the Transportation section of the *Local Planning Handbook*.

Transitways

Current Revenue Scenario Transitways

Burnsville should acknowledge in your local comprehensive plan the transitway investments planned for your community in the Current Revenue Scenario (*TPP* Figure 6-8). Burnsville includes the Orange Line transitway with a mode and alignment adopted in the *TPP*.

Burnsville should also identify potential stations along planned transitways (once identified) and adopt guiding land use policies, station-area plans, and associated zoning, infrastructure, and implementation tools that support future growth around transit stations consistent with Chapter 3 - Land Use and Local Planning from the *TPP* and consistent with the project phase of development. Communities can find further guidance for station-area planning in the Transportation section of the *Local Planning Handbook* and the *Transit Oriented Development Guide*. The Transportation section of the *Local Planning Handbook* also includes a map of existing, planned, and proposed transitway stations throughout the region and the planning status of these stations that should be reflected in Comprehensive Plans.

Increased Revenue Scenario Transitways

The *TPP* Increased Revenue Scenario shows additional transitway corridors beyond the scope of the plan's adopted and fiscally constrained Transit Investment Plan (the Current Revenue Scenario). These corridors are listed on page 6.63 of the *TPP*, and *TPP* Figure 6-9, which is attached, shows the complete transitway vision for the region.

If Burnsville believes it might be directly impacted by transitways in the Increased Revenue Scenario (for example, because they are participating in transitway corridor studies or feasibility analyses), the transitways may be acknowledged in the Comprehensive Plan. These additional corridors are or will be under study for mode and alignment recommendations, but they are not included in fiscally constrained plan. However, they should be clearly identified as not funded within the currently expected resources for transitways. The Council recognizes the important planning work that goes into a corridor prior to it becoming part of the region's Transit Investment Plan, especially if increased revenues were to become available.

Similar to Current Revenue Scenario Transitways, communities should identify known potential stations along planned transitways and consider guiding land use policies, station area plans, and associated zoning, infrastructure, and implementation tools that support future growth around transit stations. These policies can also influence station siting in initial planning phases of transitway corridors and influence the competitiveness of a transitway for funding. Communities can find further guidance for station area planning in the Transportation section of the *Local Planning Handbook* and the *Transit Oriented Development Guide*.

Aviation

All communities must include an aviation element in the transportation sections of their comprehensive plans. The degree of aviation planning and development considerations that need to be included in the comprehensive plan varies by community. Even those communities not impacted directly by an airport have a responsibility to include airspace protection in their comprehensive plan. The protection element should include potential hazards to air navigation including electronic interference.

Burnsville is within the influence area of Minneapolis-St. Paul International Airport and Airlake Airport. The long term comprehensive plan (LTCP) for these airports shown in Appendix K of the *2040 TPP* has

not changed from the LTCP included in the 2030 *TPP* adopted by the Metropolitan Council in 2010. However, updated LTCP's are anticipated prior to 2018. Communities influenced by these airports should review the LTCP to assure that the updated comprehensive plan developed by the community remains consistent with the airport plans. Consult the *Local Planning Handbook* for specific comprehensive planning requirements and considerations such as airport zoning, noise and other environmental mitigation, airport development and economic impacts, ground access needs, infrastructure requirements, and general land use compatibility.

Other Plan Considerations

Regional Bicycle Transportation Network

TPP Figure 7-1 shows the RBTN as established for the first time in the *2040 TPP*. The network consists of a series of prioritized Tier 1 and Tier 2 corridors and dedicated alignments (routes). The process used to develop the RBTN, as well as the general principles and analysis factors used in its development, can be found in the Bicycle and Pedestrian Chapter of the *TPP*.

The RBTN corridors and alignments make up the "trunk arterials" of the overall system of bikeways that connect to regional employment and activity centers. These are not intended to be the only bicycle facilities in the region, and local units should also consider planning for any additional bike facilities desired by their communities. RBTN corridors are shown where more specific alignments within those corridors have not yet been designated, so local governments are encouraged to use their comprehensive planning process to identify suitable alignments within the RBTN corridors for future incorporation into the *TPP*.

In addition, agencies should plan their local on and off-road bikeway networks to connect to the designated Tier 1 and Tier 2 alignments, as well as any new network alignments within RBTN corridors to be proposed in local comprehensive plans. Bikeway projects that complete segments of, or connect to, the RBTN are given priority for federal transportation funds through the Transportation Advisory Board's biannual regional solicitation.

Figure 7-1 shows that your community currently has one or more RBTN corridors and alignments within its jurisdiction. The Council encourages local governments to incorporate the RBTN map within their local bicycle plan maps to show how the local and regional systems are planned to work together. An on-line interactive RBTN map, which allows communities to view the RBTN links in their community at a much more detailed scale than Figure 7-1, can be found in the Transportation section of the *Local Planning Handbook*. The handbook also includes best practices, references, and guidance for all local bicycle planning.

A Minor System / Functional Classification

The *TPP* has always recognized the A minor arterial system as an important supplement to the regional highway system, and the Transportation Advisory Board (TAB) continues to maintain the official regional map of these roads. The *2040 TPP* does include an updated functional classification map (Fig. 1-2 in Chapter 1) and a modified *Appendix D - Functional Classification Criteria.* Communities should consult the Local Plan Handbook for more information on functional classification, how to reflect the A minor arterial system in their plan, and how to request functional classification changes if necessary.

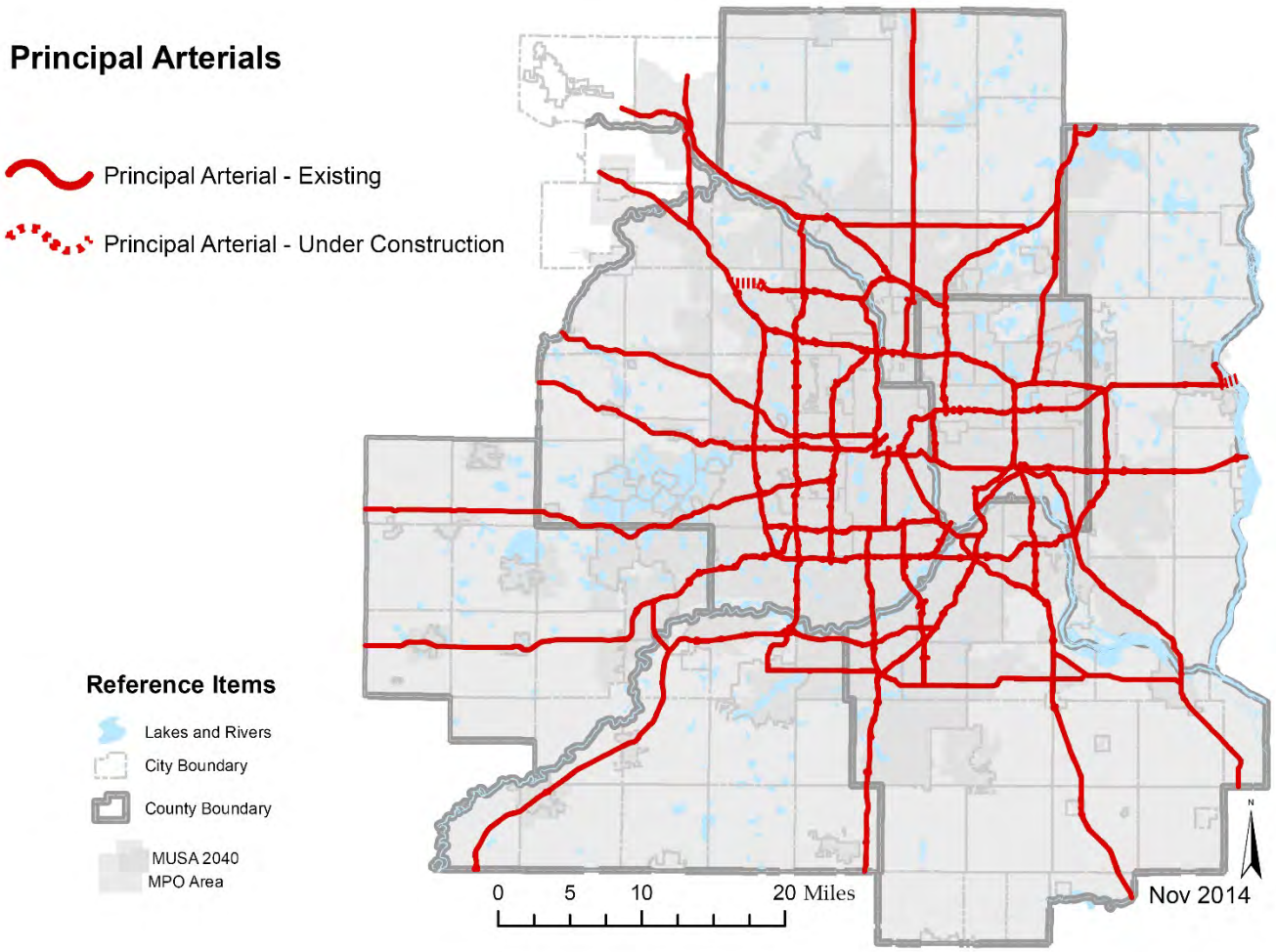
Freight

The Council encourages all local governments to plan for freight movement in their communities. Trucks are the major mode of freight movement in the region and across the nation to distribute

consumer goods as well as move manufactured goods and commodities, and they operate in every community.

Communities with special freight facilities shown on *TPP* Figure 8-1, Metropolitan Freight System, (attached) should also include those additional modes and facilities in their local plan, and plan for compatible adjacent land uses.

Figure 1-1 of the TPP



2040 TRANSPORTATION POLICY PLAN | METROPOLITAN COUNCIL

Figure 1-1

METROPOLITAN COUNCIL

Figure 1-2 of the TPP

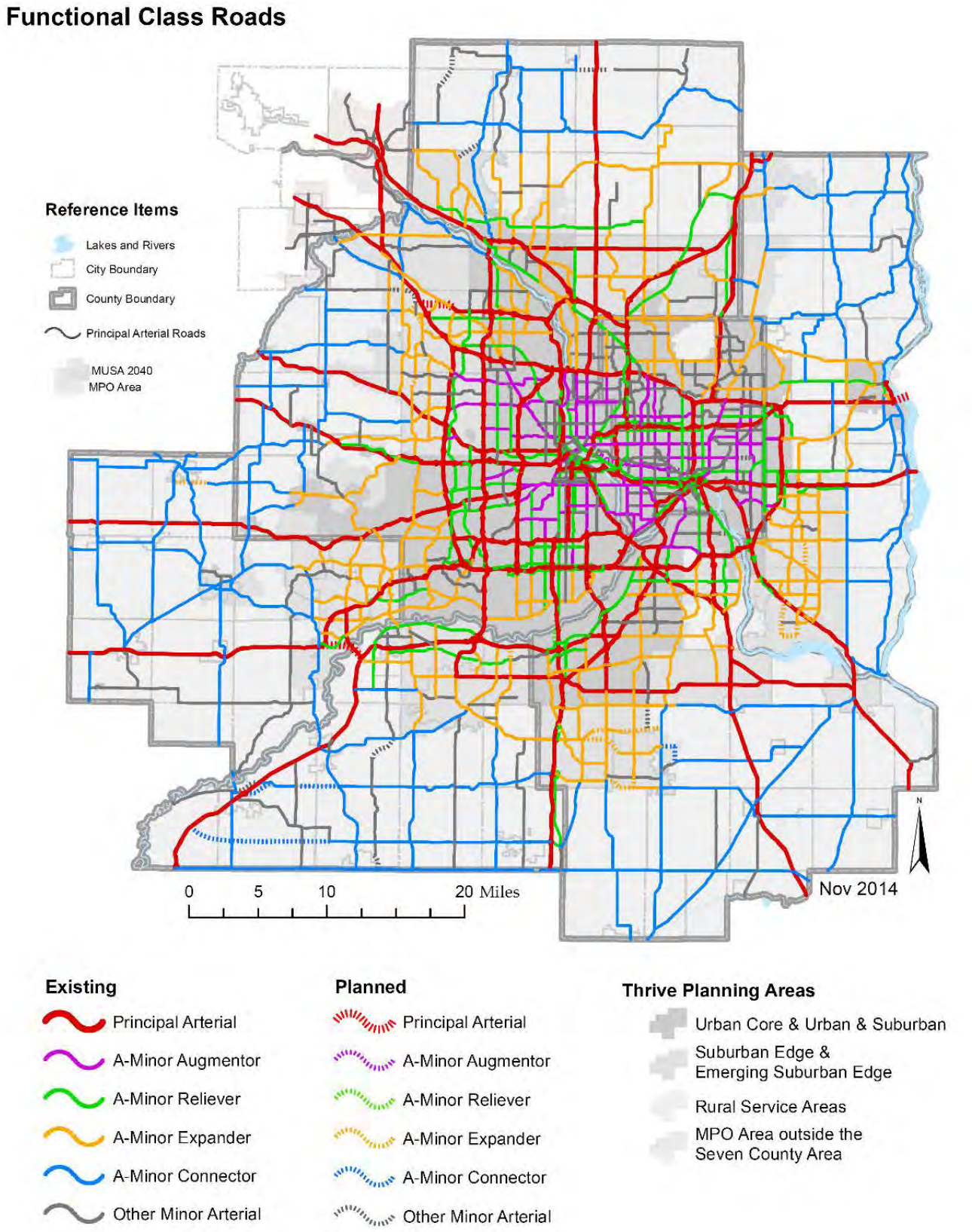


Figure 5-8 of the TPP

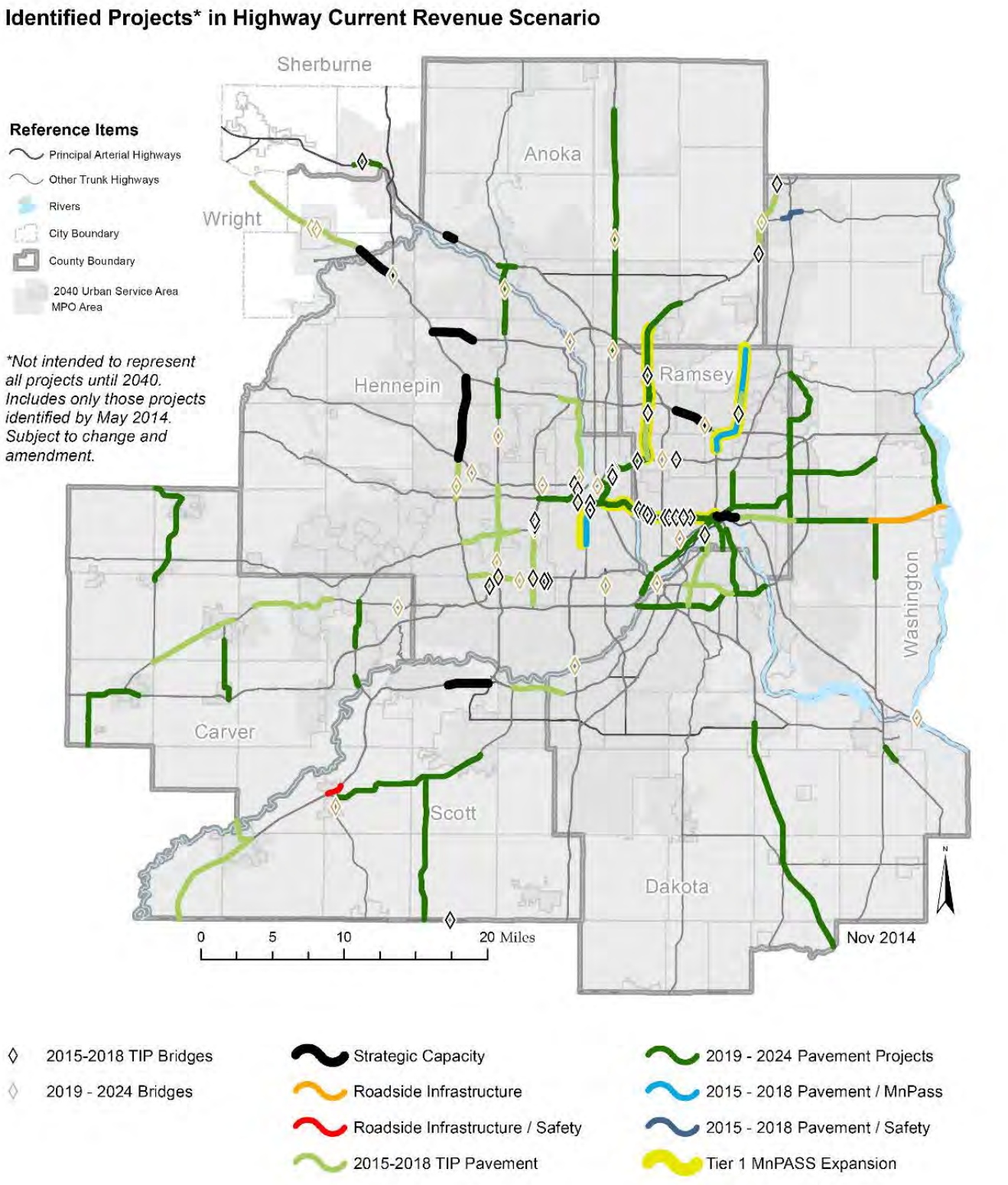


Figure 6-3 of the TPP

Transit Market Areas

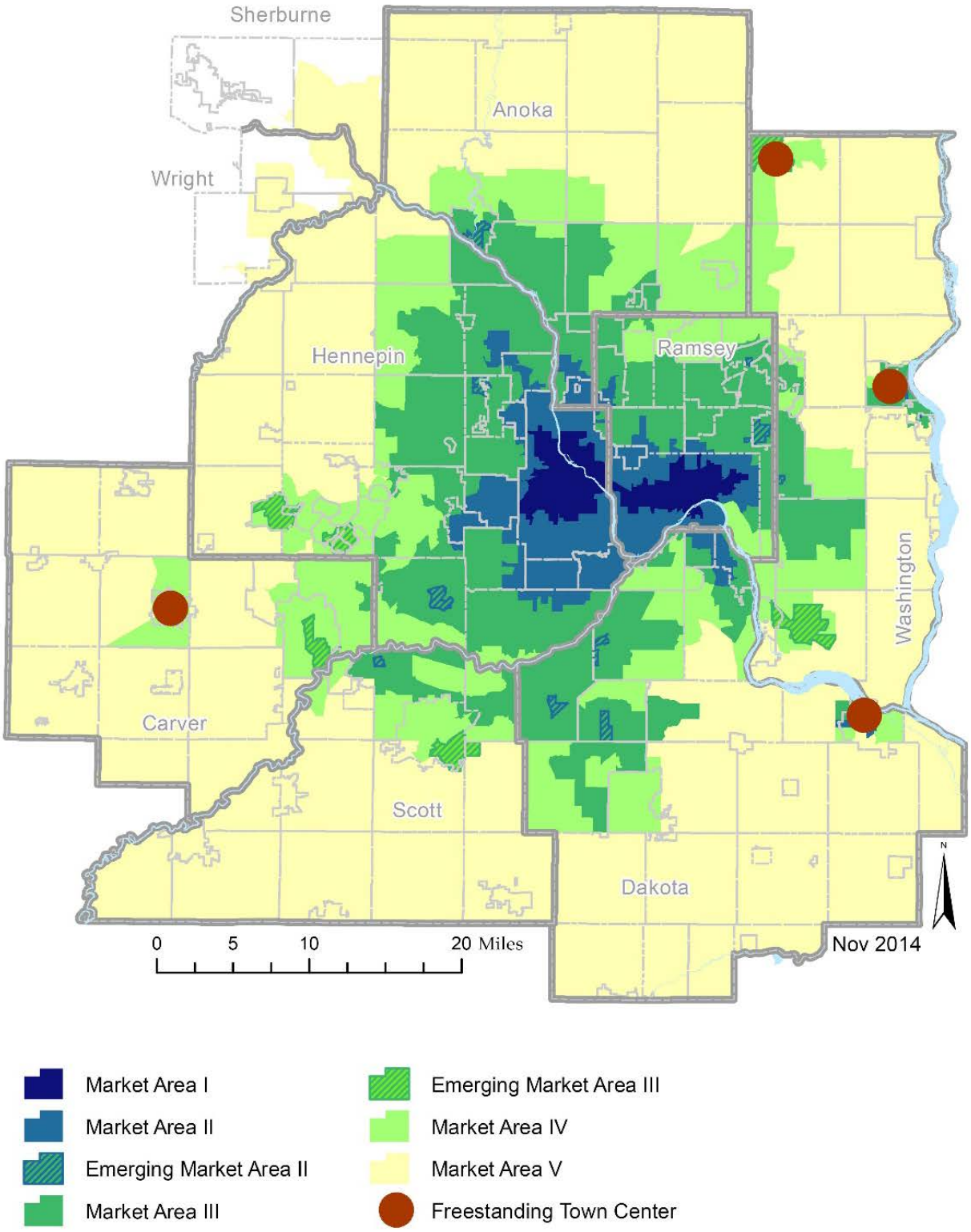


Figure 6-8 of the TPP

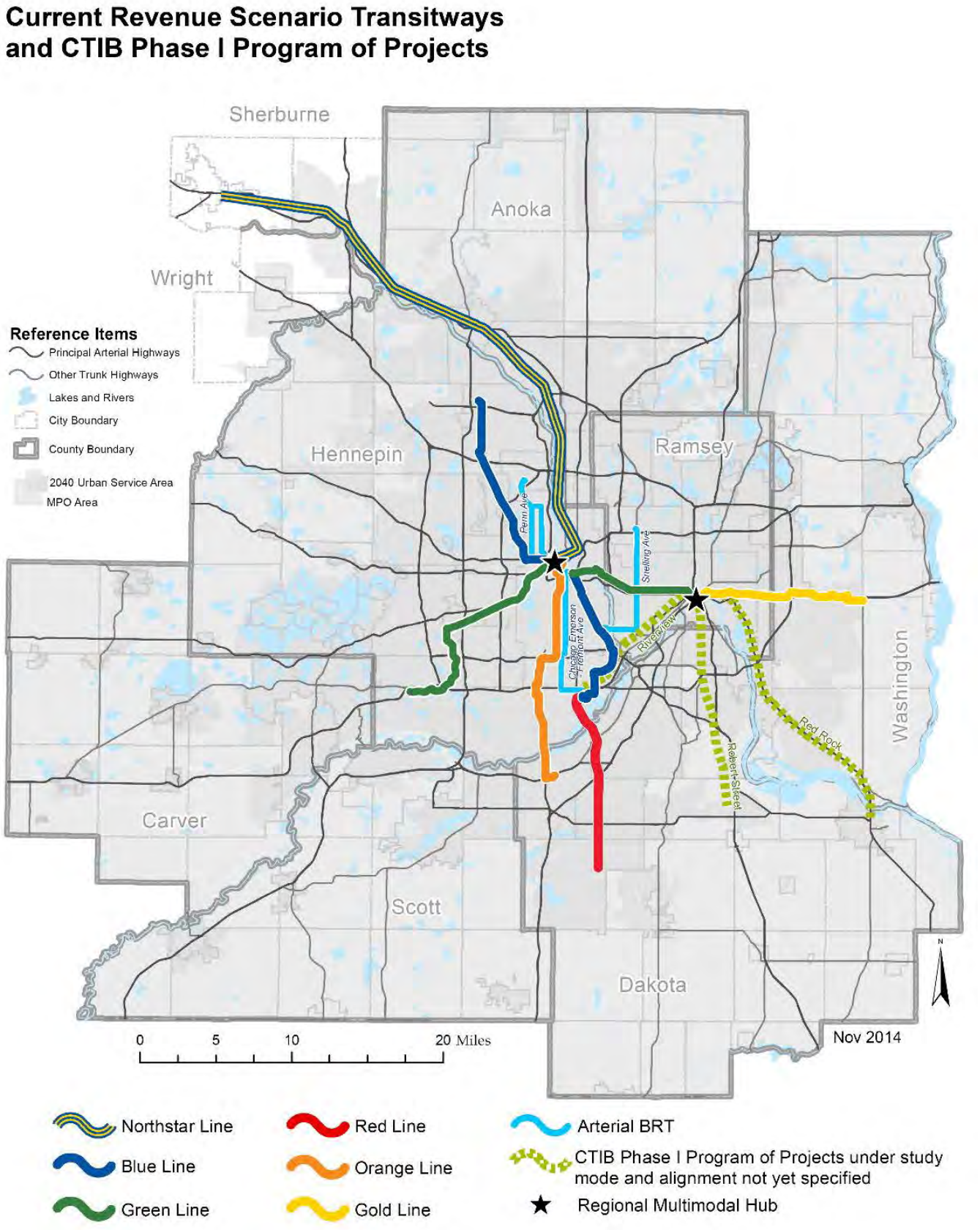


Figure 6-9 of the TPP

Increased Revenue Scenario Transitways

Building an Accelerated Transitway Vision

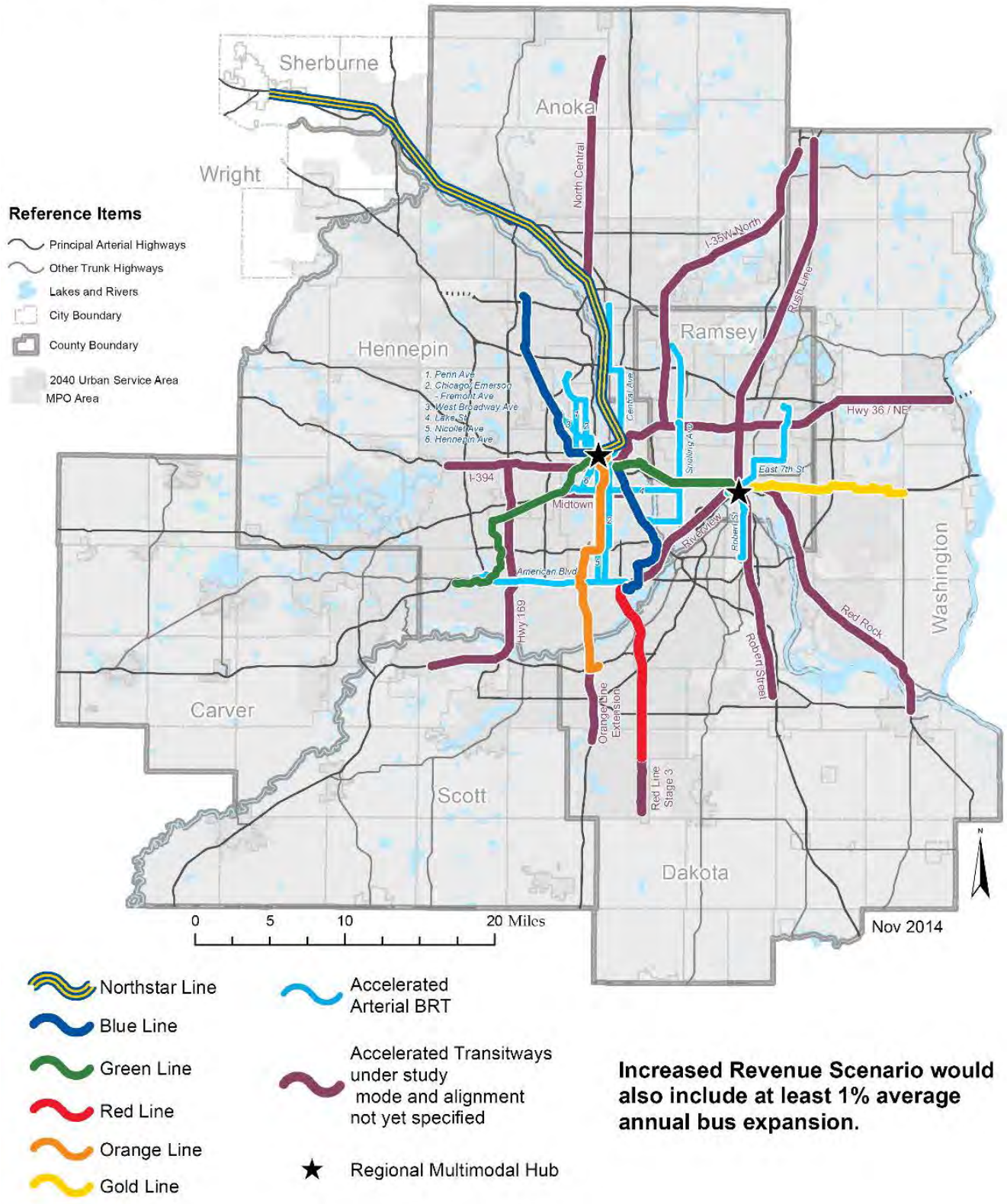


Figure 7-1 of the TPP

Regional Bicycle Transportation Network Vision

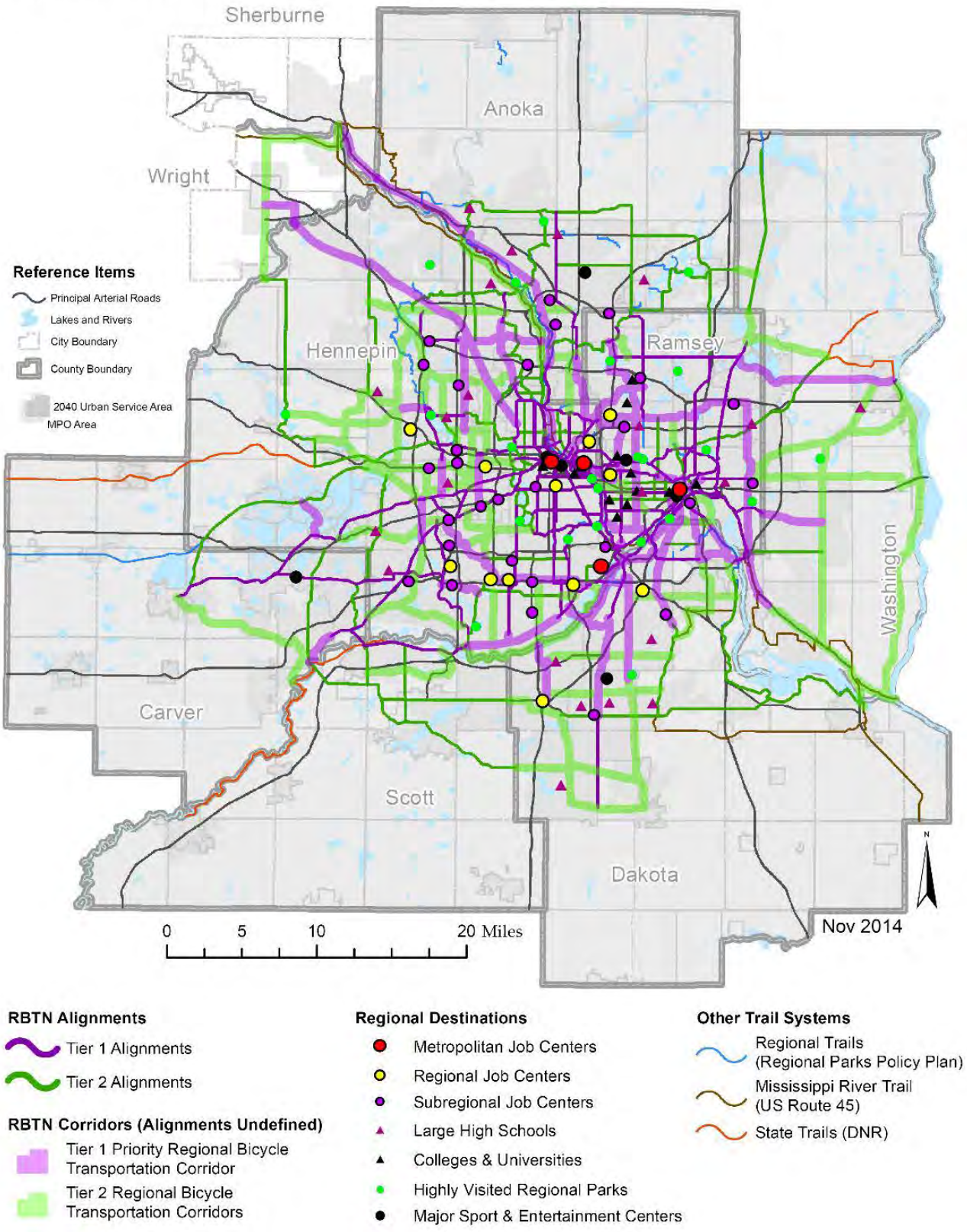


Figure 8-1 of the TPP

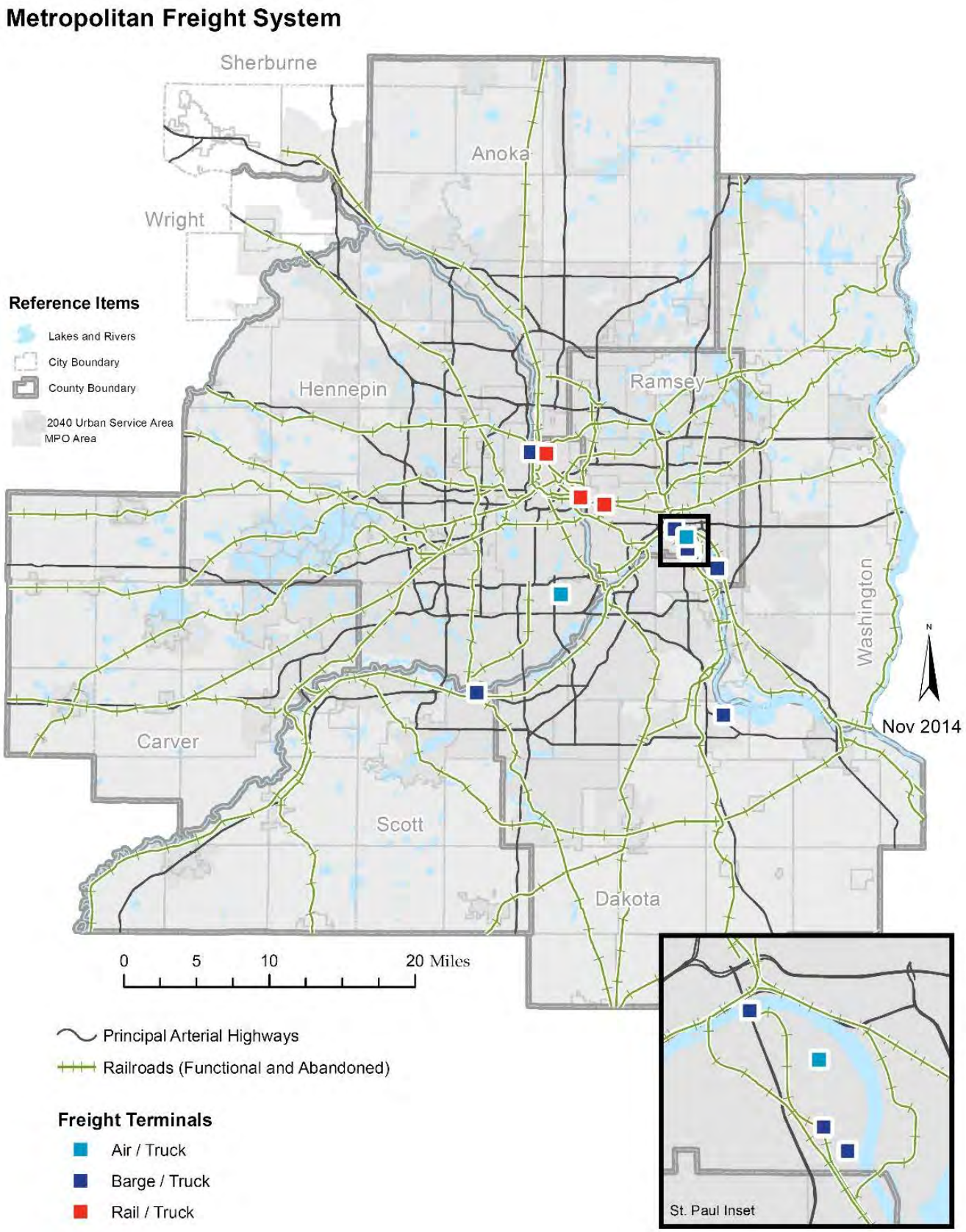
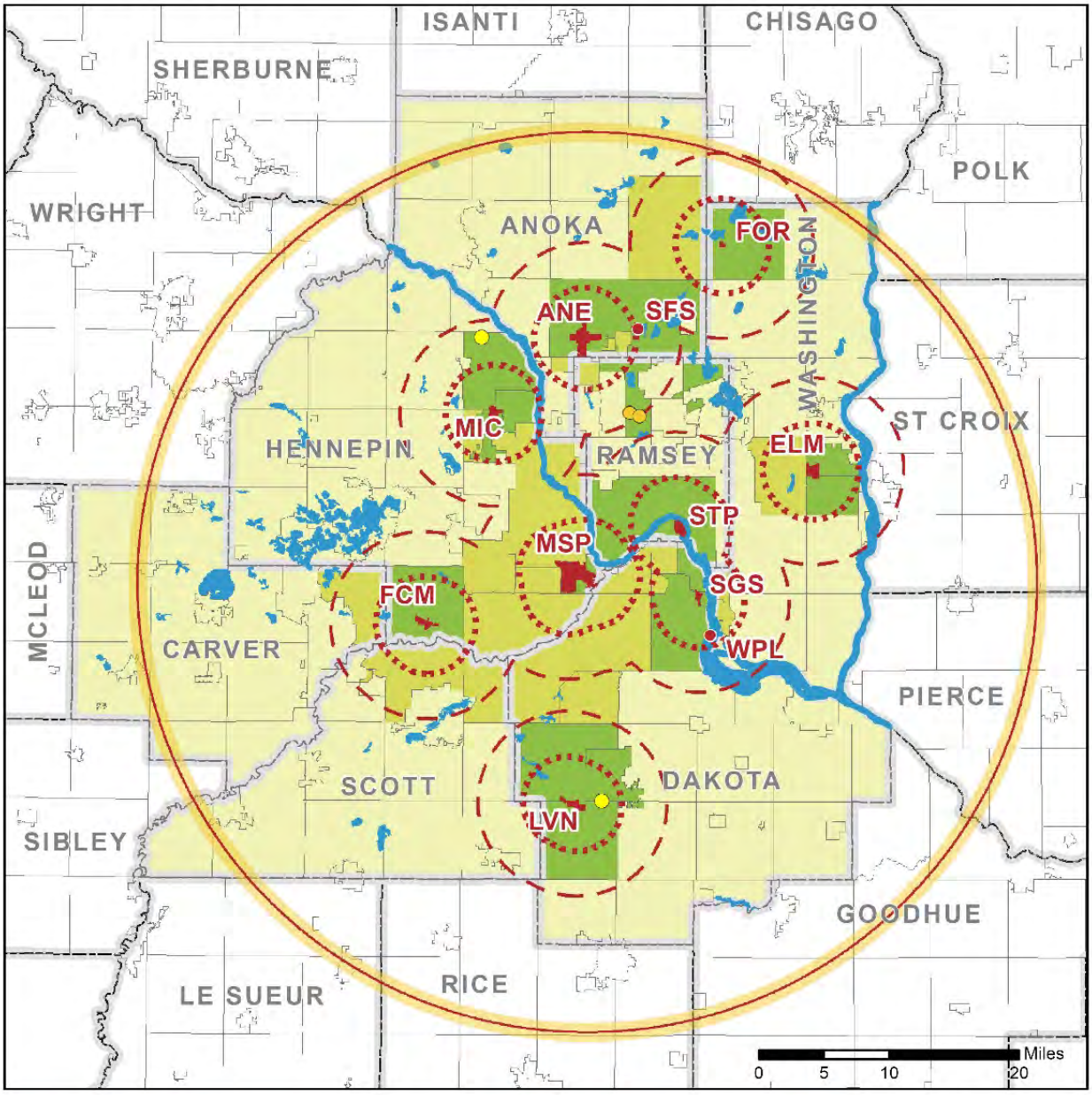


Figure 9-1 of the TPP

Airport Service Areas



Public Owned Public Use Airport

Airport Compatibility Area
(3 NM's – Noise, Zoning, Infrastructure)
(6 NM's – Landfills, Wind Towers)

MSP Minneapolis – St. Paul International Airport *(Wold-Chamberlain Field)*

STP St. Paul Downtown Airport *(Holman Field)*

ANE Anoka County – Blaine Airport *(Janes Field)*

FCM Flying Cloud Airport

MIC Crystal Airpot

SGS South St. Paul Airport *(Fleming Field)*

ELM Lake Elmo Airport

LVN Airlake Airport

FOR Forest Lake Airport

Privately Owned Public Use Airport

SFS Surf-Side Seaplane Base *(Rice Lake)*

WPL Wipline Seaplane Base *(Miss. River)*

Minneapolis Class-B Airspace Boundary

Permitted Seaplane Surface Waters *(within 7 County Area only)*

VOR Protection Zone

Tall Tower Areas

Aviation Facility Located in Community

Community Directly Affected by Facility(s)

General Airspace Notification/Protection

WATER RESOURCE REQUIREMENTS/ WASTEWATER SYSTEM STATEMENT

City of Burnsville

The *2040 Water Resources Policy Plan* includes policies and strategies to achieve the following goal:

> *To protect, conserve, and utilize the region's groundwater and surface water in ways that protect public health, support economical growth and development, maintain habitat and ecosystem health, and provide for recreational opportunities, which are essential to our region's quality of life.*

The Policy Plan takes an integrated approach to water supply, water quality, and wastewater issues. This approach moves beyond managing wastewater and stormwater only to meet regulatory requirements by viewing wastewater and stormwater as resources, with the goal of protecting the quantity and quality of water our region needs now and for future generations.

The Policy Plan includes policies and strategies to:

- Maximize regional benefits from regional investments in the areas of wastewater, water supply and surface water.
- Pursue reuse of wastewater and stormwater to offset demands on groundwater supplies.
- Promote greater collaboration, financial support, and technical support in working with partners to address wastewater, water quality, water quantity and water supply issues.
- Implement environmental stewardship in operating the regional wastewater system by reusing wastewater, reducing energy use and air pollutant emissions, and reducing, reusing, and recycling solid waste.

Key Concepts in the *2040 Water Resources Policy Plan*

Adopted by the Metropolitan Council in May 2015, the *2040 Water Resources Policy Plan* is the metropolitan system plan for metropolitan wastewater services with which local comprehensive plans must conform. The Policy Plan incorporates the following changes*:*

- Centers on and around an integrated approach to water supply, wastewater, and surface water planning.
- Promotes the investigation of the issues and challenges in furthering our work in water conservation, wastewater and stormwater reuse, and low impact development practices in order to promote a more sustainable region.
- Promotes the concept of sustainable water resources where, through collaboration and cooperation, the region will take steps to manage its water resources in a sustainable way aimed at:
  - Providing an adequate water supply for the region
  - Promoting and implementing best management practices that protect the quality and quantity of our resources
  - Providing efficient and cost effective wastewater services to the region
  - Efficiently addressing nonpoint and point sources pollution issues and solutions, and,
  - Assessing and monitoring lakes, rivers, and streams so that we can adequately manage, protect, and restore our valued resources.
- Continues the Council's position that communities that permit the construction and operation of subsurface sewage treatment systems and other private wastewater treatment systems are

responsible for ensuring that these systems are installed, maintained, managed and regulated consistent with Minnesota Rules Chapter 7080-7083.
- Includes requirements in Appendix C for comprehensive sewer plans, local water plans, and local water supply plans.
- Establishes inflow and infiltration goals for all communities served by the regional wastewater system and requires all communities to include their inflow and infiltration mitigation programs in their comprehensive sewer plan.
- Works with the State to attempt to (1) make funds available for inflow and infiltration mitigation, and (2) promote statutes, rules, and regulations to encourage I/I mitigation.

Burnsville should consult the complete Policy Plan in preparing its local comprehensive plan. In addition, Burnsville should consult *Thrive MSP 2040* and the *Local Planning Handbook* for specific information needed in its comprehensive plan.

System Plan Considerations Affecting Your Community

Metropolitan Sewer Service

Under state law (Minn. Stat. 473.513) local governments are required to submit both a wastewater plan element to their comprehensive plan as well as a comprehensive sewer plan describing service needs from the Council. Specific requirements for the sewer element of your comprehensive plan can be found in the Water Resources section of the *Local Planning Handbook*.

Forecasts

The forecasts of population, households, employment, and wastewater flows for Burnsville as contained in the adopted *2040 Water Resources Policy Plan* can be found at: *http://www.metrocouncil.org/Wastewater-Water/Planning/2040-Water-Resources-Policy-Plan.aspx* and on your Community Page in the *Local Planning Handbook*. These forecasts are for sewered development. The sewered housing forecasts were estimated using SAC data, annual city reports, current trends, existing and future local wastewater service areas and other information relating to your community. The wastewater flows are based on historical wastewater flow data, future projected wastewater generation rates, and the projected sewered population and employment data.

The Council will use these growth and wastewater flow forecasts to plan future interceptor and treatment works improvements needed to serve your community. The Council will not design future interceptor improvements or treatment facilities to handle peak hourly flows in excess of the allowable rate for your community. Burnsville, through its comprehensive planning process, must decide the location and staging of development, and then plan and design its local wastewater collection system to serve this development. The Council will use its judgment as to where to assign growth within your community to determine regional system capacity adequacy. If Burnsville wishes to identify specific areas within the community to concentrate its growth, it should do so within its Comprehensive Sewer Plan.

You should also note that urban development at overall densities that are substantially lower than those identified for your community in the Community Designation Section of this Systems Statement will also be analyzed by the Council for their potential adverse effects on the cost of providing metropolitan sewer service.

Description of the Metropolitan Disposal System Serving Your Community

Figure 1 shows the location of the Metropolitan Disposal System (MDS) serving your community. Wastewater flow from Burnsville is treated at the Seneca WWTP.

Description of the Regional Inflow/Infiltration (I/I) Program

The *2040 Water Resources Policy Plan* states that the Council will establish I/I goals for all communities discharging wastewater to the MDS. Communities that have excessive I/I in their sanitary sewer systems will be required to eliminate excessive I/I. The Council will continue the implementation of its on-going I/I reduction program. Communities identified through the program as needing to eliminate excessive I/I will be required to submit a work plan that details work activities to identify and eliminate sources of I/I. The Council can limit increases in service within those communities having excess I/I that do not demonstrate progress in reducing their excess I/I. The Council will meet with the community and discuss this alternative before it is implemented.

It is required that those communities that have been identified as contributors of excessive I/I, and that have not already addressed private property sources, do so as part of their I/I program. Significant work has been accomplished on the public infrastructure portion of the wastewater system. The Council will pursue making funds available through the State for I/I mitigation, and promote statutes, rules and regulations to encourage I/I mitigation.

Management of Subsurface Sewage Treatment Systems (SSTS) and Private Systems

The Metropolitan Land Planning Act requires the sewer element of the local comprehensive plan to describe the standards and conditions under which the installation of subsurface sewage treatment systems and other private wastewater treatment systems will be permitted and to the extent practicable, the areas not suitable for public or private systems.

The appropriate density for development with subsurface sewage treatment systems depends on the suitability of the soils to treat wastewater and whether space is available for a primary and back up drainfield. It is the Council's position that all municipalities and counties allowing subsurface sewage treatment systems should incorporate current MPCA regulations (Minn. Rules Chapter 7080-7083) as part of a program for managing subsurface sewage treatment systems in the sewer element of their local comprehensive plan and implement the standards in issuing permits.

Burnsville should adopt a management program consistent with state rules. An overview of Burnsville's management program must be included in the community's local comprehensive plan update. If adequate information on the management program is not included; the comprehensive plan will be found incomplete for review until the required information is provided to the Council. Specific requirements for the local comprehensive plan can be found in the *Local Planning Handbook*.

Small private treatment plants are located throughout the Metropolitan Area serving such developments as individual industries, mobile home parks, and other urban type uses. The Council's position is that such private wastewater treatment plants should be permitted only if they are in areas not programmed for metropolitan sewer service in the future and they are provided for in a community's comprehensive plan that the Council has approved. Furthermore, the community is responsible for permitting all community or cluster wastewater treatment systems consistent with Minnesota Rules Chapter 7080-7083 and MPCA standards. The Council will not provide financial support to assist communities if these systems fail.

Burnsville should include in the sewer element of its local comprehensive plan the conditions under which private treatment plants or municipal treatments would be allowed, and include appropriate management techniques sufficiently detailed to ensure that the facilities conform to permit conditions. Burnsville is responsible for ensuring that permit conditions for private treatment plants are met and financial resources to manage these facilities are available.

Surface Water Management

In 1995, Minnesota Statutes Section 473.859, subd. 2 was amended to make the local water plan (often referred to as local surface water management plans) required by section 103B. 235 a part of the land use plan of the local comprehensive plan. Minnesota Rules Chapter 8410, updated in July of 2015, includes the requirements for local water management plans. The main change that you need to be aware of is that all communities in the metropolitan area must update their local water plan between January 1, 2017 and December 31, 2018. This means that Burnsville must update its local water plan as part of the comprehensive plan update. The community's updated local water plan should be submitted to the Council for its review concurrent with the review by the Watershed Management Organization(s) within whose watershed(s) the community is located. **Failure to have an updated local water plan will result in the comprehensive plan being found incomplete for review until the required plan is provided to the Council.**

Local water plans must meet the requirements for local water plans in Minnesota Statutes, section 103B.235 and Minnesota Rules Chapter 8410. In general, local surface water plans need to include a summary of the priorities and problems in the community; structural, nonstructural and programmatic actions to take to address the priorities and problems; and clearly identified funding mechanisms to fix the problems.

More detailed guidance for the local water plans can be found in Appendix C of the Council's *2040 Water Resources Policy Plan* and in the Council's current *Local Planning Handbook.*

In addition, the Council has also updated its priority lake list that was first developed in the 1980s as part of the *Water Resources Policy Plan* update. Figure 2 shows the priority lakes for Burnsville. The Council uses the priority lake list to focus its limited resources. The list is also used in the environmental review process. Where a proposed development may impact a priority lake, the project proposer must complete a nutrient budget analysis for the lake as part of the environmental review process.

Also included on Figure 2 is the watershed organization(s) that Burnsville is part of and a list of impaired waters in the community for use in development of your local water plans.

Other Plan Considerations

Water Supply

Local comprehensive plans also address water supply (Minn. Stat., Sec. 473.859). For communities in the metropolitan area with municipal water supply systems, this local comprehensive plan requirement is met by completing the local water supply plan template, which was jointly developed by the Metropolitan Council and the Minnesota Department of Natural Resource (DNR).

FOR COMMUNITIES WHO OWN/OPERATE A PUBLIC WATER SUPPLY SYSTEM:

Because your community owns/operates a municipal community public water supply system (PWS), the local water supply plan must be updated as part of the local comprehensive plan (Minn. Stat., Sec. 103G.291).

The updated local water supply plan should include information about your community along with information about any neighboring communities served by your system.

You should update your local water supply plan upon notification by DNR. Local water supply plan due dates will be staggered between January 1, 2017 and December 31, 2018. Your updated local water supply plan should be submitted to the DNR. DNR will share the plan with the Council, and it will be

reviewed concurrently by both agencies. This schedule allows the local water supply plans to be completed and included in the local comprehensive plan.

Failure to have an updated local water plan will result in the comprehensive plan being found incomplete for review until the required plan is provided to the Council.

The water supply plan template fulfills multiple statutory obligations including:

- Minn. Stat., Sec. 103G.291 to complete a water supply plan including demand reduction
- Minn. Stat., Sec. 473.859 to address water supply in local comprehensive plans
- Minn. Administrative Rules 4720.5280 to address contingency planning for water supply interruption

The plan must be officially adopted by your community, and if applicable the utility board, as part of the local comprehensive plan.

At a minimum, the updated local water supply plan must use the joint DNR and Metropolitan Council template and include water demand projections that are consistent with the community's population forecast provided in the introductory section of this system statement. Potential water supply issues should be acknowledged, monitoring and conservation programs should be developed, and approaches to resolve any issues should be identified.

Guidance and information for water supply planning can be found in the Appendix C of the *2040 Water Resources Policy Plan*, the *Local Planning Handbook*, and the Council's *Master Water Supply Plan.*

The Council's *Master Water Supply Plan* provides communities in the region with planning assistance for water supply in a way that:

- Recognizes local control and responsibility for owning, maintaining and operating water systems
- Is developed in cooperation and consultation with municipal water suppliers, regional stakeholders and state agencies
- Protects critical habitat and water resources over the long term
- Meets regional needs for a reliable, secure water supply
- Highlights the benefits of integrated planning for stormwater, wastewater and water supply
- Emphasizes and supports conservation and inter-jurisdictional cooperation
- Provides clear guidance by identifying key challenges/issues/considerations in the region and available approaches without dictating solutions

Figures 3-5 illustrate some water supply considerations that the community may consider as they develop their local water supply plans, such as: aquifer water levels, groundwater and surface water interactions, areas where aquifer tests or monitoring may be needed to reduce uncertainty, regulatory and management areas, and emergency interconnections.

Figure 1. MCES Sanitary Sewer Meter Service Areas

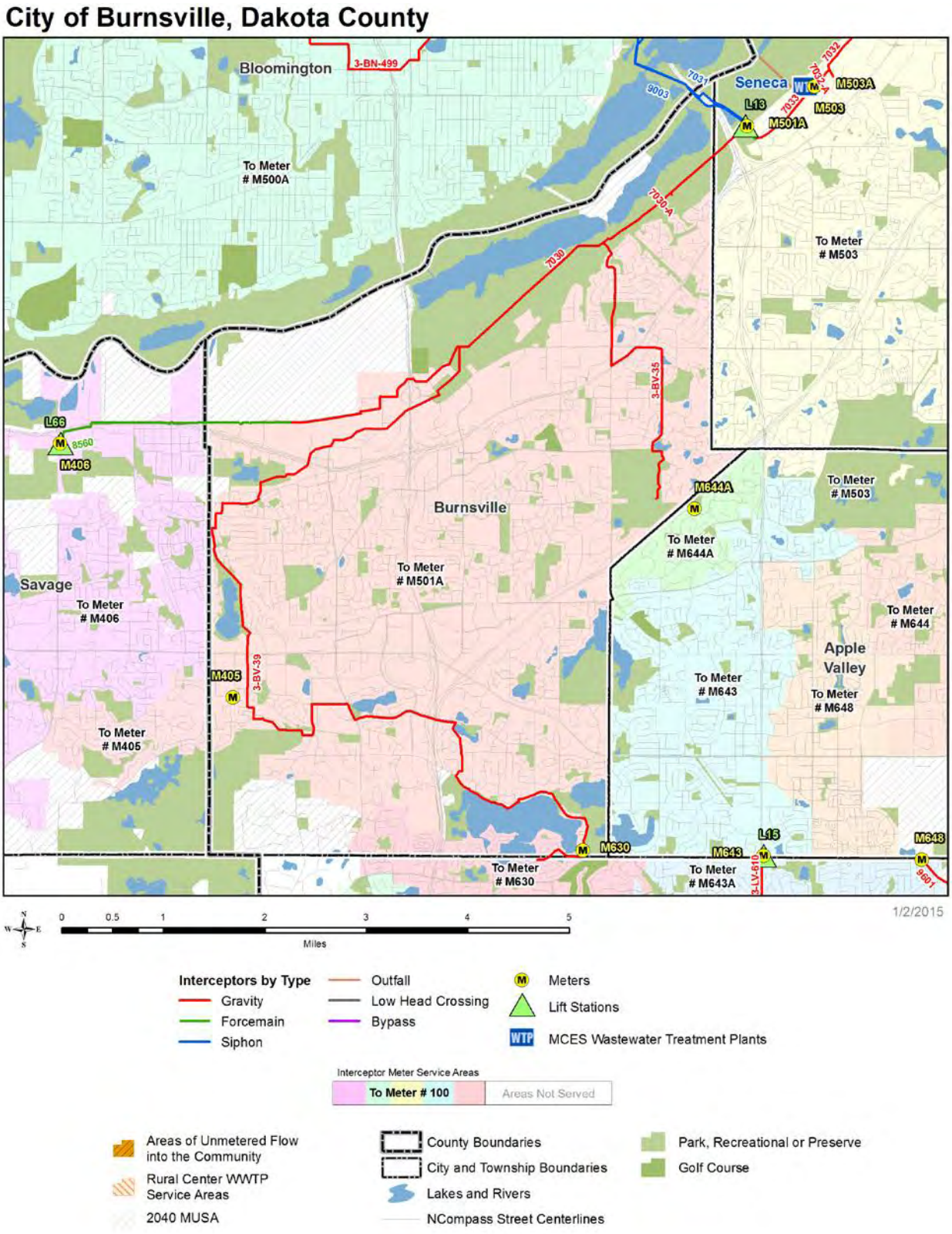


Figure 2. Surface Water Resources

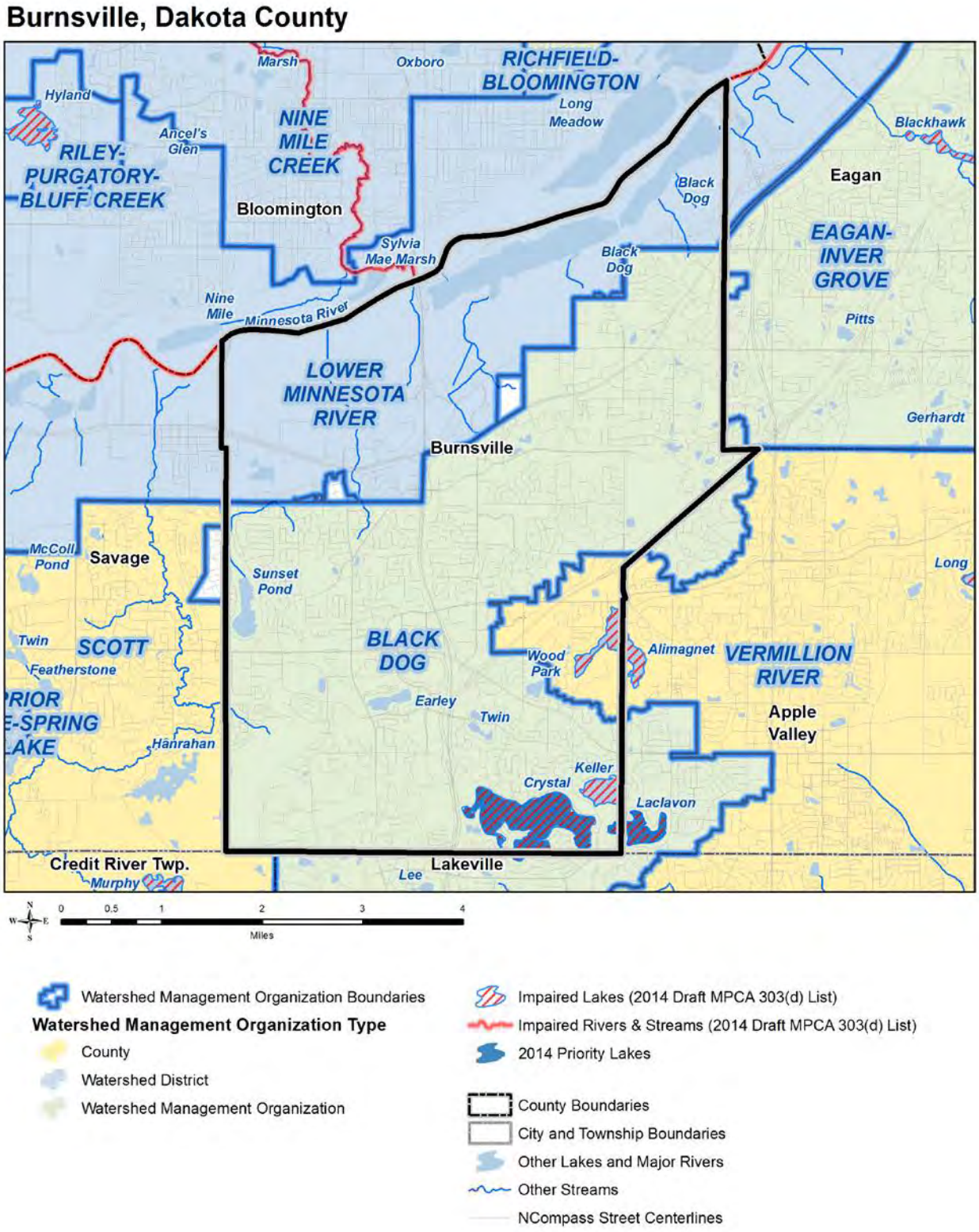


Figure 3. Surface water features and interaction with the regional groundwater system, and state-protected surface water features

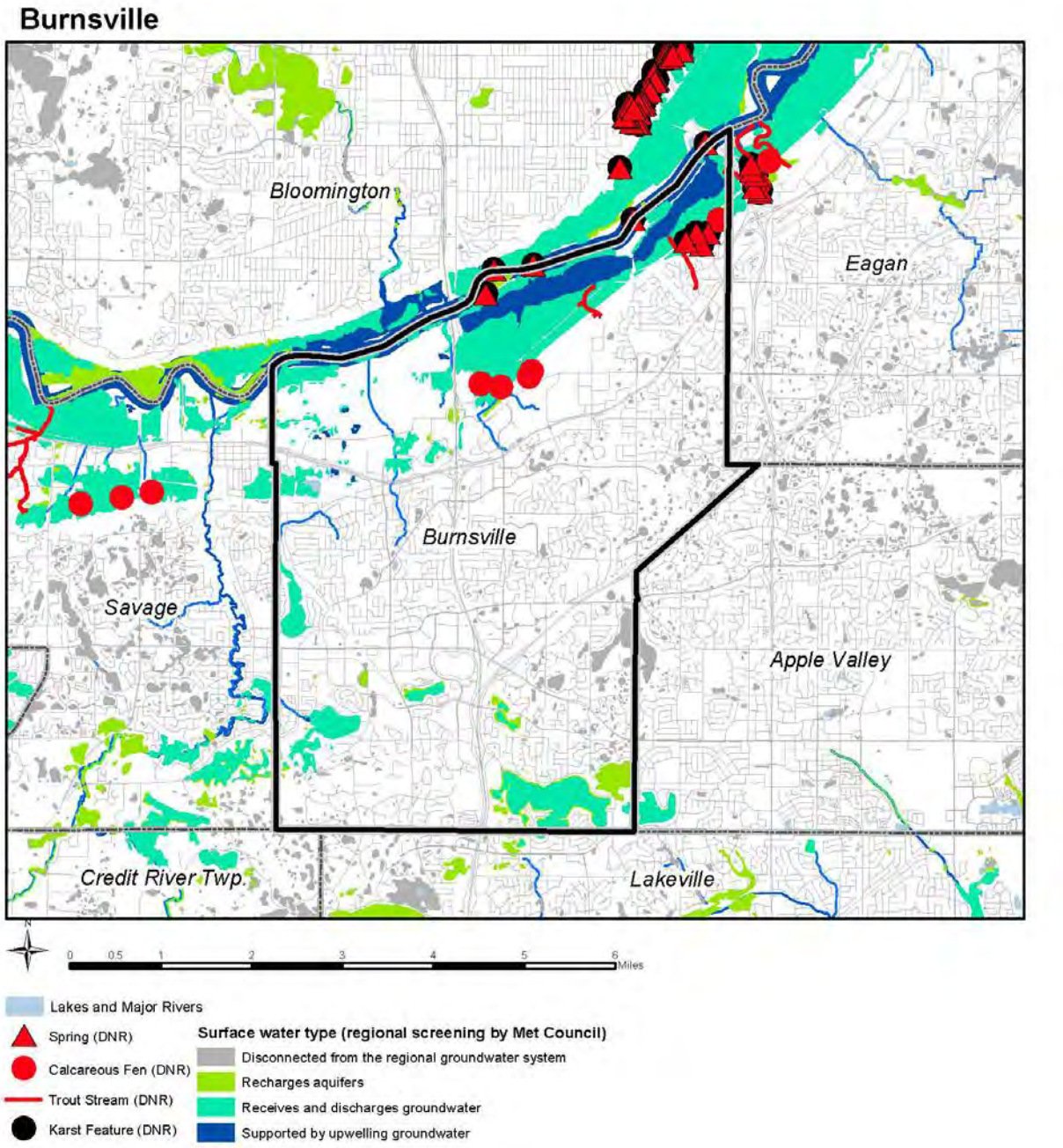


Figure 4. Availability of MN Department of Natural Resources groundwater level and MN Department of Health aquifer test data

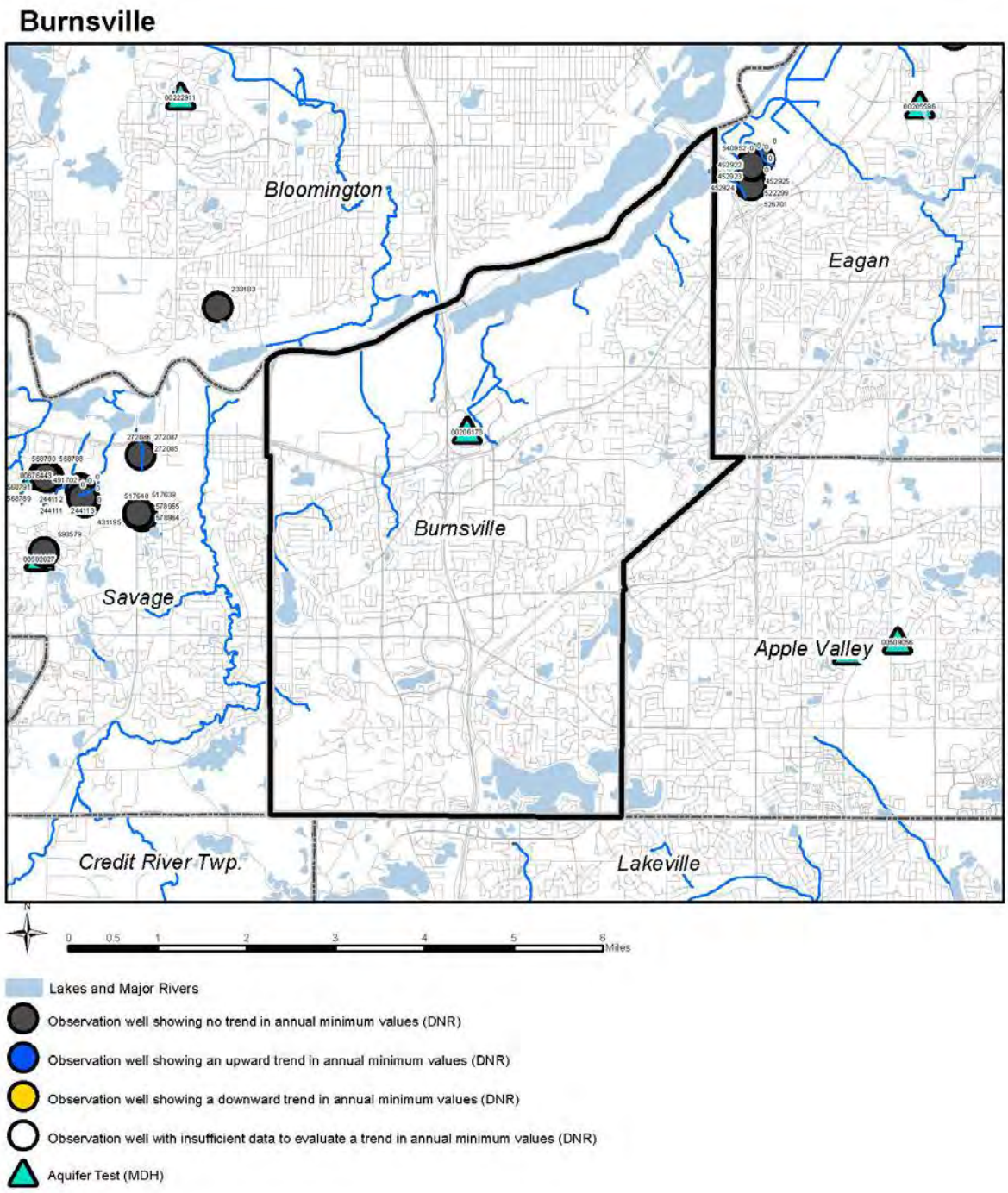
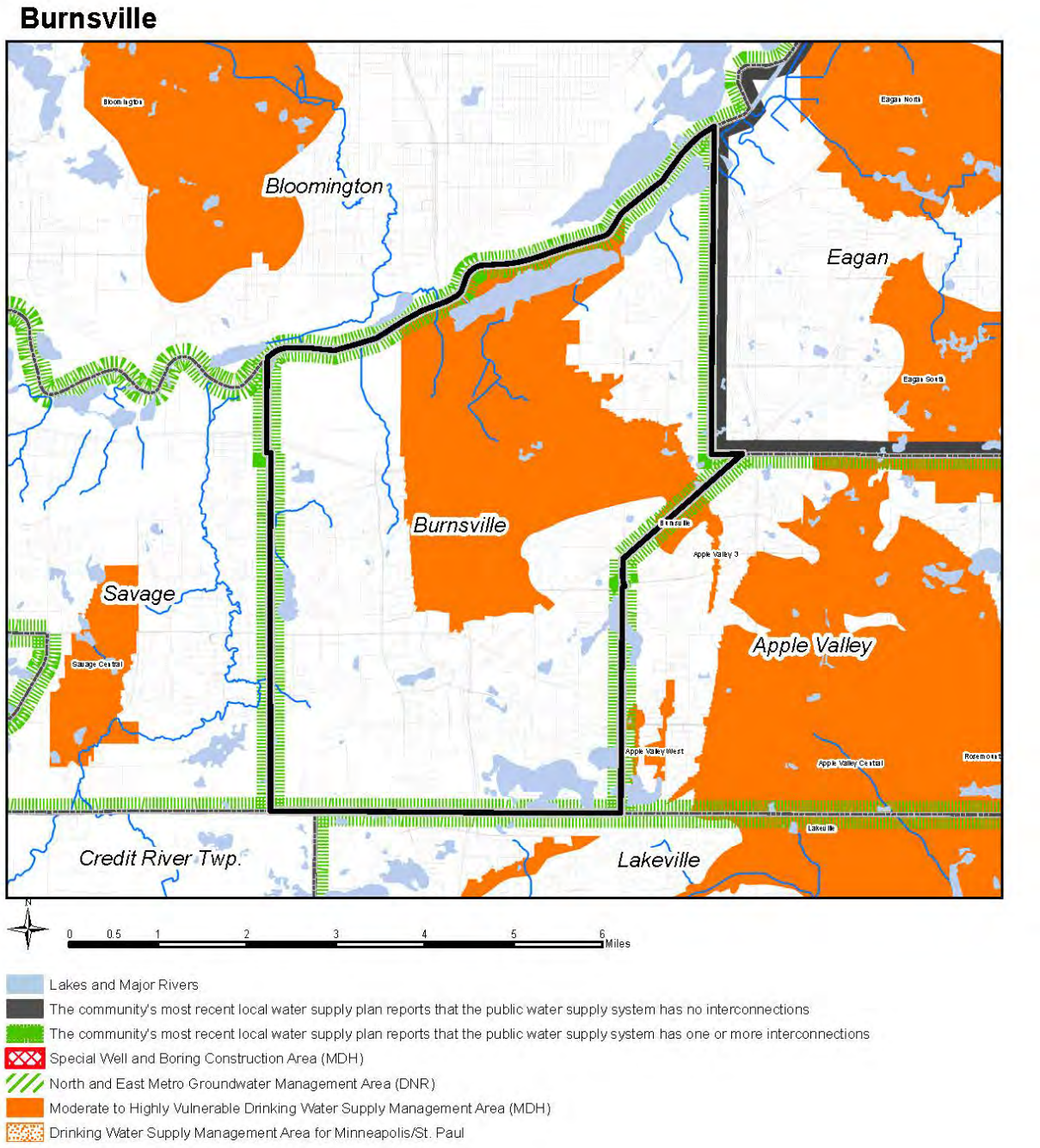


Figure 5. Municipal public water supply system interconnections and regulatory management areas



REGIONAL PARKS SYSTEM STATEMENT

City of Burnsville

The Regional Parks System includes 62 regional parks, park reserves, and special recreation features, plus more than 340 miles of regional trails that showcase the unique landscapes of the region and provide year-round recreation. The Regional Parks System is well-loved by our region's residents and attracted over 48 million annual visits in 2014.

The organizational structure of the Regional Parks System is unique, built upon a strong partnership between the Council and the ten regional park implementing agencies that own and operate Regional Parks System units. The regional park implementing agencies are:

Anoka County	Ramsey County
City of Bloomington	City of Saint Paul
Carver County	Scott County
Dakota County	Three Rivers Park District
Minneapolis Park and Recreation Board	Washington County

The *2040 Regional Parks Policy Plan* was developed based on furthering the *Thrive MSP 2040* outcomes of Stewardship, Prosperity, Equity, Livability, and Sustainability. *Thrive MSP 2040* states that the Council will collaborate with the Metropolitan Parks and Open Space Commission, the regional park agencies, and state partners to:

- Expand the Regional Parks System to conserve, maintain, and connect natural resources identified as being of high quality or having regional importance, as identified in the *2040 Regional Parks Policy Plan.*
- Provide a comprehensive regional park and trail system that preserves high-quality natural resources, increases climate resiliency, fosters healthy outcomes, connects communities, and enhances quality of life in the region.
- Promote expanded multimodal access to regional parks, regional trails, and the transit network, where appropriate.
- Strengthen equitable usage of regional parks and trails by all our region's residents, such as across age, race, ethnicity, income, national origin, and ability.

Key Concepts in the *2040 Regional Parks Policy Plan*

The *2040 Regional Parks Policy Plan* includes the following policies, each with specific associated strategies:

- **Recreation Activities and Facilities Policy:** Provide a regional system of recreation opportunities for all residents, while maintaining the integrity of the natural resource base within the Regional Parks System.

- **Siting and Acquisition Policy:** Identify lands with high-quality natural resources that are desirable for Regional Parks System activities and put these lands in a protected status so they will be available for recreational uses and conservation purposes in perpetuity.
- **Planning Policy:** Promote master planning and help provide integrated resource planning across jurisdictions.
- **Finance Policy:** Provide adequate and equitable funding for the Regional Parks System units and facilities in a manner that provides the greatest possible benefits to the people of the region.
- **System Protection Policy:** Protect public investment in acquisition and development by assuring that every component in the system is able to fully carry out its designated role as long as a need for it can be demonstrated.

The *2040 Regional Parks Policy Plan* is the metropolitan system plan for regional recreation open space with which local comprehensive plans must conform. This system statement highlights the elements of the system plan which apply specifically to your community. Find the complete text of the *2040 Regional Parks Policy Plan* on *the Council's website*.

2040 Regional Parks System Facilities

The Regional Parks System is comprised of four main types of facilities: regional parks, park reserves, special recreation features and regional trails.

Regional Parks

Regional parks most notably contain a diversity of nature-based resources, either naturally occurring or human-built, and are typically 200-500 acres in size. Regional parks accommodate a variety of passive recreation activities.

Park Reserves

Park reserves, like regional parks, provide for a diversity of outdoor recreation activities. One major feature that distinguishes a park reserve from a regional park is its size. The minimum size for a park reserve is 1,000 acres. An additional characteristic of park reserves is that up to 20 percent of the park reserve can be developed for recreational use, with at least 80 percent of the park reserve to be managed as natural lands that protect the ecological functions of the native landscape.

Special Recreation Features

Special recreation features are defined as Regional Parks System opportunities not generally found in the regional parks, park reserves or trail corridors. Special recreation features often require a unique managing or programming effort.

Regional Trails

Regional trails are classified as 1) destination or greenway trails and 2) linking trails. Destination or greenway trails typically follow along routes with high-quality natural resources that make the trail itself a destination. Linking trails are predominately intended to provide connections between various Regional Parks System facilities, most notably regional parks or park reserves.

2040 Regional Parks System Components

The *2040 Regional Parks Policy Plan* identifies six components which together comprise the vision for the Regional Parks System in 2040, as described below.

Existing Regional Parks System Facilities: include Regional Parks System Facilities that are open for public use. These facilities include land that is owned by regional park implementing agencies, and may include inholding parcels within the boundaries of these parks and trail corridors that have not yet been acquired. Existing regional trails may include planned segments that will be developed in the future.

Planned Regional Parks System Facilities (not yet open to the public): include Regional Parks System Facilities that have a Council-approved master plan and may be in stages of acquisition and development, but are not yet open for public use.

Regional Parks System Boundary Adjustments: include general areas identified as potential additions to existing Regional Parks System Facilities to add recreational opportunities or protect natural resources. Specific adjustments to park or trail corridor boundaries have not yet been planned.

Regional Park Search Areas: include general areas for future regional parks to meet the recreational needs of the region by 2040 where the regional park boundary has not yet been planned.

Regional Trail Search Corridors: include proposed regional trails to provide connections between Regional Parks System facilities where the trail alignment has not yet been planned.

2040 Regional Trail Search Corridor System Additions: include regional trail search corridors that were added to the Regional Parks System as part of the *2040 Regional Parks Policy Plan*.

Key Changes in the 2040 Regional Parks Policy Plan

Adopted by the Metropolitan Council in February 2015, the 2*040 Regional Parks Policy Plan* incorporates the following changes:

Identify all proposed regional trails as regional trail search corridors

All proposed regional trails that are not yet open to the public and do not have a Metropolitan Council approved master plan are represented as a general regional trail search corridor. The *2030 Regional Parks Policy* Plan depicted these trails with a proposed alignment. The alignment of these regional trails will be determined in the future through a planning process led by the regional park implementing agency. The alignment of these trails is subject to Metropolitan Council approval of a regional trail master plan.

Acquire and develop ten new regional trails or trail extensions to meet the needs of the region in 2040. The 2040 Regional Trail Search Corridor Additions include:

Carver County:

- County Road 61
- Highway 41

Three Rivers Park District:

- CP Rail Extension
- Dakota Rail Extension
- Lake Independence Extension
- Lake Sarah Extension
- Minnetrista Extension
- North-South 1
- North-South 2
- West Mississippi River

The *2040 Regional Parks System Plan Map* is depicted in Figure 1. Burnsville should consult the complete *2040 Regional Parks Policy Plan* in preparing its local comprehensive plan. In addition, Burnsville should consult *Thrive MSP 2040* and the current version of the Metropolitan Council's *Local Planning Handbook* for specific information needed in its comprehensive plan.

System Plan Considerations Affecting Your Community

Regional Parks System Components in your community

The following Regional Parks System Components within Burnsville as identified in the *2040 Regional Parks Policy Plan* are listed below.

Regional Parks, Park Reserves, and Special Recreation Features

Murphy-Hanrehan Park Reserve: This is an existing park reserve with an established boundary. The park reserve boundary as shown in Figure 2 should be acknowledged in the comprehensive plan.

Regional Trails

Lake Marion Greenway Regional Trail: This is a planned regional trail that is not yet open to the public. The planned regional trail travels through Burnsville, Lakeville, and Farmington as it connects Minnesota River Greenway Regional Trail, Lebanon Hills-Lake Marion Greenway Regional Trail Search Corridor, Murphy-Hanrehan Park Reserve in Scott County, and Vermillion River Greenway Regional Trail Search Corridor. The regional trail alignment as shown in Figure 2 should be acknowledged in the comprehensive plan.

Minnesota River Greenway Regional Trail: This is a planned regional trail that is not yet open to the public. The planned regional trail travels through Eagan and Burnsville as it connects Big Rivers Regional Trail, Lebanon Hills-Big Rivers Greenway Regional Trail Search Corridor, Fort Snelling State Park, Minnesota Valley National Wildlife Refuge, and Lake Marion Greenway Regional Trail. The regional trail alignment as shown in Figure 2 should be acknowledged in the comprehensive plan.

Lebanon Hills-Lake Marion Regional Trail Search Corridor: The regional trail search corridor travels through Apple Valley and Burnsville as it connects Lebanon Hills Regional Park, North Creek Greenway Regional Trail, and Lake Marion Greenway Regional Trail. Dakota County will lead a planning process in the future to determine the alignment of the regional trail. When preparing its comprehensive plan, Burnsville should verify whether a master plan has been approved by the Metropolitan Council. If a master plan has been approved, the planned regional trail alignment should be acknowledged in the comprehensive plan. Otherwise, the general search corridor as shown in Figure 2 should be acknowledged in the comprehensive plan.

Please contact Three Rivers Park District and Dakota County for more information regarding Regional Parks System Components in Burnsville.

State and Federal lands in your community

State and Federal park and open space units that provide outdoor recreation opportunities and natural resource conservation for the public complement the Regional Parks System and are recognized in the *2040 Regional Parks Policy Plan*. The following State and Federal lands as shown in Figure 2 are within Burnsville and should be acknowledged in its comprehensive plan.

- Fort Snelling State Park — Minnesota Department of Natural Resources
- Minnesota Valley National Wildlife Refuge — U.S. Fish and Wildlife Service

Please contact the Minnesota Department of Natural Resources for more information about State lands and the U.S. Fish and Wildlife Service for more information about the Minnesota Valley National Wildlife Refuge.

Figure 1. 2040 Regional Parks System Plan Map

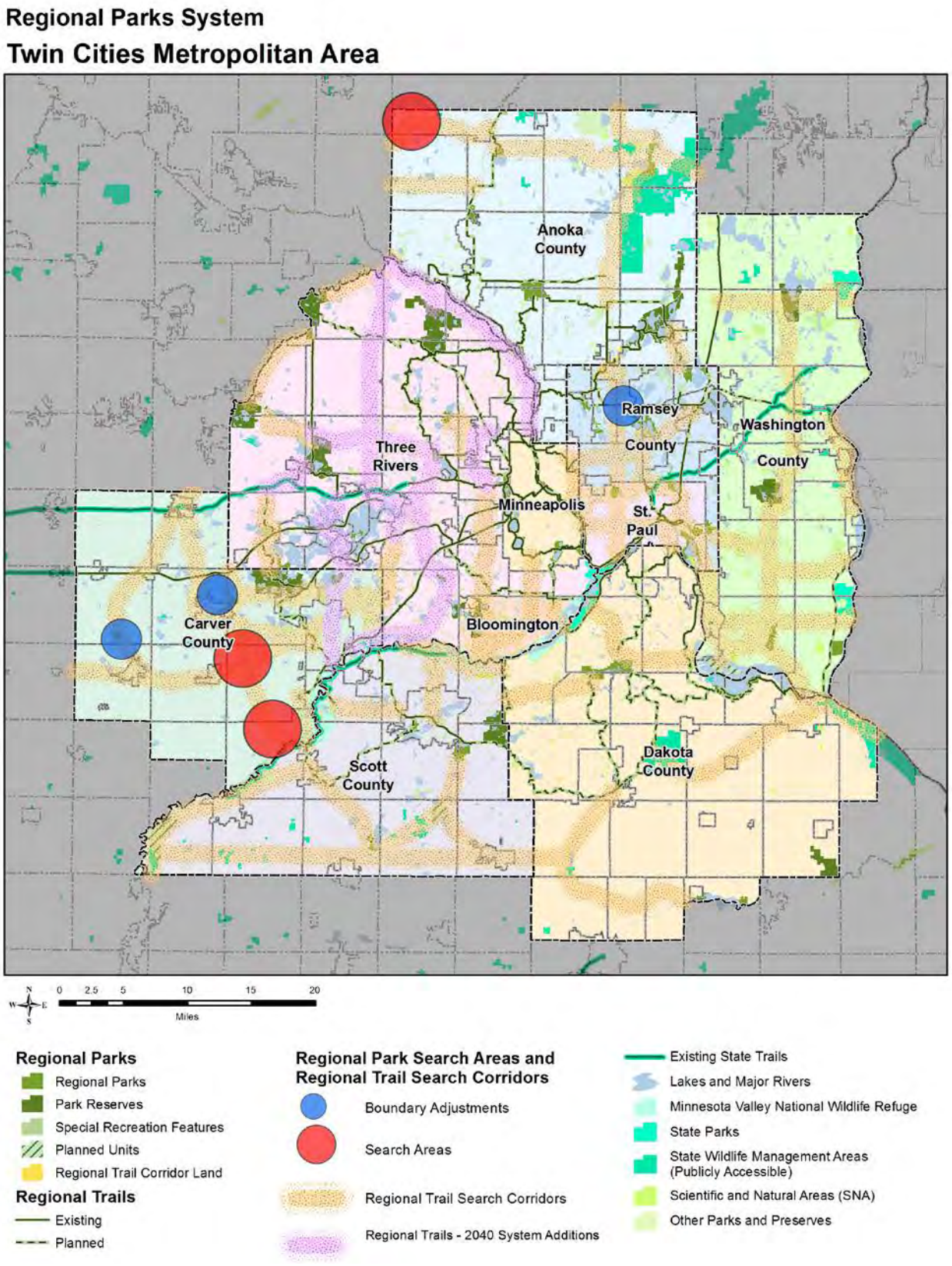
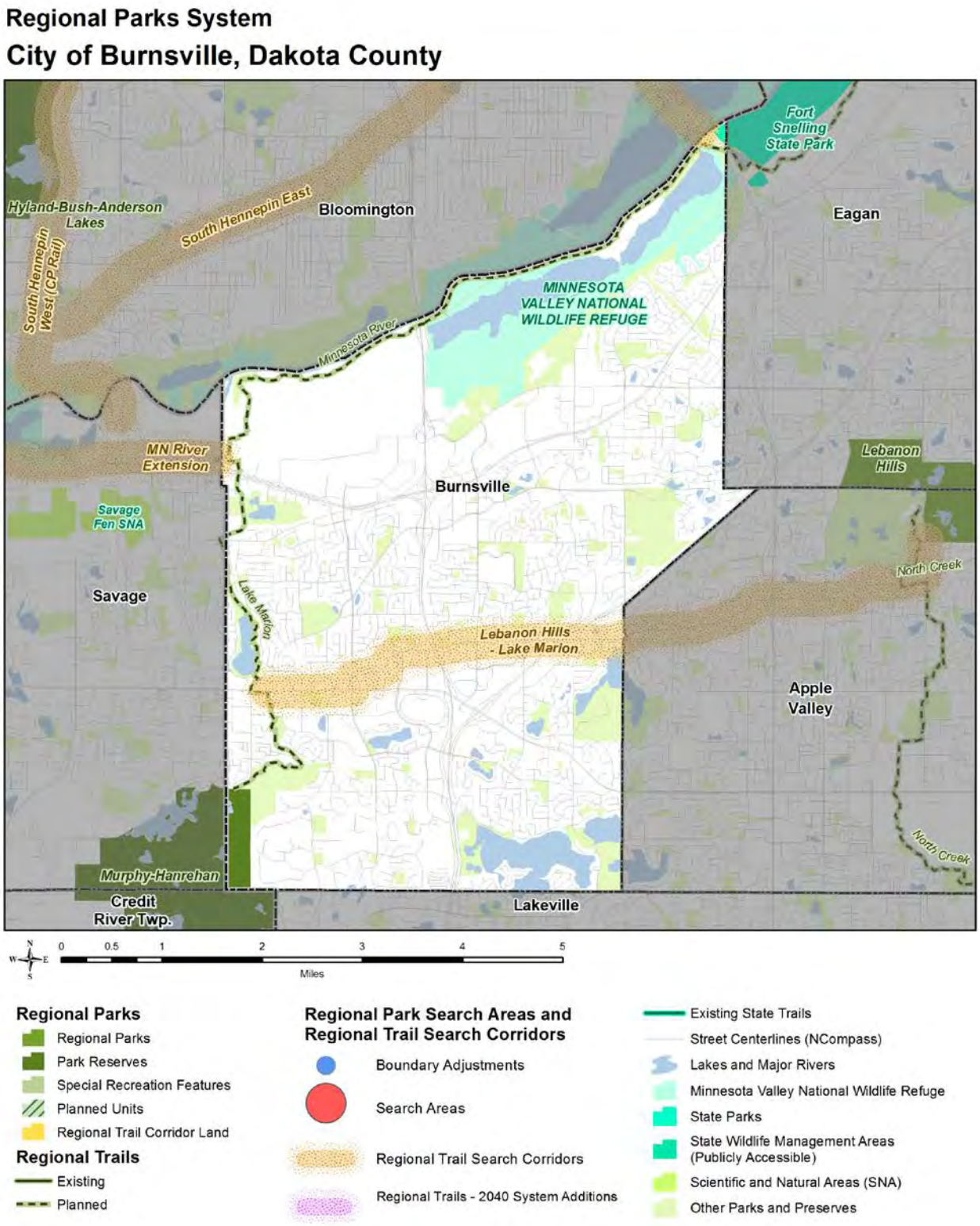


Figure 2. Regional Parks System Facilities in and adjacent to Burnsville



City Of Burnsville

Appendix B – Sustainability Approaches & Matrix

January 2018

Comprehensive Plan Chapters	Energy Reduction	Sustainable Water Supply	Waste Reduction	Sustainable Food System Opportunities	Efficient Use of Infrastructure and Land	Natural Resource Conservation	Climate Resiliency
Primary Related BPA (2009 Plan)	3, 6, 7, 8	13	1, 2, 10	NA	4, 5, 9	11	12, 14
1.0 Community Overview	Definition of Sustainability: ▪ Economic vitality includes meaningful employment opportunities, job training, education, business ownership and local re-investment. Economic sustainability is accomplished through financial practices and economic growth that fairly distributes the benefits and burdens of development, while also equitably and efficiently allocating available resources. Social equity and a healthy environment are supported by economic development and support it in turn. ▪ Environmental sensitivity includes protecting ecosystems and biodiversity, ensuring clean water and air, preventing pollution, conserving natural, cultural and historic resources, and allowing growth that is sensitive to natural resources and systems. The environmental sensitivity component involves initiatives such as renewable energy, reducing fossil fuel consumption and emissions, sustainable agriculture and fishing, organic farming, tree planting and reducing deforestation, recycling, and better waste management. ▪ Social benefit includes quality health services, safe well-lit streets, accessible public spaces, diverse housing and educational choices, creative expression through the arts, safety, and respect for cultural and historic resources. Social sustainability can be achieved by respecting and including diverse views and values, providing an equal opportunity to participate in and influence decision-making, access to government services, a sense of place and self-worth. Most importantly, the social sustainability strives to ensure the benefits and burdens of modern societies are balanced across all social groups.						
2.0 Future Land Use Guide Plan	▪ Integration of land use planning and transit-oriented development planning ▪ Increase density and incorporate mixed use zoning and design ▪ Develop multi-modal streets and areas ▪ Street & building orientation to capture sustainability opportunities (heat gain/loss, solar access) ▪ "Ensure new and redevelopment meet the City's water resources management plan development standards ▪ Designate appropriate areas for mixed-use developments ▪ Encourage mixing of uses at building, site, and neighborhood levels ▪ Grant performance standard bonuses (density, bulk/height, streamlined permitting) for green buildings (LEED levels). ▪ Promote and incentivize in-fill development ▪ Continue to preserve open space, natural beauty, and critical environmental areas	▪ New and redevelopment incorporates Low Impact Development principles ▪ Promote land use frameworks that provide a positive net effect to sustainable water supply. ▪ Include the provision and protection of local water supply at planning concepts. ▪ Continue to protect groundwater ▪ Direct development and re-development in a manner consistent with watershed health. ▪ Coordinate regional planning for a resilient municipal water supply. ▪ Pilot neighborhood-scale rain and grey-water capture, treatment and reuse	▪ Encourage waste reuse/recycling in the community. ▪ Consider flexibility and/or regulations for building repurposing. ▪ Institute educational programs to encourage restaurants/residences to recycle grease waste and organics.	▪ Support programs that support and incentivize urban agriculture (UA) and local food production and businesses. ▪ Continue implementation of ordinances and/or zoning district standards that permit Urban Agriculture and local food producers. ▪ Encourage local/cottage food industries ▪ Strategies to allow/incentivize neighborhood food production (bees, chickens, goats, etc.) ▪ Ensure that there are no neighborhoods that are food deserts. ▪ Use permaculture (examining and following nature's patterns) in landscaping.	▪ Permit and encourage mixed-use development and redevelopment. ▪ Foster a diversity of housing types. ▪ Allow increased density where appropriate. ▪ Support intergenerational housing ordinances ▪ Co-locate complementary industries (i.e. recycling and manufacturing - recycled waste becomes raw material for new products). ▪ Actively engage in Watershed Management Plans to address pollution, development patterns, water quality, degraded riparian habitat, wetlands, and restoration programs. ▪ Consider a pilot program to create an "Eco-District" in a neighborhood with shared amenities ▪ Provide infrastructure and design to support walkability & connectivity ▪ Consider quality of life measures to be included in development approvals ▪ Encourage buildings to be universally accessible, to allow everyone, no matter their capacities, to have	▪ Consider implementing an urban ecosystem services valuation program to identify economic and environmental benefits. ▪ Continue to plant shade trees in and around parking lots and government buildings to reduce energy required to heat and cool buildings. ▪ Develop a Tree Canopy Assessment Plan that includes strategies to protect/expand use of native species, as well as evaluate the ecosystem services provided by the existing urban forest. ▪ Continue to promote environmental stewardship by educational programs in areas of environmental science ▪ Provide experiences for children in local natural environments. ▪ Consider developing an Insect Assessment Plan to identify the existence and threats posed by invasive/non-beneficial insects. ▪ Continue to protect and enrich the urban forest and	▪ Continue to promote utilities to be placed underground. ▪ Encourage green infrastructure ▪ Encourage compact multi-functional green spaces ▪ Provide and promote green linkages that allows non-car commuters to get anywhere ▪ Promote climate awareness and adaptation preparedness by educational programs

Comprehensive Plan Chapters	Energy Reduction	Sustainable Water Supply	Waste Reduction	Sustainable Food System Opportunities	Efficient Use of Infrastructure and Land	Natural Resource Conservation	Climate Resiliency
					similar and simultaneous usage of services. ▪ Transition streets to Complete/Living Streets	biodiversity	
Measures of Success	1. *Establishing quantifiable baselines by measuring/monitoring: energy use, carbon emissions, in-fill & brownfield sites, road miles & parking lot acreage, percentage impervious surfaces, green roofs, LID/GI facilities, open-space acreage, mixed-use areas, transit modes, etc.* 2. *Number of sustainability-focused ordinances/policies adopted, programs initiated* 3. *Routine comparison of baseline and reduced/optimized land use: air quality, water quality, in-fill and brownfield development, and reduced waste/increased recycling; carbon or greenhouse-gas emissions, community energy use, lifecycle analysis ratings* 4. *Equality: Opportunities for a diverse staff to lead and contribute to the enterprise (e.g. women, ethnicities), as well as serving a global population across countries and income levels*						
3.0 Economic Development and Redevelopment Plan	The economic factor is imbedded in all strategies identified in the other chapters and those strategies apply here as well. Educate the local community and especially businesses on Sustainability principals using resources like: ▪ Natural Step: A simple, science-based tool for analyzing the complex issues associated with sustainable development. The A-B-C-D Analytical approach includes four elements, which are repeated as the business progresses along various pathways towards sustainability. (Awareness, Baseline Mapping, Creating a Vision, Down to Action) ▪ Triple Bottom Line evaluation: an accounting framework that incorporates three dimensions of performance: social, environmental and financial. This differs from traditional reporting frameworks as it includes ecological (or environmental) and social measures that can be difficult to assign appropriate means of measurement. ▪ Circular Economy: A circular economy is an alternative to a traditional linear economy (make, use, dispose) in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life.						
▪ ***Heart of the City***	▪ Continue to allow rooftop solar. ▪ Continue to allow wind energy (small scale) ▪ Continue use of walkable and transit-oriented developments. ▪ Explore a Brownfield Redevelopment Program to identify and promote the redevelopment of brownfield sites.	▪ Ensure new and redevelopment meet the City's water resources management plan development standards ▪ Consider green/living streets policies/standards. ▪ Continue stormwater volume control practices in multi-use spaces (recreation, public spaces)	▪ Consider organics recycling (business, residential)	▪ Continue to allow farmers markets	▪ Continue multimodal connected streets and places ▪ Allow for Mixed Housing ▪ Continue to require Quality Architecture and Urban Design	▪ Allow for and support electronic vehicle charging stations	▪ Maintain and support the urban compact green environment created ▪ Allow for green roofs
▪ ***Minnesota River Quadrant (MRQ)***	▪ Consider utilization of district energy (using lake for heat exchange). ▪ Continue to allow wind energy (small scale) ▪ Use walkable and transit-oriented developments where development is planned.	▪ Consider installation of district level greywater reuse infrastructure. ▪ Ensure new and redevelopment meet the City's water resources management plan development standards ▪ Implement Green/living streets policies/standards upon redevelopment	▪ Consider Organics recycling (business, residential)	▪ Support Aquaculture as a potential land use ▪ Consider allowing small scale farming on capped landfills ▪ Continue to allow small scale farming in floodplains	▪ Continue to encourage Farmers markets ▪ Create multimodal connected streets and places ▪ Allow for Mixed Housing ▪ Require Quality Architecture and Urban Design upon redevelopment	▪ Restore disturbed floodplain, and remediation of the old landfill	▪ Consider an Urban Compact Green environment where residential development is proposed ▪ Allow for green roofs ▪ Implement Stormwater Reuse (evap. heat loss)
▪ ***Cliff Road Business Park***	▪ Explore rooftop solar. ▪ Promote Incentive programs (with utility) for energy efficiency retrofitting.	▪ Stormwater volume control practices in multi-use spaces (recreation, public spaces)	▪ Encourage organics recycling (business-scale) ▪ Support pairing complementary industries (i.e. waste becomes raw	▪ Support local/cottage food industries ▪ Encourage aquaponics and other sustainable practices	▪ Consider how to incentivize reinvestment by existing business with energy, water, and waste efficient retrofits.	▪ Add urban trees ▪ Implement Green streets	▪ Allow for green roofs ▪ Consider how to implement alternative water sources (rainwater harvesting from roof,

Comprehensive Plan Chapters	Energy Reduction	Sustainable Water Supply	Waste Reduction	Sustainable Food System Opportunities	Efficient Use of Infrastructure and Land	Natural Resource Conservation	Climate Resiliency
			material for new products)				greywater reuse).
Measures of Success	1. *Establish regular workshops and information sharing forums, including the local chamber of commerce and local businesses.* 2. *Number of businesses attending programs and initiating sustainability practices.* 3. *Creating a regional forum and partnerships to promote sustainable practices, including pairing businesses to share their "waste product" as a "source material" for other businesses, often referred to as "circular economy," thus reducing waste, improving costs, reducing energy/GHG, and enhancing local resiliency.* 4. *Measuring new jobs created in the community, and region, that are a result of sustainability ideas or sustainable-based businesses promoted by the city.*						
4.0 Neighborhoods and Housing Plan	▪ Encourage smart energy controls ▪ Continue to allow for solar access ▪ Continue to allow for building-integrated solar systems ▪ Support LEED elements for new buildings ▪ Consider how to Promote or encourage district energy alternatives	▪ Consider adopting water conserving fixtures or irrigation requirements or incentives ▪ Consider harvest & use of stormwater out of ponds/waterbodies – public facilities, parks, golf course, private sites ▪ Consider greywater reuse infrastructure – local and district-level ▪ Continue to implement net zero stormwater discharge (over natural) standards (new/re-development) ▪ Promote rain gardens and natural vegetative landscapes ▪ Implement stormwater volume control in multi-use spaces (recreation, public spaces	▪ Consider recycled building material policy (demolition debris and diversion ordinance) ▪ Continue to recycle street surfacing materials ▪ Explore residential compostable waste collection ▪ Review and update recycling and composting goals	▪ Continue to allow for community gardens ▪ Promote Farmer's markets	▪ Consider Mixed-use and diversity of housing stock ▪ Increase density near transit and/or walkable centers ▪ Allow for farming micro scale and public spaces ▪ Create multimodal connected enhancements	▪ Ensure trail and passive park connections weaved into neighborhoods ▪ Preserve natural areas (via acquisition, if needed)	▪ Allow for and support Cool Buildings (passive heating and cooling) ▪ Promote the use of lighter color materials that absorb less heat
Measures of Success	1. *Establish quantifiable baselines by measuring/monitoring: resident income range and median, demographics (age, race, ethnicity, employment, housing status), housing values, percentage of affordable housing, vacancy rates of affordable housing, etc.* 2. *Number of sustainability-focused housing ordinances/policies adopted, programs initiated* 3. *Routine comparison of baseline and optimized housing policies:* 4. *Measure the number of physical improvements made on public or private properties such as rain gardens, solar arrays, wind turbines, community gardens, trail connections, etc.* 5. *Number of "non-traditional" stakeholders attending programs and initiating sustainable housing practices.*						
5.0 Natural Environment Plan	▪ Combine land use sustainability strategies and compact housing mixed with open spaces ▪ Integrated park and wildlife corridors to create better wildlife as well as human bike/pedestrian connections and travel ▪ Adopt conservation design development ordinance language	▪ Reduce usage of pesticides when maintaining public property. ▪ Implement land restoration projects to restore/maintain infiltration and native landscapes. ▪ Identify and capitalize upon water reuse projects ▪ Contribute to pollutant reductions necessary to bring	▪ Continue and expand communication efforts regarding waste reduction and hazardous waste management ▪ Promote waste minimization and efforts to move away from high energy methods of waste disposal	▪ Encourage/incentivize pollinator management ▪ Allow additional permaculture neighborhood gardens on city park turf areas to reduce intensive maintenance	▪ Explore adopting a conservation subdivision ordinance ▪ Promote environmentally-sound in-fill development ▪ Review the current tree permitting/conservation codes to determine whether updates are needed ▪ Protect steep slopes, bluffs, and other sensitive	▪ Explore adopting an invasive species ordinance ▪ Conduct programs to remove/mitigate invasive species. ▪ Consider the need to adopt a zoning overlay district for natural resources	▪ Encourage/incentivize alternative fuels ▪ Diversify City's energy profile ▪ Explore incorporating local energy generation and storage in coordination with parks/open spaces in the city ▪ Target vulnerable areas in our infrastructure to make

Comprehensive Plan Chapters	Energy Reduction	Sustainable Water Supply	Waste Reduction	Sustainable Food System Opportunities	Efficient Use of Infrastructure and Land	Natural Resource Conservation	Climate Resiliency
	▪ Encourage low-maintenance, native, pollinator-supporting landscaping	impaired waters into compliance with state water quality standards ▪ Pursue stormwater management initiatives by participating in local/regional partnerships to develop innovative and consistent practices. ▪ Identify and eliminate illegal discharges into the City's sewer and stormwater systems	▪ Consider innovative ways to expand rates of composting yard wastes (e.g. at-home programs), food wastes, and biodegradable waste streams (e.g. paper-based waste) in coordination with Dakota County.		environmental features		improvements to these high risk facilities which will help protect natural features.
▪ ***Natural Resources Management Plan***	▪ Develop robust urban forest and implement LID to reduce energy usage to combat urban heat island effect ▪ Hold tree giveaways ▪ Adopt a street tree ordinance ▪ Work with solar industry to strategically locate community solar gardens	▪ Increase green space to replenish groundwater	-	▪ Promote Community Gardens to replace turf grass areas	▪ Utilize stormwater harvest and use to decrease potable water demand ▪ Update city code to require green infrastructure. ▪ Prevent future development in high risk areas ▪ Work with partners to conserve land	▪ Continue natural vegetation conversion for passive park areas	▪ Utilize more green infrastructure practices on public and private
▪ ***Wetland Protection and Management Plan***	▪ Investigate if geothermal systems could be combined with wetlands areas due to moist soil conditions	▪ Wetland restoration to promote groundwater recharge		▪ Consider special use permits for food collection or vegetation harvest in wetland systems		▪ Implement wetland restoration projects identified in inventory ▪ Enforce buffer zones around wetlands	▪ Continue protection of wetlands to provide water and natural habitat storage/capacity in the landscape
▪ ***Water Resources Management Plan***		▪ Utilize green infrastructure where effective and appropriate ▪ Implement daylighting of surface water resources strategies (restore natural channels and corridors) where appropriate ▪ Shift the emphasis of stormwater infrastructure towards capture, infiltration, and utilization	▪ Use of locally sourced materials for BMPs (compost, sand, etc.)		▪ Review standards in place for consistency with a conservation subdivision ordinance ▪ Promote environmentally-sound in-fill development	▪ Identify and capitalize on opportunities to convert vegetation to passive park spaces. ▪ Promote water quality goals	▪ Promote green infrastructure where possible in public and private projects ▪ Continue to implement strategies to manage risk of water assets and natural features ▪ Complete resiliency studies to determine which sections of the City's storm water management infrastructure and natural resources have the highest risk of failure due to Climate Change or other scenarios. Identify, fund and make improvements

Comprehensive Plan Chapters	Energy Reduction	Sustainable Water Supply	Waste Reduction	Sustainable Food System Opportunities	Efficient Use of Infrastructure and Land	Natural Resource Conservation	Climate Resiliency
							to address concerns. ▪ Complete resiliency studies to determine consequence levels if certain sections of the City's storm water management infrastructure and natural resources fail. Identify, fund and make improvements to address concerns.
Measures of Success	Natural Resources 1. *Citizen awareness, understanding and support for natural resources conservation and sustainability as measured in city surveys* 2. *Number and type of trainings and workshops on Natural Resources and Sustainability* 3. *Acres of land under development or converted to native landscapes or pro-pollinator vegetated* 4. *Number of volunteers and total time spent in preserving or restoring natural resources* Wetlands 1. *Measures of citizen awareness of the importance of wetlands as measured in city surveys;* 2. *Total wetland area protected by legal or other instruments* 3. *Number and total area of wetlands created, restored or credits purchased* 4. *Number and coverage of wetland buffers, inspected, installed and maintained* Water Resources 1. *Measures of citizen awareness of the importance of water supply and water quality as measured in city surveys* 2. *Water clarity and water clarity goals for Burnsville's lakes. Number of ponds cleaned out and volume of material removed. Provide volume of material removed impacted by Poly-Aromatic Hydrocarbons (PAHs)* 3. *Occurrence and spread of aquatic invasive species* 4. *Number of Illicit Discharge reports and investigations* 5. *Number of new stormwater management Best Management Practices provided on private property because of development or redevelopment*						
6.0 Community Enrichment Plan	• Publically recognize and reward successful sustainability projects.	• City should continue hands-on activities, including education/ field trips that support learning about wastewater, stormwater, watershed, energy and other issues related to conservation.	• In conjunction with local civic organizations and other communities, continue to organize periodic Zero Waste Days. • Continue volunteer programs to pick up litter in public places, e.g. Adopt-a-Park, Adopt-a-Street. • Continue to promote an awareness program to encourage donation of materials to re-use organizations. • Continue	• Facilitate Community Engagement on local food systems • Support growing, harvesting, selling and delivery of locally-grown produce. • Work with Dakota County to identify areas with limited access to traditional food markets. • Consider identification of additional publicly-owned sites that may be suitable for community gardens and urban farms, work with advocacy groups to	• Create multimodal connected neighborhoods • Connect sidewalks/trails to amenities such as parks and open space • Establish a trail system or other non-motorized public access to amenities • Facilitate Community Engagement in Planning and Land Use Decisions • Diversify stakeholder groups targeted for land use decision making outreach/engagement • Encourage improved access to jobs and community opportunities	• Highlight innovative and successful activities • Develop environmental education, interpretive facilities, programs that develop an interdisciplinary/ interconnected understanding of ecologic systems (kiosks in natural area) • Reduce light pollution and promote dark skies by limiting the brightness of exterior fixtures and shielding adjacent uses from light sources	

Comprehensive Plan Chapters	Energy Reduction	Sustainable Water Supply	Waste Reduction	Sustainable Food System Opportunities	Efficient Use of Infrastructure and Land	Natural Resource Conservation	Climate Resiliency
			implementation of a "Pay-As-You-Throw" Program that utilizes a volume-based disposal fee system to encourage residents and contractors to reduce waste	make these sites available.			
Measures of Success	1. *Measure citizen engagement throughout city operations and outreach.* 2. *Percentage of decision-making processes with a public feedback track.* 3. *Measure how often "next steps" in a decision-making process are informed and prioritized in accordance with public feedback.* 4. *Measure how effective public feedback platforms and mediums are at reaching an equitable representation of the public.* 5. *Measure how the timing of public feedback solicitation affects the outcomes of decision-making processes.* 6. *Number of new programs and services for vulnerable and disadvantaged stakeholder groups*.						
7.0 Transportation Plan	▪ Integrate land use planning and transportation planning. ▪ Support car and bike sharing networks. ▪ Incorporate electric charging infrastructure. ▪ Prepare for autonomous vehicles. ▪ Create Greenway linkages. ▪ Consider eliminating parking minimums (replace with maximum standards). ▪ Continue to install or retrofit existing systems with LED lighting. ▪ Encourage MnDOT and Dakota County to incorporate sustainable practices and improvements with their transportation systems.	▪ Allow for reduced street widths and parking standards to decrease impervious surfaces where appropriate. Consider ordinances to allow pervious surfaces for seasonal parking facilities. ▪ LID/Green Infrastructure on streets.	▪ Continue to implement recycled content road reconstruction standards. ▪ Allow for reduced street lane widths to promote walkability and bike friendliness on street where appropriate	▪ Transportation planning should complement land use planning to increase access to food systems.	▪ Increase connectivity, both within and between modes (i.e. transit connects to transit; and transit connects to other modes). ▪ Consider sidewalks or trails on both sides of the street where appropriate. ▪ Grant density bonuses in transit or mixed-use districts. ▪ Encourage public transit use by integrating multimodal use and connectivity (Park and Ride lots, transit centers, etc). ▪ Incorporate traffic calming practices to protect pedestrians/bikes. ▪ Create places that maximize the use of existing infrastructure through infill, redevelopment, and increased density. ▪ Plan and permit road networks of neighborhood scaled streets with high levels of connectivity and short blocks	▪ Incorporate natural resources conservation into transportation plans to meet environmental requirements	▪ Green infrastructure. ▪ Drainage systems to handle large rainfall events. ▪ Roadways resistant to erosion. ▪ Roadway and utility systems that work to protect each other. ▪ Complete resiliency studies to determine which sections of the City's transportation infrastructure has the highest risk of failure due to Climate Change or other scenarios. Identify, fund and make improvements to address concerns. ▪ Complete resiliency studies to determine consequence levels if certain sections of the City's transportation infrastructure fails. Identify, fund and make improvements to address concerns.
Measures of Success	1. *Miles of City street improved using sustainable practices such as aggregate recycling, utilizing existing curb and gutter or transforming to Complete or Green Streets.* 2. *Number of developments approved with transit or multi-modal positive aspects to them.* 3. *Number of miles of trails, sidewalks or on-street bike lanes constructed/marked.* 4. *Number of intersection or crossing improvements meant to increase traffic and safety improvements.*						

Comprehensive Plan Chapters	Energy Reduction	Sustainable Water Supply	Waste Reduction	Sustainable Food System Opportunities	Efficient Use of Infrastructure and Land	Natural Resource Conservation	Climate Resiliency
	5. *Number of LED streetlights added or retrofitted.* 6. *Transportation Resiliency Metrics – Number of Catch Basins Added, number of feet storm sewer pipe extended/expanded, number of high risk roadway drainage areas improved.*						
8.0 City Services and Facilities Plan	▪ Continue to promote responsible procurement criteria ▪ Integrate the principles of a circular economy into the City's business practices. ▪ Evaluate potential for alternative energy generation ▪ Continue to participate with community solar gardens ▪ Utilize fleet maintenance system to right-size fleet and reduce vehicle idle time ▪ Consider utilization of energy efficient materials when making upgrades to City facilities.	▪ When replacing toilets in municipal buildings, consider installing high efficiency models and/or waterless urinals. ▪ Develop a rebate program for retrofitting of irrigation and homes to conserve water. ▪ Leverage Advanced Metering Infrastructure (AMI) system to encourage water conservation. Maintain residential per capita water use below 75gpcd. ▪ Utilize AMI system to keep unaccounted water use below 10% ▪ Develop post-quarry water supply plan ▪ Utilize smart irrigation at city facilities ▪ Continue to implement current City landscaping practices to reduce the need for excessive irrigation, pesticides and/or gas-powered maintenance equipment. ▪ Explore offering rebates for retrofitting sinks/showers for using grey water for irrigation.	▪ Continue to implement municipal purchasing policies of cleaning products to identify areas where green products can be used. ▪ Promote the City's recycling & waste reduction programs, using progress to encourage continuing programs and to set more aggressive targets. ▪ Implement organic recycling at city facilities	▪	▪ Continue to dedicate staff and funds to sustainability projects, programs and issues.	▪ Continue to implement best practices for winter maintenance ▪ Continue inflow and infiltration reduction measures for city infrastructure	▪ Develop and adopt an extreme weather operations plan ▪ Complete resiliency studies to determine which sections of the City's Services and Facilities have the highest risk of failure due to Climate Change or other scenarios. Identify, fund and make improvements to address concerns. ▪ Complete resiliency studies to determine consequence levels if certain sections of the City's Services or Facilities fail. Identify, fund and make improvements to address concerns.
Measures of Success	1. *Establish a plan to fund the sustainable operations strategies including grant opportunities.* 2. *Conduct energy and greenhouse gas emissions audits to set a baseline.* 3. *Review MN GreenStep Cities progress. Select and initiate new efforts to achieve more GreenStep "actions."* 4. *Achieve at least 80% of all office and custodial supplies annually are categorized as "green" by 2020.* 5. *Reduce overall municipal water use by (especially drinking water) 10%.* 6. *At least 75% of waste from municipal operations is recycled annually.* 7. *Prevent all non-storm water discharges from municipal facilities (including landscape over-irrigation) to storm drains.* 8. *Comply with storm water "Best Management Practices" (BMPs) requirements on all municipal facilities and pass annual inspections with a minimum score of 80%.* 9. *Organics recycling implemented at all City facilities.* 10. *Maintained residential per capita water use below 75gpcd.*						

NA = Not Applicable to this Chapter of the Comprehensive Plan Update

Definitions:

Net Zero and Net Positive (NZ/NP) strategies emphasize taking a systems approach to reduce water, energy, and waste footprints in installations and communities. These NZ/NP strategies provide long-term solutions for sustainability and resilience by meeting the environmental objectives of clean air and water, and reducing or eliminating waste sent to landfill, while ensuring the long-term viability of resources is not only maintained but also improved. NZ/NP strategies represent "sustainability in action". (Ref. https://www.epa.gov/water-research/net-zero-concepts-and-definitions)

1. Net Zero Energy (NZE) – A net-zero energy building or community is defined as one that, in an average year, produces as much energy from renewable energy as it consumes. (Ref. Rosen, M.A. (2015) Net-Zero Energy Buildings and Communities: Potential and the Role of Energy Storage. Journal of Power and Energy Engineering, 3, 470-474. http://dx.doi.org/10.4236/jpee.2015.34065) NZE is first conservation and energy efficiency followed by a use of renewable energy sources.
2. Net Zero Water - Limiting the consumption of water resources and returning it back to the same watershed so as not to deplete the resources of that region in quantity or quality over the course of the year and decades. (Ref. Definitions adapted from US Army Office of the Assistant Secretary of the Army for Installations, Energy, and Environment. https://www.epa.gov/water-research/net-zero-concepts-and-definitions)
3. Net Zero Waste – Achieving Net Zero Waste means reducing, reusing, and recovering waste streams to convert them to valuable resources with zero solid waste sent to landfills over the course of the year. (Ref. Definitions adapted from US Army Office of the Assistant Secretary of the Army for Installations, Energy, and Environment. https://www.epa.gov/water-research/net-zero-concepts-and-definitions)
4. Conserving Food Systems – Minimizing environmental impacts by affecting food consumption habits, production means, and transportation (food miles), while also positively affecting human health.
    a. Consumption habits can be altered to focus on low energy-intensive and energy-loss foods (emphasis on vegetable-based protein diet and decreased meat portion), along with eating seasonal and preserved foods.
    b. Environmental impacts are minimized by eating locally-sourced, organically or low-chemical-input produced foods. Facilitates the development of permaculture food systems and sources that provide habitat and self-sustaining ecosystems.
    c. Food miles is a term which refers to the distance food is transported from the time of its production until it reaches the consumer. Food miles is one factor, among others, used when assessing the environmental impact of food, including the impact on global warming. (Ref. https://en.wikipedia.org/wiki/Food_miles#References)
5. Net Zero Sprawl (for Redevelopment) – Implementing land use patterns that accomplish compact development mixing living, working, shopping, and playing in close proximity. Many of the principles are related to new urbanism, which is described as: a planning and development approach based on human-scaled urban design and the principles of how cities and towns had been built for the last several centuries: walkable blocks and streets, housing and shopping in close proximity, and accessible public spaces. (Ref. https://www.cnu.org/resources/what-new-urbanism)
6. Net Zero Loss of Ecosystem Services - Ecosystem services are the benefits people obtain from ecosystems. These include provisioning services such as food and water; regulating services such as flood and disease control; cultural services such as spiritual, recreational, and cultural benefits; and supporting services, such as nutrient cycling, that maintain the conditions for life on Earth. (Ref. Ecosystems and Human Well-being, 2003, Joseph Alcamo, Elena M Bennett; Millennium Ecosystem Assessment (Program))
7. Net Zero Urban Heat Island Effect ("Cool City") - Urban areas where the surface, sub-surface and air temperatures are not higher than the corresponding temperatures in surrounding rural areas. Altering materials used, development patterns, and use of vegetative materials in urban design to counteract the effect caused by a lack of natural evaporative surfaces (vegetation), physical characteristics of the surfaces (concrete and asphalt) and human activities that produce heat. An example of a "cool city" is Stuttgart, Germany.
8. Urban Agriculture: growing of plants and raising of animals for food and other uses within and around cities and towns, including related activities such as production and delivery of inputs, and processing and marketing of products. UA ranges from subsistence production and processing at household level to fully commercialized agriculture. It can also integrate organic solid wastes and wastewater as fertilizers (Uwe R. Fritsche, et al., "Urban Food Systems and Global Sustainable Land Use" *available at* http://iinas.org/tl_files/iinas/downloads/land/IINAS_2015_Urban_Food_Issue_Paper.pdf).

Additional Information – Definitions, Examples, Sources:

1. Net Zero Energy (NZE)

Alternative definitions:

a. Zero Energy (ZE) – means that in an average year, a community produces as much energy from renewable energy as it consumes. In other words, the actual amount of energy used by the community, is less than or equal to the amount of renewable energy generated within or by that community. The first priority of a Zero Energy approach is conservation and energy efficiency, followed by use of renewable energy sources. Zero energy approaches can be applied at a number of scales: zero energy buildings (single structures), campuses (multiple adjacent structures), or communities large collections of structures). Further, the concept is not limited to only electricity. It includes all types of energy: electricity, natural gas, steam, biogas, wood, coal, nearly any type of energy that can be bought or sold and used to produce energy. (National Renewable Energy Laboratory, (2015) A Common Definition for Zero Energy Buildings, https://energy.gov/sites/prod/files/2015/09/f26/bto_common_definition_zero_energy_buildings_093015.pdf)
b. A zero-energy community (ZEC) is one that has greatly reduced energy needs through efficiency gains such that the balance of energy for vehicles, heating and cooling, and electrical energy within the community is met by renewable energy. Communities attempt to achieve this goal via a hierarchical classification system. The hierarchical approach emphasizes using all possible cost-effective, energy-efficiency and demand-avoidance strategies first and then using renewable energy sources and technologies that are located in three places: (1) on space within the built environment or unusable brownfield sites within the community; (2) on either green space within the community or located outside the community boundary but within the region and brought into the community; (3) through the purchase of new RECs. (National Renewable Energy Laboratory (2009) Definition of a "Zero Net Energy" Community Technical Report, NREL/TP-7A2-46065, http://www.nrel.gov/docs/fy10osti/46065.pdf.

Examples:

a. Kaupuni Village (pronounced Ka-oo-poo-nee), Oahu, Hawai'i. The first net-zero energy affordable housing community in Hawai'i. It has achieved the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED®) Platinum designation. Comprised of 19 single-family homes and a community center. Not only are the structures built to be net-zero energy, the entire community was envisioned as a fully self-sufficient and sustainable environment. Everything needed to live sustainably is provided from the local ecosystem. (U.S. DOE, Kaupuni Village: A closer look at the first net-zero energy affordable housing community in Hawai'i, https://energy.gov/eere/downloads/kaupuni-village-closer-look-first-net-zero-energy-affordable-housing-community-hawaii)
b. Pine Hill Village Zero Energy Community, Harvard, Massachusetts - pocket neighborhood project off of Stow Road in Harvard is in its final permitting stage. There are five clusters of homes, each designed to a Zero Energy Attainable standard. There are 24 homes in total. (Transformation, Inc. Zero Energy Homes, http://www.transformations-inc.com/communities/transformations/harvard/).
c. Lancaster, CA – This charter city is taking numerous actions to address its energy- and water-related footprints. http://www.cityoflancasterca.org/about-us/sustainability.

d. Montpelier, VT – an attempt to transform the energy system to ensure the community has a secure, affordable, sustainable and reliable energy future. https://netzeromontpelier.org/.
e. The Zero Energy Project has several other examples. http://zeroenergyproject.org/advocate/cities-on-a-path-to-zero/.
f. ACEEE Summer Study on Energy Efficiency in Buildings, Zero Net Energy Communities: Three Cities Leading the Way, http://aceee.org/files/proceedings/2016/data/papers/10_1034.pdf.

Images:

a. Geos Launches Net Zero Community in Arvada, CO, http://cdn.boulevards.com/files/2014/10/Ge-arvada.jpg
b. Pulte Group, Zero Net Energy Homes
c. Montgomery County, ME, https://mygreenmontgomery.org/2015/net-zero-energy-homes/
d. Zeta Communities, Net Zero Homes, https://www.linkedin.com/pulse/real-estate-trends-net-zero-homes-kari-klaus

2. Net Zero Water

Alternative Definitions:

a. Zero Water means achieving a sustainable balance between water availability and demand. This involves limiting the consumption of water resources, and returning clean, treated waste water and surplus water to the watershed. The overall objective of Zero Water systems is to sustain the quantity and quality of regional water resources over the course of the year.
b. Rather than securing water supplies to meet historical demand patterns, a net zero water approach looks at local precipitation patterns and tries to maintain consumption at or below that available local supply. And, rather than allowing water quality impacts from stormwater runoff in developed areas to flow downstream, a net zero water approach looks to treat runoff on-site. NZW, or being water neutral, means using only as much water as falls on your site and eliminating all water quality impacts from the site. (Planetizen, From Net Zero Energy to Net Zero Water: A New Frontier in Sustainability, https://www.planetizen.com/node/80755/net-zero-energy-net-zero-water-new-frontier-sustainability)
c. This article promotes a Net Zero Water toolkit available for free download at the same url and here: http://brendlegroup.com/water/netzerowater.
d. Net Zero Water (NZW) is a concept that aims to change the way water resources are managed; it focuses on making water resource planning decisions based on local conditions rather than demand. The NZW concept helps individuals and organizations become water neutral. NZW focuses on understanding your water footprint and taking action to reduce consumption and improve water quality. (Brendle Group, http://brendlegroup.com/water/netzerowater)

Examples:

a. City of Seattle, Regulatory Pathways to Net Zero Water, https://www.seattle.gov/Documents/Departments/OSE/Reg-Path-Net-Zero-Water-2011.pdf.
b. Cascadia Green Building Council, Toward Net Zero, https://living-future.org/wp-content/uploads/2016/11/Toward_Net-Zero_Water.pdf.
c. City of Port Philip, Victoria, Australia, Water Plan: Toward a Water Sensitive City, http://www.portphillip.vic.gov.au/default/SustainableEnvironmentDocuments/Water_Strategy.pdf.
d. Brendle Group Net Zero Water Toolkit - http://brendlegroup.com/water/netzerowater; Case Study - http://brendlegroup.com/img/site_specific/uploads/NZW_Case_Study.pdf.
e. Several examples in this collection: https://asla.org/uploadedFiles/CMS/Meetings_and_Events/2014_Annual_Meeting_Handouts/SUN-B07_Should%20Net-Zero%20Water%20Be%20the%20New%20Standard.pdf.

Images:

a. http://static.wixstatic.com/media/ed230f_864935cf10454c32ae6dffb808a23a16.jpg_srz_966_646_85_22_0.50_1.20_0.00_jpg_srz
b. http://www.aiatopten.org/sites/default/files/styles/popup/public/04%20Water%20Diagram_0.jpg?itok=S9Lbk0HC

3. Net Zero Waste

Alternative Definitions:

a. Reduce or eliminate the production of waste during design, construction, operation, and end-of-life and find ways to integrate waste back into either an industrial or natural nutrient loops. (Veritiv, The Reality of Achieving Net Zero Waste, https://www.slideshare.net/Veritiv/the-reality-of-achieving-net-zero-waste)
b. Zero Waste is a goal for how [communities] can responsibly manage materials and the energy required to make them. Zero Waste requires a “whole system” approach to resource management that implicates purchasing, maximizes recycling, minimizes waste, reduces consumption and ensures that products are made to be reused, repaired, or recycled back into the system. (Institute for Sustainability, Energy, and Environment University of Illinois at Urbana-Champaign, https://icap.sustainability.illinois.edu/project/establish-net-zero-waste-plan-and-policy)

Examples:

a. City of San Diego, CA, Zero Waste Plan - https://www.sandiego.gov/sites/default/files/legacy/mayor/pdf/2015/ZeroWastePlan.pdf.
b. City of Vancouver, Zero Waste, http://vancouver.ca/green-vancouver/zero-waste.aspx.
c. City of Santa Monica, CA, Zero Waste Strategic Operations Plan
d. Maryland Dept of Environment, http://www.mde.state.md.us/programs/Marylander/Documents/Zero_Waste_Plan_Draft_12.15.14.pdf.
e. University of Illinois at Urbana-Champaign, https://icap.sustainability.illinois.edu/files/project/440/iCAP%20Chapter%206%20Purchasing%20Waste%20and%20Recycling.pdf.

Images:

a. A Zero Waste World, https://s-media-cache-ak0.pinimg.com/736x/c5/73/41/c57341557842fd685887586d8ce8272d.jpg

4. Conserving Food Systems

   Alternative Definitions:

   a. Local food systems seek to reduce the distance products travel between producer and consumer and can range from the neighborhood-level to a regional scale. A local "foodshed" is the area that can support the food needs within a region. While it varies in size depending on geographic features and season, foodsheds tend to encompass a 100-250 mile radius. (Sustainable Cities, Food Systems, http://www.sustainablecitiesinstitute.org/topics/food-systems)
   b. Sustainable local food systems balance economic prosperity, environmental preservation, and public health while moving agricultural products from farmer to consumer. (Liberty Prairie Foundation, Lake County Sustainable Local Food Systems, http://libertyprairie.org/impact-areas/sustainable-local-food/lake-county-sustainable-local-food-systems/)

   Examples:

   a. City of Kamloops, B.C. Urban Agriculture and Food Systems Strategy
   b. Vancouver, B.C., Food and sustainable food systems
   c. European Union, Creating space for sustainable food systems in urban communities – Practical approaches and examples for cities

   Images:

   a. http://doingsomethinggood.com.au/wp-content/uploads/2016/06/food-system.jpg
   b. https://image.slidesharecdn.com/47a3c061-eb4e-42f7-a1fa-49c0a43aaa53-150312093645-conversion-gate01/95/ffic-keynote-innovation-hub-presentation-12-638.jpg?cb=1426153079
   c. https://environmentblog3foodandsustainability.files.wordpress.com/2015/07/sustainable-food.jpg
   d. http://community-wealth.org/sites/clone.community-wealth.org/files/foodhub_0.jpg

5. Net Zero Sprawl

   Critiques:

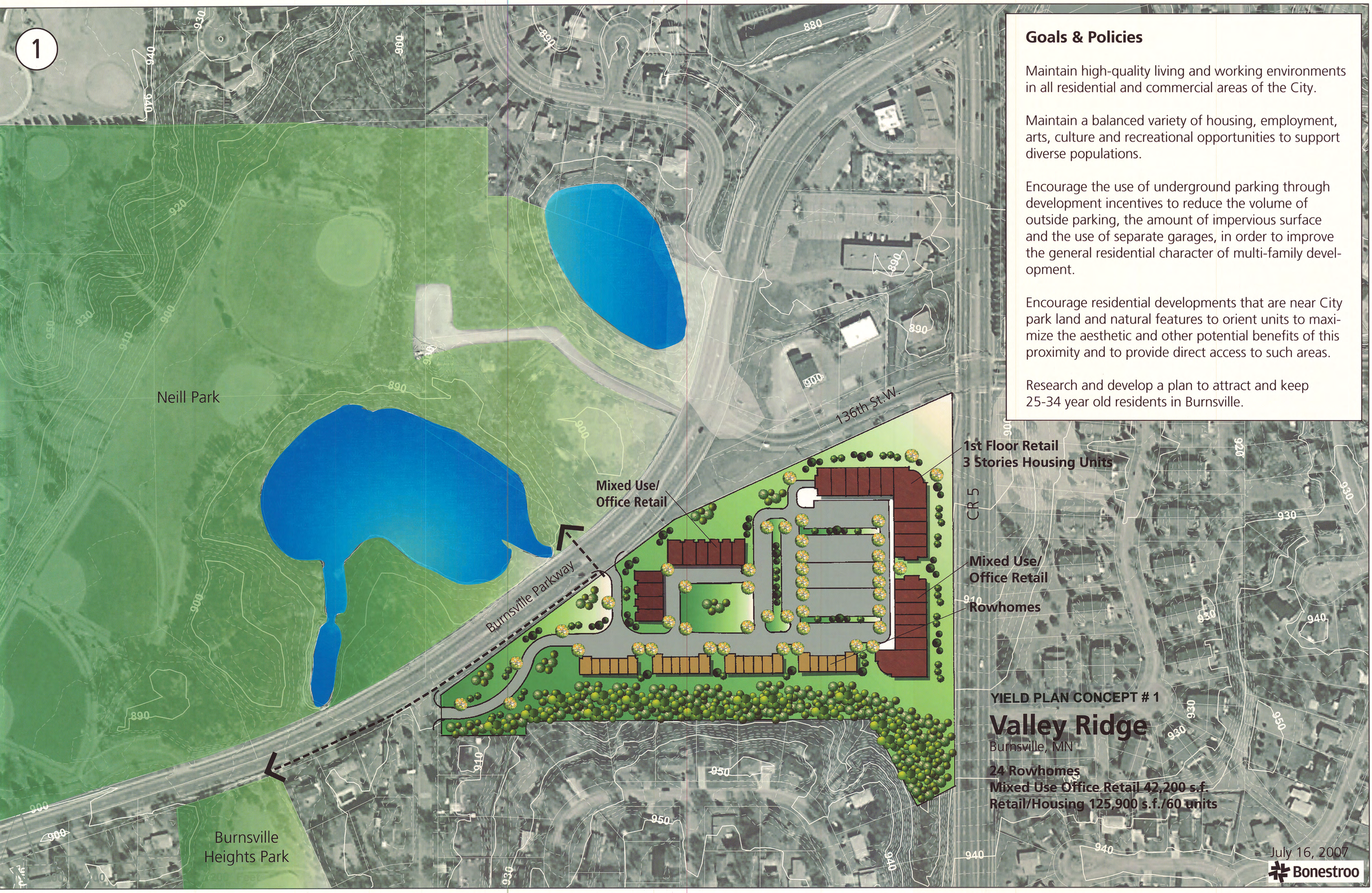
   a. Sprawl is still sprawl, even if its “green” - http://www.citylab.com/design/2013/09/sprawl-still-sprawl-even-if-its-green/6756/
   b. Prairie Ridge Estates - https://thinkprogress.org/what-does-net-zero-mean-sprawl-by-another-name-6e9ce185282f

6. Net Zero Loss of Ecosystem Services
7. Net Zero Urban Heat Island Effect (“Cool City”)

City Of Burnsville

Appendix C – Vacant/Underutilized Sites

2005



Goals & Policies

Maintain high-quality living and working environments in all residential and commercial areas of the City.

Maintain a balanced variety of housing, employment, arts, culture and recreational opportunities to support diverse populations.

Encourage the use of underground parking through development incentives to reduce the volume of outside parking, the amount of impervious surface and the use of separate garages, in order to improve the general residential character of multi-family development.

Encourage residential developments that are near City park land and natural features to orient units to maximize the aesthetic and other potential benefits of this proximity and to provide direct access to such areas.

Research and develop a plan to attract and keep 25-34 year old residents in Burnsville.

5

I-35W

I-35E

Grand Ave.

145th St. E.

Hotel

Condo

Rowhomes

Mixed Use Office

Wetland

Twin Lake

Southcross Dr. W.

N 200 100 0 200 Feet

Goals & Policies

Continue to encourage a balance in the city's housing stock to provide a variety of housing types to serve all stages of the life cycle.

Continue to enforce zoning standards to preserve and protect sensitive and other natural areas of community importance.

Implement and maintain a comprehensive Wetlands Management Plan, including runoff management, and maximize opportunities to preserve such areas through partnerships with County, State, Regional, Federal and private programs.

Protect lands and other water bodies from negative impacts of development, including pollution, sedimentation and native vegetation removal.

Continue to enforce the update of the shoreland ordinance to include the most current technology and Best Management Practices to ensure the continued protection of area lakes.

Develop and implement an Urban Forest Management plan designed to preserve and protect the trees within Burnsville; and require reforestation of areas cleared by development.

YIELD PLAN CONCEPT # 5

Healy Ramme Grandview

Burnsville, MN

60 Rowhomes
90 Condo Units- 3 Stories
Mixed Use Office 50,000 s.f.
Hotel- 150 Rooms

July 16, 2007

Bonestroo

6

Goals & Policies

Encourage infill development to be designed to be compatible with existing neighborhood development patterns.

Continue to encourage a balance in the city's housing stock to provide a variety of housing types to serve all stages of the life-cycle.

Strive to achieve compatible and harmonious relationships between different types of land uses by utilizing design standards, appropriate buffers and land use transitions and encouraging high-quality design.

Cliff Rd. E.

Hwy. 13

YIELD PLAN CONCEPT # 6

Berendt Site

Burnsville, MN

16 Duplex Units

July 16, 2007

Bonestroo

7

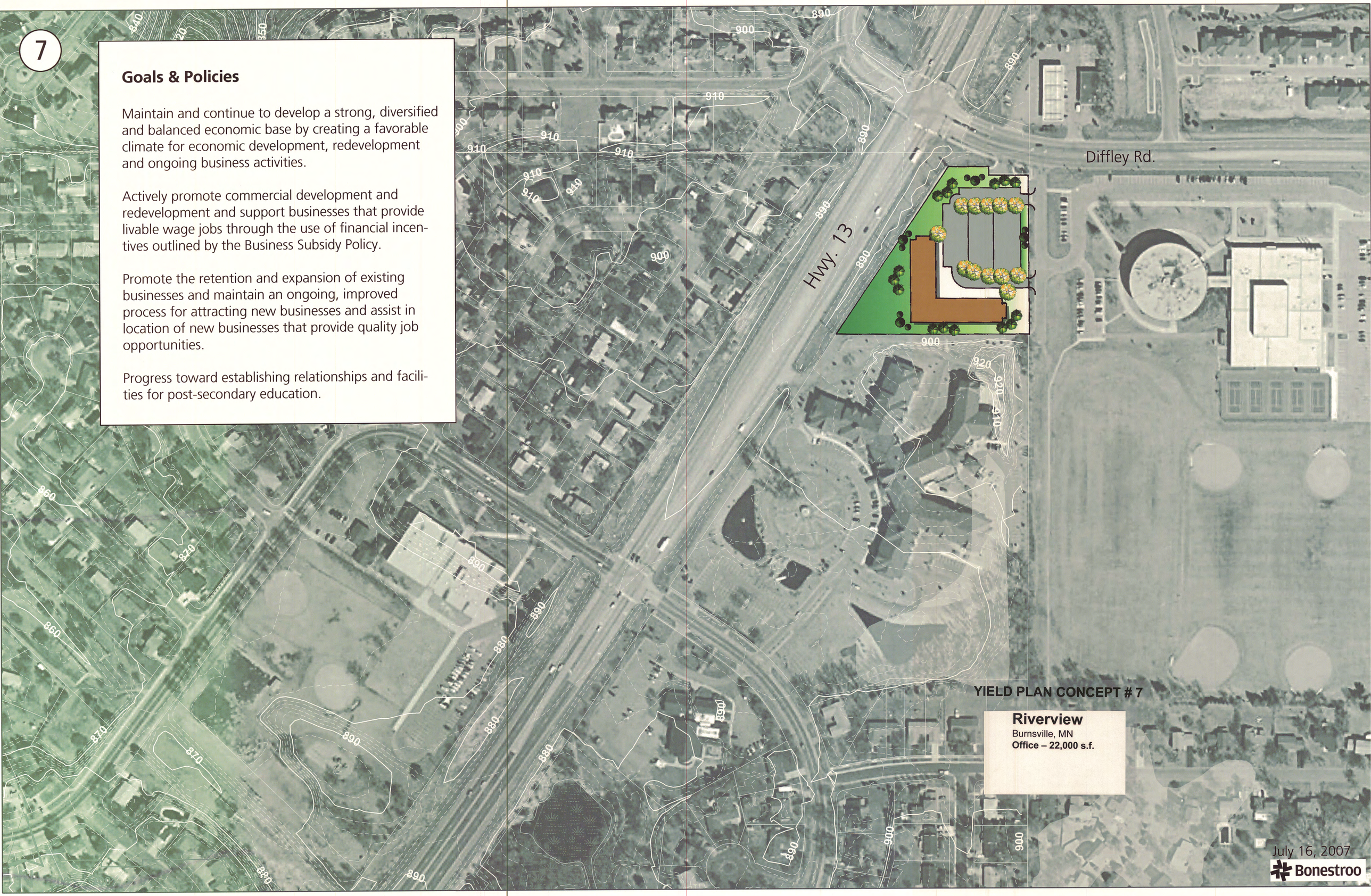
Goals & Policies

Maintain and continue to develop a strong, diversified and balanced economic base by creating a favorable climate for economic development, redevelopment and ongoing business activities.

Actively promote commercial development and redevelopment and support businesses that provide livable wage jobs through the use of financial incentives outlined by the Business Subsidy Policy.

Promote the retention and expansion of existing businesses and maintain an ongoing, improved process for attracting new businesses and assist in location of new businesses that provide quality job opportunities.

Progress toward establishing relationships and facilities for post-secondary education.



City Of Burnsville

Appendix D – Neighborhood Center Yield Plans

2005

Burnsville Auto Center

Site Characteristics						
Acres	2.03	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
		FAR		Density (units/acre-avg.)		Average Density
		0.3	0.3	14	8	11
*Land Use Mix (Acres)**		0.68	0.68	0.68	0.68	
Total Building Square Feet		8,843	8,843		11,368	**29,053**
Total Site Square Feet		29,476	29,476		29,476	**88,427**
Total Units				14.2	8.1	**22.3**
Site Impacts						
Required Green Space	Percentage Acreage	25%	25%	25%	25%	
	Development Impact (Green Space SF)	7368.90	7368.90		7368.90	**22106.70**
Impervious Coverage	Percent Impervious Coverage	75%	75%	75%	75%	
	Development Impact (Impervious SF)	22,107	22,107		22,107	**66,320**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	250	250	
	Development Impact (Gallons Wastewater)	677	677	3,553	2,030	**6,936**
Water Supply	Gallons per Commercial Acre or per Household	110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact	744	744	3908	2233	**7629**
Stormwater Ponding	Percentage of Site Area	5%	5%	5%	5%	
	Development Impact (Ponding SF)	4421.340	4421.340		4421.340	**13264**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	2	2	
	Development Impact (Number of Parking Stalls)	59.0	44.2	28.4	16.2	**147.8**
	Surface Parking Footprint (SF) (Stalls x 400SF)	23,580	17,685	11,368	6,496	**59,130**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	10,316	7,737	4,974	2,842	**25,869**
Transit	Percentage Transit Trips	2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	8.7	2.8	2.8	1.4	**15.7**
Trips per Day	Trips per 1000 Commercial SF or per Household	34	11	6.72	5.86	
	Development Impact (Trips Generated)	301	97	95	48	**541**

*Total is greater than site acreage due to stacking of housing/retail

**Generally 20 boardings/day warrants shelter at suburban transit stop

Burnsville Plaza

Site Characteristics						
Acres	4.11	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
		FAR		Density (units/acre-avg.)		Average Density
		0.3	0.3	14	8	11
*Land Use Mix (Acres)**		1.37	1.37	1.37	1.37	
Total Building Square Feet		17,903	17,903		23,016	**58,822**
Total Site Square Feet		59,677	59,677		59,677	**179,032**
Total Units				28.8	16.4	**45.2**
Site Impacts						
Required Green Space	Percentage Acreage	25%	25%	25%	25%	
	Development Impact (Green Space SF)	14919.30	14919.30		14919.30	**44757.90**
Impervious Coverage	Percent Impervious Coverage	75%	75%	75%	75%	
	Development Impact (Impervious SF)	44,758	44,758		44,758	**134,274**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	250	250	
	Development Impact (Gallons Wastewater)	1,370	1,370	7,193	4,110	**14,043**
Water Supply	Gallons per Commercial Acre or per Household	110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact	1507	1507	7912	4521	**15447**
Stormwater Ponding	Percentage of Site Area	5%	5%	5%	5%	
	Development Impact (Ponding SF)	8951.580	8951.580		8951.580	**26855**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	2	2	
	Development Impact (Number of Parking Stalls)	119.4	89.5	57.5	32.9	**299.3**
	Surface Parking Footprint (SF) (Stalls x 400SF)	47,742	35,806	23,016	13,152	**119,716**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	20,887	15,665	10,070	5,754	**52,376**
Transit	Percentage Transit Trips	2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	17.7	5.7	5.6	2.8	**31.8**
Trips per Day	Trips per 1000 Commercial SF or per Household	34	11	6.72	5.86	
	Development Impact (Trips Generated)	609	197	193	96	**1,095**

*Total is greater than site acreage due to stacking of housing/retail

**Generally 20 boardings/day warrants shelter at suburban transit stop

Byerly's Burnsville Centre

Site Characteristics						
Acres	6.14	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
		FAR		Density (units/acre-avg.)		Average Density
		0.3	0.3	14	8	11
*Land Use Mix (Acres)**		2.05	2.05	2.05	2.05	
Total Building Square Feet		26,746	26,746		34,384	**87,876**
Total Site Square Feet		89,153	89,153		89,153	**267,458**
Total Units				43.0	24.6	**67.5**
Site Impacts						
Required Green Space	Percentage Acreage	25%	25%	25%	25%	
	Development Impact (Green Space SF)	22288.20	22288.20		22288.20	**66864.60**
Impervious Coverage	Percent Impervious Coverage	75%	75%	75%	75%	
	Development Impact (Impervious SF)	66,865	66,865		66,865	**200,594**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	250	250	
	Development Impact (Gallons Wastewater)	2,047	2,047	10,745	6,140	**20,978**
Water Supply	Gallons per Commercial Acre or per Household	110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact	2251	2251	11820	6754	**23076**
Stormwater Ponding	Percentage of Site Area	5%	5%	5%	5%	
	Development Impact (Ponding SF)	13372.920	13372.920		13372.920	**40119**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	2	2	
	Development Impact (Number of Parking Stalls)	178.3	133.7	86.0	49.1	**447.1**
	Surface Parking Footprint (SF) (Stalls x 400SF)	71,322	53,492	34,384	19,648	**178,846**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	31,203	23,403	15,043	8,596	**78,245**
Transit	Percentage Transit Trips	2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	26.4	8.5	8.4	4.2	**47.5**
Trips per Day	Trips per 1000 Commercial SF or per Household	34	11	6.72	5.86	
	Development Impact (Trips Generated)	909	294	289	144	**1,636**

*Total is greater than site acreage due to stacking of housing/retail

**Generally 20 boardings/day warrants shelter at suburban transit stop

Cliffview Plaza

Site Characteristics						
Acres	2.05	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
		FAR		Density (units/acre-avg.)		Average Density
		0.3	0.3	14	8	11
*Land Use Mix (Acres)**		0.68	0.68	0.68	0.68	
Total Building Square Feet		8,930	8,930		11,480	**29,340**
Total Site Square Feet		29,766	29,766		29,766	**89,298**
Total Units				14.4	8.2	**22.6**
Site Impacts						
Required Green Space	Percentage Acreage	25%	25%	25%	25%	
	Development Impact (Green Space SF)	7441.50	7441.50		7441.50	**22324.50**
Impervious Coverage	Percent Impervious Coverage	75%	75%	75%	75%	
	Development Impact (Impervious SF)	22,325	22,325		22,325	**66,974**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	250	250	
	Development Impact (Gallons Wastewater)	683	683	3,588	2,050	**7,004**
Water Supply	Gallons per Commercial Acre or per Household	110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact	752	752	3946	2255	**7705**
Stormwater Ponding	Percentage of Site Area	5%	5%	5%	5%	
	Development Impact (Ponding SF)	4464.900	4464.900		4464.900	**13395**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	2	2	
	Development Impact (Number of Parking Stalls)	59.5	44.6	28.7	16.4	**149.3**
	Surface Parking Footprint (SF) (Stalls x 400SF)	23,813	17,860	11,480	6,560	**59,712**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	10,418	7,814	5,023	2,870	**26,124**
Transit	Percentage Transit Trips	2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	8.8	2.8	2.8	1.4	**15.8**
Trips per Day	Trips per 1000 Commercial SF or per Household	34	11	6.72	5.86	
	Development Impact (Trips Generated)	304	98	96	48	**546**

*Total is greater than site acreage due to stacking of housing/retail

**Generally 20 boardings/day warrants shelter at suburban transit stop

Colonial Ridge

Site Characteristics						
Acres	1.97	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
		FAR		Density (units/acre-avg.)		Average Density
		0.3	0.3	14	8	11
*Land Use Mix (Acres)**		0.66	0.66	0.66	0.66	
Total Building Square Feet		8,581	8,581		11,032	**28,195**
Total Site Square Feet		28,604	28,604		28,604	**85,813**
Total Units				13.8	7.9	**21.7**
Site Impacts						
Required Green Space	Percentage Acreage	25%	25%	25%	25%	
	Development Impact (Green Space SF)	7151.10	7151.10		7151.10	**21453.30**
Impervious Coverage	Percent Impervious Coverage	75%	75%	75%	75%	
	Development Impact (Impervious SF)	21,453	21,453		21,453	**64,360**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	250	250	
	Development Impact (Gallons Wastewater)	657	657	3,448	1,970	**6,731**
Water Supply	Gallons per Commercial Acre or per Household	110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact	722	722	3792	2167	**7404**
Stormwater Ponding	Percentage of Site Area	5%	5%	5%	5%	
	Development Impact (Ponding SF)	4290.660	4290.660		4290.660	**12872**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	2	2	
	Development Impact (Number of Parking Stalls)	57.2	42.9	27.6	15.8	**143.5**
	Surface Parking Footprint (SF) (Stalls x 400SF)	22,884	17,163	11,032	6,304	**57,382**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	10,012	7,509	4,827	2,758	**25,105**
Transit	Percentage Transit Trips	2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	8.5	2.7	2.7	1.3	**15.2**
Trips per Day	Trips per 1000 Commercial SF or per Household	34	11	6.72	5.86	
	Development Impact (Trips Generated)	292	94	93	46	**525**

*Total is greater than site acreage due to stacking of housing/retail

**Generally 20 boardings/day warrants shelter at suburban transit stop

Eagle Trace Center

Site Characteristics						
Acres	1.11	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
		FAR		Density (units/acre-avg.)		Average Density
		0.3	0.3	14	8	11
*Land Use Mix (Acres)**		0.37	0.37	0.37	0.37	
Total Building Square Feet		4,835	4,835		6,216	**15,886**
Total Site Square Feet		16,117	16,117		16,117	**48,352**
Total Units				7.8	4.4	**12.2**
Site Impacts						
Required Green Space	Percentage Acreage	25%	25%	25%	25%	
	Development Impact (Green Space SF)	4029.30	4029.30		4029.30	**12087.90**
Impervious Coverage	Percent Impervious Coverage	75%	75%	75%	75%	
	Development Impact (Impervious SF)	12,088	12,088		12,088	**36,264**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	250	250	
	Development Impact (Gallons Wastewater)	370	370	1,943	1,110	**3,793**
Water Supply	Gallons per Commercial Acre or per Household	110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact	407	407	2137	1221	**4172**
Stormwater Ponding	Percentage of Site Area	5%	5%	5%	5%	
	Development Impact (Ponding SF)	2417.580	2417.580		2417.580	**7253**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	2	2	
	Development Impact (Number of Parking Stalls)	32.2	24.2	15.5	8.9	**80.8**
	Surface Parking Footprint (SF) (Stalls x 400SF)	12,894	9,670	6,216	3,552	**32,332**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	5,641	4,231	2,720	1,554	**14,145**
Transit	Percentage Transit Trips	2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	4.8	1.5	1.5	0.8	**8.6**
Trips per Day	Trips per 1000 Commercial SF or per Household	34	11	6.72	5.86	
	Development Impact (Trips Generated)	164	53	52	26	**296**

*Total is greater than site acreage due to stacking of housing/retail

**Generally 20 boardings/day warrants shelter at suburban transit stop

James Plaza

Site Characteristics						
Acres	2.47	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
		FAR		Density (units/acre-avg.)		Average Density
		0.3	0.3	14	8	11
*Land Use Mix (Acres)**		0.82	0.82	0.82	0.82	
Total Building Square Feet		10,759	10,759		13,832	**35,351**
Total Site Square Feet		35,864	35,864		35,864	**107,593**
Total Units				17.3	9.9	**27.2**
Site Impacts						
Required Green Space	Percentage Acreage	25%	25%	25%	25%	
	Development Impact (Green Space SF)	8966.10	8966.10		8966.10	**26898.30**
Impervious Coverage	Percent Impervious Coverage	75%	75%	75%	75%	
	Development Impact (Impervious SF)	26,898	26,898		26,898	**80,695**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	250	250	
	Development Impact (Gallons Wastewater)	823	823	4,323	2,470	**8,439**
Water Supply	Gallons per Commercial Acre or per Household	110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact	906	906	4755	2717	**9283**
Stormwater Ponding	Percentage of Site Area	5%	5%	5%	5%	
	Development Impact (Ponding SF)	5379.660	5379.660		5379.660	**16139**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	2	2	
	Development Impact (Number of Parking Stalls)	71.7	53.8	34.6	19.8	**179.9**
	Surface Parking Footprint (SF) (Stalls x 400SF)	28,692	21,519	13,832	7,904	**71,946**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	12,553	9,414	6,052	3,458	**31,476**
Transit	Percentage Transit Trips	2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	10.6	3.4	3.4	1.7	**19.1**
Trips per Day	Trips per 1000 Commercial SF or per Household	34	11	6.72	5.86	
	Development Impact (Trips Generated)	366	118	116	58	**658**

*Total is greater than site acreage due to stacking of housing/retail

**Generally 20 boardings/day warrants shelter at suburban transit stop

Mendard Plaza

Site Characteristics						
Acres	14.91	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
		FAR		Density (units/acre-avg.)		Average Density
		0.3	0.3	14	8	11
*Land Use Mix (Acres)**		4.97	4.97	4.97	4.97	
Total Building Square Feet		64,948	64,948		83,496	**213,392**
Total Site Square Feet		216,493	216,493		216,493	**649,480**
Total Units				104.4	59.6	**164.0**
Site Impacts						
Required Green Space	Percentage Acreage	25%	25%	25%	25%	
	Development Impact (Green Space SF)	54123.30	54123.30		54123.30	**162369.90**
Impervious Coverage	Percent Impervious Coverage	75%	75%	75%	75%	
	Development Impact (Impervious SF)	162,370	162,370		162,370	**487,110**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	250	250	
	Development Impact (Gallons Wastewater)	4,970	4,970	26,093	14,910	**50,943**
Water Supply	Gallons per Commercial Acre or per Household	110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact	5467	5467	28702	16401	**56037**
Stormwater Ponding	Percentage of Site Area	5%	5%	5%	5%	
	Development Impact (Ponding SF)	32473.980	32473.980		32473.980	**97422**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	2	2	
	Development Impact (Number of Parking Stalls)	433.0	324.7	208.7	119.3	**1085.7**
	Surface Parking Footprint (SF) (Stalls x 400SF)	173,195	129,896	83,496	47,712	**434,298**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	75,773	56,829	36,530	20,874	**190,006**
Transit	Percentage Transit Trips	2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	64.0	20.7	20.3	10.1	**115.2**
Trips per Day	Trips per 1000 Commercial SF or per Household	34	11	6.72	5.86	
	Development Impact (Trips Generated)	2,208	714	701	349	**3,974**

*Total is greater than site acreage due to stacking of housing/retail

**Generally 20 boardings/day warrants shelter at suburban transit stop

NicBurn Center

Site Characteristics						
Acres	2.4	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
		FAR		Density (units/acre-avg.)		Average Density
		0.3	0.3	14	8	11
*Land Use Mix (Acres)**		0.80	0.80	0.80	0.80	
Total Building Square Feet		10,454	10,454		13,440	**34,349**
Total Site Square Feet		34,848	34,848		34,848	**104,544**
Total Units				16.8	9.6	**26.4**
Site Impacts						
Required Green Space	Percentage Acreage	25%	25%	25%	25%	
	Development Impact (Green Space SF)	8712.00	8712.00		8712.00	**26136.00**
Impervious Coverage	Percent Impervious Coverage	75%	75%	75%	75%	
	Development Impact (Impervious SF)	26,136	26,136		26,136	**78,408**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	250	250	
	Development Impact (Gallons Wastewater)	800	800	4,200	2,400	**8,200**
Water Supply	Gallons per Commercial Acre or per Household	110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact	880	880	4620	2640	**9020**
Stormwater Ponding	Percentage of Site Area	5%	5%	5%	5%	
	Development Impact (Ponding SF)	5227.200	5227.200		5227.200	**15682**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	2	2	
	Development Impact (Number of Parking Stalls)	69.7	52.3	33.6	19.2	**174.8**
	Surface Parking Footprint (SF) (Stalls x 400SF)	27,878	20,909	13,440	7,680	**69,907**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	12,197	9,148	5,880	3,360	**30,584**
Transit	Percentage Transit Trips	2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	10.3	3.3	3.3	1.6	**18.5**
Trips per Day	Trips per 1000 Commercial SF or per Household	34	11	6.72	5.86	
	Development Impact (Trips Generated)	355	115	113	56	**640**

*Total is greater than site acreage due to stacking of housing/retail

**Generally 20 boardings/day warrants shelter at suburban transit stop

Parkway 5 Shoppes

Site Characteristics						
Acres	2.91	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
		FAR		Density (units/acre-avg.)		Average Density
		0.3	0.3	14	8	11
*Land Use Mix (Acres)**		0.97	0.97	0.97	0.97	
Total Building Square Feet		12,676	12,676		16,296	**41,648**
Total Site Square Feet		42,253	42,253		42,253	**126,760**
Total Units				20.4	11.6	**32.0**
Site Impacts						
Required Green Space	Percentage Acreage	25%	25%	25%	25%	
	Development Impact (Green Space SF)	10563.30	10563.30		10563.30	**31689.90**
Impervious Coverage	Percent Impervious Coverage	75%	75%	75%	75%	
	Development Impact (Impervious SF)	31,690	31,690		31,690	**95,070**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	250	250	
	Development Impact (Gallons Wastewater)	970	970	5,093	2,910	**9,943**
Water Supply	Gallons per Commercial Acre or per Household	110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact	1067	1067	5602	3201	**10937**
Stormwater Ponding	Percentage of Site Area	5%	5%	5%	5%	
	Development Impact (Ponding SF)	6337.980	6337.980		6337.980	**19014**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	2	2	
	Development Impact (Number of Parking Stalls)	84.5	63.4	40.7	23.3	**211.9**
	Surface Parking Footprint (SF) (Stalls x 400SF)	33,803	25,352	16,296	9,312	**84,762**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	14,789	11,091	7,130	4,074	**37,084**
Transit	Percentage Transit Trips	2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	12.5	4.0	4.0	2.0	**22.5**
Trips per Day	Trips per 1000 Commercial SF or per Household	34	11	6.72	5.86	
	Development Impact (Trips Generated)	431	139	137	68	**776**

*Total is greater than site acreage due to stacking of housing/retail

**Generally 20 boardings/day warrants shelter at suburban transit stop

Parkway Plaza

Site Characteristics						
Acres	0.92	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
		FAR		Density (units/acre-avg.)		Average Density
		0.3	0.3	14	8	11
*Land Use Mix (Acres)**		0.31	0.31	0.31	0.31	
Total Building Square Feet		4,008	4,008		5,152	**13,167**
Total Site Square Feet		13,358	13,358		13,358	**40,075**
Total Units				6.4	3.7	**10.1**
Site Impacts						
Required Green Space	Percentage Acreage	25%	25%	25%	25%	
	Development Impact (Green Space SF)	3339.60	3339.60		3339.60	**10018.80**
Impervious Coverage	Percent Impervious Coverage	75%	75%	75%	75%	
	Development Impact (Impervious SF)	10,019	10,019		10,019	**30,056**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	250	250	
	Development Impact (Gallons Wastewater)	307	307	1,610	920	**3,143**
Water Supply	Gallons per Commercial Acre or per Household	110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact	337	337	1771	1012	**3458**
Stormwater Ponding	Percentage of Site Area	5%	5%	5%	- 5%	
	Development Impact (Ponding SF)	2003.760	2003.760		2003.760	**6011**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	2	2	
	Development Impact (Number of Parking Stalls)	26.7	20.0	12.9	7.4	**67.0**
	Surface Parking Footprint (SF) (Stalls x 400SF)	10,687	8,015	5,152	2,944	**26,798**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	4,675	3,507	2,254	1,288	**11,724**
Transit	Percentage Transit Trips	2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	4.0	1.3	1.3	0.6	**7.1**
Trips per Day	Trips per 1000 Commercial SF or per Household	34	11	6.72	5.86	
	Development Impact (Trips Generated)	136	44	43	22	**245**

River Hills Shopping Center

Site Characteristics						
Acres	1.6	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
		FAR		Density (units/acre-avg.)		Average Density
		0.3	0.3	14	8	11
*Land Use Mix (Acres)**		0.53	0.53	0.53	0.53	
Total Building Square Feet		6,970	6,970		8,960	**22,899**
Total Site Square Feet		23,232	23,232		23,232	**69,696**
Total Units				11.2	6.4	**17.6**
Site Impacts						
Required Green Space	Percentage Acreage	25%	25%	25%	25%	
	Development Impact (Green Space SF)	5808.00	5808.00		5808.00	**17424.00**
Impervious Coverage	Percent Impervious Coverage	75%	75%	75%	75%	
	Development Impact (Impervious SF)	17,424	17,424		17,424	**52,272**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	250	250	
	Development Impact (Gallons Wastewater)	533	533	2,800	1,600	**5,467**
Water Supply	Gallons per Commercial Acre or per Household	110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact	587	587	3080	1760	**6013**
Stormwater Ponding	Percentage of Site Area	5%	5%	5%	5%	
	Development Impact (Ponding SF)	3484.800	3484.800		3484.800	**10454**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	2	2	
	Development Impact (Number of Parking Stalls)	46.5	34.8	22.4	12.8	**116.5**
	Surface Parking Footprint (SF) (Stalls x 400SF)	18,586	13,939	8,960	5,120	**46,605**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	8,131	6,098	3,920	2,240	**20,390**
Transit	Percentage Transit Trips	2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	6.9	2.2	2.2	1.1	**12.4**
Trips per Day	Trips per 1000 Commercial SF or per Household	34	11	6.72	5.86	
	Development Impact (Trips Generated)	237	77	75	38	**426**

*Total is greater than site acreage due to stacking of housing/retail

**Generally 20 boardings/day warrants shelter at suburban transit stop

Riverview Center

Site Characteristics							
Acres		1.26	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
			FAR		Density (units/acre-avg.)		Average Density
			0.3	0.3	14	8	11
*Land Use Mix (Acres)**			0.42	0.42	0.42	0.42	
Total Building Square Feet			5,489	5,489		7,056	**18,033**
Total Site Square Feet			18,295	18,295		18,295	**54,886**
Total Units					8.8	5.0	**13.9**
Site Impacts							
Required Green Space	Percentage Acreage		25%	25%	25%	25%	
	Development Impact (Green Space SF)		4573.80	4573.80		4573.80	**13721.40**
Impervious Coverage	Percent Impervious Coverage		75%	75%	75%	75%	
	Development Impact (Impervious SF)		13,721	13,721		13,721	**41,164**
Gallons Wastewater	Gallons per Commercial Acre or per Household		1000	1000	250	250	
	Development Impact (Gallons Wastewater)		420	420	2,205	1,260	**4,305**
Water Supply	Gallons per Commercial Acre or per Household		110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact		462	462	2426	1386	**4736**
Stormwater Ponding	Percentage of Site Area		5%	5%	5%	5%	
	Development Impact (Ponding SF)		2744.280	2744.280		2744.280	**8233**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)		150	200	2	2	
	Development Impact (Number of Parking Stalls)		36.6	27.4	17.6	10.1	**91.8**
	Surface Parking Footprint (SF) (Stalls x 400SF)		14,636	10,977	7,056	4,032	**36,701**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2		6,403	4,802	3,087	1,764	**16,057**
Transit	Percentage Transit Trips		2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)*		5.4	1.8	1.7	0.9	**9.7**
Trips per Day	Trips per 1000 Commercial SF or per Household		34	11	6.72	5.86	
	Development Impact (Trips Generated)		187	60	59	30	**336**

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**Generally 20 boardings/day warrants shelter at suburban transit stop

Southcross Convenience Center

Site Characteristics						
Acres	2.08	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
		FAR		Density (units/acre-avg.)		Average Density
		0.3	0.3	14	8	11
*Land Use Mix (Acres)**		0.69	0.69	0.69	0.69	
Total Building Square Feet		9,060	9,060		11,648	**29,769**
Total Site Square Feet		30,202	30,202		30,202	**90,605**
Total Units				14.6	8.3	**22.9**
Site Impacts						
Required Green Space	Percentage Acreage	25%	25%	25%	25%	
	Development Impact (Green Space SF)	7550.40	7550.40		7550.40	**22651.20**
Impervious Coverage	Percent Impervious Coverage	75%	75%	75%	75%	
	Development Impact (Impervious SF)	22,651	22,651		22,651	**67,954**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	250	250	
	Development Impact (Gallons Wastewater)	693	693	3,640	2,080	**7,107**
Water Supply	Gallons per Commercial Acre or per Household	110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact	763	763	4004	2288	**7817**
Stormwater Ponding	Percentage of Site Area	5%	5%	5%	5%	
	Development Impact (Ponding SF)	4530.240	4530.240		4530.240	**13591**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	2	2	
	Development Impact (Number of Parking Stalls)	60.4	45.3	29.1	16.6	**151.5**
	Surface Parking Footprint (SF) (Stalls x 400SF)	24,161	18,121	11,648	6,656	**60,586**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	10,571	7,928	5,096	2,912	**26,506**
Transit	Percentage Transit Trips	2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	8.9	2.9	2.8	1.4	**16.1**
Trips per Day	Trips per 1000 Commercial SF or per Household	34	11	6.72	5.86	
	Development Impact (Trips Generated)	308	100	98	49	**554**

*Total is greater than site acreage due to stacking of housing/retail

**Generally 20 boardings/day warrants shelter at suburban transit stop

Summit Oaks Square

Site Characteristics						
Acres	3.87	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
		FAR		Density (units/acre-avg.)		Average Density
		0.3	0.3	14	8	11
*Land Use Mix (Acres)**		1.29	1.29	1.29	1.29	
Total Building Square Feet		16,858	16,858		21,672	**55,387**
Total Site Square Feet		56,192	56,192		56,192	**168,577**
Total Units				27.1	15.5	**42.6**
Site Impacts						
Required Green Space	Percentage Acreage	25%	25%	25%	25%	
	Development Impact (Green Space SF)	14048.10	14048.10		14048.10	**42144.30**
Impervious Coverage	Percent Impervious Coverage	75%	75%	75%	75%	
	Development Impact (Impervious SF)	42,144	42,144		42,144	**126,433**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	250	250	
	Development Impact (Gallons Wastewater)	1,290	1,290	6,773	3,870	**13,223**
Water Supply	Gallons per Commercial Acre or per Household	110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact	1419	1419	7450	4257	**14545**
Stormwater Ponding	Percentage of Site Area	5%	5%	5%	5%	
	Development Impact (Ponding SF)	8428.860	8428.860		8428.860	**25287**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	2	2	
	Development Impact (Number of Parking Stalls)	112.4	84.3	54.2	31.0	**281.8**
	Surface Parking Footprint (SF) (Stalls x 400SF)	44,954	33,715	21,672	12,384	**112,725**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	19,667	14,751	9,482	5,418	**49,317**
Transit	Percentage Transit Trips	2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	16.6	5.4	5.3	2.6	**29.9**
Trips per Day	Trips per 1000 Commercial SF or per Household	34	11	6.72	5.86	
	Development Impact (Trips Generated)	573	185	182	91	**1,031**

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**Generally 20 boardings/day warrants shelter at suburban transit stop

Town & Country Square

Site Characteristics						
Acres	10.34	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
		FAR		Density (units/acre-avg.)		Average Density
		0.3	0.3	14	8	11
*Land Use Mix (Acres)**		3.45	3.45	3.45	3.45	
Total Building Square Feet		45,041	45,041		57,904	**147,986**
Total Site Square Feet		150,137	150,137		150,137	**450,410**
Total Units				72.4	41.4	**113.7**
Site Impacts						
Required Green Space	Percentage Acreage	25%	25%	25%	25%	
	Development Impact (Green Space SF)	37534.20	37534.20		37534.20	**112602.60**
Impervious Coverage	Percent Impervious Coverage	75%	75%	75%	75%	
	Development Impact (Impervious SF)	112,603	112,603		112,603	**337,808**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	250	250	
	Development Impact (Gallons Wastewater)	3,447	3,447	18,095	10,340	**35,328**
Water Supply	Gallons per Commercial Acre or per Household	110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact	3791	3791	19905	11374	**38861**
Stormwater Ponding	Percentage of Site Area	5%	5%	5%	5%	
	Development Impact (Ponding SF)	22520.520	22520.520		22520.520	**67562**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	2	2	
	Development Impact (Number of Parking Stalls)	300.3	225.2	144.8	82.7	**753.0**
	Surface Parking Footprint (SF) (Stalls x 400SF)	120,109	90,082	57,904	33,088	**301,184**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	52,548	39,411	25,333	14,476	**131,768**
Transit	Percentage Transit Trips	2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	44.4	14.4	14.1	7.0	**79.9**
Trips per Day	Trips per 1000 Commercial SF or per Household	34	11	6.72	5.86	
	Development Impact (Trips Generated)	1,531	495	486	242	**2,756**

*Total is greater than site acreage due to stacking of housing/retail

**Generally 20 boardings/day warrants shelter at suburban transit stop

Valley Ridge

Site Characteristics							
Acres		14.2	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
			FAR		Density (units/acre-avg.)		Average Density
			0.3	0.3	14	8	11
*Land Use Mix (Acres)**			4.73	4.73	4.73	4.73	
Total Building Square Feet			61,855	61,855		79,520	**203,230**
Total Site Square Feet			206,184	206,184		206,184	**618,552**
Total Units					99.4	56.8	**156.2**
Site Impacts							
Required Green Space	Percentage Acreage		25%	25%	25%	25%	
	Development Impact (Green Space SF)		51546.00	51546.00		51546.00	**154638.00**
Impervious Coverage	Percent Impervious Coverage		75%	75%	75%	75%	
	Development Impact (Impervious SF)		154,638	154,638		154,638	**463,914**
Gallons Wastewater	Gallons per Commercial Acre or per Household		1000	1000	250	250	
	Development Impact (Gallons Wastewater)		4,733	4,733	24,850	14,200	**48,517**
Water Supply	Gallons per Commercial Acre or per Household		110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact		5207	5207	27335	15620	**53368**
Stormwater Ponding	Percentage of Site Area		5%	5%	5%	5%	
	Development Impact (Ponding SF)		30927.600	30927.600		30927.600	**92783**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)		150	200	2	2	
	Development Impact (Number of Parking Stalls)		412.4	309.3	198.8	113.6	**1034.0**
	Surface Parking Footprint (SF) (Stalls x 400SF)		164,947	123,710	79,520	45,440	**413,618**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2		72,164	54,123	34,790	19,880	**180,958**
Transit	Percentage Transit Trips		2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)*		61.0	19.7	19.4	9.7	**109.7**
Trips per Day	Trips per 1000 Commercial SF or per Household		34	11	6.72	5.86	
	Development Impact (Trips Generated)		2,103	680	668	333	**3,784**

*Total is greater than site acreage due to stacking of housing/retail

**Generally 20 boardings/day warrants shelter at suburban transit stop

Wood Park Crossing

Site Characteristics						
Acres	1.6	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
		FAR		Density (units/acre-avg.)		Average Density
		0.3	0.3	14	8	11
*Land Use Mix (Acres)**		0.53	0.53	0.53	0.53	
Total Building Square Feet		6,970	6,970		8,960	**22,899**
Total Site Square Feet		23,232	23,232		23,232	**69,696**
Total Units				11.2	6.4	**17.6**
Site Impacts						
Required Green Space	Percentage Acreage	25%	25%	25%	25%	
	Development Impact (Green Space SF)	5808.00	5808.00		5808.00	**17424.00**
Impervious Coverage	Percent Impervious Coverage	75%	75%	75%	75%	
	Development Impact (Impervious SF)	17,424	17,424		17,424	**52,272**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	250	250	
	Development Impact (Gallons Wastewater)	533	533	2,800	1,600	**5,467**
Water Supply	Gallons per Commercial Acre or per Household	110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact	587	587	3080	1760	**6013**
Stormwater Ponding	Percentage of Site Area	5%	5%	5%	5%	
	Development Impact (Ponding SF)	3484.800	3484.800		3484.800	**10454**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	2	2	
	Development Impact (Number of Parking Stalls)	46.5	34.8	22.4	12.8	**116.5**
	Surface Parking Footprint (SF) (Stalls x 400SF)	18,586	13,939	8,960	5,120	**46,605**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	8,131	6,098	3,920	2,240	**20,390**
Transit	Percentage Transit Trips	2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	6.9	2.2	2.2	1.1	**12.4**
Trips per Day	Trips per 1000 Commercial SF or per Household	34	11	6.72	5.86	
	Development Impact (Trips Generated)	237	77	75	38	**426**

*Total is greater than site acreage due to stacking of housing/retail

**Generally 20 boardings/day warrants shelter at suburban transit stop

Wood Park Plaza

Site Characteristics						
Acres	2.56	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
		FAR		Density (units/acre-avg.)		Average Density
		0.3	0.3	14	8	11
*Land Use Mix (Acres)**		0.85	0.85	0.85	0.85	
Total Building Square Feet		11,151	11,151		14,336	**36,639**
Total Site Square Feet		37,171	37,171		37,171	**111,514**
Total Units				17.9	10.2	**28.2**
Site Impacts						
Required Green Space	Percentage Acreage	25%	25%	25%	25%	
	Development Impact (Green Space SF)	9292.80	9292.80		9292.80	**27878.40**
Impervious Coverage	Percent Impervious Coverage	75%	75%	75%	75%	
	Development Impact (Impervious SF)	27,878	27,878		27,878	**83,635**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	250	250	
	Development Impact (Gallons Wastewater)	853	853	4,480	2,560	**8,747**
Water Supply	Gallons per Commercial Acre or per Household	110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact	939	939	4928	2816	**9621**
Stormwater Ponding	Percentage of Site Area	5%	5%	5%	5%	
	Development Impact (Ponding SF)	5575.680	5575.680		5575.680	**16727**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	2	2	
	Development Impact (Number of Parking Stalls)	74.3	55.8	35.8	20.5	**186.4**
	Surface Parking Footprint (SF) (Stalls x 400SF)	29,737	22,303	14,336	8,192	**74,568**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	13,010	9,757	6,272	3,584	**32,623**
Transit	Percentage Transit Trips	2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	11.0	3.6	3.5	1.7	**19.8**
Trips per Day	Trips per 1000 Commercial SF or per Household	34	11	6.72	5.86	
	Development Impact (Trips Generated)	379	123	120	60	**682**

*Total is greater than site acreage due to stacking of housing/retail

**Generally 20 boardings/day warrants shelter at suburban transit stop

Wood Park Shoppes

Site Characteristics						
Acres	1.33	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
		FAR		Density (units/acre-avg.)		Average Density
		0.3	0.3	14	8	11
*Land Use Mix (Acres)**		0.44	0.44	0.44	0.44	
Total Building Square Feet		5,793	5,793		7,448	**19,035**
Total Site Square Feet		19,312	19,312		19,312	**57,935**
Total Units				9.3	5.3	**14.6**
Site Impacts						
Required Green Space	Percentage Acreage	25%	25%	25%	25%	
	Development Impact (Green Space SF)	4827.90	4827.90		4827.90	**14483.70**
Impervious Coverage	Percent Impervious Coverage	75%	75%	75%	75%	
	Development Impact (Impervious SF)	14,484	14,484		14,484	**43,451**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	250	250	
	Development Impact (Gallons Wastewater)	443	443	2,328	1,330	**4,544**
Water Supply	Gallons per Commercial Acre or per Household	110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact	488	488	2560	1463	**4999**
Stormwater Ponding	Percentage of Site Area	5%	5%	5%	5%	
	Development Impact (Ponding SF)	2896.740	2896.740		2896.740	**8690**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	2	2	
	Development Impact (Number of Parking Stalls)	38.6	29.0	18.6	10.6	**96.9**
	Surface Parking Footprint (SF) (Stalls x 400SF)	15,449	11,587	7,448	4,256	**38,740**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	6,759	5,069	3,259	1,862	**16,949**
Transit	Percentage Transit Trips	2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)**	5.7	1.8	1.8	0.9	**10.3**
Trips per Day	Trips per 1000 Commercial SF or per Household	34	11	6.72	5.86	
	Development Impact (Trips Generated)	197	64	63	31	**354**

*Total is greater than site acreage due to stacking of housing/retail

**Generally 20 boardings/day warrants shelter at suburban transit stop

Woodruff Center

Site Characteristics						
Acres	1.2	Retail (Ground floor w/housing above)	Retail/Office Mix	High Density Multi Family (above Retail)	Medium Density Multi Family	Total
		FAR		Density (units/acre-avg.)		Average density
		0.3	0.3	14	8	11
*Land Use Mix (Acres)**		0.40	0.40	0.40	0.40	
Total Building Square Feet		5,227	5,227		6,720	**17,174**
Total Site Square Feet		17,424	17,424		17,424	**52,272**
Total Units				8.4	4.8	**13.2**
Site Impacts						
Required Green Space	Percentage Acreage	25%	25%	25%	25%	
	Development Impact (Green Space SF)	4356.00	4356.00		4356.00	**13068.00**
Impervious Coverage	Percent Impervious Coverage	75%	75%	75%	75%	
	Development Impact (Impervious SF)	13,068	13,068		13,068	**39,204**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	250	250	
	Development Impact (Gallons Wastewater)	400	400	2,100	1,200	**4,100**
Water Supply	Gallons per Commercial Acre or per Household	110% Wastewater	110% Wastewater	110% Wastewater	110% Wastewater	
	Development Impact	440	440	2310	1320	**4510**
Stormwater Ponding	Percentage of Site Area	5%	5%	5%	5%	
	Development Impact (Ponding SF)	2613.600	2613.600		2613.600	**7841**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	2	2	
	Development Impact (Number of Parking Stalls)	34.8	26.1	16.8	9.6	**87.4**
	Surface Parking Footprint (SF) (Stalls x 400SF)	13,939	10,454	6,720	3,840	**34,954**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	6,098	4,574	2,940	1,680	**15,292**
Transit	Percentage Transit Trips	2.9%	2.9%	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	5.2	1.7	1.6	0.8	**9.3**
Trips per Day	Trips per 1000 Commercial SF or per Household	34	11	6.72	5.86	
	Development Impact (Trips Generated)	178	57	56	28	**320**

*Total is greater than site acreage due to stacking of housing/retail

**Generally 20 boardings/day warrants shelter at suburban transit stop

City Of Burnsville

Appendix E – Satellite Center Yield Plans

2005

Aurora Village Center

Site Characteristics				
Acres	**14.42**	**Retail**	**Office**	**Total**
		FAR		
		0.2	0.3	
Land Use Mix (Acres)*		10.82	3.61	
Total Building Square Feet		41,876	62,814	**104,689**
Total Site Square Feet		471,101	157,034	**628,135**
Site Impacts				
Required Green Space	Percentage Acreage	25%	25%	
	Development Impact (Green Space SF)	117775.35	52344.60	**170119.95**
Impervious Coverage	Percent Impervious Coverage	75%	75%	
	Development Impact (Impervious SF)	353,326	117,775	**471,101**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	
	Development Impact (Gallons Wastewater)	4,807	4,807	**9,613**
Water Supply	Gallons per Commercial Acre	110% Wastewater	110% Wastewater	
	Development Impact	5287	5287	**10575**
Stormwater Ponding	Percentage of Site Area	5%	5%	
	Development Impact (Ponding SF)	31,407	31,407	**62,814**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	
	Development Impact (Number of Parking Stalls)	279.2	314.1	**593.2**
	Surface Parking Footprint (SF) (Stalls x 400SF)	111,668	125,627	**237,296**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	48,855	54,962	**103,817**
Transit	Percentage Transit Trips	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	41.3	20.0	**61.3**
Trips per Day	Trips per 1000 Commercial SF	34	11	
	Development Impact (Trips Generated)	1,424	691	**2,115**

**Generally 20 boardings/day warrants shelter at suburban transit stop

Burnhaven Drive & 143rd

Site Characteristics				
Acres	**2.45**	**Retail**	**Office**	**Total**
		FAR		
		0.2	0.3	
Land Use Mix (Acres)*		1.84	0.61	
Total Building Square Feet		7,115	10,672	**17,787**
Total Site Square Feet		80,042	26,681	**106,722**
Site Impacts				
Required Green Space	Percentage Acreage	25%	25%	
	Development Impact (Green Space SF)	20010.38	8893.50	**28903.88**
Impervious Coverage	Percent Impervious Coverage	75%	75%	
	Development Impact (Impervious SF)	60,031	20,010	**80,042**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	
	Development Impact (Gallons Wastewater)	817	817	**1,633**
Water Supply	Gallons per Commercial Acre	110% Wastewater	110% Wastewater	
	Development Impact	898	898	**1797**
Stormwater Ponding	Percentage of Site Area	5%	5%	
	Development Impact (Ponding SF)	5,336	5,336	**10,672**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	
	Development Impact (Number of Parking Stalls)	47.4	53.4	**100.8**
	Surface Parking Footprint (SF) (Stalls x 400SF)	18,973	21,344	**40,317**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	8,301	9,338	**17,639**
Transit	Percentage Transit Trips	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	7.0	3.4	**10.4**
Trips per Day	Trips per 1000 Commercial SF	34	11	
	Development Impact (Trips Generated)	242	117	**359**

**Generally 20 boardings/day warrants shelter at suburban transit stop

Burnhaven Shopping Center

Site Characteristics				
Acres	**17.97**	**Retail**	**Office**	**Total**
		FAR		
		0.2	0.3	
Land Use Mix (Acres)*		13.48	4.49	
Total Building Square Feet		52,185	78,277	**130,462**
Total Site Square Feet		587,080	195,693	**782,773**
Site Impacts				
Required Green Space	Percentage Acreage	25%	25%	
	Development Impact (Green Space SF)	146769.98	65231.10	**212001.08**
Impervious Coverage	Percent Impervious Coverage	75%	75%	
	Development Impact (Impervious SF)	440,310	146,770	**587,080**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	
	Development Impact (Gallons Wastewater)	5,990	5,990	**11,980**
Water Supply	Gallons per Commercial Acre	110% Wastewater	110% Wastewater	
	Development Impact	6589	6589	**13178**
Stormwater Ponding	Percentage of Site Area	5%	5%	
	Development Impact (Ponding SF)	39,139	39,139	**78,277**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	
	Development Impact (Number of Parking Stalls)	347.9	391.4	**739.3**
	Surface Parking Footprint (SF) (Stalls x 400SF)	139,160	156,555	**295,714**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	60,882	68,493	**129,375**
Transit	Percentage Transit Trips	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	51.5	25.0	**76.4**
Trips per Day	Trips per 1000 Commercial SF	34	11	
	Development Impact (Trips Generated)	1,774	861	**2,635**

**Generally 20 boardings/day warrants shelter at suburban transit stop

Burnhill Plaza

Site Characteristics				
Acres	**13.15**	**Retail**	**Office**	**Total**
		FAR		
		0.2	0.3	
Land Use Mix (Acres)*		9.86	3.29	
Total Building Square Feet		38,188	57,281	**95,469**
Total Site Square Feet		429,611	143,204	**572,814**
Site Impacts				
Required Green Space	Percentage Acreage	25%	25%	
	Development Impact (Green Space SF)	107402.63	47734.50	**155137.13**
Impervious Coverage	Percent Impervious Coverage	75%	75%	
	Development Impact (Impervious SF)	322,208	107,403	**429,611**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	
	Development Impact (Gallons Wastewater)	4,383	4,383	**8,767**
Water Supply	Gallons per Commercial Acre	110% Wastewater	110% Wastewater	
	Development Impact	4822	4822	**9643**
Stormwater Ponding	Percentage of Site Area	5%	5%	
	Development Impact (Ponding SF)	28,641	28,641	**57,281**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	
	Development Impact (Number of Parking Stalls)	254.6	286.4	**541.0**
	Surface Parking Footprint (SF) (Stalls x 400SF)	101,834	114,563	**216,396**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	44,552	50,121	**94,673**
Transit	Percentage Transit Trips	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	37.7	18.3	**55.9**
Trips per Day	Trips per 1000 Commercial SF	34	11	
	Development Impact (Trips Generated)	1,298	630	**1,928**

**Generally 20 boardings/day warrants shelter at suburban transit stop

Burnhill Shoppers Corner

Site Characteristics				
Acres	**3.27**	**Retail**	**Office**	**Total**
		FAR		
		0.2	0.3	
Land Use Mix (Acres)*		2.45	0.82	
Total Building Square Feet		9,496	14,244	**23,740**
Total Site Square Feet		106,831	35,610	**142,441**
Site Impacts				
Required Green Space	Percentage Acreage	25%	25%	
	Development Impact (Green Space SF)	26707.73	11870.10	**38577.83**
Impervious Coverage	Percent Impervious Coverage	75%	75%	
	Development Impact (Impervious SF)	80,123	26,708	**106,831**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	
	Development Impact (Gallons Wastewater)	1,090	1,090	**2,180**
Water Supply	Gallons per Commercial Acre	110% Wastewater	110% Wastewater	
	Development Impact	1199	1199	**2398**
Stormwater Ponding	Percentage of Site Area	5%	5%	
	Development Impact (Ponding SF)	7,122	7,122	**14,244**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	
	Development Impact (Number of Parking Stalls)	63.3	71.2	**134.5**
	Surface Parking Footprint (SF) (Stalls x 400SF)	25,323	28,488	**53,811**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	11,079	12,464	**23,542**
Transit	Percentage Transit Trips	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	9.4	4.5	**13.9**
Trips per Day	Trips per 1000 Commercial SF	34	11	
	Development Impact (Trips Generated)	323	157	**480**

**Generally 20 boardings/day warrants shelter at suburban transit stop

Burnside Plaza

Site Characteristics				
Acres	**8.27**	**Retail**	**Office**	**Total**
		FAR		
		0.2	0.3	
Land Use Mix (Acres)*		6.20	2.07	
Total Building Square Feet		24,016	36,024	**60,040**
Total Site Square Feet		270,181	90,060	**360,241**
Site Impacts				
Required Green Space	Percentage Acreage	25%	25%	
	Development Impact (Green Space SF)	67545.23	30020.10	**97565.33**
Impervious Coverage	Percent Impervious Coverage	75%	75%	
	Development Impact (Impervious SF)	202,636	67,545	**270,181**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	
	Development Impact (Gallons Wastewater)	2,757	2,757	**5,513**
Water Supply	Gallons per Commercial Acre	110% Wastewater	110% Wastewater	
	Development Impact	3032	3032	**6065**
Stormwater Ponding	Percentage of Site Area	5%	5%	
	Development Impact (Ponding SF)	18,012	18,012	**36,024**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	
	Development Impact (Number of Parking Stalls)	160.1	180.1	**340.2**
	Surface Parking Footprint (SF) (Stalls x 400SF)	64,043	72,048	**136,091**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	28,019	31,521	**59,540**
Transit	Percentage Transit Trips	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	23.7	11.5	**35.2**
Trips per Day	Trips per 1000 Commercial SF	34	11	
	Development Impact (Trips Generated)	817	396	**1,213**

**Generally 20 boardings/day warrants shelter at suburban transit stop

Burnsville Auto Mall

Site Characteristics				
Acres	**3.77**	**Retail**	**Office**	**Total**
		FAR		
		0.2	0.3	
Land Use Mix (Acres)*		2.83	0.94	
Total Building Square Feet		10,948	16,422	**27,370**
Total Site Square Feet		123,166	41,055	**164,221**
Site Impacts				
Required Green Space	Percentage Acreage	25%	25%	
	Development Impact (Green Space SF)	30791.48	13685.10	**44476.58**
Impervious Coverage	Percent Impervious Coverage	75%	75%	
	Development Impact (Impervious SF)	92,374	30,791	**123,166**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	
	Development Impact (Gallons Wastewater)	1,257	1,257	**2,513**
Water Supply	Gallons per Commercial Acre	110% Wastewater	110% Wastewater	
	Development Impact	1382	1382	**2765**
Stormwater Ponding	Percentage of Site Area	5%	5%	
	Development Impact (Ponding SF)	8,211	8,211	**16,422**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	
	Development Impact (Number of Parking Stalls)	73.0	82.1	**155.1**
	Surface Parking Footprint (SF) (Stalls x 400SF)	29,195	32,844	**62,039**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	12,773	14,369	**27,142**
Transit	Percentage Transit Trips	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	10.8	5.2	**16.0**
Trips per Day	Trips per 1000 Commercial SF	34	11	
	Development Impact (Trips Generated)	372	181	**553**

**Generally 20 boardings/day warrants shelter at suburban transit stop

Burnsville Crossings

Site Characteristics				
Acres	**10.3**	**Retail**	**Office**	**Total**
		FAR		
		0.2	0.3	
Land Use Mix (Acres)*		7.73	2.58	
Total Building Square Feet		29,911	44,867	**74,778**
Total Site Square Feet		336,501	112,167	**448,668**
Site Impacts				
Required Green Space	Percentage Acreage	25%	25%	
	Development Impact (Green Space SF)	84125.25	37389.00	**121514.25**
Impervious Coverage	Percent Impervious Coverage	75%	75%	
	Development Impact (Impervious SF)	252,376	84,125	**336,501**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	
	Development Impact (Gallons Wastewater)	3,433	3,433	**6,867**
Water Supply	Gallons per Commercial Acre	110% Wastewater	110% Wastewater	
	Development Impact	3777	3777	**7553**
Stormwater Ponding	Percentage of Site Area	5%	5%	
	Development Impact (Ponding SF)	22,433	22,433	**44,867**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	
	Development Impact (Number of Parking Stalls)	199.4	224.3	**423.7**
	Surface Parking Footprint (SF) (Stalls x 400SF)	79,763	89,734	**169,497**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	34,896	39,258	**74,155**
Transit	Percentage Transit Trips	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	29.5	14.3	**43.8**
Trips per Day	Trips per 1000 Commercial SF	34	11	
	Development Impact (Trips Generated)	1,017	494	**1,511**

**Generally 20 boardings/day warrants shelter at suburban transit stop

Burnsville Marketplace

Site Characteristics				
Acres	**26.76**	**Retail**	**Office**	**Total**
		FAR		
		0.2	0.3	
Land Use Mix (Acres)*		20.07	6.69	
Total Building Square Feet		77,711	116,567	**194,278**
Total Site Square Feet		874,249	291,416	**1,165,666**
Site Impacts				
Required Green Space	Percentage Acreage	25%	25%	
	Development Impact (Green Space SF)	218562.30	97138.80	**315701.10**
Impervious Coverage	Percent Impervious Coverage	75%	75%	
	Development Impact (Impervious SF)	655,687	218,562	**874,249**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	
	Development Impact (Gallons Wastewater)	8,920	8,920	**17,840**
Water Supply	Gallons per Commercial Acre	110% Wastewater	110% Wastewater	
	Development Impact	9812	9812	**19624**
Stormwater Ponding	Percentage of Site Area	5%	5%	
	Development Impact (Ponding SF)	58,283	58,283	**116,567**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	
	Development Impact (Number of Parking Stalls)	518.1	582.8	**1100.9**
	Surface Parking Footprint (SF) (Stalls x 400SF)	207,229	233,133	**440,363**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	90,663	101,996	**192,659**
Transit	Percentage Transit Trips	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	76.6	37.2	**113.8**
Trips per Day	Trips per 1000 Commercial SF	34	11	
	Development Impact (Trips Generated)	2,642	1,282	**3,924**

**Generally 20 boardings/day warrants shelter at suburban transit stop

Cobblestone Court

Site Characteristics				
Acres	**10.95**	**Retail**	**Office**	**Total**
		FAR		
		0.2	0.3	
Land Use Mix (Acres)*		8.21	2.74	
Total Building Square Feet		31,799	47,698	**79,497**
Total Site Square Feet		357,737	119,246	**476,982**
Site Impacts				
Required Green Space	Percentage Acreage	25%	25%	
	Development Impact (Green Space SF)	89434.13	39748.50	**129182.63**
Impervious Coverage	Percent Impervious Coverage	75%	75%	
	Development Impact (Impervious SF)	268,302	89,434	**357,737**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	
	Development Impact (Gallons Wastewater)	3,650	3,650	**7,300**
Water Supply	Gallons per Commercial Acre	110% Wastewater	110% Wastewater	
	Development Impact	4015	4015	**8030**
Stormwater Ponding	Percentage of Site Area	5%	5%	
	Development Impact (Ponding SF)	23,849	23,849	**47,698**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	
	Development Impact (Number of Parking Stalls)	212.0	238.5	**450.5**
	Surface Parking Footprint (SF) (Stalls x 400SF)	84,797	95,396	**180,193**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	37,099	41,736	**78,835**
Transit	Percentage Transit Trips	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	31.4	15.2	**46.6**
Trips per Day	Trips per 1000 Commercial SF	34	11	
	Development Impact (Trips Generated)	1,081	525	**1,606**

**Generally 20 boardings/day warrants shelter at suburban transit stop

McAndrews Center

Site Characteristics				
Acres	**4.76**	**Retail**	**Office**	**Total**
		FAR		
		0.2	0.3	
Land Use Mix (Acres)*		3.57	1.19	
Total Building Square Feet		13,823	20,735	**34,558**
Total Site Square Feet		155,509	51,836	**207,346**
Site Impacts				
Required Green Space	Percentage Acreage	25%	25%	
	Development Impact (Green Space SF)	38877.30	17278.80	**56156.10**
Impervious Coverage	Percent Impervious Coverage	75%	75%	
	Development Impact (Impervious SF)	116,632	38,877	**155,509**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	
	Development Impact (Gallons Wastewater)	1,587	1,587	**3,173**
Water Supply	Gallons per Commercial Acre	110% Wastewater	110% Wastewater	
	Development Impact	1745	1745	**3491**
Stormwater Ponding	Percentage of Site Area	5%	5%	
	Development Impact (Ponding SF)	10,367	10,367	**20,735**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	
	Development Impact (Number of Parking Stalls)	92.2	103.7	**195.8**
	Surface Parking Footprint (SF) (Stalls x 400SF)	36,861	41,469	**78,331**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	16,127	18,143	**34,270**
Transit	Percentage Transit Trips	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	13.6	6.6	**20.2**
Trips per Day	Trips per 1000 Commercial SF	34	11	
	Development Impact (Trips Generated)	470	228	**698**

**Generally 20 boardings/day warrants shelter at suburban transit stop

MGM Building

Site Characteristics				
Acres	**2.41**	**Retail**	**Office**	**Total**
		FAR		
		0.2	0.3	
Land Use Mix (Acres)*		1.81	0.60	
Total Building Square Feet		6,999	10,498	**17,497**
Total Site Square Feet		78,735	26,245	**104,980**
Site Impacts				
Required Green Space	Percentage Acreage	25%	25%	
	Development Impact (Green Space SF)	19683.68	8748.30	**28431.98**
Impervious Coverage	Percent Impervious Coverage	75%	75%	
	Development Impact (Impervious SF)	59,051	19,684	**78,735**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	
	Development Impact (Gallons Wastewater)	803	803	**1,607**
Water Supply	Gallons per Commercial Acre	110% Wastewater	110% Wastewater	
	Development Impact	884	884	**1767**
Stormwater Ponding	Percentage of Site Area	5%	5%	
	Development Impact (Ponding SF)	5,249	5,249	**10,498**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	
	Development Impact (Number of Parking Stalls)	46.7	52.5	**99.1**
	Surface Parking Footprint (SF) (Stalls x 400SF)	18,663	20,996	**39,659**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	8,165	9,186	**17,351**
Transit	Percentage Transit Trips	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	6.9	3.3	**10.2**
Trips per Day	Trips per 1000 Commercial SF	34	11	
	Development Impact (Trips Generated)	238	115	**353**

**Generally 20 boardings/day warrants shelter at suburban transit stop

Nicollet Court

Site Characteristics				
Acres	**1.3**	**Retail**	**Office**	**Total**
		FAR		
		0.2	0.3	
Land Use Mix (Acres)*		0.98	0.33	
Total Building Square Feet		3,775	5,663	**9,438**
Total Site Square Feet		42,471	14,157	**56,628**
Site Impacts				
Required Green Space	Percentage Acreage	25%	25%	
	Development Impact (Green Space SF)	10617.75	4719.00	**15336.75**
Impervious Coverage	Percent Impervious Coverage	75%	75%	
	Development Impact (Impervious SF)	31,853	10,618	**42,471**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	
	Development Impact (Gallons Wastewater)	433	433	**867**
Water Supply	Gallons per Commercial Acre	110% Wastewater	110% Wastewater	
	Development Impact	477	477	**953**
Stormwater Ponding	Percentage of Site Area	5%	5%	
	Development Impact (Ponding SF)	2,831	2,831	**5,663**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	
	Development Impact (Number of Parking Stalls)	25.2	28.3	**53.5**
	Surface Parking Footprint (SF) (Stalls x 400SF)	10,067	11,326	**21,393**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	4,404	4,955	**9,359**
Transit	Percentage Transit Trips	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	3.7	1.8	**5.5**
Trips per Day	Trips per 1000 Commercial SF	34	11	
	Development Impact (Trips Generated)	128	62	**191**

**Generally 20 boardings/day warrants shelter at suburban transit stop

Skyline Plaza

Site Characteristics				
Acres	**5.34**	**Retail**	**Office**	**Total**
		FAR		
		0.2	0.3	
Land Use Mix (Acres)*		4.01	1.34	
Total Building Square Feet		15,507	23,261	**38,768**
Total Site Square Feet		174,458	58,153	**232,610**
Site Impacts				
Required Green Space	Percentage Acreage	25%	25%	
	Development Impact (Green Space SF)	43614.45	19384.20	**62998.65**
Impervious Coverage	Percent Impervious Coverage	75%	75%	
	Development Impact (Impervious SF)	130,843	43,614	**174,458**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	
	Development Impact (Gallons Wastewater)	1,780	1,780	**3,560**
Water Supply	Gallons per Commercial Acre	110% Wastewater	110% Wastewater	
	Development Impact	1958	1958	**3916**
Stormwater Ponding	Percentage of Site Area	5%	5%	
	Development Impact (Ponding SF)	11,631	11,631	**23,261**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	
	Development Impact (Number of Parking Stalls)	103.4	116.3	**219.7**
	Surface Parking Footprint (SF) (Stalls x 400SF)	41,353	46,522	**87,875**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	18,092	20,353	**38,445**
Transit	Percentage Transit Trips	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	15.3	7.4	**22.7**
Trips per Day	Trips per 1000 Commercial SF	34	11	
	Development Impact (Trips Generated)	527	256	**783**

**Generally 20 boardings/day warrants shelter at suburban transit stop

42nd and Aldrich

Site Characteristics				
Acres	**4.31**	**Retail**	**Office**	**Total**
		FAR		
		0.2	0.3	
Land Use Mix (Acres)*		3.23	1.08	
Total Building Square Feet		12,516	18,774	**31,291**
Total Site Square Feet		140,808	46,936	**187,744**
Site Impacts				
Required Green Space	Percentage Acreage	25%	25%	
	Development Impact (Green Space SF)	35201.93	15645.30	**50847.23**
Impervious Coverage	Percent Impervious Coverage	75%	75%	
	Development Impact (Impervious SF)	105,606	35,202	**140,808**
Gallons Wastewater	Gallons per Commercial Acre or per Household	1000	1000	
	Development Impact (Gallons Wastewater)	1,437	1,437	**2,873**
Water Supply	Gallons per Commercial Acre	110% Wastewater	110% Wastewater	
	Development Impact	1580	1580	**3161**
Stormwater Ponding	Percentage of Site Area	5%	5%	
	Development Impact (Ponding SF)	9,387	9,387	**18,774**
Parking	Required Stalls (per unit or per 150 SF retail or 200 SF office)	150	200	
	Development Impact (Number of Parking Stalls)	83.4	93.9	**177.3**
	Surface Parking Footprint (SF) (Stalls x 400SF)	33,377	37,549	**70,925**
	Structed Parking Footprint (SF) (Stalls x 350 SF)/2	14,602	16,428	**31,030**
Transit	Percentage Transit Trips	2.9%	2.9%	
	Development Impacts (Potential Boardings)*	12.3	6.0	**18.3**
Trips per Day	Trips per 1000 Commercial SF	34	11	

City Of Burnsville

Appendix F – Future Land Use Development & Redevelopment Phasing

September 2018

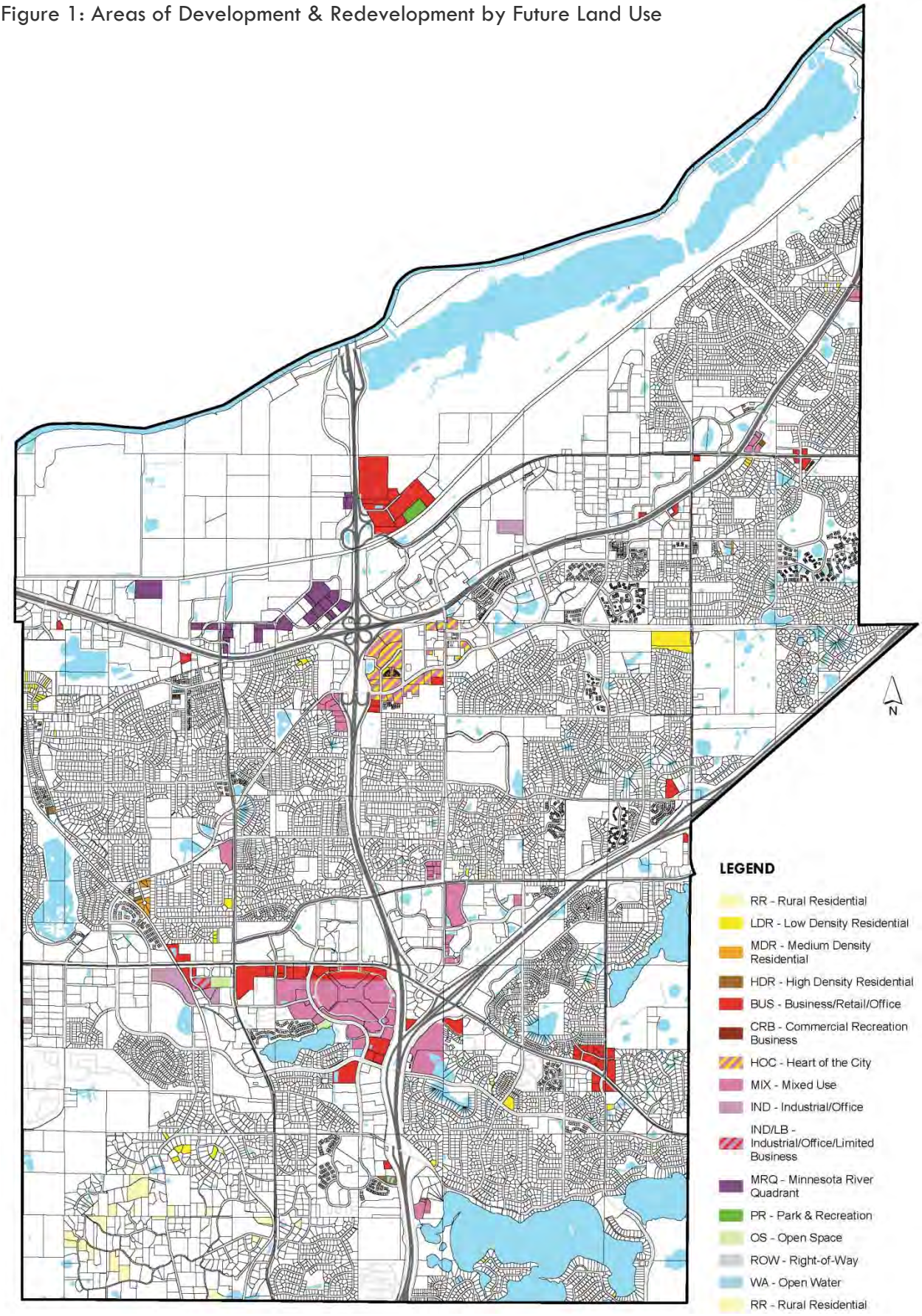
Table 1: Future Land Use Categories by 2040

Land Use Category		Net Acres	% of Total
RR	Rural Residential	541.74	3.13%
LDR	Low Density Residential	4,388.47	25.35%
MDR	Medium Density Residential	625.95	3.62%
HDR	High Density Residential	668.02	3.86%
HOC	Heart of the City	129.99	0.75%
MIX	Mixed Use	380.15	2.20%
BUS	Business/Retail/Office	915.08	5.29%
CRB	Commercial Recreation Business	59.55	0.34%
IND	Industrial/Office	739.90	4.27%
IND/LB	Industrial/Office/Limited Business	23.73	0.14%
MRQ	Minnesota River Quadrant	1,310.63	7.57%
PR	Park & Recreation	1,167.36	6.74%
OS	Open Space	650.52	3.76%
ROW	Right-of-Way	2,886.49	16.67%
WA	Open Water	1,049.50	6.06%
Wetland		1,774.25	10.25%
Total		**17,311.33**	**100.00%**

Table 2: Total Area Identified for Development/Redevelopment by Future Land Use

Land Use Category		Vacant Developable Net Acres	Redevelopable Net Acres	Total Development Net Acres
RR	Rural Residential	-	-	-
LDR	Low Density Residential	18.92	-	18.92
MDR	Medium Density Residential	4.93	-	4.93
HDR	High Density Residential	4.58	0.59	5.17
HOC	Heart of the City	14.49	47.26	61.75
MIX	Mixed Use	50.25	145.84	196.09
BUS	Business/Retail/Office	35.22	137.47	172.69
CRB	Commercial Recreation Business	-	-	-
IND	Industrial/Office	28.03	-	28.03
IND/LB	Industrial/Office/Limited Business	4.24	-	8.94
MRQ	Minnesota River Quadrant	35.07	1,265.35	1,300.42
PR	Park & Recreation		3.43	3.43
OS	Open Space	7.22	-	7.22
ROW	Right-of-Way		3.70	3.70
Total		**202.94**	**1,603.64**	**1,806.58**

Figure 1: Areas of Development & Redevelopment by Future Land Use



Source: HKGi, Dakota County GIS, Metropolitan Council GIS, City of Burnsville

Table 3: Anticipated Timing of Developable Acres, by Future Land Use

Land Use Category		2017-2020	2021-2030	2031-2040	Post 2040
RR	Rural Residential	-	-	-	-
LDR	Low Density Residential	0.46	18.46	-	-
MDR	Medium Density Residential	4.93	-	-	-
HDR	High Density Residential	0.70	4.47	-	-
HOC	Heart of the City	2.14	16.15	41.71	-
MIX	Mixed Use	69.59	37.10	89.40	-
BUS	Business/Retail/Office	36.37	108.97	27.35	-
CRB	Commercial Recreation Business	-	-	-	-
IND	Industrial/Office	17.27	10.76		-
IND/LB	Industrial/Office/Limited Business	4.24	-	4.24	-
MRQ	Minnesota River Quadrant	17.75	65.02	65.02	1,152.63
PR	Park & Recreation	-	3.43	-	-
OS	Open Space	-	-	-	-
ROW	Right-of-Way	-	0.13	-	-
Total		**153.45**	**264.48**	**223.48**	**1,152.63**

Table 4: Anticipated Housing Units from Developable Acres, by Decade & Future Land Use

Land Use Category		Density U/A		% Res.	2017-2020		2021-2030		2031-2040		Post 2040		2017-2040	
		Min	Max		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
LDR	Low Density Residential	2.0	6.0	100%	1	3	37	111	0	0	0	0	38	113
MDR	Medium Density Residential	4.0	12.0	100%	20	59	0	0	0	0	0	0	20	59
HDR	High Density Residential	8.0	20.0	100%	6	14	36	89	0	0	0	0	41	103
HOC	Heart of the City	20.0	60.0	75%	32	96	242	727	626	1,877	0	0	900	2,700
MIX	Mixed Use	15.0	30.0	55%	574	1,148	306	612	738	1,475	0	0	1,618	3,235
MRQ	Minnesota River Quadrant	8.0	20.0	10%	14	35	52	130	52	130	922	2,305	118	296
Total					**647**	**1,356**	**673**	**1,669**	**1,415**	**3,482**	**922**	**2,305**	**2,735**	**6,507**
Minimum Units/Acre					**13.55**		**10.86**		**16.28**		**8.00**		**13.91**	

Table 5: Anticipated Employment from Developable Acres, by Decade & Future Land Use

Land Use Category		FAR Low	FAR High	Jobs / SF	% Emp.	2017-2020		2021-2030		2031-2040		Post 2040		2017-2040	
						Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
BUS	Business/Retail /Office	0.2	0.5	1,000	100%	475	792	1,424	2,373	357	596	0	0	2,257	3,761
HOC	Heart of the City	0.4	1.0	1,000	25%	14	23	106	176	273	454	0	0	392	653
MIX	Mixed Use	0.4	1.0	1,000	45%	818	1,364	436	727	1,051	1,752	0	0	2,306	3,844
IND	Industrial / Office	0.2	0.8	1,500	100%	150	401	94	250	0	0	0	0	244	651
IND/ LB	Industrial / Office/Limited Business	0.2	0.4	1,500	100%	37	49	0	0	0	0	0	0	37	49
MRQ	Minnesota River Quadrant	0.2	0.8	1,000	90%	209	557	765	2,039	765	2,039	13,556	36,150	1,738	4,635
Total						**1,704**	**3,187**	**2,824**	**5,566**	**2,446**	**4,842**	**13,556**	**36,150**	**6,974**	**13,594**

City Of Burnsville

Appendix G – Historic Sites in Burnsville

2006

Office of the State Archaeologist

Fort Snelling History Center
St. Paul, MN 55111-4061
Mark J. Dudzik, State Archaeologist (612) 725-2411; FAX (612) 725-2427

Minnesota Statutes 138.31-138.42 and 307.08

Established in 1963, the Office of the State Archaeologist (OSA) is charged with sponsoring, conducting and directing research into the prehistoric and historic archaeology of Minnesota; protecting and preserving archaeological sites and objects; disseminating archaeological information through the publication of reports and articles; identifying, authenticating and protecting human burial sites; reviewing and licensing archaeological fieldwork conducted within the state; and enforcing provisions of MN Statutes 138.31-138.42. The State Archaeologist is a professional archaeologist appointed by the Minnesota Historical Society.

Under MN Statutes 138.31-138.42, licensure through the OSA is required for field archaeology undertaken on all lands or waters owned, leased by or subject to the paramount right of the state or its subdivisions, as well as on lands impacted by publicly-funded development projects. Proposed projects are reviewed to assess the appropriateness of research methodology and to assist in identifying strategies for mitigating potential adverse effects to known cultural resources. Only professional archaeologists meeting the *Secretary of the Interior's Standards for Archaeology* (36 CFR Part 61) may be licensed to conduct such investigations in the state of Minnesota. A copy of the application form, including terms and conditions for licensure, can be obtained by contacting the above address.

Minnesota's "Private Cemeteries Act" (307.08) affords all human remains and burials older than 50 years, and located outside of platted, recorded or identified cemeteries, protection from unauthorized disturbance; this statute applies to burials on either public *or* private lands or waters. Authentication of burial sites is conducted under the sole auspices of the OSA per this statute. In the event that a burial is either known or suspected to be associated with American Indian peoples, the OSA works in concert with the Minnesota Indian Affairs Council (MIAC) to ensure the integrity of such burial sites. Guidelines for the protection of burials covered under this act have been developed jointly by the OSA and MIAC. The OSA maintains a database of identified burial sites in the state.

The OSA also maintains a database of the state's identified archaeological sites in collaboration with the Minnesota State Historic Preservation Office (SHPO). For further information on this database, please contact either the above number or the SHPO (see separate listing under "Minnesota Historical Society").

Post-it® Fax Note 7671	Date 03.25.97	# of pages ▶ 1
To DEB PETERSON	From M. DUDZIK	
Co./Dept. BURNSVILLE	Co. OSA	
Phone #	Phone #	
Fax # 895-4404	Fax #	

Architecture/History Inventory

Property Name	Address	Twp.	Range	Sec.	Quarters	USGS Map	Date Built	NHRP	CEF	DOE	Inventory Number
County: Dakota											
City/Township: Burnsville											
Connelly Farmhouse (razed)	1570 E. Mn. Hwy. 13	27	24	26	SE	Bloomington	1868				DK-BVC-001
Kennelly Farmstead	off Mn. Hwy. 13	27	24	25	NE-SE-SW	St. Paul SW					DK-BVC-002
Billy Goat Bridge (razed)	Burnsville Pkwy. & Judicial Rd. over RR	115	21	23	NW-NW-SW	Bloomington	1909				DK-BVC-003
Minneapolis St. Paul Rochester & Dubuque Depot	Co. Hwy. 5 at 155th St.	115	21	35	NE-NE-SE	Orchard Lake	1910	Y			DK-BVC-004
Mortenson House	15612 Crystal Lake Rd. E.	115	20	32	NE-SW-SW	Orchard Lake					DK-BVC-005
house	12013 Co. Rd. 11	27	24	36	NW-SW-NW	St. Paul SW	1860s-70s				DK-BVC-006
Buck Hill	off Interstate Hwy. 35	115	21	36	NW-NW-SE	Orchard Lake					DK-BVC-007

Archaeological Sites by Site Location

Site No.	Site Name	Field Number	Twp	Range	Sec.	Quarter Sections	Acres	Phase	Site Description	Tradition	Context	Reports
County: Dakota												
City/Twp.: Burnsville												
21DK0041	Pemtom/River Hills (1/2)	FS5, 21DK9005	27	24	24	SE-SW	0.0	3	CEM	A-1		
21DK0041	Pemtom/River Hills (2/2)	FS5, 21DK9005	27	24	25	NE-NW		3	CEM	A-1		
21DKx	Penichon's Village/Good Road's Village/Nine Mile Creek Village		27	24	28	SE, S-SW, NE-SW, SE-NE, SE-SW-NE		7	HD		ED-1	MULT-67-01, MULT-79-06, MULT-93-01
21DKah	Crystal Lake Mounds II		115	20	31	E-SE-NW, W-SW-NE		1	EW	W-1		
21DK0042	Crystal Lake Island Findspot	FS6, 21DK9006	115	20	31	SE-SW, NW-SW-SE, SW-NE-SW	0.1	1	SA	A-2, W-2		
21DKag	Butler Mounds/Crystal Lake Mounds I		115	20	32	SW-NW		1	EW	W-1		
21DKaa	Early Lake/Earley Lake/Farley Lake/Lake Early		115	21	25	NW-SE		2	EW	W-1		
21DK0039	Renner Findspot	FS2, 21DK9002	115	21	36	E-SE-NW, W-SW-NE	0.1	1	SA	PL-1		

City of
BURNSVILLE
100 Civic Center Parkway • Burnsville, Minnesota 55337-3817 (612) 895-4400

Memo To: Terry Schultz
From: Steve O'Malley
Date: March 25, 1997

Re: Indian Mounds around Earley Lake

I talked with Mark Dudzik this morning. Good news, the Indian Mounds around Earley Lake are not at the site of the current Rieland Home development. So no problem with our trail or their development.

I did not call the resident back, because the <u>bad news</u> is that the Indian Mounds seem to be at the site of another development that is currently in the application process (Rottland Homes on the Southeast shore of the lake). Deb Peterson & Mark Dudzik talked, and the developer will be notified. I expect that you'll call the resident and deal with her, since you were the first contact. Also, perhaps by the time you return from you vacation, we have more information for you to share with her.

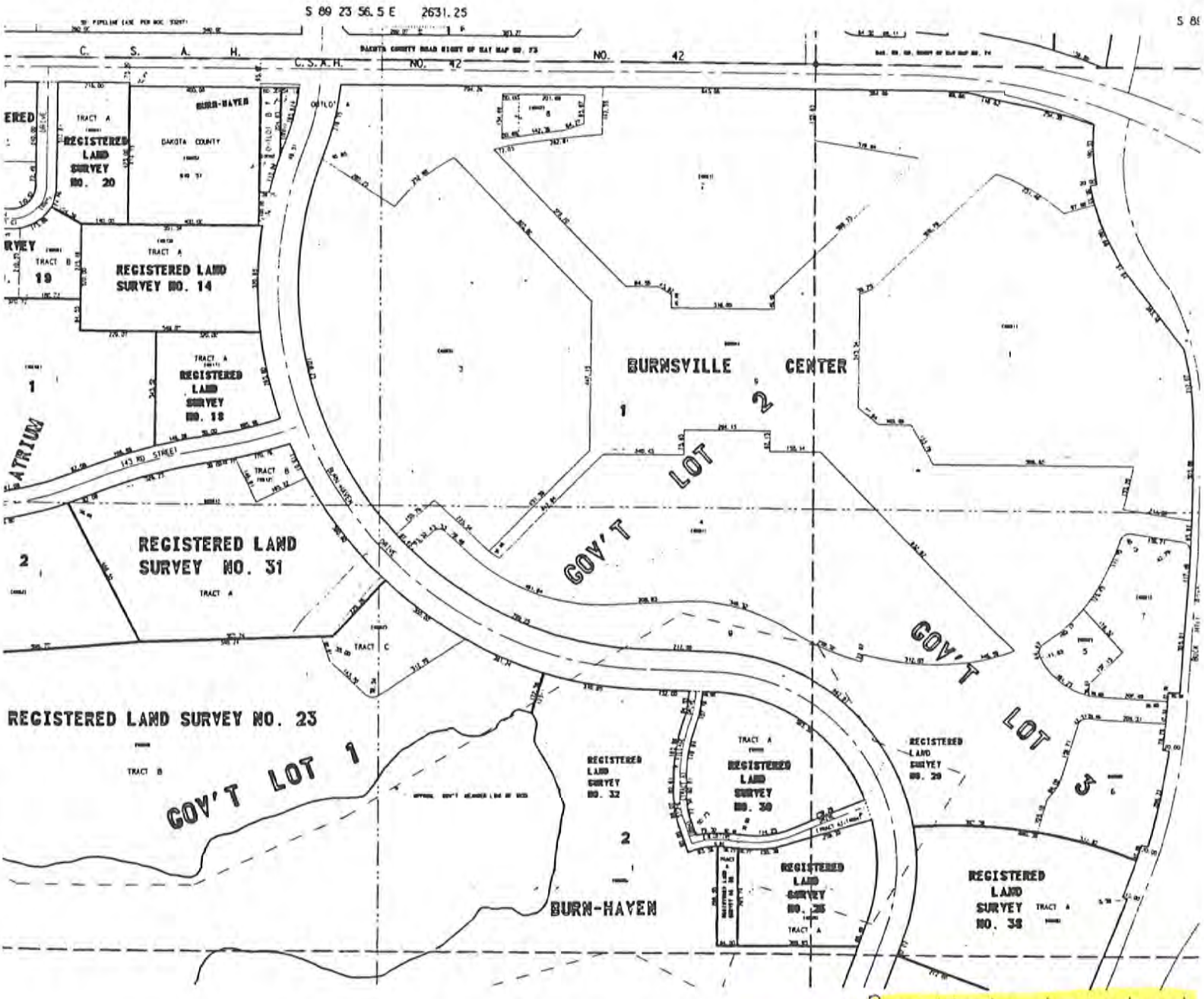
I've returned the attached information for your use.

I also let Roger Knudson know that this was a false alarm.

N1/2 SEC. 25, T. 115 N., R

CITY OF BURNSVILLE

614 S



Per State Archeologist Factory burial grounds east of Burnhaven and West of 35 W.

615 S

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ARE REFERENCED TO THE DAKOTA COUNTY SURVEY AND LAND INFORMATION OFFICE

Area Communities and Attractions

The Mdewakanton band of Dakota Sioux once lived in the Burnsville area. The village of Chief Black Dog was located on the isthmus between Black Dog Lake and the Minnesota River. Pioneers arrived in 1850 and began farming the land. Today Burnsville is the southern gateway to the Twin Cities of Minneapolis and Saint Paul. Burnsville and the southern communities offer the dual attraction of a suburban lifestyle and the amenities of a major metropolitan area.

A restored WW II Navy R4D plane at Flying Cloud Airport in Eden Prairie, northwest of Burnsville
Photo © Mike Whye

Area Communities

Apple Valley

Apple Valley was first settled in 1858 as Lebanon Township. On January 1, 1969, the area officially became known as the Village of Apple Valley. It was incorporated in 1974. Today Apple Valley has a population of more than 30,000.

The **Apple Valley Parks and Recreation Department** manages a year-round recreation program. Its various activities include swimming lessons, puppet shows, tours, and a summer playground program. The department also sponsors organized sports competitions.

Autumn leaves
Photo courtesy of the Minnesota Office of Tourism

The **Valley Athletic Association** sponsors a sports program for children, and the Apple Valley Hockey Association offers recreational leagues for children ages 6 to 16.

The **Apple Valley Outdoor Pool** is open from early June to late August. **Valleywood Municipal Golf Course**, an 18-hole public course, maintains cross-country ski trails during the winter.

Burnsville

Burnsville was founded near the site of Dakota Chief Black Dog's village, which was located on the isthmus between Black Dog Lake and the Minnesota River. The community was established during the mid-1800s on a ridge overlooking the Credit River. Today Burnsville has a population of more than 52,000.

Indian mounds are located near the Credit River, between Savage and the Minnesota River, and near Crystal and Early lakes. Burial grounds are located at River Hills North, Teepee Hill, and on the Tom Kennelly Farm.

The **Burnsville Parks Department** maintains acres of parkland with facilities for softball, baseball, soccer, football, tennis, canoeing, and picnicking.

Lac Lavon and **Crystal Beach** are popular for swimming, boating, and fishing. **Fisher Fields**, at Lac Lavon, hosts softball games. **Burnsville Ice Center**, in **Civic Center Park**, offers open skating, organized hockey games, and special events. **Birnamwood** and **Orchard Gardens** are public nine-hole golf courses.

Eagan

The land that Eagan now occupies once was inhabited by the Mdewakanton tribe of the Dakota, who established several villages near the Minnesota and Mississippi rivers. The first European settlers arrived in 1812.

When Minnesota achieved statehood in 1858, Eagan was part of Mendota Township. Two years later, the community was incorporated and named after Patrick Eagan, a member of the board of supervisors.

In 1860 the population of the community was 567. Today Eagan has 47,000 residents and is an industrial and commercial trade center for the Twin Cities.

Eagan is bordered by the Minnesota River, which provides a variety of recreation. The **Eagan Parks and Recreation Department** maintains several hundred acres of parkland with areas for bicycling, hiking, swimming, cross-country skiing, ice skating, and sledding. There are facilities for football, baseball, volleyball, tennis, and golf.

City-maintained bicycle trails include an east-west route that begins at Nichols Road (Shale Lane) and ends near Lexington Avenue. A second trail begins at Silver Bell at Hwy. 13 and connects Eagan to Bloomington.

Lebanon Hills Regional Park is popular for swimming, boating, fishing, hiking, horseback riding, and picnicking.

Farmington

Farmington is surrounded by rich Minnesota farmland. Characteristic of many of the southern-tier suburbs, Farmington combines a small-town atmosphere with the advantages of a metropolitan area.

The community was established in 1865, when the new railroad attracted farmers, lawyers, and merchants.

Chad Wohlers
City of Burnsville
100 Civic Center Parkway
Burnsville, MN 55337-3817

March 26, 1997

RE: Reported Burial Site 21-DK-aa / Proposed Village of Lake Earley Subdivision

Dear Chad,

As discussed, the above-proposed housing project lies to the west/northwest of the reported location of burial mound group 21-DK-aa (located in T115N/R21W, Section 25 NW¼/SE¼; see enclosed USGS topo map).

Note also that this area has been heavily impacted by previous construction and the mound group has, in all likelihood, been obliterated since it was first described ca. 1888 (see enclosure).

Do not hesitate to contact me if you require any additional information or clarification.

Sincerely,

Mark J. Dudzik
State Archaeologist

enc.

Fort Snelling History Center, St. Paul, MN 55111 Tel: (612) 725-2411; FAX: (612) 725-2427

Artificial mounds.]

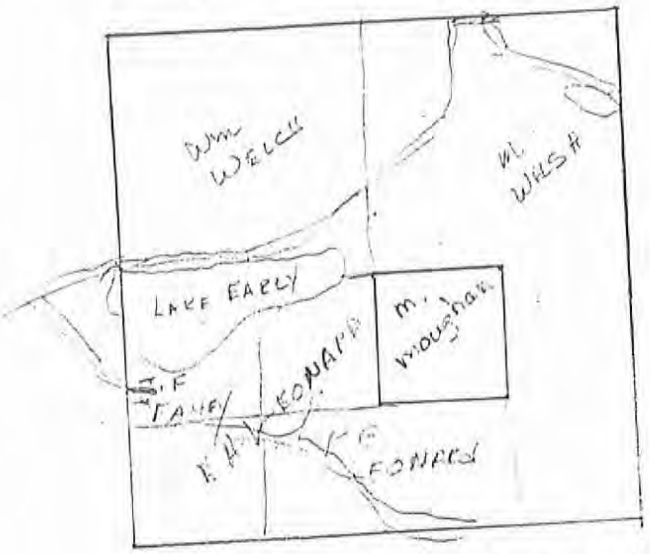
1886 (C)

In sec. 35, Eureka, and sec. 2, in Greenvale, on either side of the town-line road, are seen about a dozen artificial mounds. These are about two and a half feet high, and overlook what may have been a lake, but now is a marsh. Near the south line of sec. 34, Eureka, are six other mounds, from one to two feet in hight. These are on low, moist land, while swells thirty or forty feet high rise in the vicinity.

Two mounds, rising two to four feet, are in the yard of Thomas Butler, north side of Crystal lake, N. W. ¼ of sec. 32, Burnsville. Four or five more, of about the same size, are near the centre of sec. 31, on the north bank of the lake, about fifty feet above the water.

According to Mr. Lewis Judd, there are seven mounds on Mrs. Monghan's land, N. W. ¼, S. E. ¼, sec. 25, Burnsville, overlooking the east end of lake Early. These are on a narrow strip of land between Early and Middle lakes, rather close together. He excavated one, and discovered what appeared to be four layers of ashes, and some indications of rotting bones, but nothing that could certainly be identified as such.

21-DK-AA



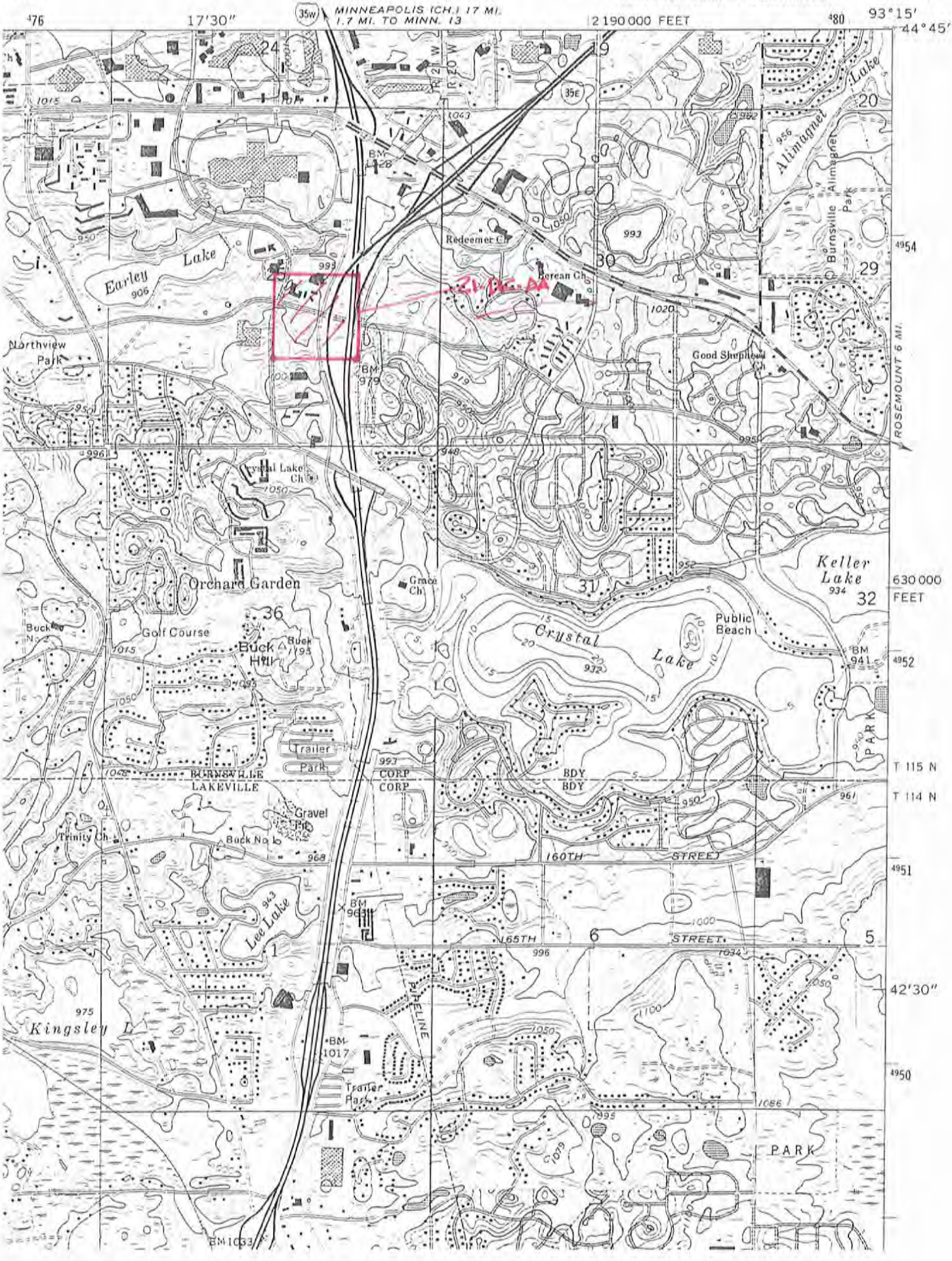
1896 PLAT BOOK OF DK. Co.

PY 1923 PLAT BOOK OF LK ST. IMPROVEMENT Co.

ION

ORCHARD LAKE QUADRANGLE
MINNESOTA
7.5 MINUTE SERIES (TOPOGRAPHIC)
NE/4 PRIOR LAKE 15' QUADRANGLE

7373 I SW
(ST. PAUL SW)



City Of Burnsville

Appendix H – Natural Resources Master Plan

2007

Natural Resources Master Plan

City of Burnsville

Prepared by Barr Engineering Company
with assistance from Kunde Company Inc.

2007

1.0 Introduction

1.1 Executive Summary

In 1999, Burnsville created its first Natural Resource Master Plan, and one of the first in all of the Minneapolis/St. Paul metropolitan area. This progressive act set in motion programs and policies to protect Burnsville's natural resources, such as a prairie management plan, a water resources management plan, and goose and deer management policies, and initiated a policy to direct the private development of remaining open space in an environmentally sound manner. Periodic updates to the plan were also recommended.

This 2007 Natural Resources Master Plan (NRMP) and the work behind it assesses the current state of natural resources in Burnsville and makes recommendations for their preservation and restoration on both public and private lands. This plan also reviews and makes recommendations for Burnsville's various natural resources related plans and policies, in order to synchronize the effort to manage natural resources.

In creating this document, a study was conducted to survey the ecological status of Burnsville's publicly owned upland natural areas. New in this plan is an extensive urban forestry component which evaluates and makes recommendations for street trees, developed park trees and natural areas forests. The entire city, including private lands, was mapped for land cover type (see Figure 1) which maps developed and undeveloped land throughout the city.

The inventory found that Burnsville has made great strides in protecting and improving water resources, protecting and restoring prairies, and is taking an ecological approach in developing private open space. Forces degrading Burnsville's natural resources, however, are mounting, and Burnsville should next direct attention to its upland natural resources, in particular its remaining natural woodlands and trees in built areas. Degradation caused by invasive plant species encroachment, and the stress put on native plant communities due to the urban heat island effect (caused by heat accumulated on pavement) and climate change are occurring at a surprisingly rapid rate and are degrading Burnsville's natural areas. Communities throughout the metro area are all facing these challenges.

To complement Burnsville's current work to protect natural resources, this plan recommends actions to be taken to protect and enhance its vulnerable natural resources. The plan makes recommendations for monitoring, land management and restoration of publicly and privately owned lands. Focus is now given to upland natural resources since diligent work has accomplished significant protection to the city's water resources. Recommendations of this plan include:

Why a Natural Resources Master Plan?

It is important to the health of our community and future generations to protect, preserve, and manage our natural resources. Natural resources offer opportunities for air and groundwater purification, carbon sequestration, stormwater management, sustaining biodiversity, passive recreation, education, improving the aesthetic appeal of a community, increased property values, and preserving an overall great place to live.

Every citizen has an impact on Burnsville's natural resources, and has a role in their preservation.

First Priority

- Expand buckthorn and invasive species control program in all RMUs.
- Create a boulevard tree planting program. (50 trees/year)
- Create a Buckthorn Brush Pickup Program for private landowners.
- Conduct a Dutch elm disease program.
- Expand the built environment tree maintenance program for younger trees.
- Create a City Center RMU Sustainability Demonstration project.
- Reduce deer population to 5 deer per square mile in select woodland restoration areas.
- Provide staff support for implementing strategies. Create education programs on buckthorn, garlic mustard and tree planting.
- Consider establishing a parking lot shading ordinance.
- Conduct a native herbaceous plant sale in conjunction with the Annual Spring Tree Sale.
- Establish and conduct a monitoring program for natural areas and forests.
- Update Woodland Preservation ordinance & update planting related ordinances.

Second Priority

- Expand existing prairie management program.
- Expand built environment tree pruning and removal budget for storm damaged and mature trees.
- Provide staff support to complete inventory of city park and street trees.
- Increase funding of existing oak wilt program.
- Create a Polka Dot Forest Regeneration Program.
- Consider establishing a Soil Protection ordinance.

This report is about solutions. The good news is that it's not too late to improve the quality of Burnsville's upland natural resources—and therefore, living conditions for the people of Burnsville. Here is where the people of Burnsville get involved. It will take the effort of every citizen to lighten negative impacts on Burnsville's natural resources, both on publicly and privately owned land.

Sustainability—meeting our needs today without negatively affecting future generations' ability to meet their needs

I.2 Introduction

Sustainability has become a focus within Burnsville government. A variety of efforts are underway to keep Burnsville a healthy place to live. Sustainability can be defined as meeting our needs today without negatively affecting future generations' ability to meet their needs. The concept of sustainability also pertains to our natural resources. Are we protecting Burnsville's natural resources to the extent that future generations can benefit as we do? Are there forces depleting Burnsville's natural resources? What should be done to ensure the preservation and enhancement of Burnsville's natural resources? These questions are answered in this plan document.

Natural resources—for the purpose of this plan—are water, soil, plants, wildlife, atmosphere and people. These manifest as terrestrial (upland), wildlife and aquatic natural communities, but also include the built environment. This plan takes a holistic look at Burnsville's natural resources, irrespective of land-ownership boundaries, but focuses on terrestrial resources. Management of aquatic resources is discussed in detail in the Comprehensive Wetland Protection and Management Plan and in the Water Resources Management Plan.

Burnsville's Natural Resources

Water	Soil	Plants	Wildlife	Atmosphere	People
In the form of precipitation, natural water bodies, and stormwater	Earth substrate that provides the basis for life	Native forests, prairies, wetlands and vegetation in parks, in home landscapes and open space	Birds, insects, mammals reptiles and amphibians	Oxygen, CO^2, sunlight and wind	Critical component of regenerating the environment

I.3 History of the Plan

In 1999, the first Natural Resources Master Plan for Burnsville was completed. The plan was built on information derived from extensive field work, and the vision of the 1997 City Council's End Statement on the Environment. The master plan suggested strategies to protect, preserve and manage natural resources, and to educate the community.

Burnsville's End Statement on the Environment

In 1997, the Burnsville City Council adopted an end statement on the environment that articulated the following vision for the city's natural resources:

"People find Burnsville is an environmentally sensitive community ensuring preservation and enhancement of its natural resources."

In stating this vision, the city council identified several long-term commitments for the city and its citizens, including:

1. The people of Burnsville acknowledge their role in preserving and enhancing the city's natural resources.
2. The city ensures that development occurs in an environmentally sensitive manner.
3. The people find Burnsville to be an attractive, clean city and are willing to do what is necessary to preserve that characteristic.
4. The citizens of Burnsville recognize the value of preserving natural water bodies.

This 2007 Plan was commissioned to update the 1999 plan. It does so by:

1. evaluating changes in the quality of Burnsville's natural resources since that time
2. updating the strategy for protecting and managing natural resources
3. providing an added level of specific management actions and goals
4. providing an urban forest management plan for natural areas and for developed parks, streets and parking lots

Several other city plans manage aspects of Burnsville's natural resources, and they have been reviewed for consistency with this Master Plan. Recommendations for unifying and providing consistency within these plans are part of this Master Plan.

1.4 Purpose and Approach

The purpose of this plan is to evaluate the quality of existing natural resources in the City of Burnsville; identify strategies to protect, preserve and manage those resources; educate the community about the importance of doing so; and lastly, to educate the community on how to carry this out.

An ecological approach is being taken to protect and manage natural resources. Ecology is the study of interactions of plants and animals with their physical environment, and an ecological approach recognizes the interdependence of all natural resources. The function and value of any one natural resource is dependent on interactions with adjacent and connected resources, both natural and built.

This report sets forth a strategy for managing and therefore preserving Burnsville's terrestrial resources. This plan does not cover topics such as solid waste, potable water use, and waste water.

Ecology is the study of interactions of plants and animals with their physical environment.

2.0 Natural Resources Inventory

The Natural Resources Inventory has been a systematic accounting of the status of Burnsville's natural resources. In an effort to focus management strategies, the Natural Resources Inventory has been broken into two parts. The first is the assessment of publicly owned natural areas that have not been developed, and the second is the assessment of publicly owned trees in the built environment.

This document refers to trees in the **built environment**. The built environment means developed parks (with lawn), street trees and public parking lots.

2.1 Natural Areas Inventory

The public upland natural areas owned by the citizens of Burnsville have been field evaluated to identify land cover type and for ecological quality.

2.1.1 Natural Areas Inventory Process

The Minnesota Land Cover Classification System (MLCCS) was used to inventory land cover. This system classifies natural and cultural landscapes for use in planning. Results of the land cover type are displayed in Figure 1. Paired with this inventory is the ranking of the ecological quality of the same areas (Figure 2). The ecological quality assessment of Burnsville's natural areas began with the review of existing Dakota County MLCCS maps. Ecologists took these maps with them to the city's natural areas to examine each land cover unit (polygon). Each polygon was given a high, medium or low ecological quality rating. These ratings are relative assessments of the natural areas within Burnsville, and are not intended for broader comparison with natural areas in less urbanized settings.

Ecological Quality Ratings

The ratings were based on the following criteria:

High Sites with little or no human disturbance, important to preserve. Less than 5 percent invasive species.

High-quality sites include many species typical of the natural community. Few weedy plants, either native or nonnative, are present. Most natural processes are occurring, including disturbances such as fire or flooding, if appropriate. There is little or no evidence of human disturbances such as logging or livestock grazing.

Medium Sites with some disturbance, but with potential for restoration. Between 5 and 40 percent invasive species.

Medium-quality sites often lack many of the species typical of the natural community. Weedy species may be abundant, but they are not more prevalent than typical native species. (In communities with multiple layers of vegetation, weedy species do not dominate any one layer.) While natural processes may be interrupted and human disturbance apparent, the nature of the community has not been altered beyond recognition.

Low Very disturbed sites, most appropriate for alternative uses or total restoration. 40 percent or more invasive species.

Weedy species are common or dominant in any or all layers of vegetation. Natural processes are highly altered and extensive human disturbance is evident. The community may not resemble any naturally occurring community (that is, one described by DNR Natural Heritage Database).

As in all urban areas, the natural resources of Burnsville receive significant stress from the surrounding cultural environment:

- heat and cold radiating off pavement
- invasive plant species
- habitat fragmentation by roads and development
- fertilizer and pesticide drift from lawn application
- lack of predators to keep animal populations in balance
- fire suppression
- soil compaction from construction and maintenance equipment
- other urban influences

Native woodland deterioration in the metropolitan area is due to two primary influences: 1) invasion of exotic plant species, and 2) deer over population.

Garlic mustard

Whitetail deer

2.1.2 Natural Areas Inventory Results

The ecological quality assessment of the public upland natural areas owned by the citizens of Burnsville evaluated the degree of ecosystem degradation as the result of human disturbance. Direct human disturbances have historically included activities such as logging, grazing, and tilling. There are also indirect disturbances to the ecosystem through the suppression of fire that allowed trees to overtake savannas, and the elimination of predators that resulted in growing deer populations. When land is disturbed, either directly or indirectly, natural cycles are interrupted; hydrologic and nutrient balances shift. This interrupts native plant life cycles and allows for weed invasion, causing further erosion and general degradation of habitat. The changes in the types of plants in a community in turn affect the types of insects, birds and animals that inhabit the community and that play a role in its sustained regeneration. Because of this, disturbance and invasive-plant-species invasion can develop into self-perpetuating problems that require active management to slow and reverse.

Despite the efforts implemented with adoption of the 1999 Natural Resources Master Plan, natural communities in Burnsville continue to experience a decrease in biodiversity. This is common throughout the Minneapolis/St. Paul metropolitan area, as native woodlands are rapidly deteriorating due to two primary influences: 1) the invasion of exotic plant species such as European buckthorn and garlic mustard, and 2) deer over population. There are other causes, but these are the most direct and easiest to control. Since 1999, extensive invasion of buckthorn has occurred. The result of this alarming rate and extent of invasion is that the vast majority of plant species in Burnsville's woodlands no longer have the ability to regenerate. The density of buckthorn poses a significant strain on the ability of oaks, the historic native dominant trees of the area, to regenerate. With the change in tree species, many song bird, mammal, amphibian and reptiles will be extirpated (locally extinct) from the city, along with countless plant species. Deer browse is also negatively impacting Burnsville's forests. A good effort is in place to control the population, but the program should be expanded in order to further protect the forests.

If buckthorn is not controlled, future forests of Burnsville (in 50 years) will be an impenetrable thicket of buckthorn with very few other species.

Knowing the types and quality of Burnsville's natural resources enables the citizens and the city staff to answer the question: what natural resources do we have, and in what condition are they? This plan has taken this information and presents a strategy for protecting and improving the city's natural resources. See Section 3.0.

When land is disturbed (left), such as by grazing, native plant life cycles are interrupted, resulting in weed invasion. A highly degraded forest floor (right) will not support the natural regeneration of native trees and plants, requiring active management.

2.1.3 Terrace Oaks Park Sample Inventory

As part of the urban forest inventory, foresters conducted a detailed evaluation of the woodlands that comprise Terrace Oaks Park. This park was selected to represent Burnsville's natural areas due to its size and varied environments. A baseline inventory was conducted using a series of permanent plots that will allow for return inventories to aid in monitoring recommended restoration efforts.

Results show that Burnsville's largest park has significant buckthorn encroachment, and that native trees, especially oaks, have great difficulty reproducing. The good management efforts initiated by city staff, with the assistance of volunteers, should be stepped up to curb this problem. See Appendix A for more detail.

Buckthorn has taken over the forest understory in most of Terrace Oaks Park.

Some native grasses still remain in the oak savanna remnants of Terrace Oaks park, but are threatened.

2.1.4 Historic Conditions

For purposes of formulating a natural resources management approach, it has been helpful to review the native plant communities of Burnsville prior to European settlement. Figure 3 shows the native plant communities of Burnsville as they existed during the original land survey of 1853-1856. Although it is not necessarily possible or desirable to restore undeveloped lands of Burnsville to the communities shown on the map, it serves as a guide in thinking about what is suited for the local environmental conditions.

Prior to European settlement, most of the area that is now Burnsville was wooded to some extent while the remainder was open water, prairies or wetlands. Four different types of wooded areas could be found. These are listed in order of land covered by each community:

1. Oak Openings and Barrens (often called oak savannas). Fire dominated these areas, minimizing the presence of trees intolerant of fire such as maples and basswood. The result was an open park-like

In this photo, taken in mid-October, buckthorn's leaves are green. Buckthorn holds its leaves late into the fall. You can easily spot buckthorn from mid-October until the first of December by its green leaves.

vista of scattered oaks growing amongst herbaceous woodland and prairie plants. Little of the expansive presettlement oak savanna remains in Minnesota.

2. Big Woods Forest. Fire was rare in these wooded areas and species such as sugar maple, basswood and elm made up a large portion of the canopy, though oaks, ash, ironwood and bitternut hickory could also be found. The forest canopy was continuous, or nearly so. Shade tolerant plants such as spring ephemeral wildflowers and ferns grew on the forest floor. The Trust for Public Land reports that only 0.01% of the original Big Woods remains in Minnesota. Remnants of the Big Woods are home to rare species like the dwarf trout lily.

3. Aspen-Oak Land. This was likely a transition area (in time and in space) between oak savannas and the Big Woods forest. After a long period without fire, shrubs and trees intolerant of fire would colonize an area. Aspen are a pioneer species that can colonize Openings and Barrens. Old oaks remained, growing high above young aspen creating a canopy that was varied in height and with varying amounts of shade on the forest floor. Other pioneer tree species such as boxelder and paper birch were likely found here as well, but in smaller numbers. Aspen-Oak land is frequently found in Burnsville today. Typically they are former oak savannas that have been colonized by a variety of trees in the absence of fire.

4. River Bottom Forests. These forests are still found along the Minnesota River. Tree diversity is not high but the function of these forests in facilitating silt deposition and filtering stormwater cannot be understated. Cottonwood, elm and silver maple are common. Flooding may be frequent or seldom, but soil moisture is typically in ample supply. Dutch Elm Disease has lowered the number of elms found in these forests over the past half-century, yet they still persist.

2.2 Built Environment Tree Inventory Process

An inventory of publicly owned trees in the built environment was undertaken in the fall and early winter of 2006. Built environment trees, for the purpose of this plan, are defined as those trees that exist outside of natural areas, such as trees in groomed (developed) parks, in parking lots, in lawns and along streets. The inventory is broken into two components: 1) the developed city parks inventory, and 2) the street tree inventory.

Sample-based inventory techniques were used to tally and assess trees in maintained areas of parks and on city road right-of-ways. The assessment determined the effectiveness of current tree planting and mainte-

nance programs and makes recommendations for future plantings and maintenance needs.

To that end, several parks were selected to represent typical developed parks throughout the city. Park age, park size, usage and location within the city were factors used in park selection so that the selected parks were a faithful representation of all parks. Similarly, several neighborhoods were selected for a right-of-way inventory to represent different areas of the city with respect to such factors as age of the neighborhood, street width and traffic volume.

2.2.1 Developed City Parks Inventory

Developed parks are those groomed parks in which trees grow within lawn.

A total of 467 trees were tallied, identified, measured and assessed in six parks: Burnhaven, Highland Forest, Sue Fischer Memorial, Echo, Wolk and South River Hills. This sampling allowed for statistical analysis of the trees in city parks.

Thirty six different species were found with green ash the most common accounting for over 21% of all trees.

The average diameter of all surveyed trees is 9.56 inches. All trees were rated for condition based on a scale of 0-10 with rating of 0 representing a dead tree while 10 represents a hypothetical, perfect tree.

- Trees rated in the 1-3 range are of poor quality and condition. No amount of pruning or other maintenance will improve the quality to great degree.
- Trees in the 4-5 range are of fair quality and condition.
- Trees in the 6-7 range are good overall.
- Those few trees ranged 8 or 9 are very good to excellent.

Most trees in this inventory fall in the 2-8 range with an average condition of 4.9.

Analysis of this data brings out several items of note. First, one species (green ash) is more than twice as common as the next most common species while the differences in representation between other species is relatively small. In other words, green ash accounts for too much of the overall park tree population which increases the exposure to tree loss from a single pest such as Emerald Ash Borer (see page 12). A lesser proportion of the city's urban forest would be lost from such an event if the city's tree population were more evenly distributed among many species. Of a positive note, all other trees are more evenly distributed among the remaining species.

Built Environment Tree Inventory

The built environment tree inventory is broken down into two components:

1. Developed city parks inventory (467 trees inventoried across six parks)
2. Street tree inventory (564 trees inventoried across three neighborhoods of varying ages)

Tree Species Distribution in Developed City Parks

Species	Percent	Species	Percent
Ash, green	21.6	Pine, white	4.1
Basswood/Lindens	9.0	Pine, Austrian	3.6
Crabapple	8.4	Spruce, white	3.2
Pine, Scots	7.7	Maple, silver	3.0
Hackberry	5.8	Ash, black	2.8
Maple, red	4.9	Hawthorn	2.1
Maple, Norway	4.3	All other	15.4
Honeylocust	4.1		

Second, the average condition of 4.9 is more typical of a natural, unmaintained woodland in the Twin Cities area rather than a maintained park. This hints to the need to increase tree pruning frequency in developed parks. Strategy 4 under Goal 3 (page 24) addresses this concern.

Finally, oaks of any species are rarely found planted in the maintained areas of city parks despite being common in Burnsville's woodlands and historically one of the most common and important native trees in Burnsville. In fact, all oak species together only account 2.1% of all trees and most of the 10 trees counted in this inventory are swamp white oaks. This plan suggests that oaks be a high priority species for new plantings in Burnsville.

2.2.2 Street Tree Inventory

Three neighborhoods were selected to be part of the street tree sample inventory. The River Hills neighborhood is an older neighborhood in Burnsville and one of the few with trees planted in tree lawns formed by curb and sidewalks. A second neighborhood near Buck Hill (20 years old) was selected as a sample inventory area, as was a neighborhood between Chicago Avenue and Lac Lavon Drive, north of Crystal Lake Road and south of County Road 42 (also about 20 years old). A sample area representing the newest neighborhoods was not selected as these neighborhoods tend to have few, if any, street trees.

564 trees representing 38 species were counted and assessed for this three neighborhood inventory. The average diameter of all trees is 13.5 and the average condition is 4.7. The most common tree is green ash accounting for 48% of all trees, primarily due to its predominance in

the River Hills neighborhood. About 80% of the green ash were found in this neighborhood.

Although it is important to note the predominance of green ash, it is not unusual to find a predominance of one tree species in a neighborhood. The common texture, size, shape and color of a single species acts as a matrix that visually binds the landscape together. The result is more pleasing to the eye than an incongruity of colors, shapes and textures. However, in light of the lesson provided by Dutch elm disease where streets lined with a single elm species were decimated and now the potential threat of Emerald Ash Borer (see page 12), neighborhoods such as this may be especially hard hit if the threat becomes a reality.

A few of the species found in the road right-of-way are not commonly recommended as street trees. Cottonwoods are often too large for a space by a street and tend to shed too many twigs, while few people like the "cotton" shed each year. Colorado Blue spruce makes a good specimen tree in a lawn but can present site line problems near the road and often get infected with diseases that result in a shortened life span. In recent years Norway maple has fallen out of favor due to its shortened life span resulting from frequent splitting and a canker that deforms the trunk and opens the tree to decay.

This map shows the locations of the three neighborhoods chosen for the street tree inventory.

Street Tree Inventory Species

Species	Percent	Species	Percent
Ash, green	48.2	Spruce, white	2.8
Spruce, Colorado Blue	13.7	Basswood/Linden	2.0
Maple, red	4.8	Cottonwood	1.8
Crabapple	4.6	Maple, sugar	1.6
Maple, silver	4.6	Olive, Russian	1.6

Also of note is that 18 of the 38 species are represented by a single tree. This is likely due to the fact that in the two neighborhoods other than River Hills, most if not all trees in the right of way were planted by homeowners or builders. Selection then comes from what is attractive or what is available rather than from a planting program that utilizes

Evidence of Emerald Ash Borer damage along a residential street in Michigan.

Emerald ash borer is an exotic insect, metallic green in color and approximately 1/2 inch long. It is not yet in Minnesota.

economy of scale while selecting the most tolerant species for steetside growing conditions. The diversity is good but the species selection is sometimes questionable. The good news here is that several of these infrequently found trees could be, and should be planted in greater numbers within the road right of ways. Honeylocust, hawthorn and Japanese tree lilac are examples. See Appendix B for a list of recommended and not recommended trees for Burnsville.

Like the representative sample of park trees, the overall condition of street trees is rather low indicated by the average of 4.71. It is very common for trees growing in the adverse conditions found along city streets to exhibit poorer growing conditions than those in parks. The City of Burnsville can combat this problem by increasing the maintenance and removal of dying trees or those in poor condition. Contributing to the low condition is the fact that few of the older green ash were properly pruned when young, so that a good branch structure could be maintained. The result is trees that frequently have side branches larger than the central leader and many of these large branches hang low above the street. The lesson learned here is that it is critical for the longevity of a street tree to be pruned regularly when young in order to establish the proper form. It is recommended to increase pruning efforts and budget for Burnsville's street trees.

Emerald Ash Borer

The Emerald Ash Borer (EAB) is a small boring insect that feeds on ash trees. The greatest damage is done when the larva feed undetected under the bark. Eventually this cuts off the flow of water and nutrients resulting in a period of decline and, eventually, death of the infested tree. In Michigan, EAB has killed more than ten million ash trees in five years. Millions more have been removed as a preventive attempt to control the spread of the insect to unaffected areas.

The EAB has not yet been found in Minnesota but the threat is real. The sample inventories performed in preparation for this plan indicate large numbers of ash trees in the City of Burnsville. Therefore, there is reason to be concerned over the potential for losing many of these trees to this threat, the loss of associated benefits, and the cost of sanitation and control.

3.0 Strategy for Natural Resources Management on Public Property

3.1 Priorities for Natural Areas Management

Undeveloped land owned by the citizens of Burnsville has been field evaluated for ecological quality (See Figure 2) and has been ranked to determine where to most effectively invest a limited natural resources budget to preserve Burnsville's highest ecological quality lands. All public lands in Burnsville are decreasing in ecological quality primarily due to invasive species. In order to guide decisions on where best to invest in preserving or restoring ecological quality, a priority ranking system was developed.

Priority A

Sites with rare species, and sites where plant community (especially forest understory) recovery is highly probable. These sites have a significant number of native species present which can serve as a seed source for reproduction. These sites will receive first priority for management funding. See Appendix C and Figure 5 for more information on rare and threatened species in Burnsville.

Priority B

Sites where plant community (especially forest understory) recovery is possible, but likelihood of success unknown. A seed bank study would be necessary to determine the likelihood of recovery. These sites will be managed by volunteer groups as they step forward. City staff will be available to direct volunteer groups. The 'polka-dot' forest regeneration program (see Section 3.1.5) will be made available for priority B sites.

The table on the next page lists publicly owned sites that rank for management as priority A or B.

All other public properties owned by the citizens of Burnsville will not be managed for invasive species at this time. These sites lack biodiversity due to invasive species encroachment and past land use. Restoration would require considerable expense and effort. Due to limited funding, these sites will not receive management through the city or by volunteers until all higher priority sites have been fully funded and managed. If strong citizen interest for restoring any of these properties arises, city staff will provide the expertise necessary to guide a restoration effort. The 'polka-dot' forest regeneration program (see section 3.1.5) will be made available for these sites.

Individual site management plans have been created for the sites listed in the Priority Sites for Management table on the next page. The management plans set forth are on-the-ground strategies for invasive species control to allow for native plant community regeneration. These plans can be found in Figures 6-23 and on the City of Burnsville web site at www.ci.burnsville.mn.us.

Priority A rankings for each site were determined by:

- Any site containing areas of plant community found to be of "high" ecological quality
- Any site that contain rare species designated in the Minnesota County Biologic Survey (MN DNR)
- All Resource Management Units (RMUs) because of their large acreage
- Sites where the level of disturbance is low enough to allow for effective management results in a relatively short time frame, and with lower costs.

Priority B rankings for each site were determined by:

- Sites where native forest canopy is intact along with some colonies of native understory vegetation.
- Sites where the extent and complexity of disturbances necessitate management actions that may take longer to complete, and at higher costs.

Priority Sites for Management

Priority	Park Name/RMU	General Quality Range	Outcome to Effort Ratio
A	Alimagnet RMU	M	High
A	Bluff Valley RMU	M	Moderate–Low
A	City Center RMU	M	Moderate
A	Crystal Lake RMU	M	High
A	Forest Heights	H-L	High
A	Judicial Park	H-M	High
A	Kraemer RMU	H-L	High
A	Quarry RMU	H-M	High
A	Southwest RMU	M-L	Moderate
A	Sunset Pond RMU	M	High
A	Terrace Oaks RMU	M-L	Moderate
B	Chateaulin	M-L	Moderate
B	Crosstown West	M-L	Moderate
B	Hollows	M-L	Low
B	Krestwood	M	Moderate
B	Neill Park	M	Moderate
B	North River Hills	M-L	Moderate
B	Wellington Crest/Water Tower (north slope)	M	Moderate

Resource management units (RMUs) as defined in the 1999 Natural Resources Master Plan are high concentrations of natural resource sites and important lakes and rivers. RMUs were created based on the concept that important resources are to be protected at the core of a resource complex. Figure 3.1 illustrates this concept. Following this concept, high priority areas are core sites for preservation and management.

The boundaries of the RMUs have been changed from those designated in the 1999 Plan (see Figure 4). The boundaries have been reduced to encompass only significant natural areas, excluding surrounding private property. Private property is not directly managed through this plan, but education and direct assistance programs recommended in Section 4 can influence these properties if the owners so choose. The boundaries have been reduced also to focus management efforts due to the limited management resources available.

3.1.1 Greenways and Corridors

Greenways and corridors potentially serve as movement pathways for plants and animals and bridge disjunct complexes of natural communi-

ties. Often they are linear and follow streams and rivers. Power line corridors can, to some extent, function as corridors for animal movement. However, these areas are strictly maintained to exclude the type of taller, forested growth that makes for more effective corridors. The scale of a greenway varies from a minimum of 200 feet in most cases to several thousand feet in the case of large river valleys. The Minnesota River Valley is an example of a large scale corridor.

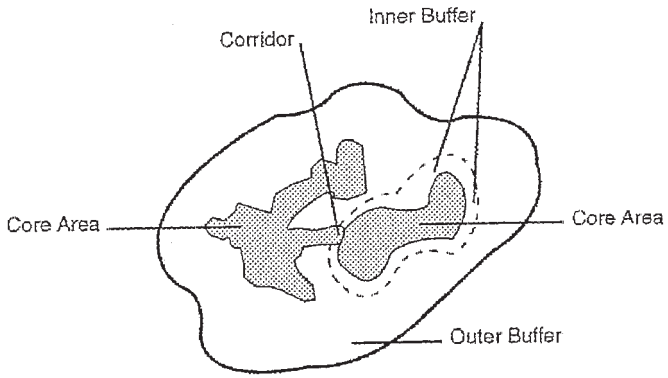


Figure 3.1

Potential greenways were identified after being analyzed in the 1999 Natural Resources Master Plan. It was found that no significant linear greenways or corridors run through Burnsville, other than the river valley. The Minnesota River Valley runs along the northern border of the City of Burnsville and this area should be the focus of any efforts to connect areas managed by Burnsville and state and federal government agencies.

3.1.2 Revised Recommendations on Land Acquisition

A list of lands recommended for acquisition was presented in the 1999 Plan. This recommendation was based on the Park and Natural Resources Commission recommendations to City Council in 1992. Land protection efforts focused on acquiring land which connects to existing habitat rather than acquiring land which is disjunct from existing habitat.

Follow-up on these goals show that the following properties still have potential for purchase, or may be preserved through a conservation easement or park dedication:

1. Minnegasco site: Still undeveloped; current land owners are in the process of restoring this forest.

2. Kraemer Nature Preserve (Chowen site): Consider expanding the existing Kraemer Nature Preserve through the city's use of its Park Dedication requirements.

All other sites recommended for acquisition in 1999 have been developed.

3.1.3 Natural Resources Management Strategies for RMUs and Individual Parks

Individual management strategy maps have been created for each of the Priority A and B sites listed in the Priority Sites for Management table on page 14. See Figures 6–23. Management for each site focuses on invasive species control. Within each site, invasive species control begins within that area that is of the highest ecological quality. It is important to protect these areas of highest biodiversity first in order to prevent further species extirpation. Common buckthorn, hybrid honeysuckle and garlic mustard are the primary invasive plant species in wooded areas, whereas spotted knapweed, leafy spurge and brome grass are encroaching into prairies and meadows.

After securing highest quality nodes within each site, management should proceed into areas of diminishing ecological quality. Removing invasive seed source from around the highest quality node reduces the likelihood of re-colonization. Invasive species removal continues in an outwardly manner as illustrated on the management maps until invasive species have been removed from the parcel. At that point the site should be evaluated for native species reintroduction, and kept on a maintenance schedule to remove occasional invasive species re-colonization.

3.1.4 Buckthorn Removal Strategies

Buckthorn control strategies include cutting the branches and leaving them on the ground to decompose.

Buckthorn removal in Burnsville's natural areas is given high priority in this plan. Techniques and cost for its removal varies upon the extent of invasion on a site and the accessibility of the site for restoration crews. Appendix D contains a series of alternative removal techniques appropriate for different conditions within an infestation, as well as a table outlining the costs of buckthorn control. These techniques were developed by Prairie Restorations Inc. in conjunction with the City of Minnetonka for a series of parks in that city.

A five-year process was developed. Typically provided by a contractor, this process involves an intensive buckthorn removal event the first year to extricate all standing plants. After initial removal, four years are committed to intensive seedling management to kill resprouting stumps and to kill small seedlings that will germinate from seed stored in the ground. After the fifth year of control by a contractor, volunteers are used to walk each site (once per year) to pull any new seedlings that might venture onto the site. It is necessary to continue this once a year volunteer event indefinitely because birds spread buckthorn seed. See Appendix D for a detailed description of buckthorn removal techniques.

Buckthorn Control Costs

Park Name or Resource Management Unit	Year 1 Buckthorn Removal Cost for Management Core Areas* ($4,000/acre**)	Management Cost for Years 2–5 for Core Areas ($1,700/acre/year)
Alimagnet RMU	$4,500	$2,000
Bluff Valley RMU	$8,400	$3,600
City Center RMU	$3,600	$1,500
Crystal Lake RMU	$17,400	$7,500
Forest Heights	$1,500	$4,000
Judicial Park	$5,400	$2,500
Kraemer RMU	$0	$0
Quarry RMU	$17,400	$7,500
Southwest RMU	$900	$500
Sunset Pond RMU	$900	$500
Terrace Oaks RMU	$14,700	$6,500

* Management Core areas pertain to the acreage encircled with the yellow line on the individual site management maps.

** Cost will vary depending on site characteristics.

3.1.5 Polka Dot Forest Regeneration Program

Some of the forests of Burnsville have evolved from land that was completely cleared for agriculture in the last century. Once farming ceased, the land was left fallow, then colonized by undesirable tree species such as boxelder, Siberian elm and Amur maple. These fast growing, weak wooded trees do not support a diversity of ground plain species, and are poor wildlife habitat. In the ecological inventory these forests rate as low quality, and they do not meet the criteria for management priority. Therefore, a concerted effort for management is not planned.

The polka dot forest regeneration program is designed to restore a minimal level of diversity to these forests by clearing small patches of undesirable vegetation and planting native trees, primarily oaks. These patches of oaks would grow and over time provide a seed source for the native forest to expand. In the future when resources become available to fund forest regeneration projects, restorationists will be able to build from these nodes of established native trees.

The program will be funded by grants or donations from local groups interested in seeing the forests of their neighborhood restored. Staff will be made available to coordinate site preparation and planting, but much of the establishment and maintenance work will be conducted by volunteers.

Open areas such as this that are colonizing with weedy trees are great places to introduce native oaks through the "Polka Dot Forest Program."

3.1.6 Prairie Management and Regeneration

Purple prairie clover is a native plant that could be reintroduced easily to Burnsville prairie remnants.

Prairies and savanna remnants are an important component of the diverse natural features in Burnsville. As with many other cities and towns in southern Minnesota, Burnsville exists in part because the proximity of Big Woods timber and the prairie's rich soils made the area attractive to settlers. The city recognizes this connection between its natural resources and its history, and continues to work toward maintaining the quality of those resources, including its prairie and savanna remnants.

An additional valuable function of prairies has become increasingly recognized in recent years. That is the ability of prairies to sequester, or hold, carbon. Carbon dioxide, or CO^2, is a major greenhouse gas contributing to climate change. Prairie plants, unlike typical turf grasses, develop long roots that extend deep into the soil, and are long-lived. CO^2 taken up by the prairie plants goes into the formation of the roots, and is held there for the life of the plant. Even after the plants die, the carbon in their roots remains in the soil as part of other processes in the carbon cycle.

Moreover, since prairie plants have evolved to the climate of the Upper Midwest, it takes far less effort to maintain them. Mowing, fertilizing and other maintenance activities that are normally important and intensive on turf grasses are not as vital and can even be unnecessary in prairie communities. Since these maintenance activities consume and release CO^2 and other carbon compounds, the use of prairie plantings can further reduce overall carbon release. The low maintenance requirements of prairie also save the City the time and expense that is required for upkeep of turf grass areas.

By protecting and expanding its prairie and savanna remnants, Burnsville recognizes both the historic and current value of these unique plant communities. Burnsville prepared the "City of Burnsville Prairie and Savanna Areas Management Plans" in 2005, with a 2006 update. This plan provides a detailed, comprehensive set of management goals and strategies for each of six areas within the City that have notable prairie and/or savanna restorations and remnants. Species lists, suggested plant palettes, information on monitoring and tools for maintenance are also reviewed. Because of the comprehensive approach to prairie management in the existing plan, there is no current need to prepare a new prairie management plan. The recommended approach to prairie and savanna management in Burnsville is to incorporate by reference the goals and strategies of the existing prairie plan, following the maintenance and monitoring direction provided there. Please refer to Section 5.0 Review of City Plans for a more detailed assessment of the existing prairie plan.

3.1.7 Monitoring to Evaluate Success

3.1.7.1 Natural Areas Monitoring Recommendation

This plan calls for restoration projects in several forms. However, the installation of a restoration project does not guarantee that these objectives will be met or these goals achieved. Restoration of a plant community (through management) is a process for which the goal of biodiversity is achieved over time. Therefore monitoring is necessary to track the success of a project over time.

Monitoring efforts should be directed at evaluating two key measures: 1) species richness (or diversity) and 2) community (vegetation) structure—the vertical layering of vegetation and the horizontal distribution of species. Data gathered from a scheduled monitoring program are useful in measuring these attributes, and can guide future management efforts.

Monitoring of natural areas should include three habitat types 1) high quality forests where invasive plant species removal is occurring, 2) high quality forests where invasive plant species removal is not occurring, and 3) managed prairies.

Managed Prairies Map

Key

1. Sue Fischer Prairie
2. Kraemer Prairie
3. Terrace Oaks Savanna
4. Alimagnet Prairie
5. Cam Ram Neighborhood Restoration
6. Cliff Fen Park Wet Meadow
7. Sunset Pond SW Prairie
8. Sunset Pond W Prairie
9. Day Park Prairie
10. Cam Ram Oak Savanna Restoration

Species richness is determined by the number of different plant species that grow in a given area. The greater the number of species, the greater the richness and the higher the ecological quality.

Community structure is the vertical layering of vegetation and the horizontal distribution of species.

Monitoring allows land managers to evaluate the success of management practices, and indicates if changes are necessary.

Burnsville currently conducts natural resources monitoring through three citizen-based programs:

- Lake water quality monitoring through the Citizen Assistance Monitoring Program
- Wetland monitoring through the Wetland Health Evaluation Program
- Bird surveys in each of the RMUs (every 5th year)

In high quality forests, a monitoring program utilizing permanent sampling transects and uniform sampling techniques should be employed. The relevé methodology is suggested to document species richness and community structure. One transect should be established for each high quality natural area with the length and number of sampling points based upon the size of the area. Large areas such as Cam Ram Park should have three to four locations. Smaller high quality areas should have at least one location that is representative of the overall site. Relevé plot placement is determined after initially observing the vegetation in each parcel and locating each of the plots to be representative of vegetation in the parcel.

Details on the relevé monitoring technique can be found in the Minnesota Department of Natural Resources 1999, Relevé Methods Manual.

RMUs with unmanaged high quality habitats should also be monitored in order to watch for potential degradation.

It is also recommended that prairies also be monitored to survey the effectiveness of their management program. Each site should receive three relevé plots located along a transect through each management area. Plot placement is determined after initially observing the vegetation in each parcel and locating the plot to be representative of vegetation in the parcel.

All three types of sites should be monitored once per year, ideally in the spring for forests, and mid summer for prairies.

3.2 Strategies for Management of the Built Environment

Several goals have been identified to maximize the benefits of trees within the developed portions of Burnsville. For each of the following goals, one or more strategies are put forth to achieve maximum results in the most practical, efficient manner.

Goal 1. Increase tree cover and diversity

1. Begin an aggressive tree planting program on city right-of-ways. Many of the major thoroughfares have significant boulevard space or tree lawns that could sustain large trees. Most major U.S. cities have significant street tree populations flourishing in small or forbidding planting spaces. Burnsville has a lot of room to grow trees. It should be kept in mind that the value of tree benefits is nearly three times the cost of planting, maintenance and removal.

2. Expand on the sample inventories of street and park trees. Use the results to further guide the selection of trees to plant and the loca-

tions available to plant. If necessary use these inventories to update recommended and non-recommended tree lists.

3. Increase the ratio of overstory trees to smaller trees in city parks. The number of trees planted in city parks likely does not need adjustment. But an effective means for increasing tree canopy without increasing the number of trees planted is to utilize some large tree species. Showy trees such as crabapples and Japanese tree lilacs are always welcome, but large trees such as oaks, elms and "cottonless" cottonwoods provide relatively large canopy cover from a single tree while adding to the community's tree height diversity—an important component in some bird-habitat requirements.

Goal 2. Reduce and prevent tree loss due to existing and potential threats

1. Continue the current oak wilt program with ongoing emphasis to the timely removal of possible spore producing, infected red oaks. Use the "Treat to the Line" method recommended by the Minnesota Department of Natural Resources whenever possible and when the situation warrants. Also called "Cut to the Line," this treatment involves removing all oaks inside a created barrier line and optionally treating oak stumps with herbicide to ensure oaks inside the barriers will not regraft and continue to spread the disease. Though this is a radical treatment of oak wilt, it is appropriate when eradication of the disease is the goal.

2. Develop a Dutch elm disease program similar to the current oak wilt program. Many communities make the mistake of leaving diseased elms up too long, providing a host for the beetles that spread the disease. The sooner diseased elms can be removed, the better. Elms that are long dead from Dutch elm disease are no longer a threat to harbor spore spreading beetles. Priority should be given to removing recently diagnosed elms or those most recently dead.

3. Prepare for the event of an Emerald Ash Borer outbreak by occasional drive-by monitoring of the city's significant ash population. This monitoring can be performed in conjunction with oak and elm inspections. The State of Minnesota has added Emerald Ash Borer to continuing education programs focused toward State Licensed Tree Inspectors. While there is still much to be learned about this pest, the use of state licensed tree inspectors will be key in early detection. Remove the poorest quality ash trees from city parks and on city streets whenever the opportunity arises. This pest prefers ash trees under stress; whenever a dying, diseased or significantly damaged ash is found, removal should be a priority. The city has a high percentage of its planted trees represented by ash species, which could present a significant financial burden should Emerald Ash Borer invade the area.

Bare boulevards, like the one pictured above, offer wonderful tree-planting opportunities.

This location offers space for street trees. Tree-lined streets shade the pavement and reduce heat; add beauty to the community; and can slow traffic by reducing the perceived width of the street.

Benefits of Trees

Trees provide many benefits to the environment and community. The past few decades of tree research has focused on documenting and quantifying the benefits of trees. Early on, researchers were quantifying the amount of greenhouse gases trees remove from the atmosphere (about ½ ton of carbon dioxide per tree per year) and pollutants (about 4.3 pounds of pollutants per tree per year). Since then, researchers have begun to document an ever growing list of benefits that may not be so obvious.

Leaves and branches reduce the amount of rainwater that reaches the storm system—preventing flooding.

Trees reduce temperatures by shading streets and sidewalks.

Benefits to the Environment

In addition to the direct removal of greenhouse gases and pollutants, mentioned above, trees:

- Reduce temperatures by shading streets, sidewalks and other hardscapes, resulting in reduced use of electricity for cooling and a corresponding reduction of any non-renewable fuels used to generate that electricity. Furthermore, there is a reduction in the emission of greenhouse gases and pollutants associated with the use of fossil fuels.
- Increase the amount of water that reaches the groundwater table as rainfall follows tree root systems down below the soil surface.
- Intercept rain with leaves and branches reducing the amount of water that reaches the storm system, particularly when properly placed to grow over streets, sidewalks, parking lots and rooftops. This results in a downstream reduction in the erosive force of large volumes of runoff to natural water bodies and flooding.
- Add organic matter to the soil which further improves the water-holding capacity of the soil.
- Improve the resiliency of soil to respond to rain events by removing water from the soil which can reduce saturated conditions which exacerbate storm water load. One mature tree can capture over 5,000 gallons of water in a year.
- In whole, trees can reduce storm water by about 2% for each 5% increase in the community's tree canopy. Despite its many tree-covered subdivisions, Burnsville has many opportunities to increase the tree canopy along streets, sidewalks and parking lots.
- Reduce soil erosion with dense root systems. Less soil, contaminated or clean, reaches the storm water system, creeks and rivers.

Benefits to the Community

Trees help promote pride in the community and a sense of place. Other benefits of trees affect us either directly or indirectly in our daily lives or have direct effects on our roads, utilities and businesses. Here is some of what we know to be true:

- Street trees are an important factor in reducing road maintenance costs. Recently, researchers showed that streets shaded by medium-sized trees required less frequent resealing than streets fully exposed to the sun.
- Tree-filled neighborhoods show lower levels of domestic violence.
- Street trees can calm traffic and lower traffic speed by reducing the perceived width of street. Streets without trees have the opposite effect, appearing "wide open."
- Trees help reduce noise levels.
- Trees are known to shorten hospital stays.
- Trees can reduce workplace stress.
- Trees can be used to screen unsightly views.
- Our trees are part of the legacy from those who came before us.

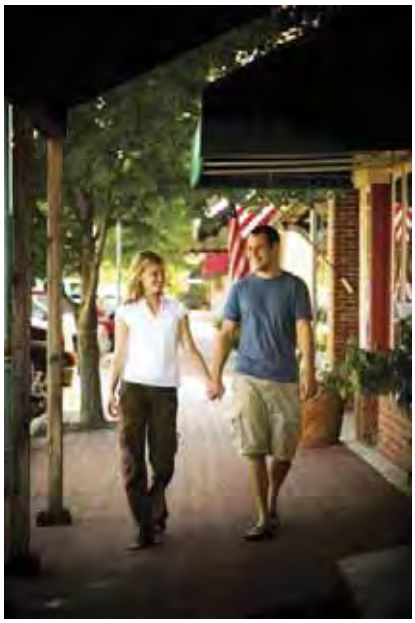
Healthy trees in neighborhoods enhance property values:

- The sales price for a home increases by about 1% for each large front yard tree.
- But a single, large, specimen tree in a yard can add 10% to the property's value.

Trees are also good for business. Surveys of shoppers in commercial districts with tree-lined streets reported that:

- They shop there more frequently
- They shop for longer periods of time
- They are more willing to pay for parking
- They spend, on average, 12% more on goods.

All when compared to shopping in areas without trees.



Surveys indicate that shoppers spend more time and money in commercial districts with tree-lined streets.

Adding it All Up

When the benefits that can be quantified are weighed against the cost of trees (i. e. purchase, planting, pruning and removal), these benefits outweigh the cost by a margin of about three to one. This doesn't include the benefits we cannot quantify such as community pride or reduction in stress and domestic violence. The City of Burnsville has been reaping and continues to reap these benefits, which started with proper planting of trees on streets and other city property, and by encouraging appropriate planting on private property. It is important to continue planting trees in Burnsville and ensure the urban forest is properly maintained to prevent an erosion of these benefits and an increase in costs associated with neglect.

Burr oak is a highly desirable native tree that is drought tolerant and supports many wildlife species. Good in any landscape situation.

Goal 3. Improve the quality and sustainability of tree plantings in the maintained areas of city parks

1. Remove Siberian elms from parks regardless of their condition or health. Siberian elms are an exotic, potentially invasive tree that often has an unappealing form, can harbor Dutch elm disease—and the bark beetles that spread it—without obvious symptoms. There are not many Siberian elms currently growing in city parks, but if crews are on site removing other trees, any Siberian elm in that park should be removed during that trip. Also, the invasive nature of this tree makes it likely that more will be found in city parks over the coming years.

2. Finish the inventory of city parks begun as part of this Plan. Use the inventory to identify all trees of low quality or potentially hazardous and remove them.

3. Increase the number of desirable trees used in future park plantings. See the tables in Section 4.1.3 or desirable/recommended and undesirable/not recommended tree species.

4. Create a strict policy of formative pruning during the early years of a tree's growth. Current research points to avoiding pruning until a newly planted tree becomes established with the exception of removing damaged or dead branches and multiple leaders. Once established (two to five years), it is critical to improve the branch structure of young trees because it is quick, inexpensive, prevents large and expensive pruning projects years later and promotes healthy, attractive and stronger branch structure and an attractive overall shape.

5. Use more native, fruit-bearing trees and shrubs. Provide birds alternatives to buckthorn. Serviceberries, cranberrybush, mountain ash and plum are among several native plants used by birds for food, all adapted to our locale and attractive in flower.

Goal 4. Update Tree Preservation and Planting Related Ordinances

Update current ordinances to reflect goals and strategies in this Natural Resources Master Plan using a discernment process to help the city determine:

- What it wishes to preserve, including which tree species, what size trees, forests versus individual trees, etc.
- Whom it wishes to hold accountable (who are the involved parties)
- Who will enforce the new policies/code
- How will it be enforced

The existing ordinances include:

- Woodland Protection Standards (Title 10, Chapter 8, Section 9) that holds builders and developers accountable for tree preservation and replacement,
- Title 8, Chapter 3, Section 3 that addresses planting on public right of ways,
- Title 11. Chapter 5, Section 5 that addresses tree planting in new subdivisions.

See Appendix E for specific recommended changes to tree-related ordinances.

3.2.1 Built Environment Tree Monitoring Recommendation

Monitoring trees in maintained areas of parks and along the city streets, will allow the city to assess the effectiveness of the strategies laid out in this plan, identify new pests and stressors, and closely follow existing, chronic problems such as oak wilt, Dutch elm disease and invasive exotics. This monitoring can take place by several means.

1. Existing program of oak wilt inspections with the addition of elm and ash inspections. These additional inspections, performed in conjunction with the oak wilt inspections, will provide sufficient monitoring of the existing, chronic problems of oak wilt and Dutch elm disease while forming the first step to quick response should emerald ash borer infest the City's ash population.
2. Completing the street tree and park tree inventories. Some of the data collected during these inventories, like the sample inventories already performed, will complete the database of information on species diversity, size and age diversity, tree maintenance needs, planting opportunities, spatial distribution and tree survival. This information can then be used to assess past tree maintenance techniques and schedule new maintenance, focus planting efforts, adjust species diversity, respond to new or existing pests and assess the success of different tree species within the city.
3. Inspect all current and future exotic species control sites. No matter how effective the method of removing and controlling buckthorn, as long as mature trees and utility poles provide perch sites for birds, sites will be reseeded. Other plants such as Siberian elm and garlic mustard can reseed into previously controlled sites. Keep in mind: anything that can happen once can happen twice. Frequent monitoring of these sites is necessary to initiate a quick response that will make new infestations easier to remove than if left to thoroughly establish.
4. Frequent inspection of the "Polka Dot Forest." Young oaks planted in wooded parks will be particularly vulnerable. In the best of con-

American Forests (a non-profit organization that supports reforestation) suggests a 40% tree canopy for best building energy efficiency and comfort in cities. The tree canopy of Burnsville is currently at 24.5%.

ditions the survival rate of newly planted trees is often disappointing. But planted into a previously hostile growing environment out of site from casual inspection, these trees will require a commitment greater than what might be necessary for trees planted in a maintained area of a park. Response to new infestations of exotics will need to be quick to favor the growth of young oaks. Timely replacement of dead oak saplings can only be done if these sites are frequently monitored.

3.3 Strategies for Addressing Climate Change

One impending force that will affect Burnsville's natural resources is climate change. Predictions indicate that Burnsville will experience more days over ninety degrees, increased wind, more intense but less frequent storm events, and less snow cover with higher average winter temperatures, among others. The ecosystem evolved under conditions other than what is now expected. This means that climate changes will affect natural resources. Increased drying of soils and lower water levels in lakes, wetlands and streams, stressed trees, frequent drought, intense (but infrequent) storm events, and many other effects will result.

Preparation for these changes should begin now and can happen in many ways. It is important to capture stormwater where it falls and infiltrate it into the ground for use by trees and to recharge ground water. This is suggested in the Water Management Plan through an infiltration requirement, and should be expanded throughout the city. It is important to shade buildings and pavement to keep ambient air temperatures moderate and save on energy costs. An urban forest canopy cover of fifty percent will block winter winds, also saving on energy costs. The tree canopy cover of Burnsville is currently 24.5%. It is important to pay attention to changes in our forests and wetlands to be sure that species are not being displaced by forces under our control (such as by invasive plant species and over grazing by deer). The challenges will become more evident in the next few years.

Climate change predictions include:

- More days over 90°
- Increased wind
- More intense but less frequent storm events
- Less snow cover with higher average winter temperatures

Preparation for climate change begins with:

- Capturing stormwater where it falls
- Appropriately shading buildings and pavement
- Monitoring changes in forests and wetlands

The strategies brought forward in this plan (and summarized in the conclusion) all focus on the protection of natural resources, but at the same time strengthen them to face environmental change. Much can be done to sequester carbon and to reduce the release of greenhouse gases, while also saving energy costs and dependence on foreign oil. Suggested actions are listed in the table on pages 43 and 44. Many other actions not listed in the table can be taken in the areas of transportation, architecture and life style that are beyond the scope of this document.

4.0 Strategy for Natural Resources Management on Private Property

Burnsville's natural resources are not confined to public property. Our ecosystem reaches across public and private land, and beyond the city limits. All properties affect neighboring lands so it is important to take a consistent ecological management approach throughout Burnsville.

This plan suggests two avenues of influencing the management of private property natural resources. The first approach is through education programs and the second through direct assistance programs.

4.1 Education Programs

When citizens understand environmental issues and the effect they are having on natural resources, they become motivated to change their behavior. Knowledge is crucial for the preservation of Burnsville's natural resources. Burnsville's public land is surrounded by private property. When both are managed to the ecological advantage, the expense and difficulty in managing both drops considerably.

Valuable information regarding Burnsville's natural resources could be provided to the citizens of Burnsville. The next page lists possibilities. One issue, however, looms greatest as a threat to natural areas in town—invasive plant encroachment in our woodlands. Two species are severely degrading the woodlands, and to control them requires that citizens remove these species from their property in concert with the efforts taken on public property. The invasive species of greatest concern are common buckthorn and garlic mustard.

4.1.1 Buckthorn Education Program

An internet-based buckthorn education program is recommended. Busy citizens are most apt to investigate an issue if the information is presented in an easy-to-access format on their home computer. Video-based programs are especially effective.

Topics to address in this program include buckthorn identification and life cycle, the impact of buckthorn on our woodlands and wildlife, and techniques for removing buckthorn and prevention of its re-colonization.

4.1.2 Garlic Mustard Education Program

Garlic mustard is an herbaceous, woodland understory plant that is invading metropolitan woodlands at an astonishingly fast rate. It quickly reproduces and displaces native wildflowers, ferns and grasses, completely eliminating them wherever it establishes.

This program should be web based as well, so that it is accessible at citizens' convenience. Citizens should understand how the plant affects the environment, how to identify it, and how to eradicate the plant.

Garlic mustard invades forests and prevents tree regeneration. Homeowners should learn to identify and control this invasive species.

Internet-based education programs reach citizens in the convenience of their own homes.

Educational Program Suggestions

After first-priority education efforts are underway, further educational programs can be developed to protect Burnsville's natural resources. Suggestions for further educational programs include the following:

Education programs pertaining to privately owned lawn landscapes

- Landscaping for energy efficiency. Learn how to place trees in your yard for best solar gain and wind protection. Save up to 15% on your heating and cooling bills.
- Alternatives to Lawn. Learn how to reduce the amount of fertilizer, pesticide, water and fossil fuels consumed in managing your lawn. Introduction to easy-to-care-for alternative ground covers to lawn. Reduce soil compaction (especially when planting trees)
- Capturing Valuable Stormwater on Your Property. Learn the value of treating stormwater as a resource. Learn why and how to collect water from roofs, driveways and streets. Learn about rainwater gardens, rain barrels and other techniques.
- How Climate Change will Affect Your Landscape. Learn what you can do in your yard to prepare for hotter summers, greater but less-frequent storm events, and higher winds. Learn how to prevent the release of carbon dioxide (the burning of fossil fuels) while culturing a landscape that sequesters carbon (through photosynthesis by deep-rooted plants).
- The importance of compost in the landscape to recycle nutrients, hold soil moisture, and sequester carbon. Learn how to build your own compost bin and put the final product to good use.
- Maintaining an Environmentally Sound Lawn. Learn how to care for a beautiful lawn without the use of fertilizers, water and pesticides.
- Cats on the Prowl. Learn about the destruction caused by feral cats.

Education programs pertaining to privately owned wooded areas

- Residential forest management including the importance of biodiversity, and the removal of weedy, non-native trees such as Siberian elm, Amur and Norway maples.
- Adding diversity to forest understory by planting wildflowers, ferns and sedges. Learn about native wildflowers. Learn to protect and enhance what you have; add diversity.
- Urban Wildlife 101. Learn how wildlife survives in urban areas. Learn how best to serve their needs and not cause damage to the ecosystem as a whole.
- Tree diseases program. Learn how to prevent, identify and control tree diseases on your property, including Dutch elm disease, red oak wilt, emerald ash borer, and others.

4.1.3 Tree Planting Education Program

This program too could simply be information posted to the city's web site. Most of the private land in the city was developed several decades ago. Therefore, many of the trees planted are now reaching maturity and the tree canopy is beginning to close. Here many of the benefits of trees are being realized. So in these maturing neighborhoods the issue is not "plant more trees" but rather, improve the quality of the urban forest by:

1. Replacing dying trees with tree species appropriate to the site and of better quality and higher potential value (see the Recommended Trees table in Appendix B). Trees once valued have since fallen out of favor because of poor performance or their ability to become invasive. An example is Norway maple. Invasive in some parts of the United States, this tree's poor branch structure and propensity to develop cankers make this a high maintenance and short-lived tree. Short-lived or week-wooded trees like silver maple and boxelder (see the Trees not Recommended table in Appendix B), should be replaced with trees such as oaks and sugar maple when the opportunity arises. These trees are potentially of higher value and can become "legacy trees" that benefit the entire community. Encourage use of a recommended tree list for all landowners.

2. Tree selection should be guided by the adage "right tree in the right place." Selected trees must be able to tolerate the growing conditions at that particular site. Honeylocust can thrive on dry sites, while it flounders on wet sites. Other trees such as bur oak are adaptable and can grow on dry, wet or mesic sites. The mature size of a tree must always be considered. Avoid planting tall trees under other trees or powerlines. Avoid planting trees with low-hanging branches near roads.

3. Promote proper maintenance of trees on private property by encouraging the use of International Society of Arboriculture (ISA) Certified Arborists and by timely removal of dead and dying trees.

4.2 Direct Assistance Programs

Publicly supported programs motivate private property owners to care for their land in an ecologically sound manner, and improve the overall quality of natural resources. Three of Burnsville's existing programs illustrate this success. Similar programs can build on this model of preserving Burnsville's natural resources. Current programs include:

1. The bare-root tree sale each spring
2 The Cul-du-Sac Island Improvement Grant Program
3. The Neighborhood Water Resources Grant Program

Planting trees is not only good for the environment, it can be a fun family activity as well.

When planting trees along streets:

- Call the city forester for free advice
- Get a free permit (required), so that appropriate species are planted
- Know where underground utilities are—they may prohibit the planting of trees along some streets

Two additional programs are suggested in this plan.

4.2.1 Buckthorn Brush Pick-up Program

One of the primary deterrents for citizens in removing buckthorn from their property is the difficulty of disposing brush that accumulates in the process. Most citizens do not own the equipment required to remove the brush. Burnsville could establish a program that, on appointment, city crews would remove and dispose of curbside buckthorn brush from private property. The City of Eagan has undertaken such a program. Burnsville could mimic this successful program for which Eagan finds to be economical and effective. Their program involves an initial visit to the property by a city forester to educate the property owner and to be sure they are removing the appropriate species and doing it in a way that is effective. Stringent guidelines for what, when and where the brush is picked up are set and enforced. This program would be an efficient way to access motivated citizens and spread the word about the importance of removing this invasive species.

It is recommended that Burnsville develop a buckthorn brush pickup program, the cost of which would be comparable to Eagan's program.

4.2.2 Native Herbaceous Plant Sale Program

Herbaceous plants are those non-woody herbs that grow in natural areas—be that prairie, savanna or woodland. Many of these species have been extirpated from local environments by invasive plant species, lack of burning, deer browse, and other causes. Because the seed source is gone, they may not regenerate after the destructive force is eliminated; for example, after buckthorn is removed. This program makes available these plants, along with providing information on which plants belong on individual sites, and how to prepare the site, plant and maintain the plants. This plant sale program could be dovetailed into the existing bare-root tree sale.

5.0 Review of City Plans

In an effort to harmonize Burnsville's plans and ordinances that support natural resources, they have been reviewed and recommendations have been written. Section 5.0 is a review of those plans.

5.1 Burnsville Comprehensive Plan (2000)

A local comprehensive plan is a public document that describes how a community agrees to develop over a specified time period. A Comprehensive Plan is a policy document that describes the goals, policies, and strategies intended to achieve the community's goals. Burnsville last updated its Comprehensive Plan in 2000 (adopted in December 1998) and is now in the process of the latest plan update with a targeted adoption date of September 2008.

When the 2000 Comprehensive Plan was prepared, the Metropolitan Council considered the Burnsville to be part of the "Urban Area" with the ability to serve all of Burnsville with links to the metropolitan utility, parks and transportation systems. The 2000 plan projected a desire to maintain a balance of land uses, ensure a strong tax base and provide a diverse housing stock. The Plan recognized that the city was fully developed and that redevelopment, contaminated sites clean up, reuse and renovation of existing structures and infill development would be the main development activities into the future. Since the adoption of the 2000 Comprehensive Plan, conceptual plans have been developed for Kraemer Quarry, the McGowan Property (amphitheater site), Minnesota River Quadrant, and Heart of the City that added park lands and natural resource holdings to the city.

The 2000 Comprehensive Plan is organized in a goals and policy framework. Goals are a general statement of community aspirations and desired objectives that project the broad social, economic, or physical state towards which Burnsville officially agrees to move. The Environment goals are the plan goals most closely targeted to the natural resources of Burnsville. Environment Goal #1 states that the city will "Promote the protection, conservation, and enhancement of natural resources within Burnsville for the community's long-term use, benefit, and passive enjoyment."

The 2000 Comprehensive Plan presents a number of polices for each of the plan goals; policies are an adopted course or method of action intended to be followed in order to accomplish the stated goals. A number of the Environment Policies (numbered below as per the 2000 Plan) are directly related to natural resource protection and management. The pertinent environmental policies state that the city shall:

#1. Continue to develop, redevelop, and maintain an organized system of open space, greenways, corridors, and active and passive parks to improve community character and protect natural resources.

#3. Manage the community's wildlife resources to protect and preserve native habitat and wildlife, and to protect human safety.

#6. Implement and maintain the Natural Resources Master Plan, and maximize opportunities to preserve such resources by partnering with County, State, Regional, Federal and private programs.

#7. Identify, preserve and maintain natural, recreational, and cultural landmarks that are unique and essential to Burnsville's identity.

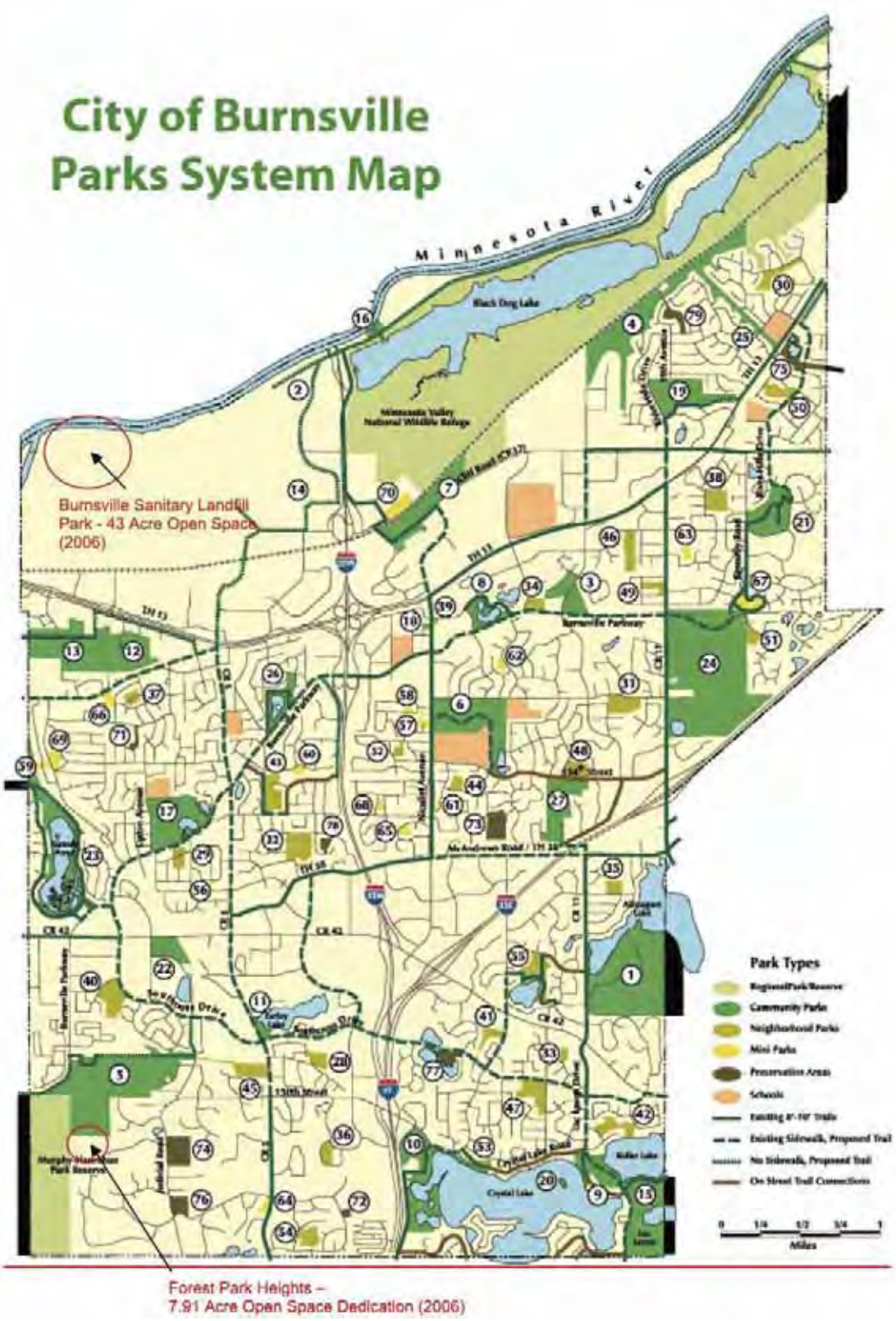
#9. Continue to monitor and preserve open space in Southwest Burnsville, respecting its natural character.

#22. Protect native vegetation, such as trees, understory growth, prairies, and other wildlife habitat; develop and implement an Urban Forest Management Plan designed to preserve and protect the trees within Burnsville; and require reforestation of areas cleared by development.

Since the 2000 Comprehensive Plan was adopted in 1998 two new parks have been planned for development in the Minnesota River Quadrant: a large park along the Minnesota River and a smaller park to be located on shore of the Kraemer quarry lake. The Minnesota River park will include land from the Burnsville Sanitary Landfill development which has already been determined and land from the McGowan landfill site. This land / trail access is anticipated to be obtained prior to or at the same time as the final platting and redevelopment of the Kraemer quarry. An additional area of park land will be added in the Southwest RMU adjacent to Cam Ram Park on the northwest corner of the Forest Park Heights development.

The locations of these new park parcels are shown on the map on the following page.

This 2007 Natural Resources Master Plan is considered to be part of the 2008 Comprehensive Plan. It is an implementation plan that follows the policies set forth in the 2000 Comprehensive Plan. This is accomplished by adding an urban forest component to this plan and by addressing the numbered points listed above.


City of Burnsville
Parks System Map
Minnesota River
Black Dog Lake
Minnesota Valley National Wildlife Refuge
Burnsville Sanitary Landfill Park - 43 Acre Open Space (2006)
Burnsville Parkway
Park Types
Regional Park/Reserve
Community Parks
Neighborhood Parks
Mini Parks
Preservation Areas
Schools
Existing 8'-10' Trails
Existing Sidewalk, Proposed Trail
No Sidewalk, Proposed Trail
On Street Trail Connections
Miles
Forest Park Heights – 7.91 Acre Open Space Dedication (2006)

5.2 Water Resources Management Plan

The City of Burnsville Water Resources Management Plan was issued in October 2002. It is a comprehensive review of the management issues affecting the City's lakes, ponds, wetlands and other water resources, with recommendations for management strategies to address those issues. The Water Resources Management Plan outlines twelve goals for water resources planning and management functions. These goals tie into the 1997 End Statement on Environment and satisfy the requirements of MN Statutes 103B.201 and 103B.251 for water resources planning.

The plan reviews Burnsville water resources, including an overview of existing stormwater management, including proposed improvements and a review of alternatives for financing them. The plan summarizes a 1997 wetland and pond inventory and classification system, and provides detailed information on the City's Vermillion, Black Dog and Lower MN River watersheds and subwatersheds. For each subwatershed, the plan provides goals, identified problems and proposed solutions.

The plan advocates a "comprehensive approach to storm water management (which) requires management of water resources, drainage systems and land use in a unique combination of balance and prioritization." In taking this approach, the plan considers the entire hydrologic cycle, including the influence of varying land uses and cover types in the water cycle. In fact, Goal 12 of the overall plan is to "recognize the relationship between land use cover and water resources management."

This is the point where the Water Resources Management Plan is most closely coordinated with the 2007 Natural Resources Master Plan. Much of the water resources plan deals with treatment strategies and stormwater management designed to improve water quality in the lakes and wetlands. These management strategies for water quality solutions should be coordinated with the appropriate proposed NRMP management strategies. For example, the 2007 NRMP includes suggestions for promoting and expanding rain gardens, reducing areas of impervious surfaces and planting more trees for shade. These are all examples of recognizing the relationship between land use and water resources management (Goal 12).

It is recommended that the October 2002 Water Resources Management Plan remain in place for the management of the City's water resources, with incorporation of appropriate land management recommendations in the 2007 NRMP into the subwatershed action plans.

5.3 Minnesota Valley National Wildlife Refuge and Wetland Management District Comprehensive Conservation Plan

The Comprehensive Conservation Plan (CCP) was approved in 2004, and provides a comprehensive overview of the natural resources of the Minnesota Valley National Wildlife Refuge (MVWNR). The 1400-acre Black Dog Unit of the MVWNR stretches along the northern border of Burnsville east of I-35W, and is contiguous with Cliff Fen, Black Dog, Tennisioux and Cedarbridge Parks. The CCP is an important tool for maintaining the ecological integrity of the refuge in the face of development pressures. Many of the management goals and strategies that the CCP details for the refuge can be extended into the contiguous Burnsville parks.

The CCP describes the natural communities and habitats of the refuge, as well as its land use history, geography, hydrology, climate, cultural and socioeconomic contexts. It details past, ongoing and planned activities for habitat management, fish and wildlife monitoring, public environmental education outreach and mitigation projects. Broad biological goals are set for six biological criteria:

- Floodplain Forests
- Wetlands
- Upland Forests
- Grasslands and Oak Savannas
- Land Protection
- Public Use

Within each goal, objectives are set for meeting the goal. In turn, specific management strategies are laid out to meet each objective.

The City of Burnsville should continue to coordinate management efforts in its contiguous parks with the applicable objectives and management strategies found in the CCP. Specifically, management of upland forest and transitions into wetlands and floodplain forest at Black Dog and Tennisioux Parks should follow or complement the management strategies found in the CCP for those resources. Partnership brings a unified effort to buckthorn removal and deer population control. Moreover, the implementation discussion in the CCP (Chapter 5) articulates the need and the benefit of working with local governments to "seek creative partnership opportunities to achieve (the CCP) vision for the future." This NRMP and continuing work with the MVWNR staff accomplishes the goal of cooperating with the CCP.

5.4 Trail Master Plan (2000)

The Trail Master Plan analyzed the status of the trail system in 2000 and made recommendations for its improvement. The new trails shown in the Plan do not impact public natural areas, therefore routing of new trails does not further dissect these habitats. When constructing new trails or repairing existing trails improvements to the surrounding environment would bolster the quality of Burnsville's natural resources. These improvements include:

- Plant trees to shade trail. This makes the trails more comfortable while extending the life of pavement and contributing to reducing stormwater runoff volumes.
- Plant deep- rooted native grasses and wildflowers along trails rather than turf grasses in order to reduce mowing, increase atmospheric carbon sequestration, increase stormwater infiltration and contribute to bird and butterfly habitat.
- When disturbing soil around trails, decompact the soils by deep tilling and adding organic matter. This allows for healthier vegetative growth along side trails, better stormwater infiltration and water storage in the soil for plant uptake, and greater carbon sequestration.

5.5 City of Burnsville Parks Master Plan

The September 2000 Parks Master Plan recognizes that parks are an integral component of Burnsville's civic infrastructure. Since the park system was essentially complete at the time of the plan's preparation, the plan focuses on the quality of the parks over the quantity of parks. The plan analyzes existing conditions in the park system, including the types and distribution of parks, demographic trends affecting the parks and public perception of the system. The goals of the Parks Master Plan are organized into a series of maps, policies and recommendations called the Parks Framework Plan, which is divided into eight topics:

- Parks System Organization
- Natural Resources and Management Priorities in the Parks
- Park-Trail Connections
- Park Management Policies
- Gemstones in the Park System: A Framework for Park Enhancements
- Site-Specific Park Improvements
- Future Parks: A Conceptual Framework
- Potential New Facilities

In terms of using undeveloped portions of parks, portions of the Parks Framework Plan would clearly be superseded by the 2007 Natural Resources Master Plan. Specifically, the Park Framework Plan sections on Natural Resources and Management Priorities in the Parks, Park Management Policies and Site-Specific Park Improvements should be reviewed to identify policy and recommendations that will be updated by the 2007 NRMP, including the management strategy maps contained in the 2007 NRMP.

Other portions of the Parks Master Plan should remain as the primary guidance for managing Burnsville parks. These include the sections of the Parks Master Plan on trails, maintenance of basic park elements and renovation and replacement of facilities. The cost estimate for parks maintenance, provided in the plan's implantation section, should be updated where applicable.

5.6 Terrace Oaks Park Master Plan (1996)

This plan created an ecological vision for the park and set goals for its use and management. The plan identifies invasive species as a concern for the quality of the park and states that an invasive species removal plan will be created.

This plan includes a strategy for managing invasive species in the park (see Figure 16). The 1996 plan also identifies that large populations of deer are a problem in the park. This plan recommends that the city re-evaluate it's policy and deer removal to increase the number removed and therefore reduce the stress on the few native plants growing in the park.

Tree diseases, especially oak wilt are identified in the plan. Current, good efforts to control tree diseases in the park should continue.

Native prairie exists on the west end of the park north of the parking lot. The master plan recommends a selective burning regime be implemented along with reintroduction of native prairie species. A fire regime has been established in the park along with some buckthorn removal in the area of the prairie remnant. These efforts should be stepped up and this unique habitat area expanded.

With the implementation of this Natural Resources Master Plan, the natural resources management component has been removed from the Terrace Oaks Park Management Plan (TOPMP) and placed in this NRMP. Park use plans remain in the TOPMP.

5.7 Prairie and Savanna Management Plans (2005 with a 2006 update)

The City of Burnsville has developed "Prairie and Savanna Areas Management Plans" that are updated annually. These plans focus on six main areas of prairie and/or savanna within the City, establishing goals and management strategies for each. The plans also provide management histories for each area and maintain current lists of plant and animal species observed within each area. The six areas of focus are:

- Alimagnet Park restored prairie;
- Cam Ram Park remnant oak savanna;
- Rudy Kraemer Nature Preserve restored and remnant prairie;
- Day Park;
- Sunset pond restored prairie;
- Terrace Oaks West Park restored prairie and remnant oak savanna.

The existing plan acknowledges that other prairie and savanna areas exist within the parks and other public lands. These include Wolk, Judicial, Loop and Cliff Fen Parks. Restoration plantings have also been installed in several other parks. In addition, the Minnesota Valley National Wildlife Refuge has within it an outstanding, diverse remnant prairie.

Management of the six focus areas began as early as 1987 for Alimagnet to 2002 for Day Park. Typical management activities have included mowing, spot-spraying and broadcast spraying. In some areas weeds have been pulled manually. Seed mixes that have been used have been typical to Minnesota prairies, and have been adjusted to the soil moisture regime.

It is recommended that the city continue to use the existing plan for guidance in managing the focus prairie areas. Restoration and management of additional prairie or savanna areas within the city should continue as time and staff area available. Additional suggestions for management of the focus prairie areas include incorporating fire management into selected areas, and restoration of additional prairie remnants in North River Hills and Chateaulin Parks.

Fire management (burning) is included as a management tool in the existing plan. Burning mimics the natural conditions under which prairie species evolved, and is the most effective means of controlling woody plant intrusion and eliminating non-natives. Public education and coordination with neighborhood groups can effectively overcome public resistance to fire management. These plant communities greatly benefit from fire. Burn management should continue in each park on a planned, but irregular schedule.

A recommended area for additional prairie restoration is in North River Hills and Chateaulin Parks. Areas currently in old field, non-native herbs and grasses should be prepared and seeded with prairie seed mixes similar to those used at Alimagnet. The specific sites within North River Hills Park are east of the ballfields and on either side of the path leading in from the southern entrance to the park. See the Management Plan Map for this park.

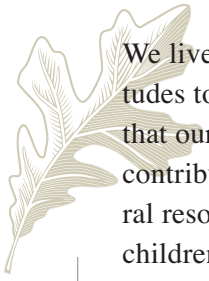
5.8 2001 Deer Management Program and the 2005 Update Report

An in depth study was undertaken in 2001 to determine the impact of Burnsville's deer population on natural resources and to suggest strategies to reduce deer impact. Several strategies were suggested and adapted at that time including an education program, adoption of an ordinance banning deer feeding, and a harvesting program. Good progress has been made to reduce the impact of deer on Burnsville's native plant communities.

The field survey conducted for this plan found extensive browse damage to native woody vegetation in Burnsville's natural areas. Native trees are having a difficult time reproducing both because of deer browse and suppression by buckthorn. As buckthorn invasion expands to encompass large natural areas, deer concentrate feeding on preferred browse—native vegetation. Remaining populations of native plants are being severely impacted by deer browse.

The 2001 Deer Management Program refers to recommendations which have set desired deer populations for other communities as low as five per square mile. The report suggested fifteen deer per square mile would be adequate for Burnsville, and that has been the target goal since 2001. At this rate the woodlands are being stressed by deer browse. These woodlands require a five year respite from browse in order to recover. For this, the deer count in Burnsville would need to drop to five deer per square mile (John Moriarity, Ramsey County Wildlife Biologist personal communication). Due to the plant community stress observed in Burnsville's woodlands, staff should be authorized to manage deer to a 5-deer-per-square-mile density in areas being restored.

6.0 Conclusion



We live in a time of environmental change. It is important that our attitudes toward the environment change as well. We can no longer assume that our natural resources will continue to serve our needs without us contributing to their sustainability. We have to take care of our natural resources in order to reap the benefits and to preserve them for our children.

The City of Burnsville has made good efforts to address natural resource issues. For example, great strides have been taken to preserve and improve the city's water resources. But degrading forces are mounting, and require the attention of the citizens of Burnsville.

Negative influences on our natural resources are increasing. Climate change is affecting—and will continue to affect—Burnsville's natural resources. Urban heat-island effect will continue to drive up building cooling costs. Invasive plant species have already established in our natural areas, and will continue to prevent native species from reproducing unless we step in. Wildlife populations are off balance. Stormwater is being sent downstream rather than being held on the land where it is needed. Soils are compacted and preventing healthy plant growth and stormwater infiltration.

6.1 Summary of Recommendations

A number of recommendations are made in this plan. Some are more urgent than others and all take some level of financial commitment. The tables below and on the following page bring these recommendations together in priority ranking.

Summary of Strategies for Implementing Natural Resources Master Plan

Priority One
A. Expand buckthorn and invasive species control program in all RMUs.
B. Create a boulevard tree planting program. (50 trees/year)
C. Create a Buckthorn Brush Pickup Program for private landowners.
D. Conduct a Dutch elm disease program.
E. Expand the built environment tree maintenance program for younger trees.
F. Create a City Center RMU Sustainability Demonstration project.
G. Reduce deer population to 5 deer per square mile in select woodland restoration areas.
H. Provide staff support for implementing strategies. Create education programs on buckthorn, garlic mustard and tree planting. (+1.0 FTE)
I. Consider establishing a parking lot shading ordinance. (Existing staff)
J. Conduct a native herbaceous plant sale in conjunction with the Annual Spring Tree Sale. (Existing staff)
K. Establish and conduct a monitoring program for natural areas and forests.
L. Update Woodland Preservation ordinance & update planting related ordinances. (Existing staff)

Summary of Strategies (continued)

Priority Two
A. Expand existing prairie management program.
B. Expand built environment tree pruning and removal budget for storm damaged and mature trees.
C. Provide staff support to complete inventory of city park and street trees. (+.35 FTE – Intern)
D. Increase funding of existing oak wilt program.
E. Create a Polka Dot Forest Regeneration Program.
F. Consider establishing a Soil Protection ordinance. (Existing staff)

Teach by Example

A potential project to show Burnsville's citizens how to initiate change in their landscape could be to retrofit the City Center complex (RMU) to reduce lawn and impervious surface, where practical, and replace them with deep-rooted plants that function to sequester carbon, and do not require the burning of fossil fuel for maintenance. This can be done in an attractive manner that inspires residents to do the same.

The demonstration gardens at the Hennepin County recycling center educate and inspire the public.

Funding Plan

The strategies recommended in this plan are new or expanded programs that will supplement the programs identified in the 1999 Natural Resources Master Plan. Increased funding above and beyond what is currently allocated will be needed to address the issues identified, and to continue the city's work towards achieving the environmental end identified for our community. Operating budget funding to implement the strategies is proposed to be phased in over a four-year period. The phasing will require an increase of approximately .35 FTE (full time equivalent) per year, totaling 1.35 FTEs and an estimated $163,000 at the end of year four. Additional capital funding of approximately $60,000 would be necessary as well. The strategies will be implemented according to the two priorities identified in the strategy summary table.

6.2 Moving Forward

What can be done to protect Burnsville's natural resources in this period of environmental change? Many things, but first and foremost, it is essential that adequate budget and staff time be made available to meet the recommendations made in this plan.

Burnsville citizens can do many things to steward natural resources to a sustainable landscape in an effort to preserve native plant communities, to sequester carbon, reduce fuel consumption and dependence on foreign oil, to reduce energy needs and associated costs, and to create a beautiful, comfortable environment in which to live. Everyone must participate for successful change to happen. All of us can think of more ways to lighten our impact on the environment—and take action.

Of note in the strategy is the need to devote more resources to the built environment forest. Many of Burnsville's trees are maturing, and many dying. To retain the canopy, regular pruning must occur, and to expand the canopy to 40%, additional trees must be planted.

The table below (and on the following page) summarizes potential solutions for the primary natural resources issues Burnsville (and the region) is facing.

Solutions for Change

Impacts to Burnsville's Natural Resources	Solutions to Reduce Impacts
Development • Destroys habitat • Compacts soil • Increases stormwater runoff	• Conservation housing development design to preserve open space • Soil protection (not disturbing or compacting soil) and remediation by decompacting • Alternative storm water management such as implementing rainwater gardens and green roofs
Urban heat island effect • Increases energy costs • Elevates overnight low temps, year round • Impacts human health	• Reduce the amount of paved surfaces which absorb heat and prevent rain water infiltration. • Plant trees to shade streets, parking lots and buildings and reduce cooling costs.
Invasive plant species • Eliminates natural diversity and plant community resiliency • Causes soil erosion and water pollution	• Monitor their encroachment. • Control where ever possible. • Plant native plants where invasives have been eradicated.
Climate change • Extreme fluctuations in temperature • More days over ninety degrees • Increased intensity of humid and dry days • Increased rainfall intensity with decreased frequency • Decreased snow cover & increased average winter temperatures • Increased wind • Increased competition from warmer-zone non-native species • Increased over wintering of insect pests • Increased stress on heat-intolerant species	• Solutions for fighting climate change include everything found in this column of this table. • It is important to reduce lawn and plant deep rooted plants. Plants sequester carbon through photosynthesis and store it in the soil. In order to have healthy, deep rooted plants, loose, fertile soils are necessary. Loose soils allow roots to penetrate deep, and reach water in times of drought. Loose soils also allow for water to easily soak into the ground rather than running of the surface, where plants can use access it when it's needed. • Plant trees which pull carbon out of the atmosphere and store it in their wood. When planted in the correct spot, they reduce energy use in buildings.
Soil compaction • Decreases storm water infiltration and soil water storage capacity • Decreases aquifer recharge • Supports fewer plants • Decreased carbon sequestration • Decreased plant growth; Trees do not mature • Favors many weed species	• Prevent compaction by keeping vehicles off natural areas and lawns. • Preserve natural areas. • Ameliorate compaction through aeration, deep tilling with the incorporation of organic matter, and by the introduction of soil microbs through compost tea. • Mulch or plant open soil. Never allow soils to be exposed.

continued on next page

Solutions for Change (continued)

Impacts to Burnsville's Natural Resources	Solutions to Reduce Impacts
Exporting stormwater (via pipes) • Treats this precious resource as a waste product • Deprives plantings of water • Increases downstream flooding • Is expensive • Reduced groundwater recharge • Reduced stream, lake and wetland base flow	• Capture stormwater in rainwater gardens, cisterns, green roofs, or a variety of other methods to hold stormwater on-site and soak it into the ground. This provides water to plants and recharges groundwater. • Plant trees to capture stormwater.
Wildlife populations off balance • Spreads disease • Reduces wildlife diversity • Degrades native plant communities through over browsing • Destroys home landscapes • Road kill/property damage • Decreases water quality	• Reduce the deer populations to the carrying capacity of natural areas dominated by buckthorn. • Continue goose control program
Unmanaged open space/forests • Loss of biodiversity and plant community resiliency • Lost habitat • Soil erosion • Open space fragmentation	• Control invasive plants • Plant native trees • Consolidate and expand existing open space through land purchase.

Appendix A—Terrace Oaks Management

Terrace Oaks Park is one of the largest parks in the city's park system and represents a portion of what was once Oak Barrens or savanna. We know this from the Minnesota Department of Natural Resources study of original survey notes that date back to the 1800's. Though some of the veteran oaks still stand in the park, the savanna is now overgrown by invasive species such as buckthorn and native species no longer suppressed by fire (i.e., black cherry, elms, etc.).

In order to better understand the present condition of this park and provide a benchmark from which to assess restoration and maintenance programs, ten plots within the park were selected for sampling. Each plot was 1/10th acre in size. The location of each plot was randomly selected. All trees and saplings within each plot were identified and tallied. The shrub layer and tree seedlings, if present, were noted. The location of each plot center was recorded using GPS then marked by embedding in the soil a one-foot long section of rebar. The quality at each of the ten sites surveyed was either medium (six sites) or low (four sites). This means that the natural process of regeneration of native trees is significantly impacted and in many areas of the park non-existent. Most of this impact is from non-native invasive small tree species, European buckthorn (*Rhamnus cathartica*), common in this forest understory. At one plot, no tree seedlings or shrubs were found other than buckthorn. Tartarian honeysuckle, another invasive species, was found in three of the plots while buckthorn was found in all ten sites and throughout the park.

Other than buckthorn, black cherry was the most common seedling found with some green ash, American elm and hackberry. Dutch elm disease was also noted at the site with elm seedlings. Red oak seedlings

Tree Species Inventory in Terrace Oaks Park

Species	Percent	Species	Percent
Elm, American	25.4	Hackberry	3.0
Cherry, black	20.3	Ash, green	1.5
Boxelder	14.9	Oak, white	1.5
Oak, red	14.0	Basswood	0.6
Aspen	11.9	Apple	0.3
Oak, bur	6.3	Elm, red	0.3

were found at only one site and no bur oak seedlings were found. Wild raspberry was the most common shrub but prickly ash, sumac and nannyberry also grows here when not out-competed by buckthorn.

Three hundred thirty-five trees were recorded within the ten plots. The largest was a 31” diameter red oak. Fifteen of the eighteen trees that are 15” or greater in diameter are oaks. At the other end of the spectrum, only six of the 44 trees that are 2.0” in diameter or less are oaks.

The overall quality of the wooded portion of this park is low and will continue to degrade, if actions are not taken to alter this trend. The lack of fire has led to the conversion of an oak savanna to overgrown woodland. Restoration here will be necessary if the legacy of oak savannas is to be part of Burnsville’s urban forest diversity in the future. See Figure 16 for a management strategy map of Terrace Oaks Park.

Appendix B—Tree Selection Recommendations

Recommended Trees

Evergreen

Common Name	Scientific Name	Notes
Balsam fir	*Abies balsemea*	Can withstand shade; not too large
White spruce	*Picea alba*	Good substitute for blue spruce; some good varieties such as Black Hills spruce
Jack pine	*Pinus bank siana*	Good for dry, sunny sites
Red pine	*Pinus resinosa*	Minnesota state tree
White pine	*Pinus strobus*	Soft-textured pine once much more common in Minnesota, can withstand some shade
White cedar	*Thuja occidentalis*	Commonly used as hedge but can grow to over 20 ft

Deciduous

Sugar maple	*Acer saccharum*	Good for shady areas, once common in the Big Woods area of southern Minnesota
Ohio buckeye	*Aesculus glabra*	Medium sized tree good for shady lawns
Downy serviceberry	*Amelanchier arborea*	Small flowering tree with good fall color
River birch	*Betula nigra*	Good substitute for paper birch or weeping willow, can grow in wet areas
Paper birch	*Betula papyrifera*	Underplanted in the Twin Cities area, likes roots shaded
American hornbeam	Carpinus caroliniana	Small tree with good fall color
Bitternut hickory	*Carya cordiformis*	Native to the forests of southern MN; under-planted
Hawthorn	*Crataegus spp.*	Can be substituted for crabapple
Hackberry	*Celtis occidentalis*	Hardy tree becoming more popular; requires more pruning than many trees
Honeylocust	*Gleditsia triacanthos*	Look for thornless varieties, light shade good for lawns
Black walnut	*Juglans nigra*	Can be detrimental for lawns, but good for areas occassionaly wet
Tamarack	*Larix laricina*	Deciduous conifer found in wetlands but can grow in sunny lawns
Ironwood	*Ostrya virginiana*	Common understory tree; can withstand some shade
White oak	*Quercus alba*	Large tree good for mesic sites
Bur oak	*Quercus macrocarpa*	Large tree good for wet or dry sites
Red oak	*Quercus rubra*	Large tree good for mesic sites
American mountain ash	*Sorbus americana*	Good small tree that can grow in light shade
Showy mountain ash	*Sorbus decora*	Good small tree that can grow in light shade
Japanese tree lilac	*Syringa reticulata*	small, showy tree overused in some cities, but not common in Burnsville
Elm, disease resistant	*Ulmus spp.*	the U of M has a list of disease resistant elms worth considering

Trees Not Recommended

Evergreen

Common Name	Scientific Name	Notes
Colorado Blue Spruce	*Picea pungens*	Overplanted, susceptible to diseases; white spruce a better choice
Austrian pine	*Pinus nigra*	Susceptible to tip blight disease, red pine a good substitute
Scotch pine	*Pinus sylvestris*	Poor form

Deciduous

Amur maple	*Acer ginnala*	Overplanted and invasive non-native tree
Norway maple	*Acer platanoides*	Prone to canker disease and often with poor form
Silver maple	*Acer saccharinum*	Brittle wood, tree requires a lot of pruning
European white birch	*Betula pendula*	More prone to borers than native paper birch
Northern catalpa	*Catalpa speciosa*	Short-lived tree
Russian olive	*Eleagnus angustifolia*	Prone to diseases
Ash (all)	*Fraxinus spp.*	Green ash already overplanted, all ash species threatened by emerald ash borer
Butternut	*Juglans cinerea*	Prone to butternut canker that shortens lifespan
Mulberry	*Morus spp.*	Short-lived tree usually with poor form, can be invasive
Lombary poplar	*Populus spp.*	Short-lived tree

Appendix C—Burnsville's Rare Species

Figure 5 shows the distribution of DNR records of rare plant and animal species and unusual plant communities in Burnsville. Some of these are records of plants and animals observed in Burnsville as long ago as 1913. However, most of the observations were recorded within the last 25 years.

Most of the DNR records are concentrated along the river, within the Minnesota Valley National Wildlife Refuge. Another grouping of rare species records is in the southwest corner of the city, near Murphy-Hanrahan Regional Park and Cam Ram Park. In all, there are records of eleven rare plant species and ten rare animal species in Burnsville. There are also examples of remnant prairie and savanna, oak woodlands, calcareous fens, wet prairies and ash swamps within the city limits.

Debris can be stacked and burned, chipped and hauled away, or chipped and spread on the forest floor.

Invasive species control requires many approaches to control. Judicial application of herbicide is very effective.

Fire is an important management tool for retaining or restoring biodiversity in prairies, savannas, and oak woodlands.

Appendix D—Buckthorn Removal Techniques

Buckthorn Removal—First Removal Techniques

These techniques are used as appropriate for site conditions.

Cut-Slash: This technique involves cutting buckthorn, laying the tree on the ground and cutting the branches into pieces that will slowly decompose. The stumps are coated with an herbicide to prevent resprouting. This process saves the expense of hauling the buckthorn off site.

Cut-Chip-Spread: This technique involves cutting buckthorn, applying herbicide to the stumps, dragging the buckthorn to a chipper, and then spreading the chips on the forest floor. This technique saves the expense of hauling the wood chips off site, but can only be used when infestations are low. Too many wood chips on the forest floor prevents native plant regeneration

Cut-Chip-Haul: This process is the same as the previous except that the wood chips are hauled off site. Removal is necessary in heavy infestations where large amounts of chips would smother emerging vegetation of the forest floor.

Cut-Pile-Burn: This process includes cutting buckthorn, applying herbicide to the stumps, dragging the buckthorn into a pile in a safe place to be burned. This technique saves the expense of chipping and hauling. Burning should be conducted in a safe place where forest soils will not be sterilized.

Buckthorn Control—Management for Years 2 through 5:

Three different management tools are available for years two through five, including:

Burning: Fire is nature's tool for maintaining savannas and open woodlands. It is very effective in killing non-native species not adapted to fire such as buckthorn, invasive honeysuckles and garlic mustard. Timing is critical to set fire to invasive plants when they are most vulnerable and before they produce seed. Fire is the least time intensive, least expensive and possibly the most effective management tool.

Over-spray: A natural bud inhibitor (Krenite) is sprayed on stump resprouts and small seedlings in late fall or early winter to prevent the plants from producing leaves in the spring. Without leaves the plant quickly dies.

Critical Period Cutting: Stump resprouts and seedlings are cut at the end of May or early June just after they have used considerable energy to produce new shoots and leaves. This depletes the plant of energy and makes them especially susceptible to fire or over-spraying.

These techniques are used in years 2-5 as is appropriate for site conditions, extent of buckthorn invasion and budget. A specific plan is created for each site based on these factors.

After the five years of buckthorn removal and control it is important to prevent buckthorn from re-establishing. Seed will continually be distributed in bird droppings, but at a very slow rate. The few seedlings that emerge after the five year program can easily be controlled by volunteers.

Appendix E—Recommended Changes to Existing Tree-Related Ordinances

The following recommendations relate to those ordinances that most directly affect tree preservation and tree planting on public and private property. The recommendations put forth here have not been reviewed by an attorney or any expert in such legal matters.

Title 8. Chapter 3, Section 3. Permits

In order to facilitate planting in road right of ways and on other city-owned property, it is recommended that existing language be changed to exempt the city from the need to issue itself a permit to plant trees on streets or public property.

When issuing permits to applicants, it is recommended that the site be inspected by the City Forester who then provides the applicant with a list of trees acceptable for planting on that particular site prior to issuing a permit. In this way, appropriately trained staff can take into account the site (soil type, sunlight levels, overhead or underground obstructions,) local and citywide tree diversity (trees under or over-planted), and insect and disease threats (EAB, Dutch elm disease, etc.).

A list of recommended trees, such as that found in Appendix B, should be made available to permit applicants. This list should be dynamic; reviewed every year or two then changed when necessary to reflect changes in tree diversity, insect and disease pests or other issues of concern to the city.

The City Forester should reserve the right to be more restrictive, when necessary, than the current recommended tree list. However, the Forester should recommend several substitutes in cases where the applicant might list inappropriate trees on their permit application.

Title 10. Chapter 8, Section 9. Woodland Protection Standards

Change the existing ordinance away from one that focuses on tree values and replacing stems to one focused on preserving tree canopy, rather than number of stems. For example, one mature bur oak may provide as much canopy as half a dozen crabapples. As suggested earlier, a discernment process involving representatives of several interested parties may be effective in coming to terms with what the city wishes to preserve, where that preservation should take place, who is responsible and what goals (such as 50% canopy cover city-wide) should be set forth.

Title 11. Chapter 5, Section 5. Requirements Applicable to Trees in New Subdivisions

Paragraph (D) requires trunk diameter to be measured at four feet above the planting line of the tree while the instruction for filling out the tree evaluation form mandates the standard height of four and one-half feet as the location to take this measurement. For internal consistency in keeping with standard measurement techniques, a height of 4 ½ feet (54”) above ground should be used.

The City Forester should have final approval on the species selected for planting in new subdivisions. To that end, either replace the tree list in paragraph (F) with Appendix B or have the City Forester indicate early in the permit process which trees should not be used on this site. The later approach allows selecting trees that match the site conditions and promote tree diversity within the neighborhood.

Bluff Valley
Quarry Complex
Kraemer
Terrace Oaks
City Center
Sunset
Alimagnet
Southwest
Crystal/Keller

RMU boundary
Burnsville City Limits

Land Cover Classification
- Urban
- Planted or Cultivated Vegetation
- Forest
- Woodland
- Shrubland
- Herbaceous
- Sparse Vegetation
- Water

0 3,000 6,000 Feet

Figure 1
LAND COVER MAP

Burnsville Natural Resources Master Plan

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Bluff Valley

Quarry Complex

Kraemer

Terrace Oaks

City Center

Sunset

Alimagnet

Southwest

Crystal/Keller

RMU boundary

Burnsville City Limits

High

Medium

Low

0 3,000 6,000 Feet

Figure 2
ECOLOGICAL QUALITY RANKING MAP
for Publicly Owned Land

Burnsville Natural Resources
Master Plan

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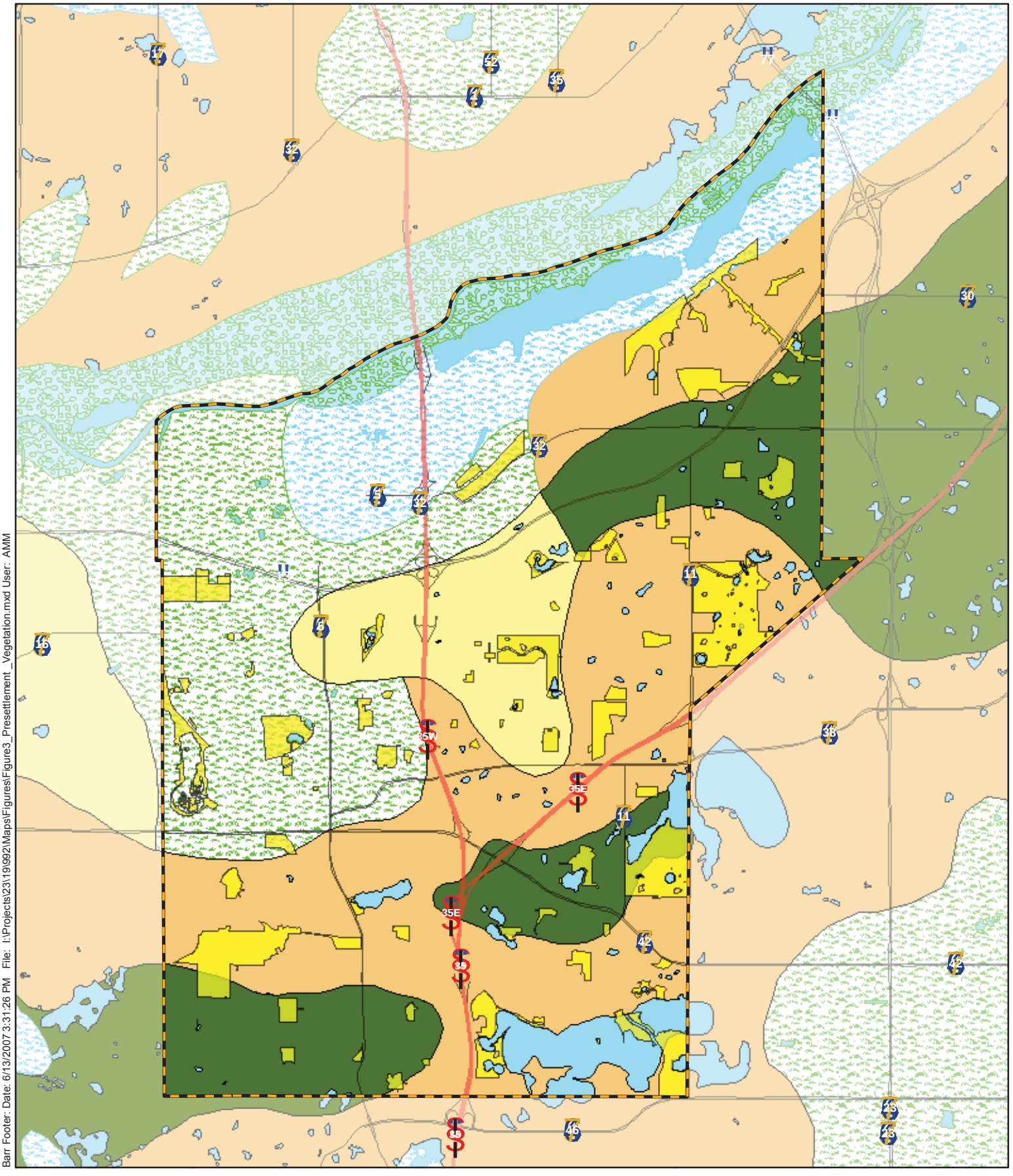

Figure 3
PRE-EUROPEAN SETTLEMENT VEGETATION

Burnsville Natural Resources
Master Plan

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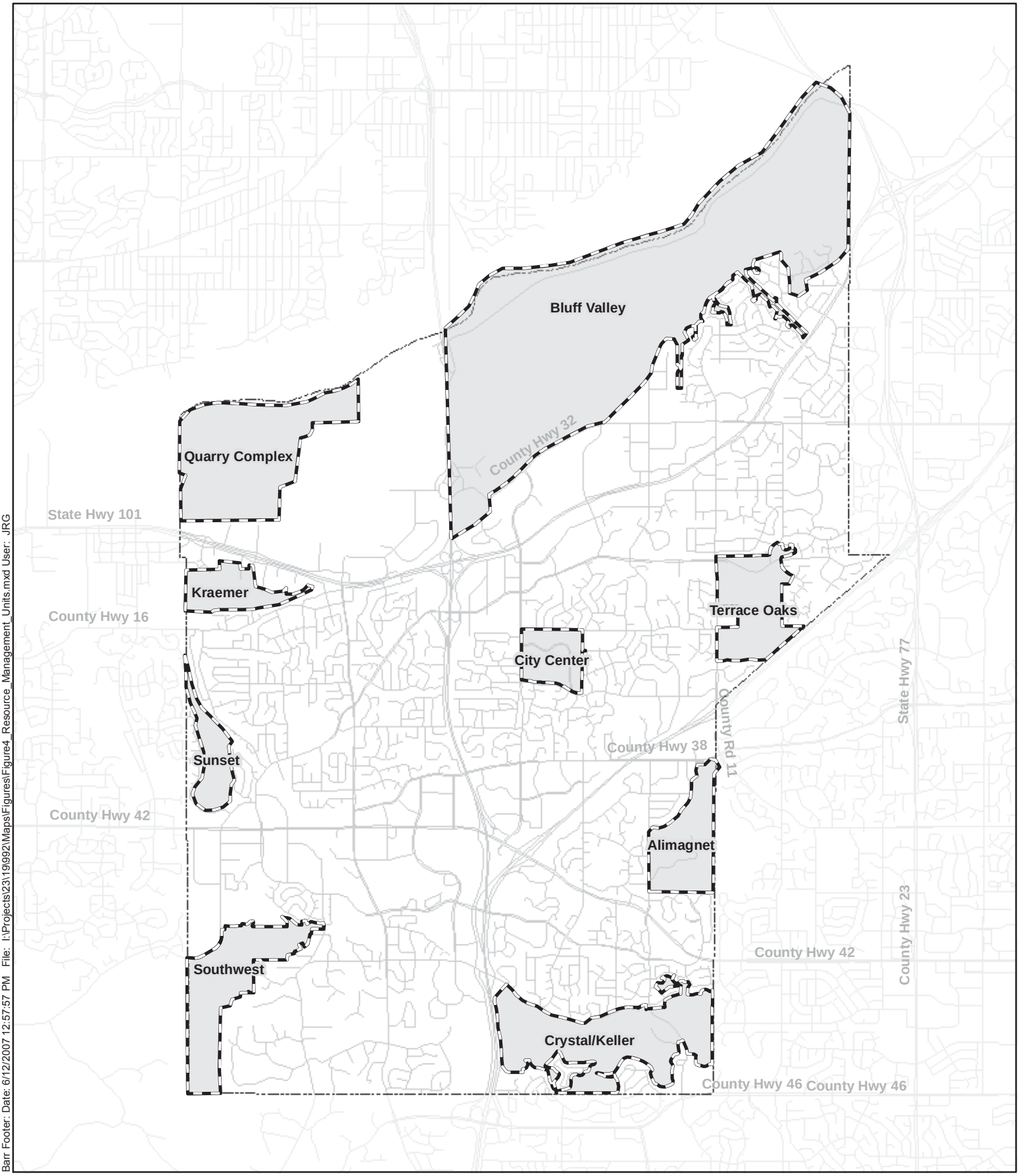

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RMU boundary

Burnsville City Limits

0 2,500 5,000 Feet

Figure 4
RESOURCE MANAGEMENT UNITS (RMU)

Burnsville Natural Resources
Master Plan

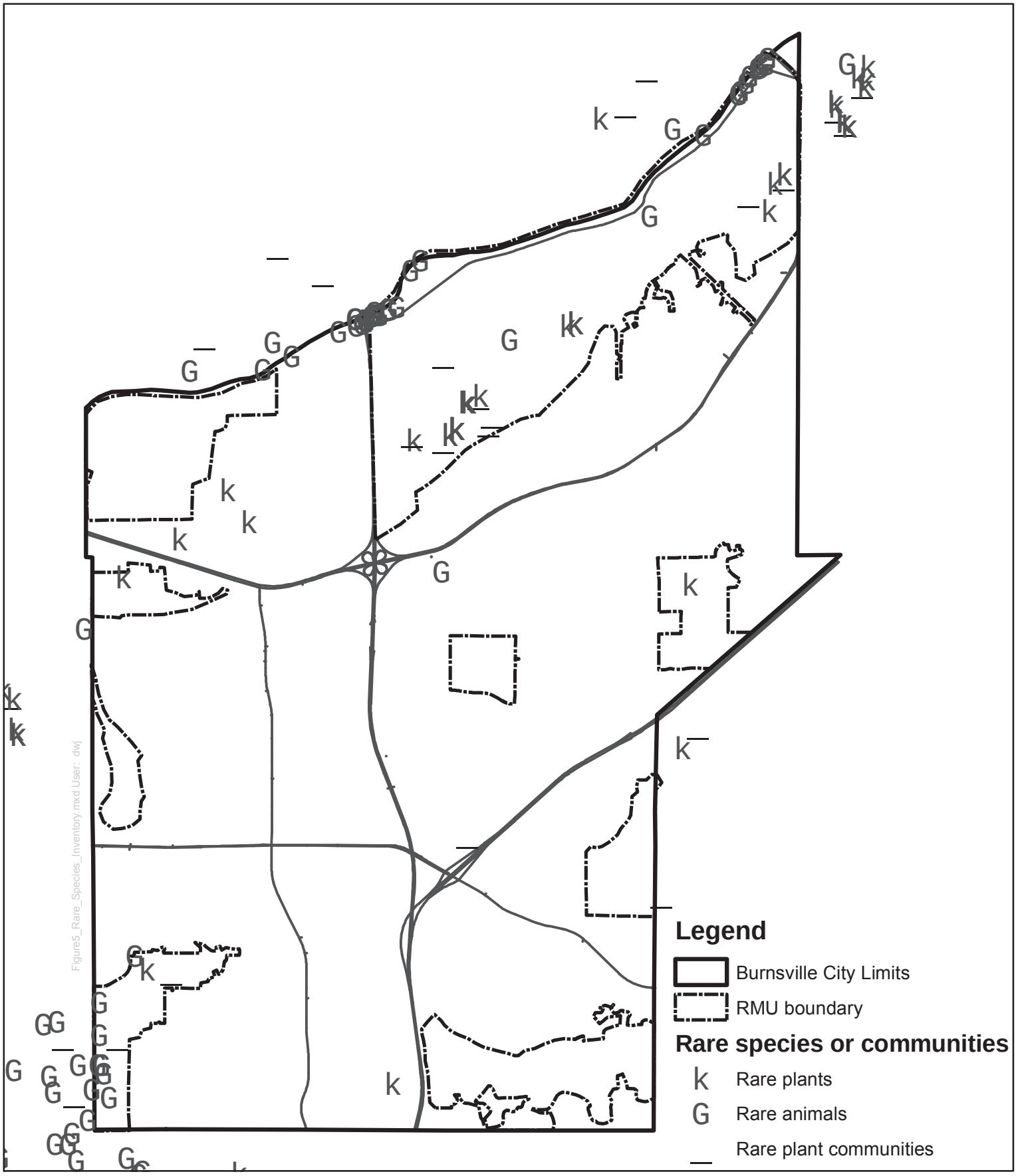

Figure 5
Rare Species Inventory Map

Burnsville Natural Resources
Master Plan

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Figure 6
Alimagnet RMU
Management Plan

Burnsville Natural Resources
Master Plan

RMU boundary
Gravel Trails
Paved Trails
bike trail
First mgmt priorities
Second mgmt priorities
Eventual mgmt areas
Best Quality Vegetation Community Node

Figure 7
Bluff Valley RMU
Management Plan

Burnsville Natural Resources
Master Plan

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RMU boundary
Gravel Trails
Paved Trails
Bike Trails
First mgmt priorities
Second mgmt priorities
Eventual mgmt areas
Best Quality Vegetation Community Node
Garlic Mustard

Figure 8
City Center RMU
Management Plan

Burnsville Natural Resources
Master Plan

Remove Siberian elm and plant oaks.

Garlic Mustard hot spot-treat immediately.

Remove Siberian elm and plant oaks.

Very degraded forest. Create 0.25 acre clearings for oak plantings. Manage competition to help keep oaks thriving.

Very low ecological quality. Plant groves of oaks with deer protection. Mow around them once per year to eliminate competition. Eventually these trees will become a source of seed for reproduction.

Begin buckthorn control in ironwood grove along the lake

Remove Siberian elm and plant oaks.

Nice Oak savanna but full of buckthorn. Great place for a volunteer buckthorn event. Then burn occassionally to keep out buckthorn.

Interlachen Rd
Grand Ave S
Crystal Lake Rd W
Unknown or No Streetname
Eileen Cir
1st Ave S
Stevens Ave
Portland Ave
150th St E
Butternut La
Tylacke Dr
Chestnut Dr
Chestnut Cir
Oakland Ave
151st St E
152nd St E
Park Ave
Chicago Ave
Rushmore Dr
Crystal View Cir
Stevens Ct
Greenhaven Dr
Buck Hill Rd
Crystal Lake Rd E
Swanson Cir
Crystal Lake Ter
153rd St E
McCrystal Dr
E Crystal Dr
Lead St
Crystal Lake Rd
Maple Island Rd
I-35
Maple Island Ct
Oak Shore Dr
Dolphin Ave
Oak Ct
S Oak Shore Dr
Kenyon Ave
Southcross Dr W
Lavon La
Granbury Pl
Rushmore Crst
Southwind Dr
Keller La
Lac Lavon Dr
Keller Lake Rd
County Hwy 42 E
150th St W
Redwood Dr
Sunrise La
Sunrise Ct
Redwood Ct
Whitney Dr
Highview Dr
Crystal Lake Rd
Pershing Cir
Martin Ave
Joseph St
Dally St
10th Ave
157th St W
Bluebill Bay Rd
Inglewood Ct
Isleton Way
160th St W

RMU boundary
Management_Areas
First mgmt priorities
Best Quality Vegetation Community Node
Second mgmt priorities
Eventual mgmt areas
Gravel Trails
Paved Trails
bike trail
Garlic Mustard

Figure 9
Crystal Keller RMU
Management Plan

Burnsville Natural Resources
Master Plan

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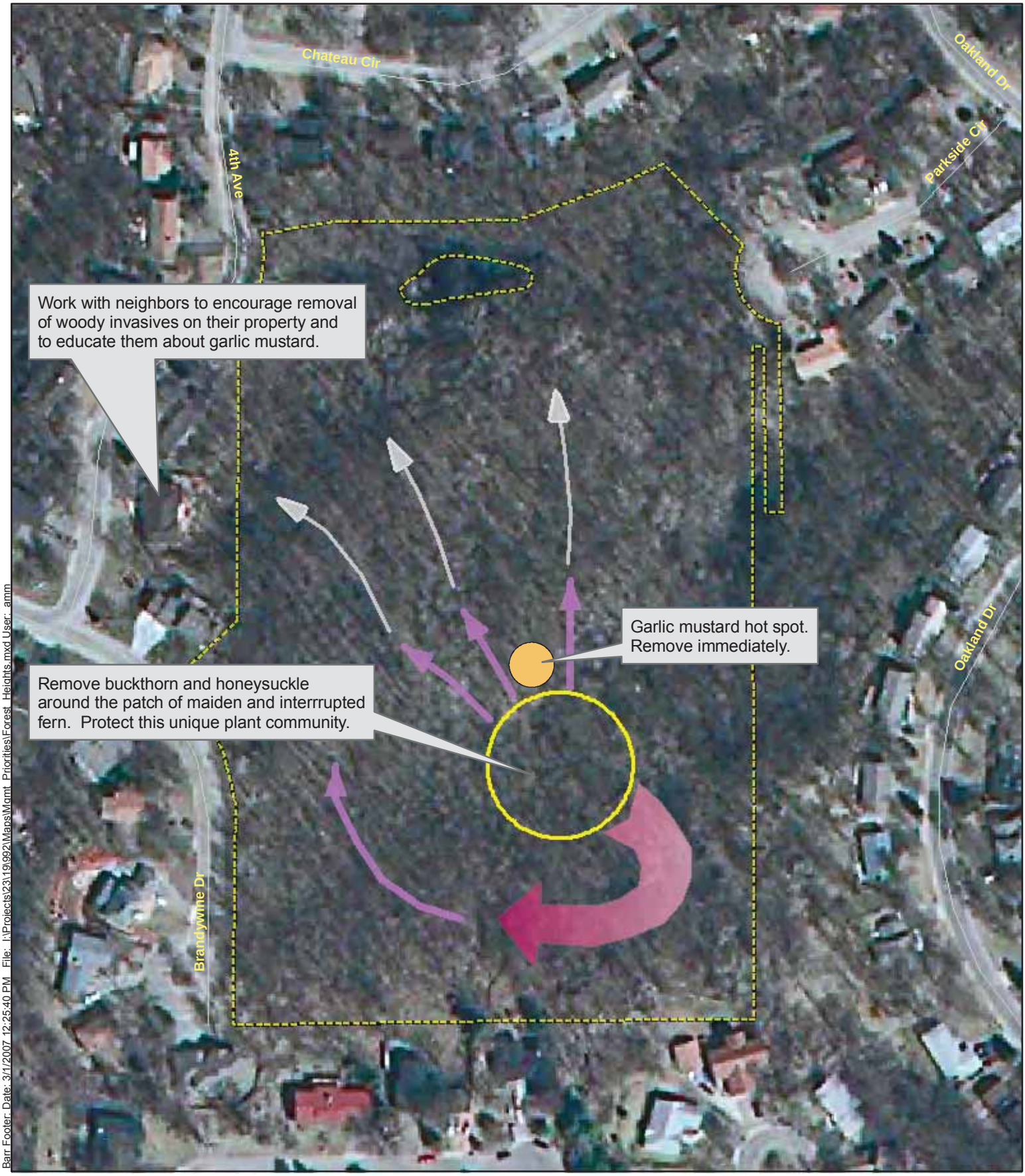

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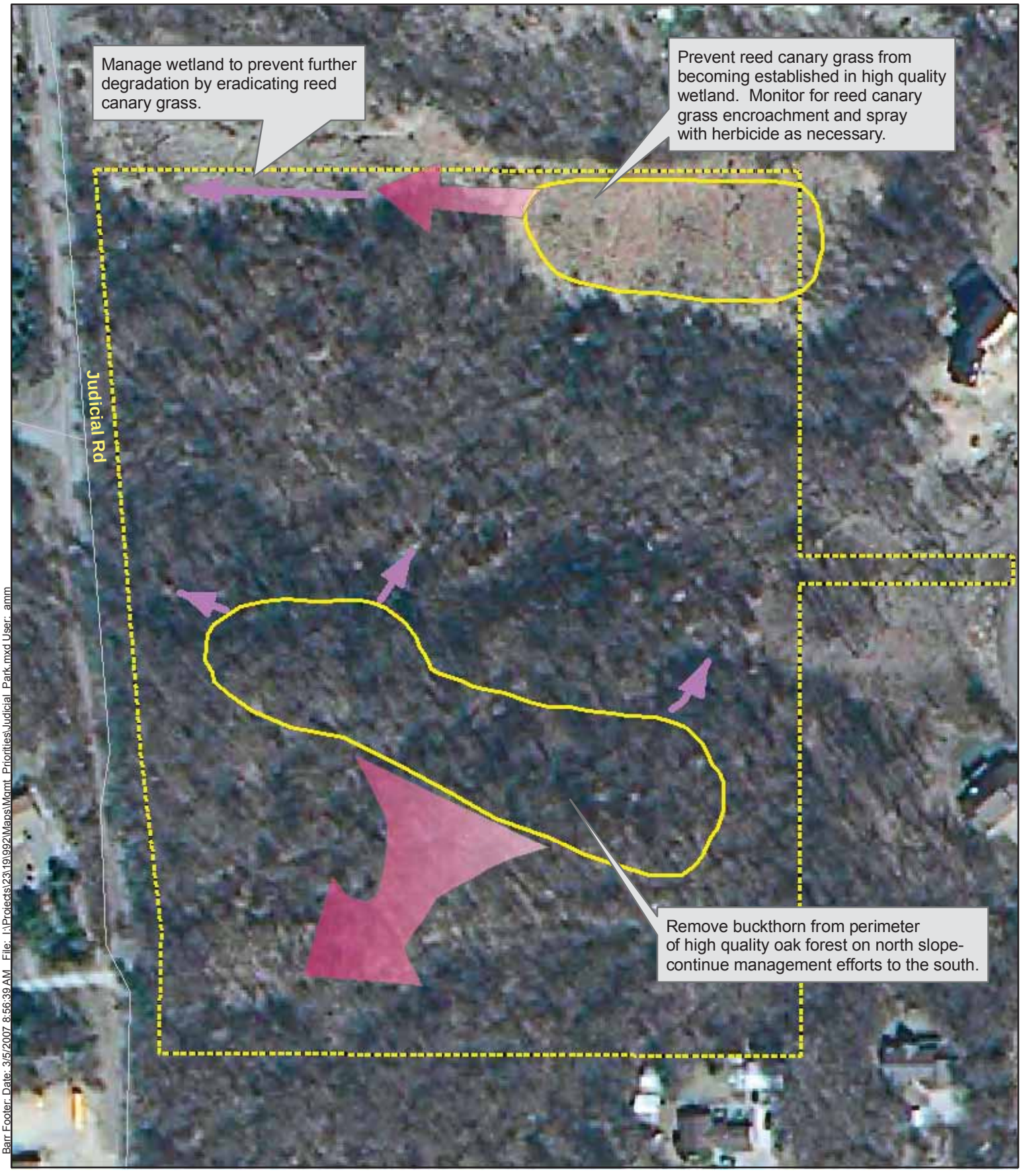
Figure 10
Forest Heights
Management Plan

Burnsville Natural Resources
Master Plan



RMU boundary
City parks
Gravel Trails
Paved Trails
bike trail
First mgmt priorities
Second mgmt priorities
Eventual mgmt areas
Best Quality Vegetation Community Node

Figure 11
Judicial Park
Management Plan

Burnsville Natural Resources
Master Plan

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Figure 12
Kraemer RMU
Management Plan

Burnsville Natural Resources
Master Plan

RMU boundary
City parks
Gravel Trails
Paved Trails
bike trail
First mgmt priorities
Second mgmt priorities
Eventual mgmt areas
Best Quality Veg Community Node

Figure 13
Quarry Complex RMU
Management Plan

Burnsville Natural Resources
Master Plan

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Keep buckthorn cut back along edges of all high quality wetlands.

Continue savanna restoration - remove brush and thin canopy with prescribed burns.

Continue managment in this area. Prescribed burn regime is needed.

Manage buckthorn to protect understory layer. Very little work is needed here.

Remove sumac and buckthorn, thin canopy and conduct prescribed burns.

Work with TRPD to prevent buckthorn invasion of sedge meadows and shrubs swamps.

150th St
Hanrehan Dr
Hanrehan Rd
Hanrehan Lake Blvd
Burnsville Pkwy W
Westcliffe Dr
Crestmount La
Burnell Park Dr
Deerwood Dr
Viewcrest La
Oakwood Dr
Wildwood Rd
Sharon La
150th St W
Estates Tr
Woods Tr S
Woods Tr
Wildwood Ct
Wildwood Tr
Valley View Dr
Judicial Rd
Scenic Hwy

- RMU boundary
- Gravel Trails
- Paved Trails
- bike trail
- First mgmt priorities
- Second mgmt priorities
- Eventual mgmt areas
- Best Quality Vegetation Community Node

Figure 14
Southwest RMU
Management Plan

Burnsville Natural Resources
Master Plan

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RMU boundary
Gravel Trails
Paved Trails
bike trail
First mgmt priorities
Second mgmt priorities
Eventual mgmt areas
Best Quality Vegetation Community Node

Figure 15
Sunset Pond Park
Management Plan

Burnsville Natural Resources
Master Plan

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Prior to European settlement the area of the park was an oak savanna. Sixty years ago it was a pasture with groves of oaks. Remove buckthorn and honeysuckle starting with best quality nodes. Establish a burn regime as resources allow - expand efforts to link nodes.

Goal: To create a restored matrix of habitat types, linking high quality wetlands with high quality upland forests or savannas.

Eventually merge NE and SW restoration nodes.

Work with neighbors to encourage them to remove invasive woody plants.

125th St E
Villaburne Dr
Allen Dr
125th St E
Mystic La
Kennelly Rd
Dalridge Cir
Norway Cir
Pinehurst Dr
31st Ave
Skyline Dr S
Parkway Pl
Burnsville Pkwy
Burnsville Pkwy E
Teton Ct
Wind Cave Ct
Park Dr
Crater Ct
Lassen Ct
Rainier Cir
Isle Royale Ct
Rainier Ct
Bryce Ct
Glacier Ct
County Hwy 11
130th St E
Sheffield La
I-35E
I-35E
Chaparral Dr
Shoshoni Tr
Belmont Ct
Belmont Rd
Hialeah Path
Acorn Cir
Great Oaks Dr
Great Oaks Dr

RMU boundary
Gravel Trails
Paved Trails
First mgmt priorities
Second mgmt priorities
Eventual mgmt areas
Best Quality Veg Community Node

Figure 16
Terrace Oaks RMU
Management Plan

Burnsville Natural Resources
Master Plan

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RMU boundary
City parks
Gravel Trails
Paved Trails
First mgmt priorities
Second mgmt priorities
Eventual mgmt areas
Best Quality Veg Community Node

Figure 17
Chateaulin Park
Management Plan

Burnsville Natural Resources
Master Plan

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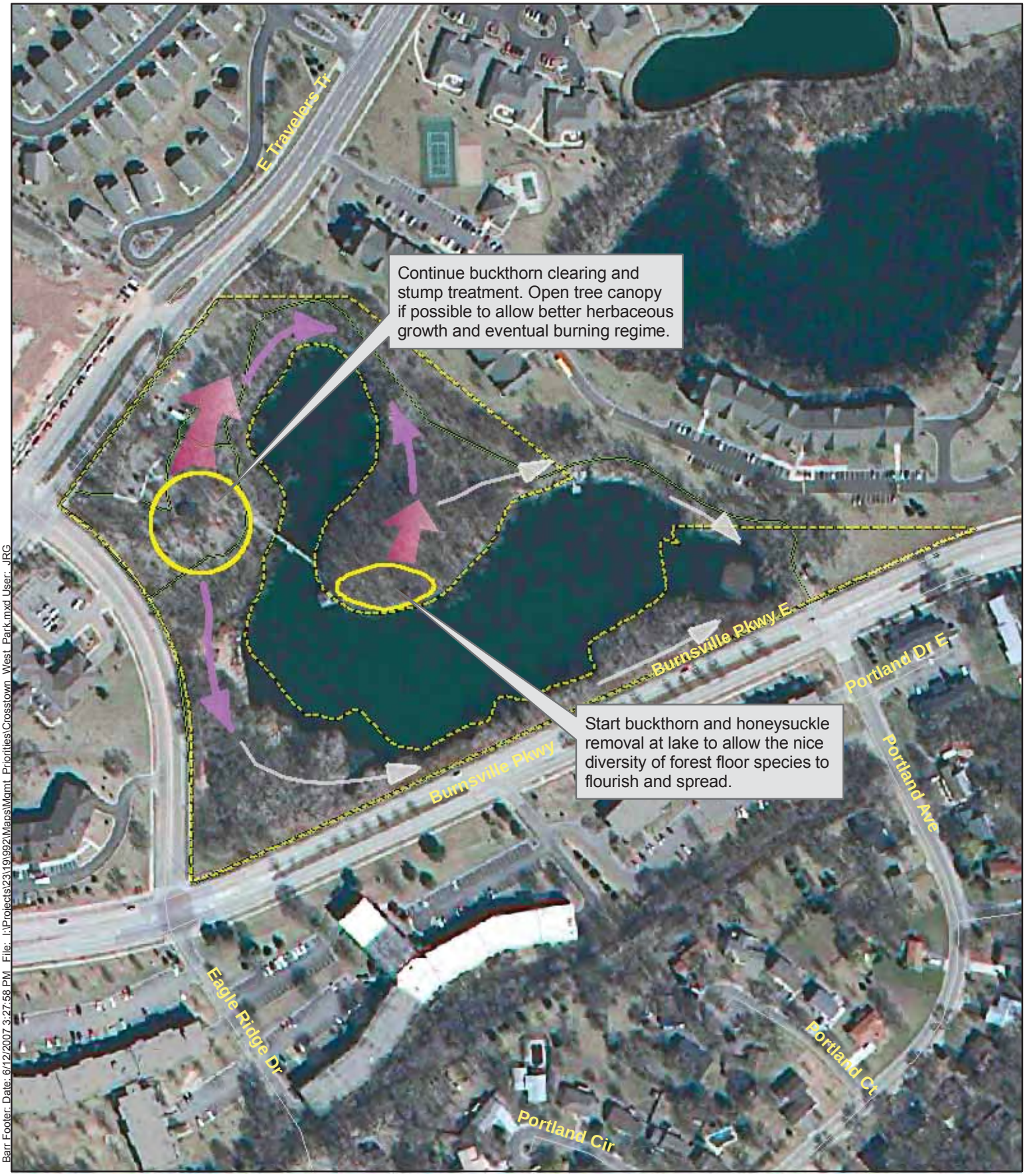

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RMU boundary
City parks
Gravel Trails
Paved Trails
Bike Trails
First mgmt priorities
Second mgmt priorities
Eventual mgmt areas
Best Quality Veg Community Node

Figure 18
Crosstown West Park
Management Plan

Burnsville Natural Resources
Master Plan

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RMU boundary
City parks
Gravel Trails
Paved Trails
First mgmt priorities
Second mgmt priorities
Eventual mgmt areas
Best Quality Vegetation Community Node

Figure 19
Hollows Park
Management Plan

Burnsville Natural Resources
Master Plan

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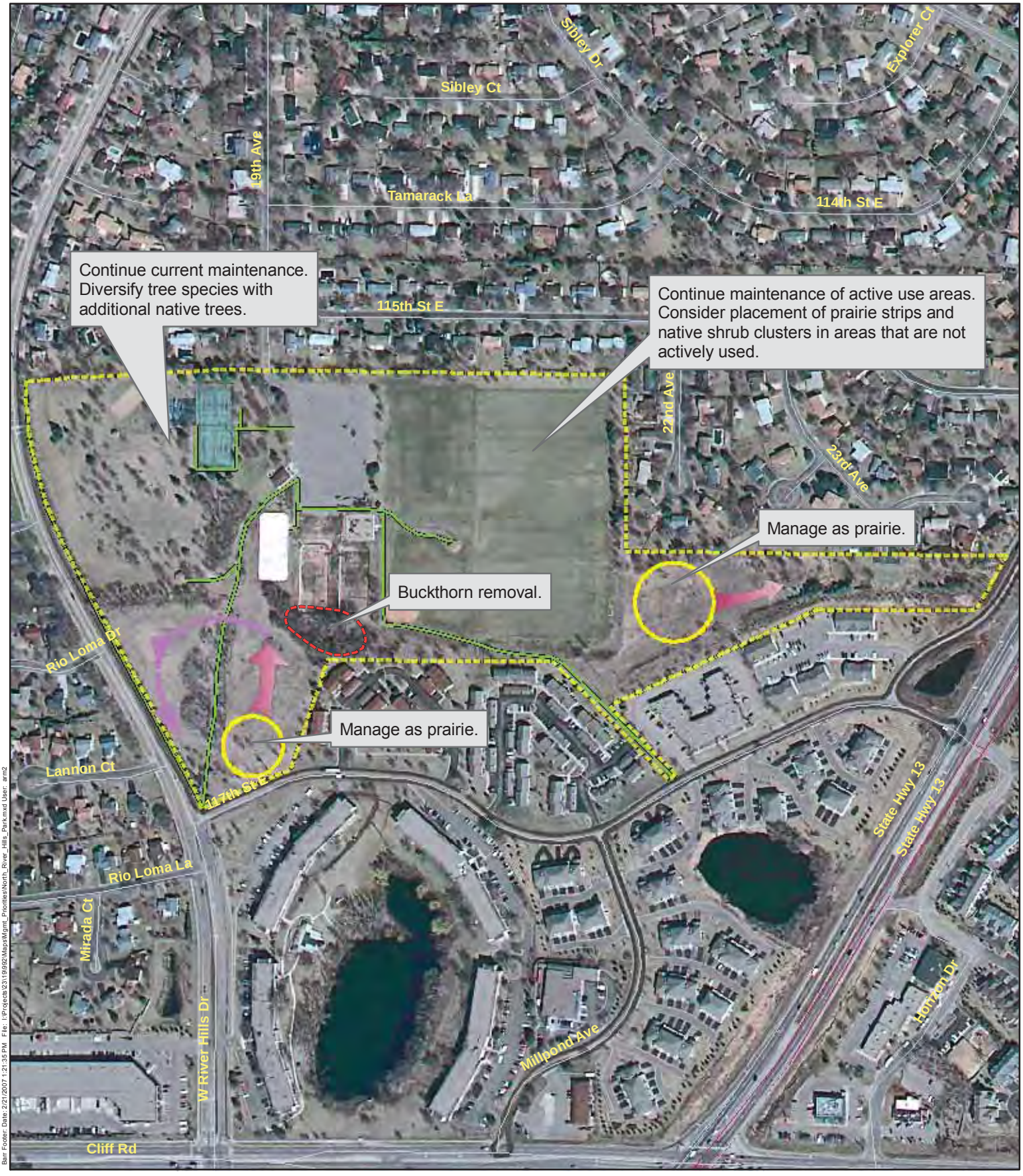
RMU boundary
City parks
Gravel Trails
Paved Trails
bike trail
First mgmt priorities
Second mgmt priorities
Eventual mgmt areas
Best Quality Vegetation Community Node

Figure 21
Neil Park
Management Plan

Burnsville Natural Resources
Master Plan



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RMU boundary
City parks
Gravel Trails
Paved Trails
Bike Trails
First mgmt priorities
Second mgmt priorities
Eventual mgmt areas
Best Quality Vegetation Community Node
Management_Areas

Figure 22
North River Hills Park
Management Plan

Burnsville Natural Resources
Master Plan

RMU boundary
City parks
Gravel Trails
Paved Trails
First mgmt priorities
Second mgmt priorities
Eventual mgmt areas
Best Quality Veg Community Node

Figure 23
Wellington Crescent/Water Tower
Management Plan

Burnsville Natural Resources
Master Plan

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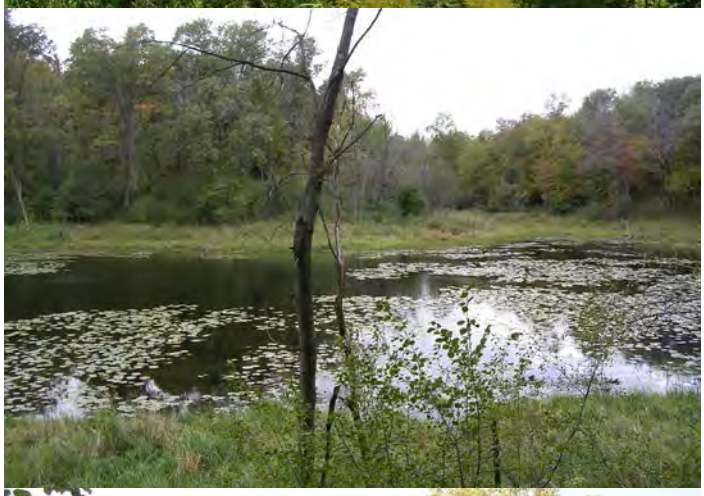
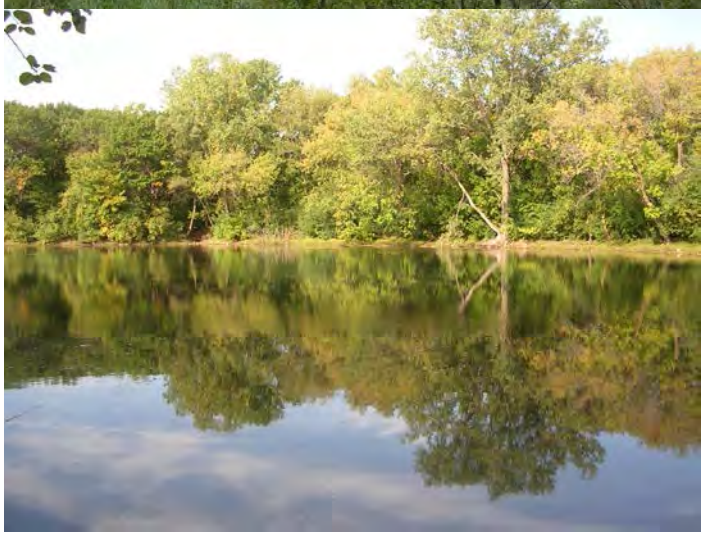
City Of Burnsville

Appendix I – Wetland Protection and Management Plan

November 2017





Wetland Protection and Management Plan

BURNSVILLE

Amended November 2017

City of Burnsville, Minnesota

Executive Summary

The City of Burnsville (City) covers approximately 17,282 acres, of which approximately 2,785 acres, or 16 percent, are wetlands or other water features. These surface water resources include six lakes, 266 wetlands, 59 storm water or other created ponds, and portions of three designated trout streams that are located wholly or partially within the City. Wetlands alone constitute 1,824 acres, or about 11% of the city area. One of the most prominent features in the City is the Minnesota River and the extensive backwater and wetlands associated with it. The Minnesota River associated wetlands and Black Dog fen within the Minnesota Valley National Wildlife Refuge account for 913 acres, or about half of the wetland habitat within the city limits.

The City of Burnsville is located at the northern boundary of Dakota County (Figure 1). The City includes portions of four watersheds; the Black Dog, Lower Minnesota River, Vermillion River, and Credit River (Figure 2). These watersheds are managed by several watershed organizations, of which the City is an active member. This Plan has been drafted to comply or exceed the requirements of these organizations.

This Wetland Protection and Management Plan has been developed to provide the City with an updated wetland inventory and functions and values analysis, to provide enhanced management strategies to preserve and protect the wetland resources, and to comply with local watershed organizations plans. The regulatory framework developed in this Plan will be incorporated into the City's existing planning and zoning regulations and implemented by ordinance. This Plan is an update to the original Plan completed in 1998.

Wetlands within the City have been classified into four categories to provide a range of protection standards. These categories are Protection, Improvement, Management, and Management II. The first three categories are unchanged from the 1998 inventory and Plan. The exception to this is the automatic classification of any Outstanding Resource Waters as Protection. The validity of the 1998 classification system was tested using the Minnesota Routine Assessment Method Version 3.0 (MnRAM) to see if the older classes continue to accurately represent the wetland functions and values. Comparison of a subsample of the of the 1998 inventory to the MnRAM-derived classifications demonstrated that the older inventory was equal or more conservative than the more current methods, and was therefore still acceptable. A new category, Management II, has been added to the updated Plan to provide a category for wetlands currently being used for storm water management purposes, but would be regulated as a wetland.

This Plan update includes:

- Updated inventory of the wetlands in the City; including accurate mapping, functions and values analysis, and classification;
- Differentiation of regulated wetlands from other water features;
- Development of regulatory and non-regulatory options for wetland preservation and protection;
- Identification of potential wetland mitigation sites within the city;
- Refinement of a GIS-based wetland management system.

Purpose of the Plan

The purpose of this Plan is to establish a comprehensive wetland protection and management program to protect, conserve, and manage the wetlands within the City. The Plan also recognizes that development and redevelopment will continue well into the future, and will serve as a guide for City staff and developers to follow as they evaluate the potential impacts of a given project. The Plan will serve as the toolbox for the City, and includes the best available mapping of the wetlands and water resources, differentiation of wetlands from other water features, and development of regulatory policies and goals. This Plan is also intended to

meet or exceed the requirement of the watershed management organizations within the city, and allow the City to continue managing its wetland resources in accordance with the Plan.

Basis for the Plan

This Plan has been prepared following the requirements of Minnesota Rule Chapter 8420.0650, Local Comprehensive Wetland Protection and Management Plans. These statutes and rules allow for the City to regulate wetland policy, provided that minimum standards are met. The planning process must include the following:

- Provide for resource agency and public participation;
- Wetland functional assessment information for the plan area;
- High priority area identification;
- Meet no-net loss of wetlands within the plan area;
- Follow Wetland Conservation Act requirements; and
- Adopt a local ordinance that implements the plan.

This Plan has also been prepared with the requirement that it comply with the standards of the local watershed management organization plans. The City is located within four major watershed units as shown in Figure 2. These watersheds are regulated by three organizations including: Black Dog Watershed Management Organization (BDWMO), Lower Minnesota River Watershed District (LMRWD), and Vermillion River Joint Powers Organization. The fourth watershed, Credit River, is administered by the BDWMO for the portion of the watershed within Dakota County.

Goals and Objectives

The main objective for the updated Wetland Protection and Management Plan is to provide a current inventory of the wetland resources in the City, differentiate regulated wetlands from other water features, and develop a comprehensive approach to regulate and protect wetlands based on wetland functions and associated public values.

This Plan includes an update of the results of a complete field inventory of the City along with an assessment of the quality of the wetland resources completed in 1998. It is intended to provide a guide for City staff and residents to make informed decisions about the future development and redevelopment of the City with respect to the protection, conservation, and management of wetland resources.

Wetland Inventory Database

The 1998 wetland inventory was reviewed and updated using recent high-resolution aerial photographs. The previous inventory used field-based attributes, but the boundaries were based on the National Wetlands Inventory (NWI) (Figure 4). The NWI is a good reference, but is not accurate enough to substitute for a current wetland inventory. This revised database replaces the former inventory. Review and updating of the 1998 inventory was needed as many of the former basins were not mapped correctly, mapped basins were not present, and some wetlands may have been missed. The results of the 2006 inventory are shown in Figure 5, which includes the management classification for each wetland. The official inventory will reside within the City's GIS database.

Classification of Wetland Basins

Each basin within the city has been classified into one of four categories. These categories are the basis for which protection standards have been established. The 1998 inventory attributed classifications based on the

Natural Resource Evaluation, supplemented with data from the City's 1994 Storm Water Management Plan, the Dakota County Biological Survey and other sources.

The database and supplemental information were used to determine the classification of each wetland basin by sorting the data according to total points and applying the ranking strategy. The resulting classifications include the following:

- *Protection Areas* - Basins with Native Grades of A or B, sites with complete Community Structure, any sites supporting rare species, and any sites within or adjacent to significant natural communities as identified by the Dakota County Biological Survey. This is comparable to the Preserve Classification used in the MnRAM.
- *Improvement Areas* - Basins with 3 of 4 of the Community Structure criteria, sites greater than ten acres in size, Minnesota Department of Natural Resources Protected Waters and Wetlands (Public Waters), and basins within existing City parks that are not classified as Protection Areas. Although there is some overlap, this classification is similar to the Manage I and Manage II MnRAM classifications.
- *Management Areas* - Remaining wetlands, but generally of low quality and located outside of protected areas. Management wetlands are also likely to receive untreated storm water runoff, but have not been altered to enhance treatment capabilities. This classification is comparable to the Manage II and Manage III MnRAM classifications.
- *Management II Areas* – These basins include any of the water features that may have been historic wetlands, and would remain subject to the requirement of the Wetland Conservation Act. These basins will have minimal protection standards as they currently function primarily to provide storm water management.

A detailed description of the classifications and ranking strategy is included in the Wetland Inventory and Classification section of this report.

In 2006, the older classification system was reviewed to determine if the wetland designations were still accurate and comparable to more recent assessment methods. To accomplish this, random samples of ten wetlands from each of the management classes were selected for review using the Minnesota Routine Assessment Method Version 3.0 (MnRAM). This provided a total of 30 basins to be assessed and compared to the older classifications. A detailed discussion of the comparison is included in Section III, however it has been determined that the existing classification system remains adequate or even more protective than the comparable MnRAM classification.

Wetland Restoration Areas

In addition to identifying the current wetlands, the plan update has identified areas of potential wetland restoration. This has been completed by comparing the updated inventory, mapped hydric soils, the National Wetlands Inventory, current land use, and recent and historic aerial photographs to identify areas that have the potential to either be restored or created wetland. Several areas, mainly along the northern 1/3 of the City, have been identified. These areas have been shown in Figure 5.

Major Changes from 1998 Plan

While much of this plan is a general update to the 1998 plan, there are some areas of significant change that should be identified. Although described in greater detail in the main document, the following are major changes of note:

1. The wetland inventory has been refined to separate wetlands from other water features. This includes a removal of lakes and created ponds from the wetland inventory. The result of this is that a direct comparison of wetland areas from 1998 to 2006 would reflect a significant decline. This is not accurate,

however, as lakes and ponds have been categorized as non-wetland features. In reality, the amount of wetland is unchanged.

2. Storm water ponds that were created since 1998 and are in upland soils have been excluded from the wetland inventory, but have been included as a separate GIS coverage and discussed in the Surface Water Management Plan.

3. Storm water ponds that may still be WCA regulated have been classified as a new management classification called Management II. This allows them to remain in the inventory as wetlands, but have appropriate management strategies applied to them.

4. The buffer requirements have been changed from a standard setback of 20 feet for all wetlands to a setback of 20 feet for Management II, 25 feet for Management, 35 feet for Improvement, and 50 feet for Protection.

5. Storm water pretreatment requirements have been improved to require removal of 90% of total suspended solids (TSS) and 60% of total phosphorus (TP) for areas of new development, and 70% of TSS and 30% TP removal for areas of redevelopment. Infiltration requirements have also been established. All of these are regulated in accordance with the updated Surface Water Management Plan.

6. Hydrologic guidelines have been changed to be more specific for the wetland management classes. Protection wetlands will require that excess hydrology be diverted if it is isolated or does not currently received storm water. If a Protection basin is not isolated, or currently receives untreated discharge, than the bounce on a 10-year event must be less than 6 inches, and must not exceed existing inundation by more than 1 day for 1 and 2 year events and 3 days on a 10 year event. Improvement basins allow for a bounce on a 10-year event of 9 inches, and inundation duration to be existing plus 3 days for 1 and 2 year events, and 5 days for 10-year events. Management basins allow for a bounce on a 10-year event of 12 inches, and inundation to be existing plus 5 days for 1 and 2-year events and 15 days for a 10-year event. Outlet controls standards have also been established to limit water level manipulations.

November 2017 Amendments

Section 4.2.1 was added to the plan to incorporate the Minnesota State Buffer Law. In addition, Figure 5 was revised with updated stormwater management features.

Acknowledgements

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Vermillion River Joint Powers Organization
Lower Minnesota River Watershed District
Board of Water and Soil Resources
Minnesota Pollution Control Agency
Minnesota Department of Natural Resources
U.S. Army Corps of Engineers
Dakota County Soil and Water Conservation District
Minnesota Valley National Wildlife Refuge

Table of Contents

Executive Summary
Acknowledgements
Table of Contents

Page

1.0 Introduction 1
1.1 Purpose of the Plan 1
1.2 Basis for the Plan 1
1.3 Goals and Objectives 2
1.4 Plan Overview 3
1.5 City of Burnsville Outcomes 3
1.6 Review Process 4

2.0 Background Information 5
2.1 Wetlands 5
2.2 Wetland Classification 5
2.2.1 Circular 39 5
2.2.2 Cowardin 6
2.2.3 Eggers and Reed 6
2.2.4 Natural Heritage Program 7
2.3 Functions and Values 8
2.4 Land Use 9
2.5 Unique Wetland Features 9
2.5.1 Minnesota Valley National Wildlife Refuge 9
2.5.2 Black Dog Fen and Scientific and Natural Area 9
2.5.3 Kelleher Park and Murphy Hanrehan Park Reserve 9
2.6 Lakes 10
2.7 Streams and Linear Waterways 10
2.8 Storm Water Ponds 11

3.0 Wetland Inventory and Functions and Values Analysis 12
3.1 Summary of 1998 Inventory 12
3.1.1 Wetland Inventory Database 13
3.1.2 Wetland Classification 13
3.2 Description of 2006 Inventory 14
3.2.1 2006 Inventory Results 14
3.2.2 Comparison of Wetland Inventories 15
3.3 Functions and Values Assessment and Wetland Classifications 16
3.3.1 Comparison of Wetland Classifications 16
3.3.2 Critical Resources 18
3.3.3 Calcareous Fens 19
3.3.3.1 State Wildlife Management Areas 19
3.3.3.2 Designated Trout Streams 19

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3.3.4 Summary of Wetland Classification results 20
3.4 Analysis of Wetland Restoration and Creation Opportunities....21
4.0 Existing Wetland Management Priorities and Objectives 23
4.1 Minnesota Wetland Conservation Act (WCA) 23
4.2 Minnesota Department of Natural Resources 23
4.2.1 State of Minnesota Buffer Law 23
4.3 United States Army Corps of Engineers 24
4.4 Watershed Management Organizations 24
4.5 City of Burnsville 24
4.5.1 Non Regulatory Tools 24
4.5.2 Regulatory Planning Tools 25
5.0 Wetland Protection and Management Plan Strategies 26
5.1 Management Standards 26
5.1.1 Educational and Cultural Strategies 26
5.1.2 Regulatory Standards 26
5.1.3 Management Strategies 29
6.0 Implementation Plan 30
6.1 Wetland Management 30
6.2 Wetland Monitoring 30
6.3 Amendments to Plan 31
6.3.1 Amendments to Wetland Inventory 31
6.3.2 Amendments to Wetland Classifications 31
6.3.3 Amendments to Policies, Strategies, and Standards....32

List of Tables

Table 1 Plan Goals and Goal Statements 3
Table 2 Wetland Inventory Goals and Methods of Accomplishment....12
Table 3 Summary of Basins Based on Wetland Type 15
Table 4 Comparison of NWI, 1998, and 2006 Inventories 15
Table 5 Comparison of Wetland Management Classes....17
Table 6 Summary of 1998 and 2006 Wetland Classifications....21
Table 7 Wetland Buffer Requirements 28
Table 8 Wetland Implementation Plan....30
Table 9 Functional Classification Conversion Chart 31

List of Appendices

Appendix A Figures
Appendix B Acronyms and Glossary
Appendix C Literature Review and Website Links
Appendix D Summary Of MNRAM 3.0 Methods And Classifications
Appendix E Summary of Wetland Protection and Management Policies

Wetland Protection and Management Plan

1.0 Introduction

The City of Burnsville (City) is located in the northern portion of Dakota County as shown in Figure 1. The City is bordered to the north by the Minnesota River, which forms a boundary between the Cities of Burnsville and Bloomington. To the east lie the Cities of Eagan and Apple Valley, to the south is the City of Lakeville. The western portion of the City lies along the Dakota and Scott County line and the City of Savage. A very small portion of the southwest side of the city is also adjacent to Credit River Township. The city is located within four watersheds, including the Black Dog, Lower Minnesota, Vermillion River, and Credit River. The locations of these watershed organizations are identified in Figure 2.

The City has completed this updated Wetland Protection and Management Plan (WPMP, the Plan) to improve the accuracy of the previous wetland inventory, review the existing classification system compared to current assessment methods, differentiate wetlands from unregulated water features, and establish a more useful and up-to-date resource to guide future planning. This Plan builds on the City's 1998 Plan, and addresses some of the deficiencies present in the previous Plan, while presenting contemporary methodologies and policies.

This introductory section begins with a brief description of the purpose and basis for this updated Plan, followed by an outline of the major sections of goals that were used to guide development of the Plan.

1.1 Purpose of the Plan

The purpose of this Plan is to establish a wetland protection and management program that protects, conserves, and manages the quality of the wetlands within the City. The Plan also recognizes that development and redevelopment will continue well into the future, and will serve as a guide for city staff and developers to follow as they evaluate the potential impacts of a proposed project. The Plan will serve as a toolbox for the City that includes the best available mapping of the wetlands and water resources, differentiation of wetlands from other water features, and development of regulatory policies and goals.

1.2 Basis for the Plan

This plan has been prepared following the requirements of Minnesota Rule Chapter 8420.0650, Local Comprehensive Wetland Protection and Management Plans. This Plan formally serves as an alternative to the rules adopted under Minnesota Statutes, section 103G.2242. However, before this occurs, the Plan would need to be approved by the Board of Water and Soil resources (BWSR), be adopted by the City, and must require equal or greater standards and procedures as compared to the Wetland Conservation Act (WCA). This is the intention of this Plan.

The benefits of a WPMP include a current functions and values assessment for management and wetland ordinance development, greater flexibility in sequencing and replacement standards for wetlands, and improvement and management of higher quality wetlands within the City. The planning process must include the following:

- Provide for resource agency and public participation;
- Wetland functional assessment information for the plan area;

- High priority area identification;
- Meet no-net loss of wetlands within the plan area;
- Follow Wetland Conservation Act requirements; and
- A local ordinance that implements the plan.

This Plan has also been prepared with the requirement that it comply with the standards of the local watershed management organization plans. The City is located within four major watershed units as shown in Figure 2. These watersheds are regulated by three organizations, including: Black Dog Watershed Management Organization (BDWMO), Lower Minnesota River Watershed District (LMRWD), and Vermillion River Joint Powers Organization. The fourth watershed, Credit River, is administered by the BDWMO within Dakota County. All three of the organizations have jurisdictional authority within the City, and therefore each must review the City's Plan to evaluate consistency with their respective WMO Plan.

1.3 Goals and Objectives

The main objective for the updated Plan is to provide a current inventory of the wetland resources in the City, differentiate regulated wetlands from other water features, and develop a comprehensive approach to regulate and protect wetlands based on wetland functions and associated public values.

This Plan includes an update of the results of a complete field inventory of the City along with an assessment of the quality of the wetland resources completed in 1998. It is intended to provide a guide for City staff and residents to make informed decisions about the future development and redevelopment of the City with respect to the conservation, protection, and management of wetland resources.

This Plan has been developed to provide the City of Burnsville with an updated comprehensive inventory of the existing wetland resources in the community and establish management strategies for wetland preservation and protection. This plan will be implemented by City staff through the City's adoption of an amended wetland ordinance.

The 1998 Plan and wetland inventory was initiated by the City under the Minnesota Board of Water and Soil Resources 1997 Challenge Grant Program which provided financial support for the project. It also fulfilled the goal of the City's Storm Water Management Plan to develop a wetland management plan.

This plan update includes:

- Updated inventory of the wetlands in the City; including accurate mapping, functions and values analysis, and classification;
- Differentiation of wetlands and other water features;
- Development of regulatory and non regulatory options for wetland preservation and protection;
- Identification of wetland mitigation sites within the city;
- Refinement of a GIS based wetland management system.

The Plan will be the basis for wetland regulation in the City of Burnsville and the implementation of the WCA. The regulatory framework developed in this Plan will be incorporated into the City's existing planning and zoning regulations and implemented by ordinance.

1.4 Plan Overview

The Plan seeks to provide appropriate protection to the City's wetland resources. To accomplish this, a series of goals and goal statements have been generated (Table 1). These goals will be accomplished through the updating of the wetland inventory, refinement of the wetland functions and values, identification of a wetland classification system, and establishment of regulatory criteria to protect the resources.

Table 1
Plan Goals and Goal Statements

Goal Number	Goal	Goal Statement
1	Wetland Inventory	Map and characterize the existing wetlands within the city
2	Define Wetlands	Differentiate regulated wetlands from other unregulated or non-jurisdictional water features
3	Develop Policy	Update and refine policies to incorporate current standards
4	Wetland Mitigation	Map and identify wetland mitigation sites
5	Refine GIS	Develop GIS process to maintain active wetland tracking

1.5 City of Burnsville Outcomes

It is a priority of the City of Burnsville to maintain and improve the quality of the natural resources in the community. To that end, the City has adopted an end statement and a set of outcomes that reflect the overall philosophy or approach to wetland protection and management. This Plan has been developed with the intention of supporting he community's efforts to achieve those end goals and the related outcomes.

City of Burnsville's Environmental End Statement and Related Outcomes

Environmental End Statement:

People find Burnsville is an environmentally sensitive community ensuring preservation and enhancement of its natural resources

Related Outcomes:

- People find that Burnsville is an environmentally sensitive community and they understand their role in pursuing these results.
- Development and redevelopment occur in an environmentally sensitive manner, preserving our natural resources.
- Citizens value natural water bodies and recognize the importance of preserving them.

1.6 Review Process

The review process was designed to involve as many of the wetland resource stakeholders as possible. The Plan has been initially reviewed by City staff to determine the adequacy and applicability of the recommendations, goals, and policies. Based on preliminary City staff review, the Plan was submitted to the Parks and Natural Resource Committee for additional internal review.

Once the internal review was complete, an Agency Review Draft of the Plan was prepared and submitted to the agencies and organizations that have jurisdiction in the City of Burnsville for their review and comment. In addition, the Plan was made available for public review during this period, including a formal Public Hearing process. Once this review process was complete, and comments and revisions were made, and the Plan was finalized, submitted to the BWSR Board for approval, and adopted and implemented by the City Council.

2.0 Background Information

The City of Burnsville covers approximately 17,282 acres, of which approximately 2,785 acres, or 16 percent, are a wetland or water features. These surface water resources include six lakes (as identified in the City's Lakes Ordinance, except for Wood Pond and Twin Lake, which are included in both), 266 wetlands, 59 storm water ponds, and portions of three designated trout streams that are located wholly or partially within the City. Wetlands alone constitute 1,824 acres, or about 11% of the city area. One of the most prominent features in the City is the Minnesota River and the extensive backwater and wetlands associated with it. The Minnesota River associated wetlands and Black Dog fen within the Minnesota Valley National Wildlife Refuge account for 913 acres, or just over half of the wetland resources within the city limits.

Within the city limits are four primary watersheds and three watershed management organizations (Figure 2). The majority of the City is within the Black Dog WMO, which also regulates the portion of the City within the Credit River watershed. The Black Dog WMO regulates about 66% of the City. The Lower Minnesota River Watershed District covers approximately 27% of the City, which includes the entire northern portion of the City. This watershed includes the Minnesota Valley National Wildlife Refuge, Black Dog Fen Scientific and Natural Area, and the City's only trout streams. The Credit River watershed is located in the southwest portion of the city and drains west into Scott County. The most notable wetlands in the watershed are located in the Kelleher Park. The final watershed in the City is the Vermillion River, which is represented in approximately 6% of the City and includes the Lake Alimagnet area. The Vermillion River watershed is distinct in that it drains to the Mississippi River, not the Minnesota, and represents a divide in major watersheds.

2.1 Wetlands

Wetlands are defined in the Federal Register as:

"Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas."

Wetlands are characterized by unique vegetative communities that are adapted to anaerobic conditions that result when soils are saturated for extended periods of time. Saturated soils also develop unique physical and chemical characteristics that distinguish them from other upland soils.

2.2 Wetland Classification

Wetlands are primarily classified using dominant hydrology and vegetation characteristics. While there are several classification systems available, there are several that are used most frequently. These classifications systems are described in the following pages.

2.2.1 Circular 39

The classification method developed for the initial state wetland protection program is entitled Wetlands of the United States. It was published by the U.S. Fish and Wildlife Service as Circular 39 in 1956 and republished in 1971. The system was utilized in the Protected Waters Inventory legislation of 1976 and 1979 and in the 1996 amendments to the Wetland Conservation Act. The Circular 39 classification method describes 20 types of wetland basins, eight of which are found in Minnesota. The system classifies wetland basins primarily on the basis of vegetation and depth and seasonality of water. The eight types of inland fresh wetlands are listed below.

Type 1 Seasonally Flooded Basins or Floodplains: Type 1 wetlands are seasonally flooded basins or flats in which soil is covered with water or is waterlogged during variable seasonal periods but

usually is well-drained during much of the growing season. Type 1 wetlands are located in depressions and in overflow bottom lands along water courses. Vegetation varies greatly according to the season and duration of the flooding, and includes bottom land hardwoods, as well as herbaceous plants.

Type 2 Wet Meadow: Occurs along the shallow edges of lakes, marshes and floodplains, or in perched depressions. The soil is usually without standing water during much of the growing season, but is waterlogged within at least a few inches of the surface. Vegetation includes grasses, sedges, rushes and various herbaceous plants.

Type 3 Shallow Marsh: Soil is usually water logged during the growing season, often covered with as much as six inches or more of water. Vegetation includes grasses, bulrushes, cattails, arrowheads, smartweeds and other emergent aquatic vegetation.

Type 4 Deep Marsh: Soil covered with six inches to three feet or more of water during growing season. Vegetation includes cattails, reeds, bulrushes and wild rice. Open water areas may contain pondweeds, naiads, coontail, water milfoils and other submergent aquatic vegetation.

Type 5 Open Water: Water is usually less than six feet deep and is fringed by a border of emergent vegetation. Vegetation includes pondweeds, naiads, coontail, water milfoils and other submergent aquatic vegetation.

Type 6 Scrub shrub: Occurs along sluggish streams or on floodplains. The soil is usually waterlogged during the growing season, and is often covered with as much as six inches of water. Vegetation includes alder, willow, and dogwood.

Type 7 Wooded Swamp: Occurs along sluggish streams, on floodplains, on flat perched depressions and in shallow lake basins. The soil is waterlogged to within a few inches of its surface during the growing season and is often covered with as much as one foot of water. Vegetation typical to this wetland includes tamarack, white cedar, black spruce, balsam fir, red maple and black ash.

Type 8 Bog: Occurs along sluggish streams, on flat perched depressions and shallow lake basins. The soil is waterlogged and supports a spongy covering of mosses. Vegetation typical to this wetland type includes sphagnum moss, heath shrubs and sedges. Minnesota bogs contain leatherleaf, Labrador tea, cranberries and pitcher plants. Scattered stunted black spruce and tamarack also are common features of bogs.

2.2.2 Cowardin

A second type of wetland classification system that is often used is the Cowardin system. This classification system is used by the National Wetlands Inventory (NWI) and is based on a tiered system. This system identifies a wetland based on hydrology and vegetation composition, plus any special modifiers. The hierarchical structure progresses from Systems and Subsystems at the most general levels to Classes, Subclasses, and Dominance Types at the most specific levels.

2.2.3 Eggers and Reed

A third classification system has recently been adopted for use in determining wetlands for the purposes of identifying in-kind wetland replacement. The Eggers and Reed (1997) system recognizes 12 wetland types, rather than the eight recognized by Circular 39. The advantage of Eggers and Reed is that it expands the Circular 39 classification to be more specific to some of the vegetative and ecological variability of wetlands. The 12 wetland classifications are identified below.

Shallow Open Water: Submergent aquatic systems or shallow open water, usually less than 6.6 feet in depth. Vegetation dominated by submergent and floating leaved species. Equivalent to Type 5

Deep Marsh: Emergent and submergent aquatic communities in water depths ranging from 6 inches to 3 or more feet. Vegetation composed of bulrushes, water lily, and duckweed. Equivalent to Type 4.

Shallow Marsh: Emergent aquatic community with hydrology ranging from saturated to 6 inches. Vegetation composed of emergent species such as cattails, arrowheads, and sedges. Equivalent to Type 3

Sedge Meadow: Inland fresh meadow dominated by sedge species. Soils are typically peat or muck. Equivalent to Type 2.

Fresh (Wet) Meadow: Inland fresh meadow dominated by grasses and forbs in roughly equal numbers. Equivalent to Type 1 and Type 2.

Wet to Wet-Mesic Prairies: Inland fresh meadow dominated by an open herbaceous plant community dominated by native grasses. Equivalent to Type 1 and Type 2.

Calcareous Fen: Unique plant communities supported by groundwater inflow rich in carbonates. Plants are dominated by calciphiles. Equivalent to a Type 2 or a Type 6.

Open Bog or Coniferous Bog: Unique communities growing on saturated and acid peat soils. Open bogs are dominated by sphagnum mosses and shrubs, while coniferous bogs are dominated by black spruce and tamarack trees. Equivalent to Type 8.

Shrub-Carr or Alder Thicket: Plant community composed of tall deciduous shrubs growing on saturated or seasonally flooded soils. Plants may be willows, dogwoods, or alder. Equivalent to Type 6

Hardwood Swamp or Coniferous Swamp: Wetlands dominated by tree species and having soils saturated for much of the growing season and short-term inundation as much as 1-foot. Equivalent to Type 7

Floodplain Forest: Wetlands dominated by deciduous hardwood trees growing on alluvial soils associated with riverine systems. Soils are inundated during flood events, but are well-drained during much of the growing season. Equivalent to Type 1.

Seasonally Flooded basins: Poorly drained shallow depressions that may have short-term inundation, but are dry for majority of the year. Often composed of exposed mud flats or pioneering vegetation. Equivalent to Type 1.

2.2.4 Natural Heritage Program

A third classification system that is used is based on the classifications used by the Natural Heritage Program (NHP) at the Minnesota Department of Natural Resources. This program has developed the Minnesota's Native Vegetation: A Key to Natural Communities to classify wetland as well as other natural communities. The key was designed as a tool for recognizing and preserving important natural communities in Minnesota. The NHP provided much of the basis for the development of the 1998 Plan.

2.3 Functions and Values

Wetland functions are defined as natural processes that occur in wetlands. Wetland functions vary according to the type of wetland, the season of the year, location within the watershed, and surrounding land uses. Individual wetlands can provide one or many functions. Wetland values are typically subjective benefits that are realized to society through the natural processes that occur to a different extent in various wetland types. The SEH Natural Resource Evaluation was used to evaluate wetland functions and values in the 1998 Plan. The method allows for direct comparison of wetland and terrestrial resources while addressing the functions and values included in Minnesota Statutes 103B.3355 (Wetland Functions for Determining Public Values). The Minnesota Routine Assessment Method for Evaluating Wetland Functions (MNRAM) was developed by the Minnesota Interagency Wetland Group as a field evaluation tool to assess wetland functions on a qualitative basis.

The method used in the 1998 Plan provided an assessment of the wetland functions and values listed below. The list is limited to the functions and uses typical of the urban nature of the study area.

Wetland Functions

A. Floral Diversity & Integrity

B. Wildlife Habitat

C. Fisheries Habitat

D. Flood & Storm Water Attenuation

E. Water Quality Protection

F. Shoreline Protection

G. Groundwater Recharge and Discharge

H. Aesthetic/Recreation/Education & Science

Wetland values can be associated with one or more wetland functions. Those functions typically associated with individual value are indicated by the letter(s) following each of the listed wetland values. Wetland values can be subjective and different between individuals depending upon their perspective. The MnRAM has sought to standardize the determination of wetland values by eliminating some of the subjectivity.

Wetland Values

A. Flood protection (D)

B. Sediment control (E)

C. Nutrient removal (E)

D. Recreation (A, H)

E. Open space (A, B, H)

F. Aesthetics (A, H)

G. Plant and animal refuges (A, B, C)

H. Education and research (A, B, C, H)

I. Erosion control (D, E, F)

J. Historical and archeological resources (H)

K. Threatened and endangered species habitat (A, B, C, H)

L. Water quality (E)

M. Water supply (G)

2.4 Land Use

The City of Burnsville is a nearly fully-developed community, but has had recent increases in interest of redevelopment. A majority of the land-use in the city is residential, although there are concentrations of commercial development, primarily in the northwest portion of the City and around Burnsville Center. The City has made a commitment to maintain open space and parks, and public areas are plentiful. Many of these public areas are dominated by wetland, including the vast expanse of the Minnesota Valley National Wildlife Refuge, but there are also significant upland and mixed land cover classifications in several major parks, including Sunset Pond Park, Lac Lavon Park, Alimagnet park, Terrace Oaks, Kraemer Preserve, and Murphy Hanrehan Park Reserve.

2.5 Unique Wetland Features

The City of Burnsville has numerous wetland resources, but has several that are worth noting for their unique or outstanding values.

The following paragraphs summarize some of the unique water and natural resource features within the City.

2.5.1 Minnesota Valley National Wildlife Refuge

The majority of the wetlands along the Minnesota River are included within the Minnesota Valley National Wildlife Refuge (MVNWR). The area lying between the railroad grade and the Minnesota River is part of the Black Dog Unit of the Refuge, and is under the authority of the U.S. Fish and Wildlife Service. The lands within the refuge are managed in accordance with the "National Wildlife Refuge and Wetland Management District Comprehensive Conservation Plan" completed by the U.S. Fish and Wildlife Service in 2004.

2.5.2 Black Dog Fen and Scientific and Natural Area

The Black Dog wetland complex is located within the Minnesota Valley National Wildlife Refuge south of Black Dog Lake and is a designated calcareous fen by Minnesota Rules (part 7050.0180, Outstanding Resource Waters). Fens are unique wetlands, in that they are hydrologically supported by upwelling of calcium–rich groundwater. Fens commonly harbor unique aquatic vegetation, and are often identified as critical wildlife habitat.

The Black Dog Scientific and Natural Area (BDSNA) is a designated protected area, which includes portions of the Black Dog fen. The BDSNA also includes areas of wet meadow and mesic prairie. The BDSNA is managed by the Minnesota Department of Natural Resources (MNDNR) and the Nature Conservancy.

2.5.3 Kelleher Park and Murphy Hanrehan Park Reserve

Located in the southwest portion of the city, the Kelleher (formerly Cam Ram) and Murphy Hanrehan Park Reserve areas have been designated as a high-priority site in the City's Natural Resources Master Plan. The County Biological Survey also indicates that this area has critical habitat and contains state-listed plant species. The Kelleher wetland is also monitored through the Wetlands

Health Evaluation Program (WHEP). This area is relatively undeveloped, and has high quality uplands, and a high density of wetlands overall.

2.6 Lakes

The City of Burnsville is blessed with numerous lakes and other waterbodies. Most lakes are deeper than six feet, which is considered to be deep water habitat, and therefore do not meet the jurisdictional criteria of a wetland following the guidelines of the 1987 manual. This is typically true for lakes that are also identified as Public Waters by the MNDNR, for which administration of the WCA does not apply for areas below the Ordinary High Water (OHW) elevation. For this reason, the management of lakes is not included in this Plan. Many lakes, however, do have wetland fringe areas that may extend above the OHW, or have never had an OHW established. In these instances the WCA would still have jurisdiction for the wetland areas above the OHW. The removal of lakes from the wetland plan does not decrease the level of protection placed upon them as the city has identified goals and policies for the protection of lakes in the Water Resources Plan.

The 1998 Plan included lakes in the wetland inventory, which is also how they are identified on the NWI. The 2006 revision has removed seven lakes from the wetland inventory, which allows for a better representation of the actual wetland resources. The seven lakes removed from the wetland inventory include: Black Dog Lake, Alimagnet Lake, Crystal Lake, Earley Lake, Keller Lake, Lac Lavon, and Horseshoe Lake. These lakes are all identified and protected by the City's Lake Ordinance. Wood Park and Twin Lake are also identified in the Lake Overlay District, but are small and function more like a wetland than a lake. These two lakes are identified in both the wetland inventory and the Lake Overlay. Lac Lavon is a unique lake as it is not identified in the City's lake overlay district or the wetland inventory. Lac Lavon is a deep lake created from a former quarry and is not a wetland or natural water body. It is also not regulated by the MNDNR as a Public Water.

Several of the smaller lakes and ponds remain in the wetland inventory, notably Sunset Pond, as they have considerable wetland areas and tend to have large areas shallower than six feet. If lakes have extensive areas of emergent vegetation, that portion has been included within the inventory. Extensive emergent areas are not abundant, but mapping of them allows for both the inventory of all wetland areas, and for tracking changes in the extent of emergent vegetation on subsequent wetland inventory updates. It is important to note, however, that the wetland inventory did not use the OHW to establish wetland boundaries. The OHW is a jurisdictional, not ecological, boundary, and requires a site specific survey to identify.

2.7 Streams and Linear Waterways

While the City has abundant wetlands and lakes, it is relatively sparse in streams and other linear waterways. Linear features include ditches, grassed swales, and other areas designated for conveyance of surface waters.

The City does have designated trout streams in the northeast portion of the City. These include Unnamed Trout Stream Segment #7, One Mile Creek (also identified as Segment #4), and a very small portion draining into Harnack Creek (Segment #1). All of these drain into the Minnesota River through the Black Dog Lakes. These trout stream segments are several remnant trout streams identified by the DNR as part of its' Metro Trout Stream Watershed Protection Initiative.

The Minnesota River forms the northern boundary of the City, and is an important navigable waterway. This section of the river has extensive wetlands associated with it, many of which are of high quality and receive significant state and federal protection. The entire area east of Interstate 35W along the river is within the Minnesota Valley Wildlife Refuge. The river west of I-35W is primarily just the main channel, but has several docking facilities.

2.8 Storm Water Ponds

The 1998 wetland inventory used the NWI as a guide to identify the wetlands in the city, and as a result, several storm water treatments ponds were included. Most of these were well-defined basins, and are classified as Type 4 or Type 5 wetlands. If a pond was created in a non-wetland area without the intention of being wetland, it may not be regulated under the WCA, or may have less stringent requirements, such as not requiring wetland mitigation for impacts. The 1998 inventory did not make the distinction between storm water treatment ponds and natural wetlands and as a result, several treatment ponds were mapped and classified as wetlands. This is problematic as the designation of a basin as a wetland triggers buffer, bounce, and water quality pretreatment requirements before discharge. Most of these basins were classified as Management, which has the lowest protection standards; however this remains contrary to the intention of these basins. The removal of unregulated and non-jurisdictional water features from the inventory is one of the primary goals of the inventory and Plan revisions.

In 2006, a total of 94 basins used as storm water treatment ponds were mapped within the City. The total area of these features within the city was approximately 61 acres. Of the ponds mapped, 35 were included in the 1998 inventory, but were determined to currently function for storm water treatment. These 35 basins have been included in the inventory, but have been classified as a new management classification called Management II. The purpose of this additional classification is to allow for less stringent wetland management standards for areas currently functioning for storm water treatment. These basins, however, were likely to have been wetland prior to conversion for storm water treatment.

Historically, natural wetlands were used extensively for storm water treatment, either through restricting outflows or excavating wetlands to create additional open water areas and storage volume. While this practice has since been discouraged, many of the older storm water ponds were likely wetlands that have been converted. Inclusion of storm water ponds that are still regulated as wetland within the inventory allows these basins to be tracked and managed appropriately. Storm water ponds created out of upland areas and that were not wetland previously have been mapped and are discussed in the Surface Water Management Plan.

3.0 Wetland Inventory and Functions and Values Analysis

One of the requirements of a Comprehensive Wetland Protection and Management Plan (MWPMP) is to provide a wetland inventory and functions and values analysis. This was completed with the 1998 Plan, but has been reevaluated with the 2006 revision. This is necessitated as several issues have been detected through review of the 1998 inventory. One of the biggest needs was to differentiate wetlands from other water features. The 1998 plan includes many storm water treatment ponds, which may still be regulated under the WCA, but would not be subject to buffer, bounce, and water quality pretreatment standards. The 1998 inventory also included lakes, which would also not be regulated as wetlands, but would remain protected as Public Waters, and through the Surface Water Management Plan.

The primary goals of the updated wetland inventory are summarized in Table 2.

Table 2
Wetland Inventory Goals and Methods of Accomplishment

Goal Number	Goal	Goal Statement
1	Improve accuracy of wetland inventory	Review 1998 mapping using recent high-resolution, rectified, aerial photographs. Edits include adjustment of boundaries, removal of basins no longer present, and additional of new features.
2	Differentiate wetlands from other water features	Review aerial photographs, 1998 Plan, and GIS storm water infrastructure coverages to determine which features are wetlands, from those that are other water features. Lakes, which are considered to be deep water habitat, would also be removed.
3	Prioritize wetland regulations based on functions and values	Evaluate the classifications used in the 1998 Plan to determine if they are still representative of the wetland functions and values. Compare 1998 outcomes to current function and value classification methodologies.
4	Identify the status and trends of wetlands from the 1998 inventory through the 2006 revision	Compare number and size of wetlands to determine if there are any detectable changes in wetland size, type, or quality since 1998 Plan approval.

3.1 Summary of 1998 Inventory

In 1998, the City completed a wetland inventory for the original CWPMP. The 1998 Plan was based on the National Wetland Inventory (NWI) map and the City's Storm Water Management Plan (SWMP), which were used as the initial base maps for the field inventory. Existing wetlands identified on the NWI and SWMP maps were visited during the field inventory.

Data for the function and value assessment were collected during a brief visit to each wetland basin or complex. The Natural Resource Site Survey Form was used to collect data at each location and the approximate location, size, and boundary was compared to the NWI map. The forms include a physical description of the basin, characterization of the plant community such as dominant species of vegetation and any exotic or rare species, hydrologic characteristics, and wildlife and fishery habitat. Copies of the completed data sheets from the survey can be obtained from the City.

Characterization of adjacent upland areas was also noted for land use, disturbances, or other influences on the wetland basins. Photographs of each basin were taken and are maintained on file at the City as a historic reference.

Wetlands discovered to no longer be present were deleted from the maps, while major changes to the boundaries were also completed. Field mapping of wetland boundaries was not completed, however.

The field assessment resulted in the collection of data on 314 wetland basins, complexes and riverine segments and a total of 2,678 acres of wetland habitat. This total included all of the lakes, any storm water treatment ponds that were also on the NWI, and tended to divide complexes into separate basins based on wetland type, rather than as contiguous units. The intention of this was to maximize management opportunities, but has had the end result of including lakes and ponds in the survey. These features are generally not regulated as wetlands, and their inclusion in the 1998 plan has had the effect of amplifying the total number of basins acres of wetlands within the city. This is exemplified by the wetlands around Black Dog Lake. The 1998 Plan includes the lake, and has mapped the area surrounding the lake as 12 different wetlands. The 2006 revision has removed Black Dog Lake as a wetland, and has the surrounding area identified as two unique wetlands divided by the railroad.

3.1.1 Wetland Inventory Database

The 1998 Plan made a bold step and advanced the usefulness of the wetland inventory by maintaining the data electronically and classifying each basin into a management class. The SEH Natural Resource Evaluation Method was used in the assessment and ranking of the wetland resources in the City. This evaluation method was unique, but similar to the first generation of the Minnesota Routine Assessment Methodology. Similar criteria for evaluation of the wetland basins can be found in the Minnesota Natural Heritage Program (NHP), and several other sources in order to evaluate both natural and disturbed communities and other open spaces. The SEH evaluation method was also used in the City's original Natural Resources Master Plan.

3.1.2 Wetland Classification

For each wetland, a numeric point value was assigned for each wetland function, which resulted in a total point value for each basin. Additional information was assembled from the Wetland Inventory, the City's existing GIS data, the City's 1994 Storm Water Management Plan, the Dakota County Biological Survey and other sources. Those wetlands containing endangered, threatened, or special concern species and those located within significant communities identified by the Dakota County Biological Survey were given special consideration. Public Waters were identified from the MNDNR's Protected Waters Inventory Maps.

The existing classification from the City's Storm Water Management Plan was reviewed with City staff and revised when necessary. The presence of man made hydrologic connections (storm sewer) and level of surrounding development was also used in the determination. The sensitivity to storm water impacts was determined according to the Guidance for Evaluating Urban Storm Water and Snowmelt Runoff Impacts to Wetlands. Lastly, the proximity of each basin to other wetlands and existing City parks was determined. Although no points were applied to this additional data, the information was used in the final determination of wetland classification and influenced the proposed management of wetland resources.

The database and supplemental data were used to determine the classification of each wetland basin by sorting the data according to total points and applying the following ranking strategy.

- *Protection Areas* - Basins with Native Grades of A or B, sites with complete Community Structure, any sites supporting rare species, and any sites within or adjacent to significant natural communities as identified by the Dakota County Biological Survey. This is comparable to the Preserve Classification used in the MnRAM.
- *Improvement Areas* - Basins with 3 of 4 of the Community Structure criteria, sites greater than ten acres in size, Minnesota Department of Natural Resources Protected Waters and Wetlands (Public Waters), and basins within existing City parks that are not classified as Protection Areas. Although there is some overlap, this classification is similar to the Manage I and Manage II MnRAM classifications.
- *Management Areas* - Remaining wetlands, but generally of low quality and located outside of protected areas. These wetlands are also likely to receive untreated storm water runoff, but have not been altered to enhance treatment capabilities. This classification is comparable to the Manage II and Manage III MnRAM classifications.

3.2 Description of 2006 Inventory

During the summer of 2006, the results of the 1998 inventory were reviewed to determine if it was still accurate, both with respect to mapping accuracy and to the management classification. This involved tasks of reviewing the mapping of each basin to determine if the wetland was still present, if the boundary was accurate, and if the basin was wetland or a non-wetland water feature.

The mapping of the 2006 inventory was accomplished by comparing the 1998 inventory to high resolution aerial photographs of the City taken in 2005. The inventory was reviewed again in 2007 using high resolution 2006 aerial photographs that had become available following the initial field reviews. The use of high-resolution photos is a marked improvement upon the technology available for the 1998 Plan. Each basin was reviewed, and the boundaries adjusted appropriately. Adjustments ranged form very minor boundary changes to elimination of the basin as it was no longer present.

Several changes to what was included in the inventory also occurred. For starters, seven lakes were dropped from the inventory. These are classified as deep water habitat, and would not be regulated under this plan, but would remain regulated under other plan and agencies. No protection was reduced with the changes to the inventory. The other change was the removal of any area that currently functions to provide storm water treatment, and have been verified to have been created in non-wetland areas. Ponds that have been potentially created from former wetland have remained, but have been designated as a Management II classification. The Management II classification would still be regulated under the Wetland Conservation Act for alterations, but would not require additional protection from this Plan.

Additional Classification added to the 2006 plan update:

- *Management II Areas* – These basins include any of the water features that may have been historic wetlands, and would remain subject to the requirement of the Wetland Conservation Act. These basins would not be subject to reduced wetland protection standards, however, as they no longer function as natural wetlands.

3.2.1 2006 Inventory Results

The 2006 inventory mapped a total of 264 wetlands, which are shown in Figure 5. These wetlands covered 1,794 acres of land, and represent all of the Circular 39 types, with the exception of Type 8

bog. For the purposes of this Plan, wetlands have been classified as one primary wetland type, even though a majority of the wetlands are not solely just one type.

Table 3 lists the distribution of the wetlands identified in the 2006 inventory.

Table 3
Summary of Basins Based on Wetland Type

Wetland Type	Description	Number of Basins	Total Area[1] (acres)
Type 1	Seasonally Flooded	16	55
Type 2	Wet Meadow	11	12
Type 3	Shallow Marsh	72	1,041
Type 4	Deep Marsh	54	73
Type 5	Shallow Open Water	52	158
Type 6	Scrub Shrub	7	35
Type 7	Wooded Swamp	18	418
Riverine	Rivers and Streams	1	1
Pond	WCA-regulated Storm Water Ponds	35	31
Total		**270**	**1,824**

[1] Rounded to nearest whole number

3.2.2 Comparison of Wetland Inventories

As previously noted, the 1998 inventory contains several lakes and ponds, and significantly fragmented the basins to provide both a high number of wetlands, and also a larger wetland area. For this reason, a direct comparison of the two inventories isn't legitimate, as the 2006 update will appear to be much smaller, and suggest a significant loss of wetlands. To accurately compare the 1998 and 2006 inventories, the data for the lakes and storm water ponds must be considered. Table 4 shows the comparison of the two inventories.

Table 4
Comparison of NWI, 1998, and 2006 Inventories

Wetland Type	Total Area (acres)	
	1998[1]	2006
Type 1	62	55
Type 2	8	12
Type 3	944	1,041
Type 4	174	73
Type 5	1,103	158
Type 6	128	35
Type 7	166	418
Riverine	93	1
Storm Water Ponds[2]		31
Storm Water Ponds[3]		30
Lakes[4]		931
Totals	**2,678**	**2,785**

[1] Note that lakes and storm water ponds are included as wetlands

[2] WCA-regulated

[3] Created in upland areas and are exempt under WCA
[4] These are regulated through the Surface Water Management Plan and shoreland ordinances, except for Wood Park and Twin Lakes

Including lakes and storm water ponds to the totals, the area of wetlands and water features between the NWI, 1998 inventory, and 2006 inventory are similar. The slight increase of 107 acres of wetland and water resources between 1998 and 2006 is at least partially explained by the addition of more storm water ponds and wetland restoration work completed in the City since 1998. Changes in mapping accuracy also account for some of the differences.

In summary, the 2006 inventory has improved the accuracy of the mapping, and has demonstrated that there has not been a significant change in the amount of wetland and water resources in the City since 1998. Based on these values, it appears that the goal of "no net loss" has been achieved.

3.3 Functions and Values Assessment and Wetland Classifications

In additional to more accurate mapping, the 2006 inventory sought to evaluate the wetland classification system to see if the 1998 system was comparable to more recent assessment methods. This was completed by subsampling the 1998 inventory and assessing each basin using the MnRAM 3.0. The results of this comparison are described on the following pages.

3.3.1 Comparison of Wetland Classifications

The objective of this comparison was to reevaluate a subset of wetlands in the City of Burnsville using the MnRAM 3.0 and verify that the current management classes established in 1998 (Protection, Improvement, and Management) still accurately represent the basins. The MnRAM electronic database allows the user to answer questions relating to wetland vegetative quality as well as functions such as flood attenuation, maintenance of an area's hydrologic regime, wetland water quality, shoreline protection, aesthetics, and wildlife and fish habitat, among others. A score is calculated for each of the wetland functions, and one of the following overall management classes is assigned to the wetland: Preserve, Manage 1, Manage 2, and Manage 3. Details of the MnRAM process are included in Appendix D.

The Management II classification was added after this comparison and incorporates the storm water ponds that are presumed to have formerly been wetland. This fourth category used in the updated plan does not affect the comparison between the 1998 classifications and the 2006 MnRAM evaluation.

Ten wetland basins in each of the Protection, Improvement, and Management classes were chosen at random and reevaluated using the MnRAM. Wetlands obviously impacted by recent development, wetlands converted to storm water ponds, and wetlands in the Minnesota Valley National Wildlife Refuge were not included as potential resurvey locations, as the MnRAM results may be skewed and not allow for accurate comparison.

Table 5 illustrates the comparison between the current management class and the MnRAM management class for each of the thirty wetlands reevaluated. The table includes the current city identification, identification code created by the MnRAM, the identification of the basin if it is a Public Water, the classification of the basin in the current system, the classification generated by the MnRAM, and a note if the classification systems are significantly different between the two methodologies. A significant difference is a change in any direction greater than one step in classification. This is used since the city classifications originally used in the 1998 plan had three categories, while the MnRAM has four, and direct comparisons are not possible. The addition of

Management II to the 2006 Plan, is not necessarily a direct comparison to the Manage II classification used in the MnRAM.

Table 5
Comparison of Wetland Management Classes

Wetland ID		MN DNR PWI	1998 Classification	2006 MnRAM 3 Classification	Major Change
City ID	MnRAM 3 ID				
Protection Class					
11	19-115-21-20-011-A		Protection	Manage 1	No
62	19-115-21-27-062-A		Protection	Manage 1	No
93	19-115-21-34-093-A		Protection	Preserve	No
141	19-115-20-17-141-A	192W	Protection	Manage 2	Yes
152	19-115-20-29-152-A		Protection	Manage 2	Yes
155	19-115-20-29-155-A	358P	Protection	Manage 1	No
188	19-115-21-24-188-A		Protection	Manage 1	No
206	19-115-20-29-206-A		Protection	Manage 1	No
259	19-115-21-34-259-A		Protection	Preserve	No
312	19-115-21-34-312-A		Protection	Preserve	No
Improvement Class					
46	19-115-20-32-046-A		Improvement	Preserve	Yes
68	19-115-21-35-068-A	382W	Improvement	Manage 1	No
80	19-115-21-35-080-A		Improvement	Manage 2	No
117	19-027-24-36-117-A	174W	Improvement	Manage 2	No
157	19-027-24-35-157-A		Improvement	Manage 1	No
161	19-027-24-35-161-A	171W	Improvement	Manage 2	No
164	19-115-20-18-164-A	114W	Improvement	Manage 1	No
168	19-115-20-18-168-A	116W	Improvement	Manage 2	No
232	19-115-20-17-232-A		Improvement	Manage 1	No
247	19-115-20-17-247-A		Improvement	Manage 1	No
Management Class					
110	19-027-24-36-110-A		Management	Manage 2	No
116	19-027-24-36-116-A		Management	Manage 2	No
121	19-027-24-36-121-A		Management	Manage 2	No
144	19-115-20-17-144-A		Management	Manage 2	No
165	19-115-20-18-165-A		Management	Manage 2	No
167	19-115-20-18-167-A		Management	Manage 2	No
178	19-115-20-17-178-A		Management	Manage 2	No
198	19-115-20-30-198-A		Management	Manage 2	No
213	19-115-20-29-213-A		Management	Manage 2	No
215	19-115-20-29-215-A		Management	Manage 2	No

Out of ten wetlands in the current Protection class that were reevaluated using the MnRAM, three were rated as Preserve, five were rated as Manage 1, and two were rated as Manage 2. It was expected that wetlands in the Protection class would be rated as Preserve and Manage 1. The wetlands that were reevaluated and rated as Manage 2, Wetlands 141 and 152, have undergone severe

vegetation or hydrology alterations. Wetland 141, previously dominated by native sedges, is now dominated by purple loosestrife (*Lythrum salicaria*). Wetland 152, also previously dominated by native sedges and rushes, is now dominated by smartweeds and reed canary grass (*Phalaris arundinacea*) and has seen a measurable decrease in hydrology. In general, the basins that were expected to be protect, but no longer meet the highest criteria, have had a significant change causing them to drop in status.

Out of ten wetlands in the current Improvement class that were reevaluated using the MnRAM, five were rated as Manage 1, four were rated as Manage 2, and one was rated as Preserve. It was expected that wetlands in the Improvement Class would be rated as Manage 1 or Manage 2. The wetland that was reevaluated and rated as Preserve, Wetland 46, is a shoreline wetland on the fringe of Keller Lake. It received a high rating for shoreline protection, therefore was designated as Preserve by the MnRAM, the older methodology would not have considered this as highly as MnRAM does, which would explain the lower classification.

All of the ten wetlands in the current Management class that were reevaluated using the MnRAM were rated as Manage 2. It was expected that wetlands in the Management class would be rated as Manage 2 or Manage 3 by the MnRAM. Manage 3 wetlands are rated as low for vegetative diversity and also rate low for most other wetland functions except flood attenuation and downstream water quality protection. It is possible that wetlands that would be rated as Manage 3 by the MnRAM are already functioning as storm water ponds and therefore were not included in this resurvey. In general, MnRAM does not assign a significant number of basins to the Manage 3 category as these basins must be degraded and also fail to provide water quality improvement and/or flood attenuation. Most degraded wetlands function highly for storm water and flooding, so they end up being classified by the MnRAM as Manage 2.

With the exception of two wetlands out of 30 that declined in protection, all of the reviewed basins were similar or had improved protection under the 1998 classifications. As the comparison between the 1998 classifications and the more recent MnRAM provide similar results, it has been determined that there is no need to redo the entire functions and values assessment for the remaining basins. The three wetlands that did have a significant change (Wetland IDs 46, 141, and 152) have been updated to follow the MnRAM classifications, all other wetlands will retain the 1998 classifications in the current Plan. The exceptions to this are for areas of critical resources, which are described next.

3.3.2 Critical Resources

With any functions and values assessment, one of the first measures is to determine if a wetland is identified as a critical resource. Wetlands in the assessment area are evaluated for designation as critical resources based on several features defined by Minnesota Statutes. These critical wetland resources should be classified into the Protection management class due to their special functions. This classification is automatic, and will be used regardless of what classification is actually determined using the evaluation method.

Criteria for designating wetlands as critical resources are as follows:

- Outstanding Resource Value Waters (Minn. Rules 7050.0180)
- Designated Scientific and Natural Areas (Minn. Rules 86A.05)
- Wetlands with known occurrences of Threatened or Endangered Species (Minn. Stat. 84.0895)
- State Wildlife Management Areas (Minn. Stat. 86A.05, subpart 8)
- State Aquatic Management Areas (Minn. Stat. 86A.05, subpart 14)

- Wellhead Protection Areas (Minn. Stat. 103I.101, MN Rules Chapter 4720)
- Sensitive Ground Water Areas (MN Rules 8420.0548, Subp. 6)
- Designated trout streams or trout lakes (MN Rules 6264.0050)
- Calcareous fens (MN Rules 8420.1010 through 8420.1060)
- High priority areas for wetland preservation, enhancement, restoration and establishment (MN Rules 8420.0350, subpart 2)
- Designated Historic or Archaeological Sites
- State or federal designated wild and scenic rivers (MN Rule Chapter 7050)
- MN Pollution Control Agency "special waters search" mapping utility

A description of the critical resources located within the city follows.

3.3.3 Calcareous Fens

Calcareous fens are defined in MN Rules 8420.1020 as peat-accumulating wetlands dominated by distinct groundwater inflows having specific chemical characteristics. The water is characterized as circumneutral to alkaline, with high concentrations of calcium and low dissolved oxygen content. The chemistry provides an environment for specific and often rare hydrophytic plants. Minnesota Rules 8420.1010-1070 sets out minimum standards and criteria for the identification, protection, and management of calcareous fens as authorized by Minnesota Statutes, section 103G.223. The MNDNR is charged with identifying and maintaining a list of calcareous fens in the state and maintains a database of them. Calcareous fens are also listed in the Classifications for Waters in Major Surface Water Drainage Basins. Finally, the rules for Nondegradation of Outstanding Resource Value Waters also list identified calcareous fens in the state.

3.3.3.1 State Wildlife Management Areas

State wildlife management areas are established to protect those lands and waters which have a high potential for wildlife production and to develop and manage these lands and waters for the production of wildlife, for public hunting, fishing, and trapping, and for other compatible outdoor recreational uses. State wildlife management areas satisfy the following criteria:

- Includes appropriate wildlife lands and habitat, including but not limited to marsh or wetlands and the margins thereof, ponds, lakes, stream bottomlands, and uplands, which permit the propagation and management of a substantial population of the desired wildlife species; and
- Includes an area large enough to ensure adequate wildlife management and regulation of the permitted recreational uses.

3.3.3.2 Designated Trout Streams

Designated trout streams and lakes in the state of Minnesota are inhabited by trout other than lake trout. Fishing and other restrictions have been placed on these waterbodies to protect and foster the propagation of trout. Wetlands associated with these streams and lakes are an integral part of the whole ecosystem that functions to maintain the characteristics necessary to support the cold-water fishery.

Wetlands with Known Occurrences of Threatened or Endangered Species

Endangered and threatened plant and animal species are protected under Minnesota Statute 84.0895 and are designated as one of three categories:

- Endangered, if the species is threatened with extinction throughout all or a significant portion of its range.
- Threatened, if the species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
- Species of Special Concern, if although the species is not endangered or threatened it is extremely uncommon in this state, or has unique or highly specific habitat requirements and deserves careful monitoring of its status.

In 1987 the state began a systematic survey of rare biological features through the Minnesota County Biological Survey. The goal of this survey was to identify significant natural areas and to collect and interpret data on the distribution and ecology of rare plants and animals. The data collected by the county biological survey is available through published maps of each county. The data available for Burnsville is through the *Natural Communities and Rare Species of Dakota County, Minnesota*. This resource identifies rare natural communities or rare plant species within the Minnesota Valley National Wildlife Refuge, Murphy-Hanrehan Regional Park, and south of Lake Alimagnet.

The City of Burnsville has wetlands that meet some of these criteria including the large wetlands along the Minnesota River, which are part of the Minnesota Valley National Wildlife Refuge and the Minnesota Valley Wildlife Refuge. This also includes Black Dog Fen, and the Black Dog Scientific and Natural Area. One Mile Creek and two unnamed creeks would also be included as they are designated trout streams, although they are not associated closely with any wetlands. The City also has an abundance of high quality habitats that are known to contain threatened and endangered species. These areas are not restricted to wetlands, although the wetlands would be the prime emphasis for protection under this Plan. The 1998 Plan has several of the basins along the Minnesota River as Improvement and Management classes, although they are located in the Minnesota Valley National Wildlife Refuge. These basins have been upgraded to Protection status.

3.3.4 Summary of Wetland Classification results

The classification system from 1998 has been tested to still be relevant, and will be maintained as the classification system for the Plan update. There are some exceptions to this generality; however, including:

- Any Critical Resource wetland has been attributed to the Protection classification regardless of what the classification was in 1998. This has significantly increased the amount of wetland in the Protection classification by adding the wetlands along the river and Black Dog fen to that category. This is somewhat deceiving as the summary of results in Table 6 shows a decrease, but all of the lakes, which are now removed from the wetland inventory, had previously been included as Protection basins.
- The three wetlands (ID's 46, 141, and 152) that had significant differences between the 1998 classification and 2006 MnRAM have been changed to the equivalent MnRAM-determined classification.
- Eight lakes and all of the storm water ponds that were not formerly wetland have been removed from the inventory. This reduces the total wetland area, but provides a more accurate measure of how much is protected under the wetland plan.

- The Management II classification has been added, and is used to categorize storm water ponds that are still regulated as wetlands. This additional classification dilutes the results somewhat, but does not constitute a significant percentage of the basins or changes that were made.

Overall, the amount of wetland that has been categorized within the Protection category is nearly three quarters of the total wetland area. Granted this is skewed by the vast amount of wetland along the Minnesota River, but nonetheless provides maximum protection for the majority of the resources. A comparison of the changes in classification from 1998 to 2006 demonstrates that there is no plan to diminish protection. If anything, both the protection standards and the number of protected basins are significantly increased with the 2006 Plan.

Table 6 summarizes and compares the distribution of wetland classifications in 1998 and 2006.

Table 6
Summary of 1998 and 2006 Wetland Classifications

Classification	Total Area (acres)			
	1998		2006	
	Acres of Wetland[1]	Percent of Basins in Category	Acres of Wetland	Percent of Basins in Category
Protection	1,521	57	1,375	75
Improvement	887	33	247	14
Management	272	10	171	9
Management II[2]	0	0	31	2
Totals	**2,680**		**1,824**	

[1] 1998 Plan included lakes and storm water ponds, which gives an higher total acreage of wetlands than the 2006 plan. This is a change in what is included as wetlands, and does not reflect a loss of wetlands between the inventories

[2] Management II was not a category in the 1998 Plan

3.4 Analysis of Wetland Restoration and Creation Opportunities

As part of the investigation of the wetland inventory, there was also an opportunity to look for potential areas of wetland restoration and creation. The 1998 Plan had identified areas of restoration opportunities, but relied on identifying areas that contained mapped hydric soils, but were not currently wetland. The assumption was that areas of mapped hydric soil were wetland, and that opportunities to restore these areas were probable. Refinement beyond correlation between hydric soils and no wetlands being present was not completed.

The 2006 Plan has also looked for opportunities to either restore wetlands or create new wetland areas. While the basic concept of looking for hydric soils that are not currently wetland is still used, the process has been refined. The current identification of potential restoration opportunities has been completed by compiling a significant amount of GIS data, including: Hydric soils, the National Wetlands Inventory, subwatershed divides (to determine potential drainage areas), landuse (defining open space, parks, public lands, and vacant properties), topography, and storm water infrastructure. This information is available on the City's GIS database. Maps used in this analysis are available in .pdf format upon request.

All of the available data was compiled to try and find areas where a majority of positive features, such as hydric soils, on vacant land, with a large contributing watershed, were present. Using topographic information and high resolution area photographs, the sites with positive indicators were investigated

further to see if conditions would allow for restoration opportunities to occur. The focus was on larger areas, typically exceeding one acre in size. Smaller areas where wetland could be created are certainly present, but would be difficult to discern in a large scale review. Potential areas located on private property have also been identified, although it is understood that restoration in these areas will not be feasible without the owner's participation. Several of the identified potential wetland creation areas are also wooded. Often wooded sites are not selected as the tree removal is undesirable, but in identifying potential areas, this has not been used to reject sites.

Several potential areas were identified that would be suitable for additional investigation. The majority of the potential areas are located in the north third of the city near the river. There appears to be considerable areas of mapped hydric soils, but the drainage patterns have been altered, or the areas have been filled in. The northern portion of the city has an advantage as it is lower in elevation and has some storm water flow toward that area. Excavation and manipulation of drainages may be sufficient to provide hydrology to these areas.

There are fewer opportunities in the southern two thirds of the city as it is mostly developed, and has less available land for restoring wetlands. There is also more topographic variation, with much more relief that is generally not favorable for ponding water. Most of the small depressions and waterways are currently wetland, or are nor suitable for restoration/creation. Some small opportunities are available in some of the city parks, however.

Figure 5 includes the potential wetland restoration or creation areas.

4.0 Existing Wetland Management Priorities and Objectives

Although one of the main purposes of the WPMP is to allow the City to regulate and manage their wetland resources, there are several layers of protection already in place. These regulations may be implemented at the state, local, or federal level, and can come from a variety of agencies and organizations. The following are summaries of some of the main agencies and organizations that may be encountered.

4.1 Minnesota Wetland Conservation Act (WCA)

The WCA was first passed in 1991 and has been subsequently amended as the Act has evolved. The Board of Water and Soil Resources (BWSR) is the lead agency for administering the WCA, and its guidelines are published in Minnesota Rules 8420. The BWSR website posts the most current wetland regulatory information available (http://www.bwsr.state.mn.us/index.html) The intent of the WCA was to achieve no net loss of wetlands in the state. This is achieved by regulating the filling, draining, excavation, and alteration of wetlands within the state. There are some notable exemptions, such as allowing temporary impacts, utility crossings, farming of wetlands, and allowing small impacts to occur (de minimis). If an activity cannot avoid impacts and certain thresholds of impacts are met, creation of new wetland, or restoration of an altered or drained wetland must occur.

The WCA is administered by the Local Government Unit (LGU), which is the City of Burnsville for all areas within the city limits. This authority, within the rules of the WCA, allows the city to regulate wetland impacts and replacement criteria. The city is assisted with the administration of the WCA by a Technical Evaluation Panel (TEP). The TEP is comprised of the LGU, plus representatives of the BWSR, the County Soil and Water Conservation District (SWCD), and the MNDNR. Other agencies and experts may be invited to attend TEP meetings, but are not voting members.

4.2 Minnesota Department of Natural Resources

The Minnesota Department of Natural Resources has regulatory authority of Protected Waters and Protected Water Wetlands, which are identified on the Public Waters Inventory (Figure 3). Public Waters include both Protected Waters and Protected Water Wetlands. Regulatory authority is to all areas below the Ordinary High Water (OHW) elevation of lakes and any area below the top of bank for rivers and streams. If an OHW has not been set, which is often the case for Protected Water Wetlands, the jurisdiction will be the delineated wetland edge.

Within the city, there are eight listed Protected Waters, 36 Protected Water Wetlands, and three waterways, which are also the designated trout streams. Public Waters maps are also available for viewing at the MNDNR's website (http://www.dnr.state.mn.us/waters/watermgmtsection/pwi/maps.html). Work below the OHW or within the channel of a Protected Water may require a permit from the MNDNR. Water appropriations may also require permits depending on the rate and amount of water used. Administration of the MNDNR's regulations is conducted by the Area Hydrologist.

4.2.1 State of Minnesota Buffer Law

State of Minnesota Buffer Law (Minnesota Statutes 2014, sections 103B.101, subdivision 12; 103E.315, subdivision 8; Minnesota Statutes 2015 Supplement, sections 103B.101, subdivision 12a; 103F.48, subdivisions 1, 3, 4, 7, 8, 10 and CHAPTER 85--S.F. No. 2503l 2016 amendments) requires the establishment of either a 50-foot average, 30-foot minimum, continuous buffer of perennial rooted vegetation around all public waters, streams, and public ditches as identified and mapped on a buffer protection map. The buffer protection map is maintained by the Minnesota Department of Natural Resources, through a buffer mapping website (http://arcgis.dnr.state.mn.us/gis/buffersviewer/). The buffer law is administered by the Board of Water and Soil Resources (BWSR), with technical support

for land owners provided by the Dakota County Soil and Water Conservation District. Resources requiring protection under the buffer law are present in the City of Burnsville, but are limited to ten public waters, and four unnamed streams draining into Black Dog Lake. These aquatic resources currently meet the standards of the buffer law, and no action is required to comply with the recently implemented legislation. The current buffer standards incorporated in the Burnsville Surface Water Management Plan exceed the state requirements for the aquatic resources, which protects these resources should adjacent land use change.

4.3 United States Army Corps of Engineers

The USACE regulates filling and excavation of wetlands through Section 404 of the Clean Water Act. It also regulates impacts to navigable waters through Section 10 of the Rivers and Harbors Act, which includes the Minnesota River. The USACE has regulatory authority over any navigable water, and any wetlands hydrologically connected or adjacent to them. Currently, the USACE does not have the authority to regulate isolated wetlands, which are relatively abundant in Burnsville. Future legislative action may change this restriction, however, so care should be taken that regulations in place at the time a project commences be reviewed.

Any impacts, including filling, dredging, or excavation may require a permit from the USACE. Additionally, the USACE also approves wetland delineations, and can participate on a Technical Evaluation Panel. Permitting is conducted through the regulatory branch, and agents are identified on a by county basis. More specific information of the USACE regulatory process can be found at their website (http://www.mvp.usace.army.mil).

4.4 Watershed Management Organizations

Within the city limits are three watershed management authorities including Black Dog Watershed Management Organization, the Lower Minnesota River Watershed District, and the Vermillion River Joint Powers Organization. The former Credit River organization is currently administered through the Black Dog WMO. These organizations may have additional regulatory requirements which must also be complied with for both the surface water and wetland components of the Plan. All of these organizations have management plans and requirements for compliance in their respective areas.

More information on these organizations can be found on their websites

Black Dog WMO - http://dakotacountyswcd.org/watersheds/blackdogwmo/

Lower Minnesota River WD - http://www.watersheddistrict.org/index.html

Vermillion River JPO - http://www.co.dakota.mn.us/CountyGovernment/PublicEntities/VermillionJPO/default.htm

4.5 City of Burnsville

There are numerous planning tools which can be used to implement and guide the land-use and development decision-making process with regard to wetland resources. They can be divided into regulatory and non-regulatory categories. The best strategy is to utilize a combination of planning tools.

4.5.1 Non Regulatory Tools

Non-regulatory planning tools are strategies to protect a resource by obtaining it and choosing not to develop it. These tools are likely to have a more permanent impact than regulatory tools. Rules and regulations may change if the political climate changes, but if a property or its development rights are obtained and it is designated for non-development, it is more likely to remain undeveloped. Listed

below are nine non-regulatory planning tools appropriate for consideration in protecting wetland habitats.

- Outright Purchase
- Purchase of Development Rights
- Grants
- Land Banking
- Land Trusts or Conservancies
- Cooperative Agreements
- Covenants
- Endowments
- Condemnation

4.5.2 Regulatory Planning Tools

Regulatory planning tools are those rules and regulations that are designed to protect adjacent land uses from one another and are intended to be used as a guide on how development should occur. Regulatory planning tools are mandated by government agencies and consist of set rules and procedures that are to be followed. These regulations can be designed to protect and preserve wetlands and other natural areas. A combination of regulatory planning tools is recommended as the best strategy to ensure the preservation of natural areas. Listed below are six different regulatory planning tools that can be used in natural resource preservation.

- Overlay Zoning
- Performance Zoning
- Cluster Development
- Planned Unit Development (PUD)
- Subdivision Regulations
- Dedication

The City of Burnsville is the Local Government Unit (LGU) responsible for implementation of the WCA within the boundaries of the City. The WCA is enforced through Chapter 8 of the City Zoning Code, Environmental Overlay Districts. The Environmental Overlay District ordinance provides for the protection of wetlands and other natural resources, including restrictive and erosive soils, woodlands and shoreland areas.

5.0 Wetland Protection and Management Plan Strategies

It is a priority in the City of Burnsville to preserve and enhance the quality of the natural resources in the community. The following are the policies that will be utilized by the city of Burnsville to preserve and evaluate the community's wetland resources.

- Maintain primary responsibility for managing water resources at the local level but continue coordination and cooperation with other agencies and organizations.
- Establish appropriate protection criteria based on wetland functions and values
- Achieve water quality standards in lakes, streams, and wetlands consistent with their designated uses and established classifications.
- Protect and rehabilitate wetlands to maintain or improve their function and value.
- Minimize soil erosion and sedimentation in wetlands. Improve Water Quality.
- Use GIS and available resources on restorable wetlands to identify likely areas of wetland restoration. Identify opportunities to control invasive species.
- Provide information and educational resources to improve knowledge and promote an active public role in management of water resources.

5.1 Management Standards

Following are the strategies and standards that will be used to protect, preserve, and manage Burnsville's wetland resources. The requirements apply to all areas meeting the regulatory definition of wetland habitat, regardless of their inclusion in this wetland inventory. The classification of wetlands identified outside of this inventory will be calculated using the MnRAM version in use at the time of discovery. A discussion of the MnRAM process and conversion table from MnRAM derived classifications to the City classifications is in Appendix D.

The following management strategies will apply to both new development and redevelopment projects submitted to the City for review and approval. Any wetland habitat on the property to be developed will be subject to the following management standards, as well as the rules and requirements of the Wetland Conservation Act and other City regulations, regardless of the proposed direct or indirect impacts to wetland habitat.

5.1.1 Educational and Cultural Strategies

1. The City will distribute information on pertinent water and wetland management issues via the Burnsville Bulletin. The Bulletin will be the primary source of information to identify opportunities for residents to participate in wetland management activities.
2. The City will make an ongoing effort on both a local and regional level toward educating the public by distributing information to its residents on responsible practices they should employ to protect water resources within the community. The program shall also educate residents on the proper use of fertilizer and lawn chemicals, and the effects of these on wetlands and waters.
3. The City will promote the use of native vegetation to buffer shoreland and wetland fringe habitats.

5.1.2 Regulatory Standards

1. The City of Burnsville will accept the local governmental unit responsibility for wetland management and will protect and manage these wetlands in conformance with the requirements

of the Wetland Conservation Act, as amended, and its associated rules (Minnesota Rules Chapter 8420).

2. The City of Burnsville will utilize the available technical resources of outside agencies, such as the members of the Technical Evaluation Panel, Dakota Soil and Water Conservation District, the Board of Water and Soil Resources, the U.S. Army Corps of Engineers, the Minnesota Department of Natural Resources, and/or the Watershed Management Organizations for review of private developments and City-proposed projects that may affect wetland resources. The City will utilize the U.S. Fish and Wildlife Service, Minnesota Valley National Wildlife Refuge for review of projects that abut the Refuge.
3. The City will utilize the wetland inventory information developed in this Plan to preliminarily identify the general location of wetlands. Project proposers must provide field delineation in accordance with applicable rules and regulations to determine the jurisdictional boundaries of wetlands. The City will only accept delineations completed by a Certified Wetland Delineator, or a wetland delineator that has been preapproved by City staff. A report of the results of the field delineation, including the methodology and findings of the delineation and a printed and electronic copy of the approved delineation boundary will be required. Electronic copies of the coordinates of the delineated boundary shall also be provided either in ascii, cadd, or GPS compatible format.
4. Prior to any site development activities, the City will complete a site inspection to identify the location and extent of any wetlands present. The results of the inspection will be compared to the field delineation data provided by the developer. Protection of wetland functions and values will be provided in accordance with the requirements of this Plan through the City's Wetlands Overlay District Ordinance.
5. Any review of a proposed wetland encroachment will initially address the issue of avoidance and project alternatives. It will be the City's policy that, prior to allowing any wetland encroachment, all reasonable attempts to avoid such alteration must be demonstrated. This avoidance must also consider the reasonableness of the no build alternative. This process is described collectively as sequencing.
6. Sequencing Flexibility, as defined in the Wetland Conservation Act, may be applied to Management Area wetlands. Sequencing Flexibility shall not apply to wetlands classified as Improvement or Protection. Before approved, projects must still demonstrate that efforts have been taken to both avoid and minimize impacts to all wetlands.
7. Replacement for unavoidable wetland impacts will be provided by the developer within the City of Burnsville, and within the same watershed in accordance with the requirements of the Wetland Conservation Act. If wetland mitigation is not possible within the City limits, the replacement wetlands should be located as close to the impacted wetland as possible, preferably within the same watershed. Minimum replacement ratios shall follow those identified in the WCA, but the City may increase the replacement ratios for replacement outside of the City Limits, up to a maximum of 4 to 1
8. Completion of a MnRAM assessment shall be completed on all impacted wetlands to establish the functions and values of that basin. All replacement areas will also require a MnRAM assessment to document that lost functions and values have been replaced. The MnRAM assessments shall be completed by a Certified wetland professional using the most current version of the assessment tool available, and should be submitted with a replacement plan.
9. Credits for non-wetland creation/restoration/preservation (such as upland buffer) will be allowed in accordance with current WCA standards.

10. The City will not allow excavation or other non-filling related alterations to an existing wetland without the expressed written approval of the LGU. Excavation within the boundaries of existing wetlands will be allowed only if the action will not change the use or character of the basin.
11. Excavation within wetlands may be allowed without replacement in basins classified as Management if they are Type 1 or Type 2 wetlands, provided this is consistent with the WCA. Excavation will not be allowed in Type 1 or Type 2 wetlands classified as Improvement or Protection Areas, unless it can be shown that the proposed excavation will improve or enhance the functions and values of the basin. No excavation will be allowed in the permanently or semipermanently flooded portions of Type 3, 4, and 5 wetlands regardless of classification without replacement.
12. Regulation of storm water impacts on wetlands shall be in accordance with the requirements of the Storm Water Management Plan. A summary of the requirements is presented in Appendix E.
13. The City of Burnsville will require the inclusion of oil skimmers in the construction of new pond outlets. The City will add skimmers to the existing system whenever feasible and practical. The designs shall conform to the requirements of the City's Storm Water Management Plan.
14. Buffers of natural vegetation must be maintained outside the wetland boundary in accordance with Table 7. Exceptions to the width of the buffer can be made for Management Areas if the buffer results in a hardship. The presence of a buffer is beneficial to the pollutant and nutrient removal capabilities of all wetlands.

Table 7
Wetland Buffer Requirements

Wetland Classification	Permanent Buffer Strip Average Width (feet)	Minimum Permanent Buffer Zone Width (feet)	Percentage Native Vegetation
Protection	50	30	Entire
Improvement	35	25	Entire
Management	25	20	Majority
Management II	20	20	Majority

15. Erosion and sedimentation control plans shall be reviewed and enforced by the City of Burnsville for all new developments and redevelopments. These plans shall conform to the general criteria set forth by the City's erosion and sediment control ordinance.
16. The City of Burnsville supports the use of wetland banking for the replacement of wetland impacts to Management Area wetlands. Those proposing banking projects are encouraged to locate mitigation banks in those watersheds within the City having lost significant wetland habitat and at sites approved by the City. Restoration of wetland habitat is preferred to wetland creation, when possible. Priorities for wetland banking include the potential restoration sites identified in this plan, interspersion of wetland types, successful revegetation with diverse native species, areas greater than 10 acres in size and position within a watershed that provides needed functions.
17. The City will encourage developers to include wetland improvement as well as wetland protection strategies in proposed development and redevelopment projects.
18. The City will use the potentially restorable wetland areas identified in the Plan to look for future opportunities to restore wetlands. The City will assess opportunities for purchase of vacant properties with restoration or wetland improvement opportunities. Incentive to explore property acquisition may include the need for wetland mitigation or banking for City projects,

identification of a significant resource needing preservation, identification of tax forfeited property, or offer of purchase by the property owner.

19. Annual monitoring of wetland replacement, banking, and improvement projects will be required as specified in the rules of the Wetland Conservation Act. The City will maintain an escrow account for each development or redevelopment project requiring wetland monitoring. A portion of the escrow will be returned to the developer each year upon receipt of the annual report. Any remaining balance in the account will be returned to the developer upon approval of the project by the Technical Evaluation Panel.

5.1.3 Management Strategies

1. The City will observe the strategies of this Plan in the management of public golf course and park and recreational lands, including open space and athletic fields.
2. The City will continue its involvement in the Wetlands Health Evaluation Program (WHEP) and the Minnesota Pollution Control Agency's Citizen Assisted Monitoring Program (CAMP).
3. The City of Burnsville will sweep the streets at least two times annually. Furthermore, future purchases of street sweeping units will give consideration to street sweepers which have the greatest ability to remove nutrients from the streets within the community.
4. The use of open space and overland flow will be encouraged to improve infiltration wherever it is practical and reasonable to do so.
5. The City will clean all sump catch basins or sump manholes at least annually and more often if inspection demonstrates that more frequent clean out is necessary.
6. The City will develop a retention/treatment basin clean out and maintenance plan that will address maintenance to the extent feasible and practical.
7. The wetlands and associated recreational and wildlife habitat opportunities within the areas zoned as Conservancy Districts will continue to be protected to a maximum practical extent.

Appendix E includes a summary of the water quality, hydrologic alteration, and buffer requirements for the wetland management classifications.

6.0 Implementation Plan

The implementation plan summarizes the schedule for recommended actions, as well as the prioritization of administration, inspections, permitting, public involvement and monitoring programs.

6.1 Wetland Management

Table 8 outlines activity steps that are intended to guide the City in achieving the wetland goals of this Plan. Table 8 also shows a list of possible resources available, the measurement system, and a project target date for each of the identified activities.

Table 8
Wetland Implementation Plan

ID	Activity/Project	Resources	Measurement	Schedule
1	Implement the wetland management program	• Wetland inventory • GIS database • Development reviews	• Project review • Implemented projects • New wetland created	Ongoing
2	Maintain Wetland Inventory. Update known changes	• Development projects • MnRAM, GIS Database	• Maintained, updated database	Ongoing
3	Update wetland management ordinance	• Wetland inventory • Wetland Ordinance	• Completed ordinance update	2007
4	Assess wetland restoration and banking opportunities	• Wetland inventory • Plan guidelines • GIS database	• New wetland created	Annually
5	Continue citizen participation and education	• Burnsville Bulletin • Local papers	• Citizen participation • Citizen feedback	Ongoing
6	Review inspection and maintenance of sumps, catch basins, and treatment ponds	• City Staff • GIS database	• Annual NPDES report	Annually
7	Develop summary of wetland guidelines for developers, residents, and city staff	• Plan guidelines	• User feedback	With any Plan revision
8	Sweep streets giving priority to drainage area of Protected class wetlands	• GIS database • City staff	• Number of street sweeps	2 times annually

6.2 Wetland Monitoring

In order to measure the success of the Plan objectives, it is recommended that periodic monitoring be accomplished. Wetlands are not static. Land use changes and landscape level activities will influence the functional status of wetlands. Changes in the amount of surrounding open space, surface water systems, and ground water can lead to changes in wetland bio-diversity, habitat, dominant vegetative cover, and hydrology.

Monitoring is suggested by periodic review of the inventory and evaluation of the functions and values assessment. Monitoring can be facilitated by requiring a MnRAM assessment to be completed on any impacted wetland as part of any project review. This will allow comparison of the classification to the one in the Plan. This will also be useful to measure and ensure that any replacement wetlands adequately replace the lost functions and values, not just the lost wetland area.

A second monitoring program can look at wetlands in more depth than the MnRAM. The City, in partnership with the Dakota County Environmental Education Program, operates a volunteer wetland

monitoring program named the Wetland Health Evaluation Program (WHEP). Burnsville's WHEP program allows citizens to assist in monitoring the health of several wetland areas in the City by sampling and documenting wetland plant, frog, and invertebrate communities. Volunteers are trained in how to gather and document the health assessment information. The city will continue to use the WHEP program to assess the health of the community's wetland resources.

6.3 Amendments to Plan

While the intent of the Plan is to remain as dynamic as possible, there is the potential that portions will require updating before the next major revision. The Plan anticipates this reality, and provides guidelines for amending the plan.

6.3.1 Amendments to Wetland Inventory

The WPMP is intended to be a dynamic and flexible document that will adjust easily to changes in policy and the desires of the City. It is intended that features such as the wetland inventory, wetland boundaries, and other GIS-related features will be reviewed as more accurate data becomes available. For example, an approved wetland delineation should replace the wetland boundary identified in the wetland inventory. The entire inventory will be reviewed for boundary accuracy and to track the status and trends of wetlands a minimum of every 10 years. More frequent review will occur if needed, and can be limited to partial city review if specific areas of interest are identified. Adjustments to wetland boundary, types, and classifications do not require a formal revision to the plan. City staff will be in charge of maintaining the official wetland inventory, which will be the "Wetland Inventory" coverage in the City's GIS database, rather than a hard copy map.

6.3.2 Amendments to Wetland Classifications

As described in the functions and values section, the official inventory classifications will remain Protection, Improvement, and Management, even though more current classification systems have been developed. The decision to maintain the older classifications is based on a comparison of the two methods, and concluded that the older method was similar or even more protective than the classifications generated using the MnRAM. A project applicant, however, can request a change in the classification by appealing the previous classification. The applicant, however, must demonstrate that the current classification is not accurate. This will require submittal of a request to change the classification, and will use the recommended functions and values assessment method in place at the time of the appeal.

For the purposes of the Plan, the protection standards associated with the Protection, Improvement, and Management will remain in effect. If the appeal to accept the MnRAM classification is approved, the standards and requirements will still be used based on the current three class system. Table 9 shows the conversion to be used from MnRAM –derived management class to the Plan management class.

Table 9
Functional Classification Conversion Chart

MnRAM Classification	Plan Classification
Preserve	Protection
Manage 1	Improvement
Manage 2	Management
Manage 3	Management II

6.3.3 Amendments to Policies, Strategies, and Standards

Revision to the plan, policies, and goals require additional review and approval. Amendment requests can be made by any individual, and will initially be reviewed by City staff, which will make a decision as to the completeness and validity of the request. Staff will reply within 30-60 days of a written request to amend the plan, and can respond in one of three ways:

1. Reject the amendment. Staff will reject the amendment if the request reduces, or has the potential to reduce, the Plan's ability to achieve the goals and policies of the Plan, or will result in the Plan no longer being consistent with one or more of the watershed district's plans.
2. Accept the amendment as a minor issue, with minor issues collectively added to the plan at a later date. These changes will generally be clarifications of plan provisions or to incorporate new information available after the adoption of the 2006 Plan. Minor changes will generally be evaluated on the potential of the request to help staff better implement and achieve the goals and policies the Plan. Minor issues will not result in formal amendments but will be tracked and incorporated formally into the Plan at the time any major changes are approved. Adjustments to maintain consistency between the Wetland Plan and other city Plans (i.e. the Surface Water Management Plan, Natural Resources Management Plan) shall be considered minor issues.
3. Accept the amendment as a major issue, with major issues requiring an immediate amendment. In acting on an amendment request, staff should recommend to the City Council whether or not a public hearing is warranted. In general, any requests for changes to the goals and policies or the development standards established in the Plan will be considered major amendments.

Staff will make every attempt to respond to the request within 30-60 days of receiving sufficient information from the requestor. The timeframe will allow staff to evaluate the request internally and gather input from the WD/WMOs and other technical resources, as needed. The response will describe the staff recommendation and which of the three categories the request falls into. The response will also outline the schedule for actions, if actions are needed to complete the requested amendment.

All proposed major amendments must be reviewed and approved by the appropriate Watershed Management Organizations and Water Districts prior to final adoption of the amendments. Staff will review the proposed amendments with the WD/WMOs to determine if the change is a major amendment and if determined to be major amendment, then will assess the ability of the requested amendment to maintain consistency with WD/WMO plans.

Major amendments and the need for a public hearing will be determined by staff. The requestor will be given an opportunity to present the basis for, and intended outcomes of, the request at a public hearing and will be notified of the dates of all official actions relating to the request.

The initiation of a public hearing will allow for public input or input based on public interest in the requested amendment. Council, with staff recommendations, will determine when the public hearing should occur in the process. Consistent with other formal Council actions and based on the public hearing, Council would adopt the amendment(s), deny the amendment(s) or take other action.

Appendix A

Figures

Figure 1 – City Location Map

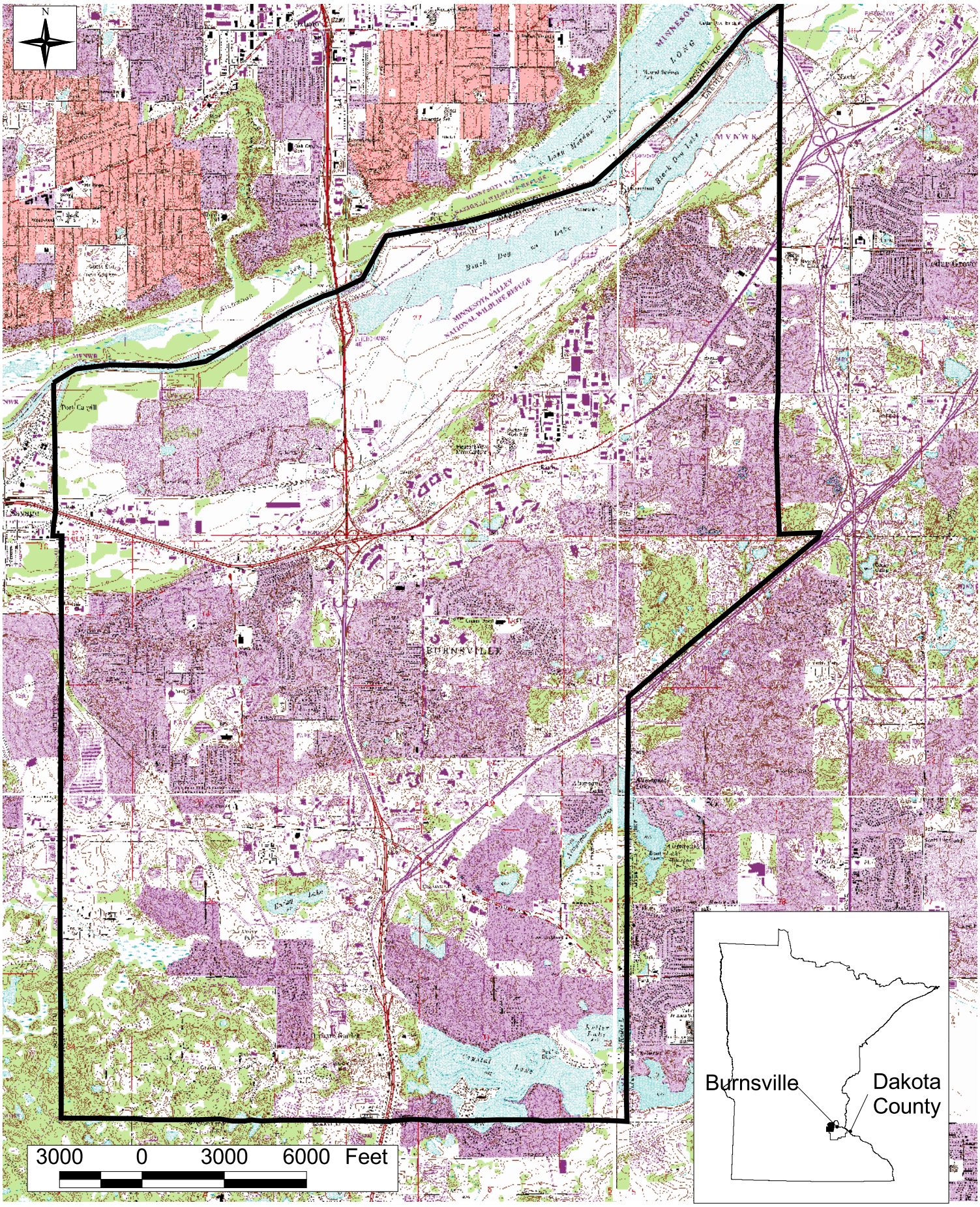
Figure 2 – Watershed Boundaries

Figure 3 – Public Waters Inventory

Figure 4 – National Wetlands Inventory

Figure 5 – Wetland Inventory, Management Classification, and Potential Wetland Restoration/Creation Areas*

*LOCATED IN POCKET FOLDER AT END OF REPORT



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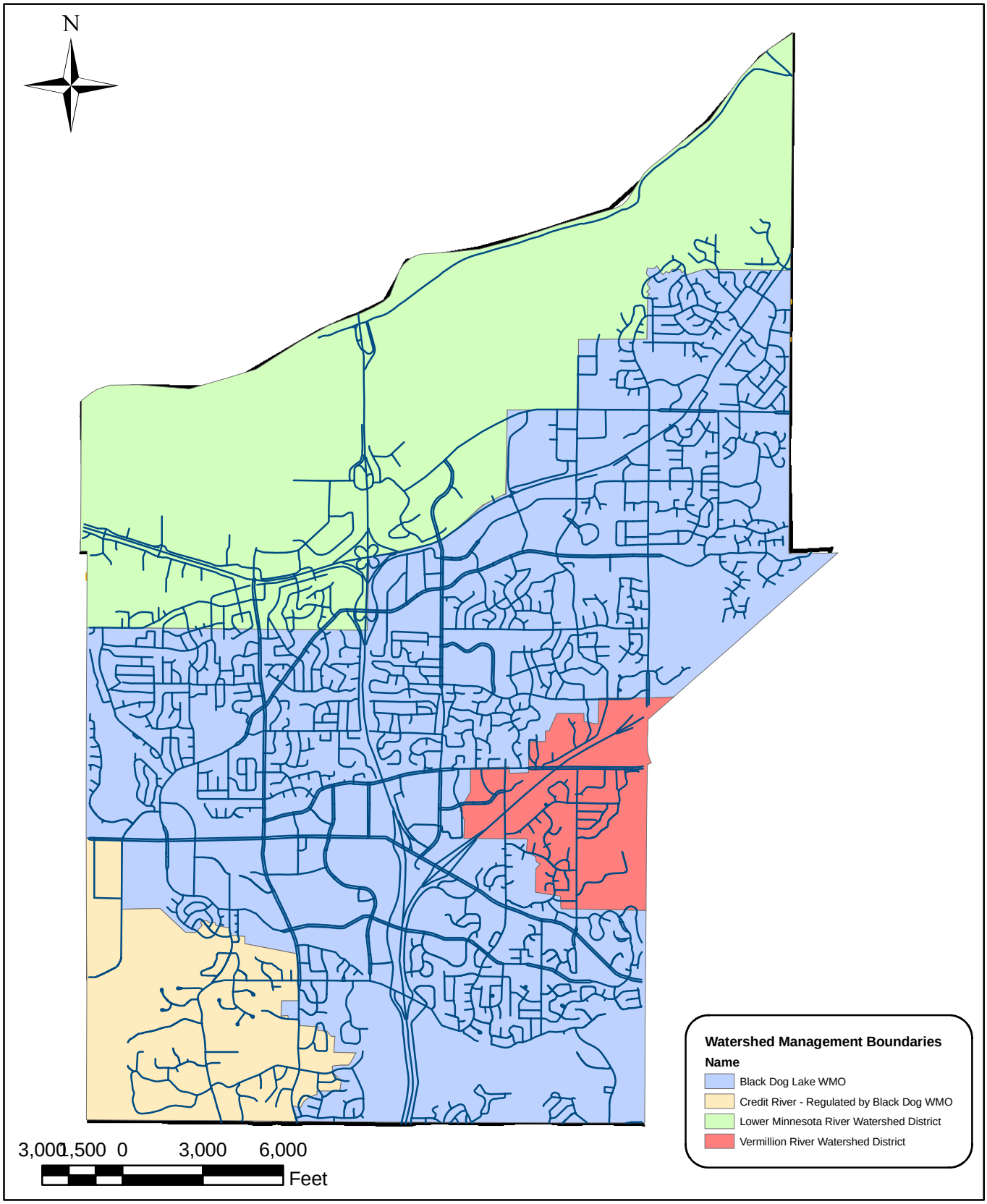
City of Burnsville
USGS Topographic Map

A-BURNS0608.00

Figure 1



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City of Burnsville
Watershed Management Organizations

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Figure 2

Map Document: (C:\temp\8-5x11Port_SEH_Border_Type 1.mxt)
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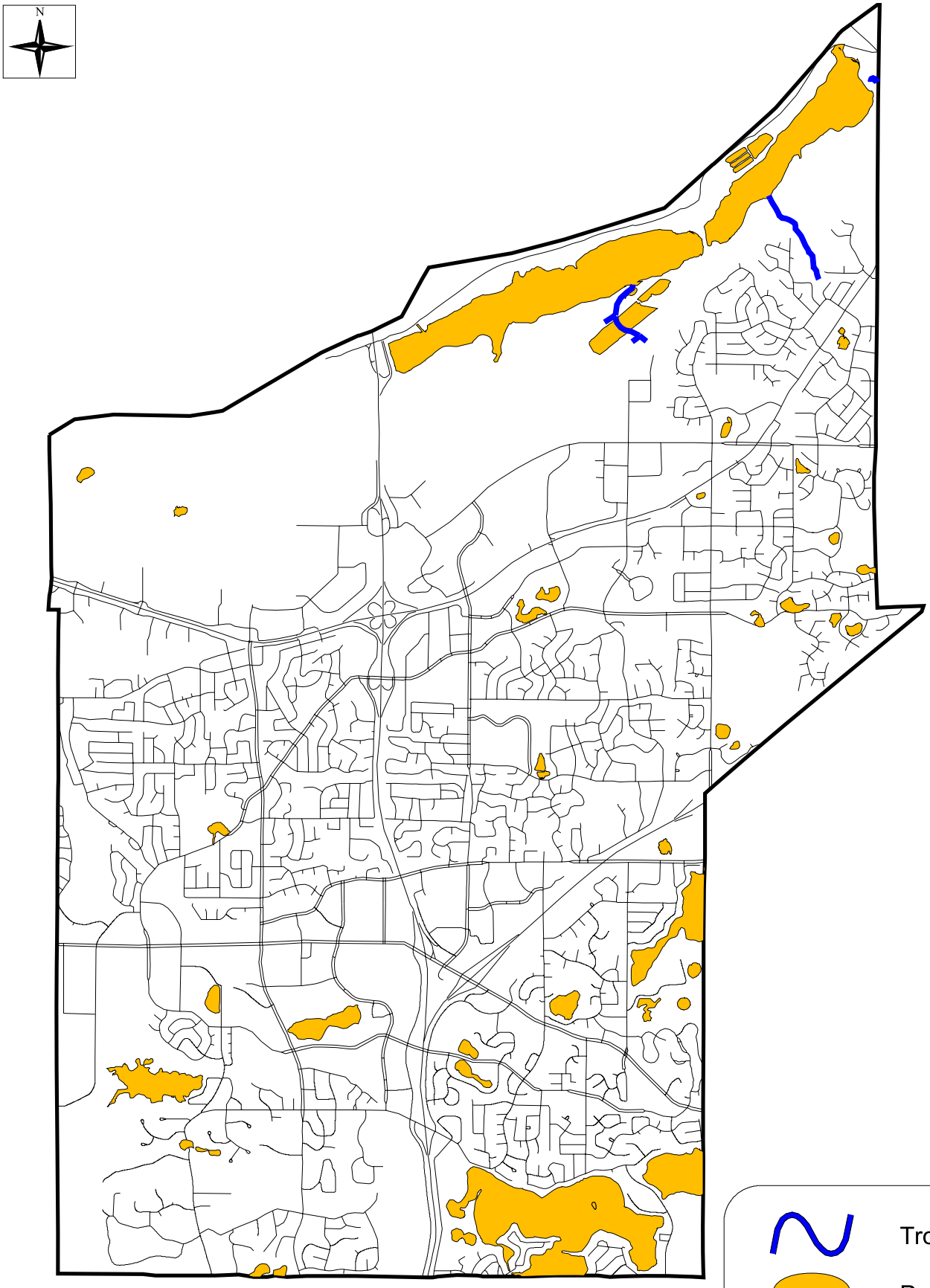

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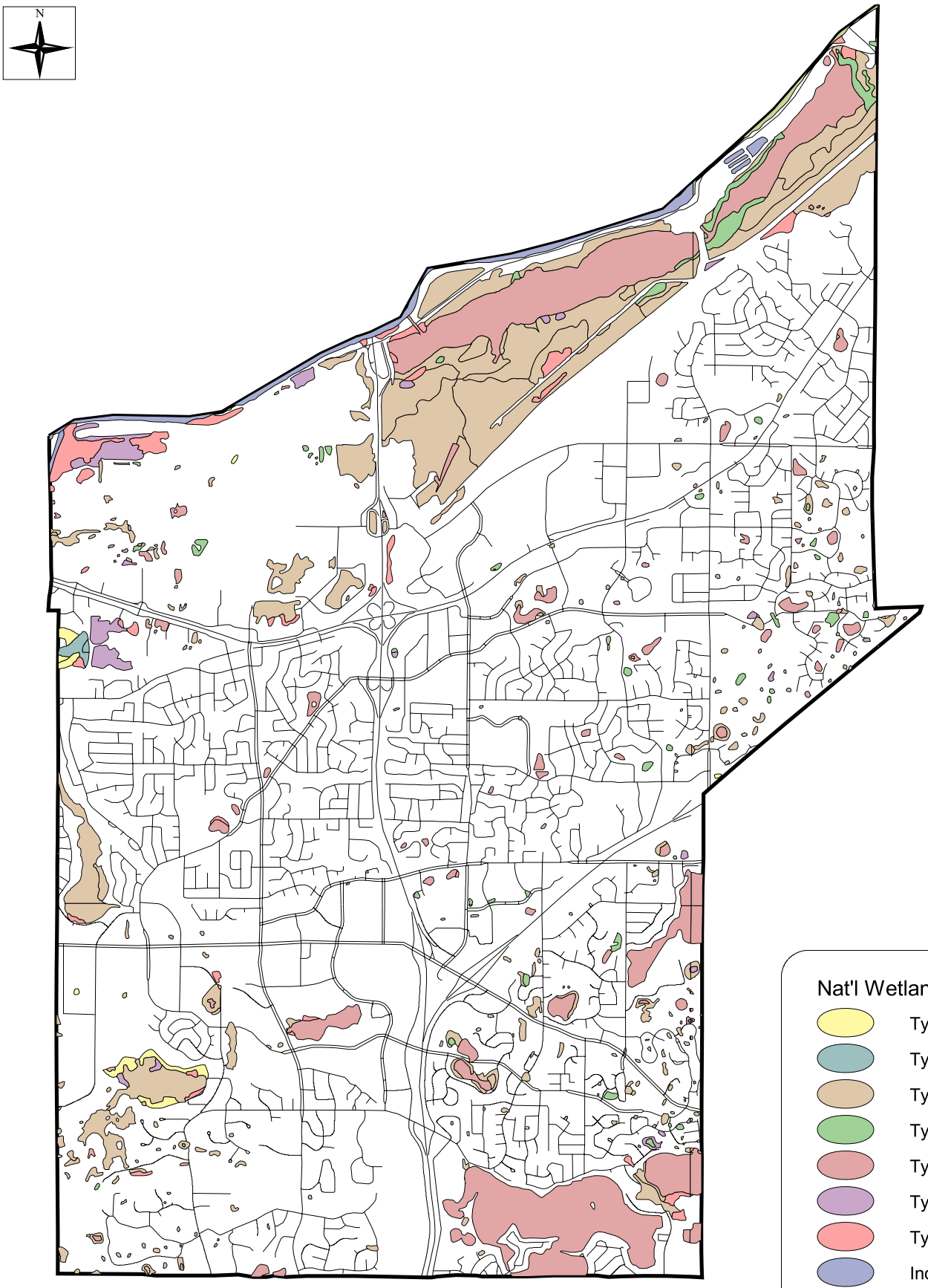
City of Burnsville
Public Waters and Trout Streams

A-BURNS0608.00

Figure 3



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City of Burnsville
National Wetlands Inventory

A-BURNS0608.00

Figure 4

Appendix B

Acronyms and Glossary

Acronyms

BDWMO	Black Dog Watershed Management Organization
BWSR	Minnesota Board of Water and Soil Resources
MNDNR	Department of Natural Resources
GIS	Geographic Information System
GPS	Global Positioning System
LMRWD	Lower Minnesota River Watershed District
MnRAM	Minnesota Routine Assessment Method
MPCA	Minnesota Pollution Control Agency
SCWMO	Scott County Watershed Management Organization
SWCD	Soil and Water Conservation District
SWMP	Surface Water Management Plan
USACE	United States Army Corps of Engineers
VRWJPO	Vermillion River Watershed Joint Powers Organization
WCA	Minnesota Wetland Conservation Act
WHEP	Wetlands Health Evaluation Program
WPMP	Wetland Protection and Management Plan
WD	Watershed District
WMO	Watershed Management Organization

Glossary

Agricultural Land: Any land designated specifically for agricultural production. This may include row crops, pasture, hayland, orchards, or land used for horticultural purposes

Army Corps of Engineers (USACE): The United States Army Corps of Engineers is a regulatory agency involved in design, permitting and construction projects related to or impacting navigable waters of the United States including lakes, waterways and wetlands.

Best Management Practice (BMP): A combination of land use, conservation practices, and management techniques, which when applied to a unit of land will result in the opportunity for a reasonable economic return with an acceptable level of water quality or water quantity improvements.

Bluff: A natural topographic feature such as a hill, cliff, or embankment having the following characteristics: (1) The slope rises at least 25 feet above the toe of the bluff; and (2) The grade of the slope from the toe of the bluff to a point 25 feet or more above the toe of the bluff averages 30 percent or greater; and (3) An area with an average slope of less than 18 percent over a distance for 50 feet or more shall not be considered part of the bluff.

Buffer: The use of land, topography, difference in elevation, space, fences, or vegetation to screen or partially screen a use or property from the vision of another use or property, and thus reduce undesirable influences such as: sight, noise, dust, and other external effects. Also defined as area immediately adjacent to a wetland that is unmowed and/or unmanaged. Buffers are ideally dominated by native vegetation and add to the ecological health of the wetland by adding habitat and assisting and filtering pollutants from surface water runoff.

Buffer Strip: An area of vegetated ground cover abutting a water body that is intended to filter sediment or other pollutants from runoff.

BWSR: Board of Water and Soil Resources. This is the lead regulatory agency that oversees the Wetland Conservation Act in the State of Minnesota.

Circular 39: Wetland classification system developed by United States Fish and Wildlife Service in 1956 that categorizes wetlands in Minnesota into eight types. This is the same classification system generally accepted by the State of Minnesota for wetland classification.

Comprehensive Plan: As defined in Minnesota Statutes 394.21, the policies, statements, goals and interrelated plans for private and public land and water use, transportation and community facilities that guide future development (and growth).

Cowardin Classification: Wetland classification system developed by the United States Fish and Wildlife Service in 1979. This system defines wetlands by a tiered system and is more detailed that the Circular 39 method. The Cowardin System is the classification System used in the National Wetlands Inventory.

Detention: The temporary storage of runoff from rainfall and snowmelt events to control peak discharge rates and provide an opportunity for physical, chemical and biological treatment to occur.

Development: The construction, installation or alteration of any structure, the extraction, clearing or other alteration of terrestrial or aquatic vegetation, land or the course, current or cross section of any water body or water course or division of land into two (2) or more parcels. See also re-development, new development and existing development.

Draining: The removal of surface water or ground water from land.

Easement: A grant of one or more property rights by a property owner for use by the public, a corporation, or another person or entity.

Erosion: The wearing away of land surface and soil by the action of natural elements (wind and/or water).

Eutrophication: Process by which overabundance of nutrients in a waterbody lead to accelerated productivity and general decrease in water clarity and quality.

Existing Development: A property or parcel of land that has previously been subject to development, and that is not undeveloped property.

Exotic Species or Invasive Species: Non-native plants or wild animals that can naturalize, have high propagation potential, are highly competitive for limiting factors, and cause displacement of, or otherwise threaten, native plants or native animals in their natural communities.

Flood: A temporary rise in stream flow or stage that results in inundation of the areas adjacent to the channel or water body.

Flood Frequency: The average frequency, statistically determined, for which it is expected that a specific flood stage or discharge may be equaled or exceeded.

Floodplain: Floodplains are lowland areas adjoining lakes, wetlands, and rivers that are susceptible to inundation of water during a flood. For regulatory purposes, the floodplain is the area covered by the 100-year flood and it is usually divided into districts called the floodway and flood fringe. Areas where floodway and flood fringe have not been determined are called approximate study areas or general floodplain.

Floodplain Forest: Wooded area adjacent to stream or river that is periodically flooded. Within this plan, floodplain forests have been specifically identified as a separate wetland category due to their unique ecology and protection needs.

Floodway: The floodway is the channel of a river or other watercourse and the adjacent land areas which must remain open in order to discharge the 100-year flood.

Forbs: Vegetation that is not a tree, grass or shrub. Usually associated with flowering plants.

Geographic Information System (GIS): Computer database of georeferenced information on the City's various resources.

Global Positioning System (GPS): Network of satellites used to map and identify locations on the earth. Data is used with a portable datalogger called a GPS Unit

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

Hydrophytic Vegetation: Macrophytic plant life growing in water, soil, or a substrate that is at least periodically deficient in oxygen as a result of excessive water content.

Impervious Surface: The portion of the buildable parcel which has a covering which does not permit water to percolate into the natural soil. Impervious surface shall include, but not be limited to, buildings, all driveways and parking areas (whether paved or not), sidewalks, patios, swimming pools, tennis and basketball courts, covered decks, porches, and other structures. Open, uncovered decks are not considered impervious for the purposes of this ordinance. The use of patio blocks, paver bricks or class 5 gravel material are considered impervious surfaces as a majority of water runs-off the surface rather than being absorbed into natural soils underneath. Some exceptions to these conditions may include paver blocks or pavement systems engineered to be permeable with the underlying soils suitable for infiltration.

Infiltration Basin: An impoundment where incoming storm water runoff is stored until it gradually infiltrates into and through the soil of the basin floor.

Infrastructure: Public facilities and services, including transportation, storm water pipes, structures and ponds, water and sewer pipes and structures, telecommunications, recycling and solid waste disposal, parks and other public spaces, schools, police and fire protection, and health and welfare services.

Invasive Species or Exotic Species: Non-native plants or wild animals that can naturalize, have high propagation potential, are highly competitive for limiting factors, and cause displacement of, or otherwise threaten, native plants or native animals in their natural communities.

Local Government Unit (LGU): Agency that has the primary responsibility of administering the Wetland Conservation Act. The City of Burnsville acts as LGU for all wetlands within the City limits and shares responsibility for basins that border adjacent municipalities.

Mesotrophic: Describes a lake of moderate photosynthetic productivity.

MNRAM: The Minnesota Routine Assessment Method as referenced by Minnesota Rules 8420. MNRAM is the primary tool used to assess wetland functions and values on a qualitative basis. The MNRAM evaluates wetlands based on vegetation, wildlife habitat, water quality, flood and storm water attenuation, recreational opportunities, aesthetics, fishery habitat, groundwater interactions, and commercial use. The version referenced in this plan is Version 3.0.

Monotypic: Used to describe vegetation communities in which only one species is present. Most often used to describe areas that are entirely dominated by reed canary grass or cattails.

Navigable Waters. Waters defined by the United States, 33 Code of Federal Regulations Section 329.4 as those waters that are subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.

New Development: Development of a property or portion thereof that is currently undeveloped property.

Ordinary High Water Level (OHWL or OHW): 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 flowage, the ordinary high water level is the operating elevation of the normal summer pool. In Burnsville all of the lakes have an OHW established. For streams and waterways, the OHW is considered the top of bank. Areas below the OHW are under the jurisdiction of the Minnesota Department of Natural Resources and are not regulated by the Wetland Conservation Act.

Protected Water: Any water or wetland designated by the Minnesota Department of Natural Resources and identified by statute on the Protected Waters Inventory.

Public Waters: Those waters of the state identified as public waters or wetlands under Minnesota Statutes, Section 103G.005.

Reach: A hydraulic engineering term to describe a longitudinal segment of a stream or river influenced by the natural or man-made obstruction. In an urban area, the segment of a stream or river between two (2) consecutive bridge crossings would most typically constitute a reach.

Redevelopment: Any development including but not limited to rebuilding, renovation, revision, remodel, reconstruction or redesign of or at an existing development.

Riprap: A combination of large stone, cobbles and boulders used to line channels, stabilize banks, reduce runoff velocities, or filter out sediment.

Runoff (Storm Water): The overland and near surface flow from storm water and snowmelt.

Runoff Conveyance: Methods for safely conveying runoff to a BMP to minimize disruption of the stream network, and promote infiltration or filtering of the runoff.

Sequencing: The process used by the Local Government Unit to evaluate the necessity of an activity impacting a wetland. The party proposing the impact must demonstrate that the activity proposed complies with the following principles in descending order of priority.

Avoids direct or indirect impacts to the wetlands that may diminish or destroy them;

Minimizes the impact to the wetland by limiting the degree or magnitude of the wetland activity and its implementation;

Rectifies the impacts by repairing, rehabilitating, or restoring the affected wetland;

Reduces or eliminates the impact to the wetland over time by preservation and maintenance operations; and,

Replaces unavoidable wetland impacts to the wetland by restoring or, if wetland restoration opportunities are not reasonably available, creating substitute wetland areas having equal or greater public value as provided for under the Wetland Conservation Act.

Shoreland: Land located within the following distances from public waters: one thousand feet (1,000') from the ordinary high water level of a lake, pond, or flowage; and three hundred feet (300') from a river or stream, or the landward extent of a floodplain designated by ordinance on a river or stream, whichever is greater. The limits of shoreland may be reduced whenever the waters involved are bounded by topographic divides which extend landward from the waters for lesser distances and when approved by the Commissioner of the DNR.

Storm Water Treatment: Detention, retention, filtering or infiltration of a given volume of storm water to remove pollutants.

Shoreland Wetland Protection Zone: The land located within 1,000 feet from the Ordinary High Water Elevation of a Protected Water, 500 feet from the Minnesota River or the landward extent of the designated floodplain, and 300 feet from any stream designated in the shoreline management ordinance.

Storm Water: (See Runoff)

Storm Water Treatment Pond: Any waterbody that has been specifically created to remove sediment and nutrients and "treat" surface water runoff. Storm water ponds that were created from existing wetland are still regulated as wetlands. Storm water ponds created from upland areas are not wetland and are exempt from regulatory jurisdiction.

Subwatershed: A subdivision based on hydrology corresponding to a smaller drainage area within a larger watershed.

Technical Evaluation Panel (TEP): A panel of technical professionals from the Board of Water and Soil resources, Carver or Hennepin County Conservation Districts, and a Minnesota Department of Natural Resources representative. Additional members can also be invited, including the U.S. Army Corps of Engineers. The TEP provides decision making support for the LGU for many wetland and regulatory issues.

Upland: General term to describe any area that is not a wetland.

Vegetated Filter Strip: A vegetated section of land designed to accept runoff as overland sheet flow from upstream development. It may adopt any natural vegetated form, from grassy meadow to small forest. The dense vegetative cover facilitates pollutant removal. A filter strip cannot treat high velocity flows; therefore, they have generally been recommended for use in agriculture and low-density development. A filter strip can also be an enhanced natural buffer, whereby the removal capability of the natural buffer is improved through engineering and maintenance activities such as land grading or the installation of a level spreader. A filter strip differs from a grassed swale in that a swale is a concave vegetated conveyance system, whereas a filter strip has a fairly level surface.

Watershed: A topographically defined area within which all runoff water drains to a point.

Wetland: Transitional land between terrestrial and aquatic systems where the water table is at or near the surface or the land is covered by shallow water. For purposes of the plan, wetlands must have a predominance of hydric soil, be inundated or saturated to the surface or groundwater at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in saturated soils; and under normal circumstances supports a prevalence of hydrophytic vegetation.

Wetland Conservation Act (WCA): In 1991 Minnesota adopted the initial Wetland Conservation Act (Minnesota Laws Chapter 354) to protect the states wetland resources. This act has been amended and updated periodically, but is used by reference to the current program, and any future amendments.

Wetland Delineation: The process and procedure by which an area is adjudged a wetland or non-wetland including a determination of the wetland boundary based on the point where the non-wetland areas shift to wetlands or aquatic habitats.

Wetland Mitigation: Wetlands created to replace wetland areas destroyed or impacted by land disturbances.

Wet Pond: A conventional wet pond has a permanent pool of water for treating incoming storm water runoff and a live storage component for flood storage and additional water quality treatment detention (see typical cross section in Appendix D).

Appendix C

Literature Review and Website Links

Literature Review

1. Black Dog Watershed Management Organization. 2002. *Watershed Management Plan*
2. Burnsville, City of, Comprehensive Wetland Protection and Management Plan, 1997.
3. Cowardin, L.M., V. Carter, F.C. Golet, R.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service, FWS/OBS079/31, 103 pp.
4. Eggers, S.D. & D.M. Reed. 1997. Wetland Plants and Plant Communities of Minnesota & Wisconsin. 2nd edition. US Army Corps of Engineers, St. Paul.
5. Lower Minnesota River Watershed District. 1999. *Lower Minnesota River Watershed District Water Management Plan.*
6. Minnesota County Biological Survey Map Series No. 16. Dakota County, Minnesota. 1997.
7. Minnesota Department of Natural Resources Protected Waters and Wetlands Inventory Map, Dakota County, Electronic format.
8. Scott County Comprehensive Water Resource Management Plan, 1994.
9. Shaw, S. and C.G. Fredine. 1956. Wetlands of the United States Circular 39. U.S. Fish and Wildlife Service. U.S. Government Printing Office, Washington, D.C.
10. *Storm -Water and Wetlands: Planning and Evaluation Guidelines for Addressing Potential Impacts of Urban Storm-Water and Snow-Melt Runoff on Wetlands, State of Minnesota*. Storm-Water Advisory Group, June, 1997
11. U.S. Army Corps of Engineers, 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. Waterways Experiment Station, Vicksburg, Mississippi.
12. U.S. Department of the Interior, 1988. National List of Plant Species that Occur in Wetlands: North Central (Region 3). Biological Report 88 (26.3), Fish and Wildlife Service. In cooperation with the National and Regional Interagency Review Panels. Washington, D.C.
13. U.S. Fish and Wildlife Service. 1984. Comprehensive Plan, Minnesota Valley National Wildlife Refuge, Recreation Area and State Trail. U.S. Dept. of the Interior. 187 p.
14. U.S. Fish and Wildlife Service. 2004. Minnesota Valley National Wildlife Refuge and Wetland Management District Comprehensive Conservation Plan. U.S. Dept. of the Interior.
15. Vermillion River Watershed Joint Powers Organization. 2006. Draft Standards

Water Management Agency/Organization Contacts

Numerous agencies and organizations in Minnesota have varying authorities and/or interest in surface water management activities relative to the City's Plan. A summary of these agencies and organizations is listed below with a link to their respective website at the time this Plan was created. More detailed information is available on each web page including contacts and key responsibilities relative to surface water management.

Agency/Organization	**Website Link**
State	
MN Pollution Control Agency	http://www.pca.state.mn.us
MN Department of Natural Resources	http://www.dnr.state.mn.us
Board of Water and Soil Resources	http://www.bwsr.state.mn.us
Local	
City of Burnsville	http://www.ci.burnsville.mn.us
Carver County WMO	http://www.co.carver.mn.us/water
Dakota County	http://www.co.dakota.mn.us
Dakota County SWCD	http://dakotacountyswcd.org
Scott County WMO	http://www.co.scott.mn.us
Watersheds	
Black Dog WMO	http://dakotacountyswcd.org/watersheds/blackdogwmo/
Lower Minnesota River WD	http://www.watersheddistrict.org
Vermillion River JPO	http://www.co.dakota.mn.us/CountyGovernment/PublicEntities/VermillionJPO/default.htm
Federal	
U.S. Army Corps of Engineers	http://www.mvp.usace.army.mil
U.S. Environmental Protection Agency	http://www.epa.gov/
Natural Resources Conservation Service	http://www.nrcs.usda.gov

Appendix D

Summary Of MNRAM 3.0 Methods And Classifications

Currently, most wetland functions and values assessment are completed using the most recent version of MnRAM, which is version 3.0. While the same functions and values are measured, the current version specifically measures the following functional criteria:

The functional criteria that are evaluated in the MnRAM are:

- Maintenance of Characteristic Vegetative Diversity/Integrity
- Maintenance of Hydrologic Regime
- Flood/Storm water Attenuation
- Downstream Water Quality
- Maintenance of Wetland Water Quality
- Shoreline Protection
- Maintenance of Characteristic Wildlife Habitat Structure
- Maintenance of Characteristic Fish Habitat
- Maintenance of Characteristic Amphibian Habitat
- Aesthetics/Recreation/Education/Cultural
- Commercial Uses
- Ground Water Interaction

Additional Evaluation Information

- Restoration Potential
- Sensitivity to Storm Water & Urban Development
- Additional Storm Water Treatment Needs

As described in the functions and values section, the official inventory classifications will remain Protection, Improvement, and Management, even though more current classification systems have been developed. The decision to maintain the older classifications is based on a comparison of the two methods, and concluded that the older method was similar or even more protective than the classifications generated using the MnRAM. A project applicant, however, can request a change in the classification by appealing the previous classification. The process to request an appeal is described in Section 4 Part D. The applicant, however, must demonstrate that the current classification is not accurate. This will require submittal of a request to change the classification, and will use the current system, which is the MnRAM.

For the purposes of the Plan, the protection standards associated with the Protection, Improvement, and Management will remain in effect. If the appeal to accept the MnRAM classification is approved, the standards and requirements will still be used based on the current three class system. Table 12 shows the conversion to be used from MnRAM –derived management class to the Plan management class

The remainder of this appendix describes the MnRAM-derived classification system and how it compares to the Plan classification.

The Board of Water and Soil Resources (BWSR) has established recommended guidelines for classifying and managing wetlands based on the result of the MnRAM analysis. The BWSR guidelines provide two classification standards based on wetland recommendations and in compliance with the WCA, state water quality standards, and multiple wetland management plans. Suggested classifications are either Basic Protection or Increased Protection, with the local authority determining which level of protection is most appropriate. Both standards are illustrated in the following flowcharts, although the City has selected to use the Basic Protection Standard. The Increased Protection Standard will remain for reference purposes, and may be used as an alternative if an additional level of protection is warranted.

The Basic Protection Standard is the minimum recommended to satisfy no net loss goals, protect critical resources, and allow for use of some wetlands in developing areas. The increased Protection Standard will include more wetlands in the Preserve category that would otherwise be considered Manage 1. This has the net effect of protecting more wetlands with higher standards.

Using the system recommended by BWSR, each wetland will be classified into one of four categories: Preserve, Manage 1, Manage 2, or Manage 3. The Preserve category is for exceptional and highest-functioning wetlands, or those sensitive wetlands receiving conveyed storm water runoff that have yet retained a medium level of vegetative diversity/integrity. These wetlands are those that should be preserved in (or improved to) their most pristine or highest functional capacity with wide, natural buffers, in perpetuity.

In the Manage 1 category are high-quality wetlands that should be protected from development and other pressures of increased use, including indirect effects. Maintaining natural buffers will help to retain the significant function these wetlands provide. In the event that impacts to these wetlands cannot be avoided, replacement ratios for mitigation should exceed the state-required minimums. Manage 2 wetlands provide medium functional levels and the wetland extent should be maintained. These wetlands often provide optimal restoration opportunity. Manage 3 wetlands have been substantially disturbed and have the lowest functions and values.

1. Preserve

This is comparable to the Protection classification used in the Plan.

Wetlands classified as Preserve have at least one of the following characteristics.

- Are identified as Critical Resources
- Wetlands rated with exceptional vegetative diversity/integrity, which may include wetlands with natural communities not significantly impacted by invasive species or other human-induced alterations, wetlands harboring endangered or threatened plant species, or rare wetland habitats classified as imperiled (S1) or critically imperiled (S2) by the state rankings.
- Wetlands rated as exceptional for wildlife habitat. These include wetlands known to harbor endangered or threatened animal species, rare communities, or wildlife refuges and fish and wildlife management areas whose purpose is maintaining suitable habitats for wildlife.
- Wetlands rated as high for amphibian habitat.
- Wetlands rated as exceptional for fish habitat. These wetlands include those specifically managed for fish management; designated trout streams, lakes or adjacent wetlands; and known spawning habitat for game fish.

- Wetlands rated high for shoreline protection. Wide wetlands bordering lakes and feeder streams that have persistent, emergent, submergent, or floating-leaved vegetation are critical to protecting the water quality of the lakes from bank erosion and sedimentation from upstream.
- Wetlands rated exceptional for aesthetics/education/recreation/cultural and rated high for wildlife habitat, include those located on public lands that provide a unique or rare recreational, educational, or cultural opportunity, and have high functional level for wildlife since that is typically a primary focus for users.
- Wetlands that are exceptionally sensitive to storm water impacts and have a vegetative diversity/integrity rating of medium or higher were also placed in this category. These wetlands may have suffered some degradation from human influences due to their heightened sensitivity. The vegetative quality of the wetland is such that improved management may allow for restoration of the community.
- Wetlands with a high vegetative diversity/integrity rating and a high rating for wetland water quality. The vegetative community in these wetlands typically has been only slightly affected by humans and still maintains high functioning to maintain water quality, which is critical to wetland sustainability.
- Wetlands with a high vegetative diversity/integrity rating and a high rating for hydrologic regime. The vegetative community in these wetlands typically has been only slightly affected by humans and still maintains high functioning levels for hydrologic regime, which is critical to wetland sustainability.

2. Manage – 1

This classification is comparable to the Improvement class in the Plan

Wetlands classified as Manage 1 have at least one of the following characteristics:

- Wetlands rated with high vegetative diversity/integrity, which typically include diverse wetland plant communities with less than 20 percent cover of non-native or invasive species.
- Wetlands rated as high for wildlife habitat. These generally include wetlands located within large tracts of undeveloped land or in parks, which allow for wide high quality upland buffers. In addition, this includes seasonal wetlands that are well buffered.
- Wetlands rated as medium for amphibian habitat. This includes seasonal wetlands that are well buffered.
- Wetlands rated as high for fish habitat. These wetlands are lacustrine/riverine or are contiguous with a permanent waterbody or watercourse and provide spawning/nursery habitat, or refuge for native fish species in adjacent lakes, rivers or streams.
- Wetlands rated medium for shoreline protection. These wetlands include those that are moderately wide and support persistent emergent, submergent, or floating-leaved vegetative cover bordering lakes and feeder streams.
- Wetlands rated high for aesthetics/education/recreation/cultural and medium for wildlife habitat, include those that provide a number of benefits that may include: spatial buffering, accessibility, public ownership, multiple recreational opportunities, and medium-quality wildlife habitat.
- Wetlands which are highly sensitive to storm water impacts and have a vegetative diversity/integrity rating of medium or high. The vegetative quality of the wetland is such that improved management may allow for restoration of the community.

- Wetlands with a medium vegetative diversity/integrity rating and a high rating for wetland water quality. The vegetative community in these wetlands has only been moderately affected by humans and still maintains high functioning levels for water quality, which is critical to wetland sustainability. These wetlands would likely benefit from active management.
- Wetlands with a medium vegetative diversity/integrity rating and a high rating for hydrologic regime were placed in the Manage 1 category. The vegetative community in these wetlands has only been moderately affected by humans and still maintains high functioning levels for hydrologic regime, which is critical to wetland sustainability. These wetlands would likely benefit from active management.
- Wetlands rated high for commercial use. These wetlands provide important social value without having an altered hydrology.

3. Manage – 2

This is comparable to the Protection classification used in the Plan.

Wetlands classified as Manage 2 have at least one of the following characteristics:

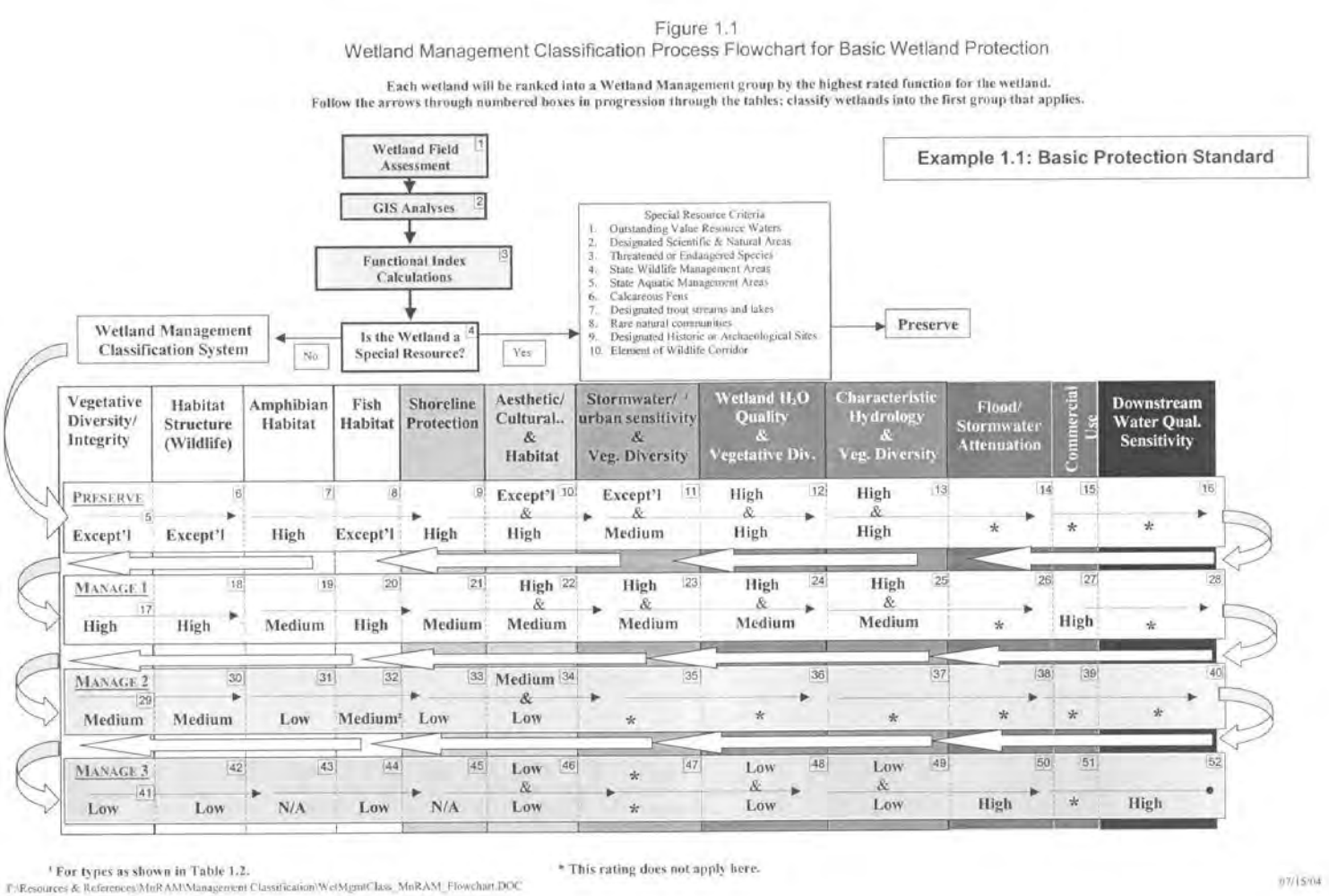
- Wetlands rated with medium vegetative diversity/integrity, which typically include wetlands with less diversity and up to 50 percent cover of non-native or invasive species.
- Wetlands rated as medium for wildlife habitat. These often include wetlands that are increasingly separated from natural communities and wildlife corridors; they often lack significant upland buffers and are increasingly altered.
- Wetlands rated as low for amphibian habitat. These wetlands are increasingly altered, but they still have some opportunity to provide either breeding, over wintering, or resting habitat for amphibians.
- Wetlands rated as medium for fish habitat. These wetlands include those which are intermittently connected to waterbodies supporting native fish populations
- Wetlands rated low for shoreline protection. While these wetlands are not providing the highest level of protection to the lake or river systems, their mere presence provides some level of protection that should not be dismissed. These wetlands are typically narrow, with little emergent, submergent, or floating-leaved vegetation.
- Wetlands rated Medium for aesthetics/education/recreation/cultural and Low for wildlife habitat.

4. Manage – 3

Wetlands classified as Manage 3 include all of the remaining wetlands that did not fit into any of the above-described conditions. All of these wetlands would rate low for vegetative diversity/integrity. Many of these wetlands rate medium or high for downstream water quality protection and for flood storage/attenuation. This correlation is expected since wetlands that provide higher levels of water quality treatment and runoff/rate control often suffer from ecological degradation.

Flow Sheets used to identify the MnRAM-derived management classification are included on the following pages.

Figure 1.1
Wetland Management Classification Process Flowchart for Basic Wetland Protection



[1] For types as shown in Table 1.2.

* This rating does not apply here.

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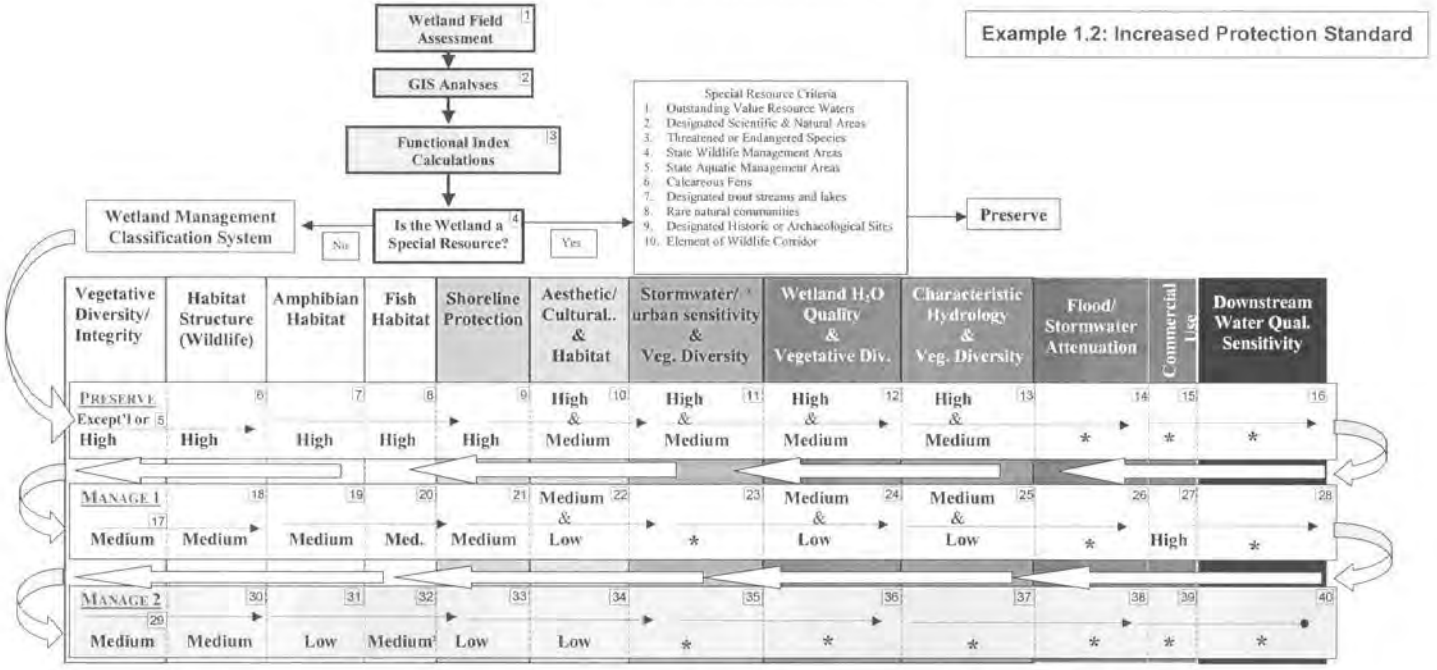
07/15/04

Figure 1.2
Wetland Management Classification Process Flowchart for Increased Wetland Protection

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.



[1] For types as shown in Table 1.2.

* This rating does not apply here.

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Appendix E

Summary of Wetland Protection and Management Policies

Summary of Proposed Wetland Management Categories and Strategies

Management Class	Management Strategy	Storm Water Treatment	Minimum Buffer	Mitigation Standard	Hydrologic Guidelines
Protection	Maintain wetland and existing functions, values and wildlife habitat. Possible need for active management of wetland to protect unique features. Apply strict avoidance standards. May be appropriate to develop a conservation easement.	New Development - Treatment to 90% TSS removal, 60% TP removal, 1.0 inch infiltration volume where allowed Redevlopment - Treatment to 70% TSS removal, 30% TP removal, 0.5 inch infiltration volume where allowed Rate controls - no increase from existing conditions for 1 or 2, 10 and 100 year events Storm water modeling needed if more than 5,000 square feet of new impervious or more than one half acre disturbed See Water Resources Management Plan for more detailed design criteria	50 feet Require monuments to mark buffer edge.	WCA minimum or greater replacement ratio with documented replacement of functions/values. Consider requiring buffer replacement. Emphasis on replacement within watershed	**If isolated or currently not receiving storm water:** Maintain existing hydrology—divert increased flows. **If flow-through or currently receiving discharge** *Bounce (10 yr)*: Existing + 6” *Inundation (1 & 2 yr):* Existing plus 1 days *(10 yr)*: Existing plus 3 days *Outlet Control*:[3] No Change
Improvement	Maintain wetland without degrading existing functions, values and wildlife habitat. Apply WCA sequencing process.		35 feet Require monuments to mark buffer edge.	WCA minimum or greater replacement ratio. Emphasis on replacement of functions and values on-site	*Bounce (10 yr)*: Existing + 9" *Inundation (1 & 2 yr):* Existing plus 3 days *(10 yr)*: Existing + 5 days *Outlet Control*:[2] No Change
Management	Maintain wetland footprint. Improve wetland biological and plant community diversity/integrity or enhance other functions if possible. Apply WCA sequencing process. Consider for restoration. Consider sequencing flexibility with justification		25 feet Require monuments to mark buffer edge.	WCA minimum or greater replacement ratio. Emphasis on replacement of functions and values on site if possible. Allow sequencing flexibility if MnRAM 3.0 data supports Manage 3 Classification	*Bounce (10 yr)*: Existing + 12” *Inundation (1& 2 yr):* Existing plus 5 days *(10 yr):* Existing + 15 days *Outlet Control*: [2] 0 to 2.0 ft above existing outlet
Management II	Maintain storm water treatment	Pretreatment required, minimum of grit removal, required to existing storm water ponds that have capacity for the contributing area	20 feet	May be subject to WCA, Allow sequencing flexibility	See Water Resources Management Plan for more detailed design criteria

Legend

Stormwater Features (139)

2006 Wetland Inventory

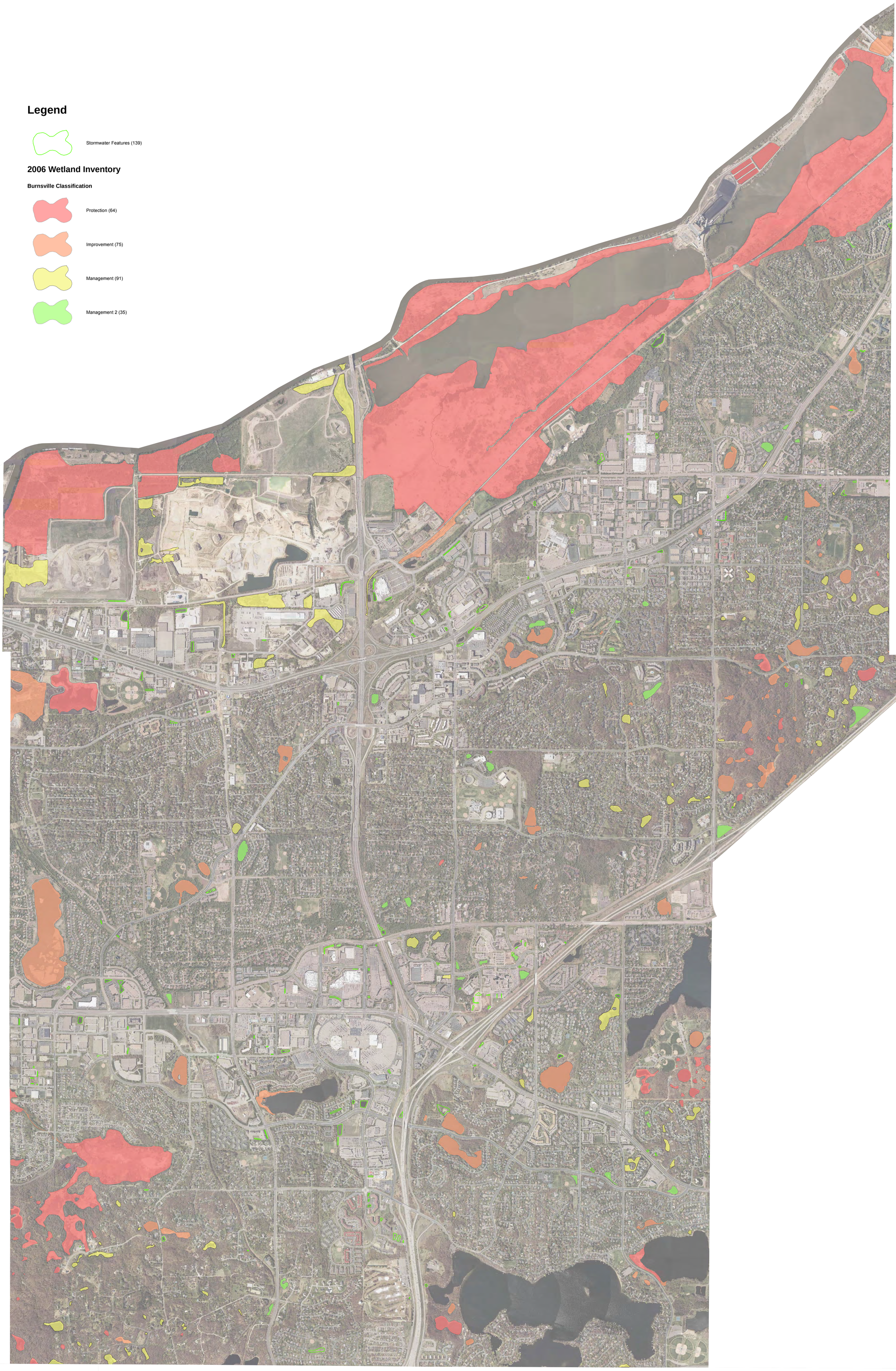
Burnsville Classification

Protection (64)

Improvement (75)

Management (91)

Management 2 (35)



Path: S:\AE\B\Burns\135090\69_GIS\MXDs\Figure\Nature\Mammals.mxd

SEH

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www.sehinc.com

Project: BURNS 135090
Print Date: 11/6/2017

Map by:
Projection: NAD 1983 UTM Zone 15N
Source:

Wetland Classification Map

Wetland Protection and Management Plan
BURNSVILLE, MINNESOTA

Figure 5

This map is neither a legally recorded map nor a survey map and is not intended to be used as one. This map is a compilation of records, information, and data gathered from various sources listed on this map and is to be used for reference purposes only. SEH does not warrant that the Geographic Information System (GIS) Data used to prepare this map are error free, and SEH does not represent that the GIS Data can be used for navigational, tracking, or any other purpose requiring exacting measurement of distance or direction or precision in the depiction of geographic features. The user of this map acknowledges that SEH shall not be liable for any damages which arise out of the user's access or use of data provided.

City Of Burnsville

Appendix J – Water Resources Management Plan

November 2017

Water Resources Management Plan

Burnsville, Minnesota

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November 6, 2017

SEH
Building a Better World for All of Us®
Engineers | Architects | Planners | Scientists

Water Resources Management Plan
Burnsville, Minnesota

SEH No. BURNS135090

November 6, 2017

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Executive Summary

Purpose and Need

The primary purposes of this Plan is to meet regulatory requirements and to protect and improve surface and ground water resources within the City. There are two primary programs that establish the regulatory need to update the City's Water Resources Management Plan (WRMP or Plan). First, Minnesota Statutes, Sections 103B.201 to 103B.255 and Minnesota Rule, Chapter 8410 comprise the State's Metropolitan Surface Water Management Program (MSWMP). These Statutes and Rules require the preparation of watershed plans by watershed management organizations (WMOs) and the preparation of local (City) water management plans. The City is located within the jurisdiction of three local WMOs including: Black Dog Watershed Management Organization (BDWMO), Lower Minnesota River Watershed District (LMRWD), and Vermillion River Watershed Joint Powers Organization (VRWJPO). These organizations are critical partners in the implementation of the City's overall surface water management program.

In July of 2015, the Minnesota Rules, Chapter 8410 was amended which made significant changes in the timing of local water management plan revisions. Local water management plans must be revised once every ten years in alignment with the local comprehensive plan schedule. The current round of local comprehensive plan updates are due by December 31, 2018. Therefore, all cities and towns in the seven-county metropolitan area must complete and adopt their local water plan between January 1, 2017 and December 31, 2018. Upon adoption by Council, this 2017 WRMP becomes part of the City's overall 2040 Comprehensive Plan.

The second regulatory program, very much related to the goals, policies and standards of this Plan, is the National Pollutant Discharge Elimination System (NPDES) Phase II Stormwater Permit Program for Municipal Separate Storm Sewer Systems (MS4) that is administered in the State by the Minnesota Pollution Control Agency (MPCA). The goals, policies and standards of this plan were developed to be consistent with the requirements of the City's NPDES MS4 permit and associated Surface Water Pollution Prevention Plan (SWPPP) as well as the respective WMO plans. The implementation program included in this plan and the SWPPP are intended to be a coordinated effort to realize combined efficiencies.

Building on Past Success

The City's first comprehensive drainage plan was completed in 1966. In 1994, the City completed its first Comprehensive Stormwater Management Plan. Through the 1994 plan, the City formalized a policy of using natural ponds and wetlands as part of the stormwater drainage system. The City completed its second generation plan in 2002 which focused on addressing water quality and quantity (flooding) issues. The third generation plan was completed in 2008 and provided updates to the water quality goals and development design standards. In 2014, the third generation plan was amended with a minor update again focusing on development design standards and updating precipitation frequency estimates published in Atlas 14. These past Plans have established the foundation for addressing numerous flooding and erosion problems, efficiently improving water quality in City water and implementing development standards that are reasonable and effective.

The following projects and accomplishments are just a few of the dozens of projects and actions that the City has completed in the past 15 years to improve water quality, reduce flooding and achieve the City's water resources goals.

- Removal of Earley Lake from the 303(d) Impaired Waters List in 2011.
- Completion of improvements in the Northeast Burnsville area to address widespread flooding issues that occurred in July 2000.
- Construction of Yellow Freight Regional Pond to provide treatment of previously untreated runoff and treatment capacity for future development and redevelopment in the contributing area.

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- Black Dog Slope Failure Repair to replace a failed corrugated metal pipe (CMP) and related major ravine erosion problem as part of the City's CMP pipe replacement program.
- Developing and distributing materials and holding numerous educational and public information activities on a wide range of water resources related topics.

Looking Forward

This 10-Year Plan continues to build on the impressive foundation of water resources work completed by the City over the past decades. In the 2002 Plan, the primary focus was water quantity (or addressing flooding) following the extreme rainfall event in July of 2000. Water quality was a close second and had been the top public priority in 1999 and early 2000, prior to July 2000. Today water quality dominates the discussion and the evolution of the NPDES MS4 Permit Program also places an expectation and requirements on the City to continue to make improvements in water quality.

In addition to water quality, public input during the planning process focused on concerns with managing aquatic vegetation. A range of weather and other factors in 2016 created the perfect storm in some ways for significant aquatic vegetation and algae issues in Burnsville's water bodies. The City will continue to provide technical support of landowners, complete vegetation management on selected waters, develop improved educational materials and access to information on required permits what landowners can do and permits they may need to complete those activities. The City has updated it Aquatic Plant Management Policy as part of this Plan update and will be preparing management plans for each of its lakes.

Implementation Program and Funding

The implementation plan includes identification and prioritization of capital improvements, administration, maintenance and inspections, permitting, plan amendments, financing alternatives, public involvement and monitoring programs. Prioritization of improvements was based on a review of all recommended actions.

The Implementation Plan is not a hard and fast commitment to complete each and every activity in the time frame suggested. Rather, it is a suggested course of action that will accomplish the major goals of this plan, to accommodate growth in the community while protecting and improving Burnsville's water resources. The Implementation Plan should be reviewed on an annual basis. At that time, each proposed improvement is to be reconsidered, City budgets adjusted, and additional improvement projects or management activities added to or removed from the program. The City Council is required to specifically approve a project or budget prior to making the funds available for the project or activity.

Table of Contents

Title Page
Executive Summary
Table of Contents

Page

1.0 Introduction 1
1.1 History 1
1.2 Purpose 2
1.3 Watershed Organizations 2
1.3.1 Vermillion River Watershed Joint Powers Organization 3
1.3.2 Black Dog Watershed Management Organization 3
1.3.3 Lower Minnesota River Watershed District 4
2.0 Physical Environment and Land Use 4
2.1 Topography 5
2.2 Soils 5
2.3 Geology and Groundwater Resources 6
2.3.1 Surficial Aquifers 7
2.3.2 Bedrock Aquifers 7
2.4 Climate and Precipitation 8
2.5 Surface Water Resources 10
2.5.1 Public Waters 11
2.5.2 Metropolitan Council Priority Lakes 11
2.5.3 Wetlands 11
2.5.3.1 Burnsville Wetland Inventory 13
2.5.4 Major Waterbodies 15
2.5.4.1 Lake Alimagnet 15
2.5.4.2 Crystal Lake 16
2.5.4.3 Earley Lake 17
2.5.4.4 Horseshoe Lake 17
2.5.4.5 Keller Lake 17
2.5.4.6 Lac Lavon 18
2.5.4.7 Sunset Pond 19
2.5.4.8 Twin Lake 20
2.5.4.9 Wood Pond 21
2.5.5 Water-based Recreation Areas 21
2.6 Stormwater 21
2.6.1 Watersheds and Drainage Areas 21
2.6.2 Discharge, Storage Areas, and Floodplains 22
2.7 Pollutant Sources 23
2.8 Natural Resources 23
2.8.1 Natural Communities and Rare Species 24
2.8.2 Trout Streams 24
2.8.3 Fens 25
2.8.4 Greenways and Corridors 26

Table of Contents (Continued)

2.8.5 Resource Management Units 26
2.9 Land Use 27
2.9.1 Land Development Density 27
2.9.2 Minnesota Valley National Wildlife Refuge, Recreation Area and State Trail 28
2.9.3 Southwest Burnsville 28
3.0 Goals and Policies 29
3.1 Goal 1: Water Quality 29
3.2 Goal 2: Water Quantity 31
3.3 Goal 3: Erosion Prevention and Sediment Control 33
3.4 Goal 4: Wetland Management 34
3.5 Goal 5: Public Participation, Information and Education 35
3.6 Goal 6: Monitoring 36
3.7 Goal 7: Maintenance and Inspection 38
3.8 Goal 8: Recreation, Fish, and Wildlife 39
3.9 Goal 9: Groundwater Protection 40
3.10 Goal 10: Regulatory Responsibilities 42
3.11 Goal 11: Finance 43
3.12 Goal 12: Land Use Management 44
4.0 Resolved Issues & Past Project Examples 47
4.1 Yellow Freight Pond 47
4.2 Black Dog Slope 47
4.3 Earley Lake 48
4.4 Northeast Burnsville flooding prevention 49
5.0 Assessment of Current Issues 50
5.1 Water Quality 50
5.1.1 Impaired Waters 51
5.1.2 Pollution Prevention 52
5.1.2.1 Street Sweeping 52
5.1.2.2 Ice Control Priorities 52
5.1.2.3 Fertilizer Application 52
5.1.2.4 Animal Waste 53
5.1.3 NPDES MS4 Permit 53
5.1.3.1 Anti-degradation Assessment 54
5.1.4 Individual Sewage Treatment Systems 54
5.1.5 Subwatershed Assessments 54
5.1.5.1 Alimagnet Lake Subwatershed 54
5.1.5.2 Crystal Lake Subwatershed 55
5.1.5.3 Earley Lake Subwatershed 56
5.1.5.4 Keller Lake Subwatershed 56
5.1.5.5 Twin Lake Subcatchment 57
5.1.5.6 Sunset Pond Subcatchment 57
5.1.5.7 Wood Pond Subcatchment 57
5.2 Flooding 58
5.2.1 River Hills/ Northeast Burnsville 58
5.2.2 Keller-Crystal-Twin-Earley Lake System 59

Table of Contents (Continued)

5.2.2.1 Keller Lake 59
5.2.2.2 Crystal Lake 59
5.2.2.3 South Twin Lake 59
5.2.2.4 Earley Lake 60
5.3 Recreation, Wildlife, and Habitat 60
5.3.1 Goose Control 60
5.3.2 Aquatic Plant Management 61
5.3.2.1 Permitting 61
5.3.2.2 Chemical Control of Aquatic Plants Near Shore 62
5.3.2.3 Controlling Algae and Excess Vegetation in Lakes 62
5.3.2.3.1 Alum Treatment 62
5.3.2.3.2 Copper Sulfate 62
5.3.2.4 Weed Harvesting 62
5.3.2.5 Aeration 62
5.3.3 Aquatic Invasive Plant Species 63
5.3.3.1 Purple Loosestrife 63
5.3.3.2 Eurasian Watermilfoil 63
5.3.3.3 Curly-leaf Pondweed 64
5.4 Erosion and Sedimentation 65
5.4.1 Sediment Resuspension 65
6.0 Assessment of Emerging/Future Issues 67
6.1 Invasive Species 67
6.1.1 Zebra Mussels 67
6.2 Groundwater Sustainability 68
6.3 Climate Change 68
6.4 Maintenance of the Stormwater System 68
6.4.1 Removal and Disposal of Accumulated Sediment 68
6.4.2 Environmental Manhole Cleaning 69
6.4.3 Stormwater Facility Maintenance Agreements 69
7.0 Implementation Program and Funding 70
7.1 Funding Sources 73
7.1.1 Ad Valorem Tax 75
7.1.2 Special Assessments 75
7.1.3 User Charges or Stormwater Utilities 75
7.1.4 Grants 75
8.0 Amendment Process 77
8.1 Request for Amendments 77
8.2 Staff Review 77
8.3 Council Consideration 78
8.4 Public Input and Council Approval 78
8.5 Agency Review Process 78
8.5.1 Metropolitan Council and Dakota County Review 78
8.5.2 Watershed Organization Approval 78
8.6 Council Adoption 78

Table of Contents (Continued)

9.0 Definitions and Acronyms 79
9.1 Definitions 79
9.2 Acronyms 89

List of Tables

Table 1 Precipitation Summary – Minneapolis/St. Paul Airport Station 9
Table 2 Atlas 14 Precipitation Frequency Estimates (in inches) 10
Table 3 Comparison Between the National Wetland Inventory and the 1997 Wetland Inventory 13
Table 4 Summary of Basins Based on Wetland Type 2008 Update 14
Table 5 Physical Lake Data Summary 15
Table 6 Lake Alimagnet Data 16
Table 7 Crystal Lake Data 16
Table 8 Earley Lake Data 17
Table 9 Keller Lake Data 18
Table 10 Lac Lavon Data 19
Table 11 Sunset Pond Data 20
Table 12 North and South Twin Lake Data 20
Table 13 Wood Pond Data 21
Table 14 Base Flood Elevations (BFEs) for Major Water Bodies 23
Table 15 Lake Water Clarity Goals 30
Table 16 Water Quality Policies 31
Table 17 Water Quantity Policies 32
Table 18 Erosion Prevention and Sediment Control Policies 33
Table 19 Summary of Buffer Requirements 34
Table 20 Wetlands Policies 35
Table 21 Public Participation, Information and Education Policies 36
Table 22 Water Resource Monitoring Program Summary 37
Table 23 Monitoring Policies 37
Table 24 Maintenance and Inspection Policies 39
Table 25 Recreation, Fish and Wildlife Policies 40
Table 26 Ground Water Policies 41
Table 27 Regulatory Policies 43
Table 28 Finance Policies 44
Table 29 Land Use Policies 46
Table 30 2016 Draft Impaired Waters Summary 51
Table 31 Eurasian Watermilfoil Infested Waters 64
Table 32 Mixing Depths of Power Boats 65
Table 33 Water Resources Implementation Plan 71
Table 34 Advantages and Disadvantages of Different Funding Alternatives 74
Table 35 Example Grant Programs 76

Table of Contents (Continued)

List of Figures

Figure 1	Local Watershed Organizations
Figure 2	Hillshaded Surface Elevation
Figure 3	Hydrologic Soil Group
Figure 4	Surficial Geology
Figure 5	Bedrock Geology
Figure 6	Public Water Inventory
Figure 7	Metropolitan Council Priority Lakes
Figure 8	Burnsville 2008 Wetland Inventory
Figure 9	Subwatershed
Figure 10	Special Flood Hazard Areas
Figure 11	Natural Plant Communities
Figure 12	Existing Land Use
Figure 13	Big River Regional Trail
Figure 14	August 2015 Reported Flooding

List of Appendices

Appendix A	Minnesota River Quadrant Analysis
Appendix B	Volume Control/Infiltration Worksheet
Appendix C	Engineering Standards
Appendix D	Hydrologic and Hydraulic Model Summary
Appendix E	Water Resource Related Agreements
Appendix F	Local Permitting Process

Water Resources Management Plan

Prepared for City of Burnsville

1.0 Introduction

This report provides the update to the City of Burnsville's (City) Water Resources Management Plan (2017 WRMP or 2017 Plan) and a look into some of the key issues related to water resources that are facing the City over the next ten years. This section begins with a brief history of water resource management in Burnsville dating back to the 1960's and concludes with the purpose of the plan.

1.1 History

Burnsville has experienced phenomenal growth in the last sixty years, increasing in population from about 600 in 1950 to more than 60,000 today. This growth occurring primarily in the 1950s and 1960s, along with topographic constraints in many areas of the City, contributed significantly to local flooding problems. Numerous small local ponds flooded on occasion because they had limited storage capacity and no natural overflows. The only solution at that time was to drain these ponds into other low spots. Ponds that were receiving water from other locations were subsequently threatened themselves by stormwater that had never been directed to them before, causing legal dilemmas.

The City's first comprehensive drainage plan was completed in 1966. The 1966 drainage plan addressed extreme fluctuations in water levels on Crystal Lake. On several occasions in the late 1960's and in the early 1970's, it became necessary to pump the lake to lower its level. The City ultimately decided to install a gravity storm sewer system so that the discharge (i.e., lake level) would not be subject to the uncertainties of a mechanical pump. The next major hurdle was to construct a large lake/pond north of County Road 42 near the Savage and Burnsville border. The "new" Sunset Pond was created to accept the surface water from the new homes and businesses in west central Burnsville and the outflow of water from Crystal Lake. Shortly after completion of Sunset Pond, the downstream pipes were installed and the Crystal Lake outlet was finally in-place.

In 1994, the City completed its first generation local water resources plan (Comprehensive Stormwater Management Plan, OSM). The City completed its second generation plan in 2002 which focused on addressing water quality and quantity (flooding) issues. The third generation plan was completed in 2008 and provided updates to the water quality goals and development design standards. In 2014, the third generation plan was amended with a minor update again focusing on development design standards and updating precipitation frequency estimates published in Atlas 14.

The Lower Minnesota River Watershed District, the Black Dog and Vermillion River Watershed Management Organizations (WMOs) have in recent years taken steps towards, or completed, updating their watershed plans. Each of these organizations have jurisdiction over water resources related issues within portions of the City and have goals and policies to which this plan must align.

1.2 Purpose

There are two primary programs that establish the regulatory need to update the City's Water Resources Management Plan. First, Minnesota Statutes, Sections 103B.201 to 103B.255 and Minnesota Rule, Chapter 8410 comprise the State's Metropolitan Surface Water Management Program (MSWMP). These Statutes and Rules require the preparation of watershed plans by watershed management organizations (WMOs) and the preparation of local (City) water management plans.

The purposes of the water management programs required by Minnesota Statutes §103B.205 to 103B.255 are to:

- Protect, preserve and use natural surface and groundwater storage and retention systems;
- Minimize public capital expenditures needed to correct flooding and water quality problems;
- Identify and plan for means to effectively protect and improve surface and groundwater quality;
- Establish more uniform local policies and official controls for surface and groundwater management;
- Prevent erosion of soil into surface water systems;
- Promote groundwater recharge;
- Protect and enhance fish and wildlife habitat and water recreational facilities; and
- Secure the other benefits associated with the proper management of surface and groundwater.

In July of 2015, the Minnesota Rules, Chapter 8410 was amended which made significant changes in the timing of local water management plan revisions. Local water management plans must be revised once every ten years in alignment with the local comprehensive plan schedule. The next local comprehensive plans are due December 31, 2018, thus all cities and towns in the seven-county metropolitan area must complete and adopt their local water plan between January 1, 2017 and December 31, 2018. This 2017 WRMP is part of the City's overall 2040 Comprehensive Plan.

The second regulatory program, very much related to the goals, policies and standards of this Plan, is the National Pollutant Discharge Elimination System (NPDES) Phase II Stormwater Permit Program for Municipal Separate Storm Sewer Systems (MS4) that is administered in the State by the Minnesota Pollution Control Agency (MPCA). The goals, policies and standards of this plan were developed to be consistent with the requirements of the City's NPDES MS4 permit and associated Surface Water Pollution Prevention Plan (SWPPP) as well as the respective WMO plans. The implementation program included in this plan and the SWPPP are intended to be a coordinated effort to realize combined efficiencies.

1.3 Watershed Organizations

The City is located within four major watershed units. These watersheds are regulated by three local watershed organizations including: Black Dog Watershed Management Organization (BDWMO), Lower Minnesota River Watershed District (LMRWD), and Vermillion River Watershed Joint Powers Organization (VRWJPO). The fourth watershed, Credit River, is administered by the BDWMO for the portion of the watershed within Dakota County. The administrative boundaries for the three local watershed organizations are shown in Figure 1.

1.3.1 Vermillion River Watershed Joint Powers Organization

A 21-member Vermillion River Watershed Management Commission (VRWMC) previously governed the watershed. The legal basis for the commission was a Joint Powers Agreement (JPA), which was formulated on June 15, 1984. The purpose of the Commission was to preserve and use natural water storage and retention in the Vermillion River Watershed to meet Surface Water Management Act goals.

In accordance with the Metropolitan Surface Water Management Act, the WMO began to prepare a second generation plan for managing the water resources of the Vermillion River Watershed. A draft plan dated August 1999 was published and was in the process of review, but was not immediately adopted. Because a new joint powers agreement could not be established, the VRWMC was dissolved and management of the WMO reverted to Dakota and Scott Counties.

The Vermillion River Watershed located in Scott and Dakota Counties in Minnesota, is administered through a Joint Powers Agreement. The counties formed a Joint Powers Organization to exercise leadership in the development of policies, programs and projects that will protect and preserve the water resources in the Vermillion River Watershed. The VRWJPO is governed by a three-member Joint Powers Board (JPB) composed of two Dakota County Commissioners and one Scott County Commissioner. A nine-member citizen advisory Watershed Planning Commission supports the Joint Powers Organization.

Based on tax capacity, Dakota and Scott Counties jointly fund the administration and activities of the VRWJPO. The Counties established special taxing districts within their portions of the Watershed to provide a mechanism for funding VRWJPO costs. A nine-member Watershed Planning Commission (WPC), consisting of eight members from the Dakota County portion of the Watershed and one member from the Scott County portion, provides support to the JPB. The general duties of the WPC are to advise the JPB regarding its duties under the Joint Powers Agreement.

The VRWJPO adopted its first watershed management plan in 2005 and recently in June 2016 adopted a second generation watershed management plan for 2016-2025.

1.3.2 Black Dog Watershed Management Organization

The legal basis for the BDWMO is a Joint Powers Agreement (JPA), which was formulated in June 1985 between the cities of Apple Valley, Burnsville, Eagan, Lakeville and Savage. The WMO was formed in response to the requirements of the State Metropolitan Surface Water Management Act of 1982. The BDWMO's first watershed plan was approved on November 22, 1989.

In 1999, the Dakota County portion of the former Credit River watershed was added to the jurisdiction of the BDWMO. As a result, a revised and restated joint powers agreement was signed by the member communities. The BDWMO and Scott County signed a memorandum of understanding regarding the management of the Credit River watershed in Dakota County.

In 2002, the BDWMO published a second generation watershed management plan and most recently updated their watershed plan in 2012 for the years 2012-2022.

The BDWMO's general purposes include the following:

- Keep regulation at the local level;
- Assist member communities with inter-community issues;

- Monitor, classify and manage strategic water bodies (Crystal Lake, Keller Lake, Lac Lavon and Sunset Pond in Burnsville);
- Monitor, evaluate and/or model stormwater runoff quality;
- Improve the quality of stormwater runoff reaching the Minnesota River;
- Develop policies to be implemented by member cities to achieve the organization's goals; and
- Assess the performance of the BDWMO and the member cities in achieving the organization's goals.

1.3.3 Lower Minnesota River Watershed District

The Lower Minnesota River Watershed District is a watershed district created under Minnesota Statutes 103. The Minnesota Water Resources Board (now the Board of Water and Soil Resources) established the District on March 23, 1960. The District was originally established to be a legal entity for providing local participation to the U.S. Army Corps of Engineers (COE) to construct a navigation channel. The initial focus of the District was based on maintaining the 9-foot navigation channel on the Minnesota River.

This districts first watershed management plan was published in 1961 with a second generation plan completed in 1999. The current third generation plan was originally approved in 2011 and most recently was amended in June 2015.

The affairs of the District are managed by the Board of Managers. The Board is comprised of five county-appointed managers. The District's current purposes differ from its historical focus. The mission of the District is to manage and protect the Minnesota River, lakes, streams, wetlands, and groundwater, and to assist and facilitate in providing river navigation by:

- Promoting open communication, and partnering, with citizens, community organizations, and local, state, and federal agencies.
- Improving and protecting the quality of the Minnesota River and all water bodies in the watershed.
- Minimizing the negative effects of floods and droughts on the Minnesota River and all water bodies in the watershed.
- Collecting and distributing information regarding surface water and groundwater in the watershed to assist in establishing priorities and developing local plans to improve water resources in the watershed.
- Monitoring and understanding the effects of municipal groundwater appropriations and drought on groundwater levels.
- Working with LGUs to enforce the Wetland Conservation Act.
- Assisting and facilitating the efforts of state and federal agencies to maintain the navigation channel.
- Educating stakeholders about the impact they have on the water resources in the watershed and motivating them to change behaviors that have a negative impact.

2.0 Physical Environment and Land Use

The following sections provide a general overview of the major physical environment and land use features within Burnsville. This section is intended to highlight some of the major

features and their general connection to water resources management. Sources for more detailed information are noted where applicable.

2.1 Topography

In general, the land within Burnsville slopes from south to north toward the Minnesota River. At the southern end of the watershed, an upland ridge slopes down to Crystal Lake. Continuing north, the upland transitions into an undulating glacial outwash plain. This area is pitted with shallow depressions surrounded by mounds of glacial till. Further north, the pitted outwash plain gives way to an outwash terrace, just above the Minnesota River floodplain. This transition corresponds roughly to the political boundary between the Black Dog WMO and the Lower Minnesota River Watershed District.

Some areas in east central Burnsville in the vicinity of Alimagnet Lake drain to the east to Alimagnet Lake and ultimately to the Vermillion River. Areas in the southwest corners of the City within the Credit River Subwatershed direct stormwater runoff to the south and west to the Credit River. The highest point within the City of Burnsville is Buck Hill, with an elevation of 1,215 feet above sea level. The lowest point in the City is just above the banks of the Minnesota River at approximately an elevation 700 feet.

High-accuracy digital elevation data, based on data collected using LiDAR technology is available for the entire City of Burnsville through the Minnesota Digital Elevation Mapping Project and the Dakota County GIS online mapping tool. This topographic information can also be viewed and downloaded through the MnDNR supported MnTOPO web application. A hillshaded topographic map based on this digital elevation data is shown in Figure 2.

2.2 Soils

Soil Composition, slope and land management determine the effect of soils on stream and lake water quality. Soil composition and slope are important factors affecting the rate and amount of stormwater runoff. The shape and stability of aggregates of soil particles, expressed as soil structure, influence the permeability, infiltration rate, and erodibility of soils. Slope is important in determining stormwater runoff rates and hence susceptibility to erosion.

Infiltration capacities of soils affect the amount of direct runoff resulting from rainfall. The higher the infiltration rate for a given soil, the lower the runoff potential. Conversely, soils with low infiltration rates produce high runoff volumes and high peak discharge rates.

Four general soil hydrologic groups (HSG) have been established by the Natural Resources Conservation Service (NRCS). These groups are:

HSG A	Low runoff potential – high infiltration rate
HSG B	Moderate infiltration rate
HSG C	Slow infiltration rate
HSG D	High runoff potential – very slow infiltration rate

The hydrologic grouping symbols (A-D) are combined with land use and used to estimate the amount of runoff that will occur over a given area for a particular rainfall amount. Figure 3 illustrates the HSG soil classification from the Dakota County soil survey, however, because of substantial urban development, significant portions of Burnsville are mapped as undefined HSG.As land is developed for urban use, much of the soil is covered with impervious surfaces, and soils in the remaining areas are significantly disturbed and altered.

Development often results in consolidation of the soil and tends to reduce infiltration capacity of otherwise permeable soil, resulting in significantly greater amounts of runoff.

Most of the soils in Burnsville are well to excessively well drained. Silty and loamy sediments over glacial till can be found throughout the watershed. According to the Dakota County soil survey, there are four general soil types in the Burnsville area: 1) nearly level, silty and loamy soils (on floodplains); 2) level to very steep, silt, loamy, and sandy soils (on outwash plains and terraces); 3) nearly level to steep, loamy and silty soils (on uplands); and 4) gently sloping to very steep, loamy and sandy soils (on uplands and pitted outwash plains).

The Minnesota River Valley includes, on its lowest level, floodplain soils such as alluvium, peat, and muck identified as the Chaska-Minneiska-Colo soil complex. Alluvial soils are usually flood deposits. The particulate sizes range from gravelly sand to silt and clay, with silt and very fine sands being predominant. The alluvial soils are questionable with respect to supporting structures, although some building is economically possible, with wise application of loading techniques. Peat and muck are terms for soils of high organic content. In peat, one can identify some partially decayed vegetative (organic) matter such as reeds, grasses, mosses, and leaves. In muck, the decomposition has advanced to such a stage that the materials are not definable. Peat and muck are poor soils in an engineering sense. These soft materials require expensive methods to support structures.

At the edge of the Minnesota River Valley floodplain, just below the bluffs which border the valley, lie well-drained silt loams and more poorly drained silty clay loams. These soils are a result of erosion of soils on the higher levels of the bluffs.

More detailed soil information may be found in the Soil Survey of Dakota County Minnesota prepared by the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service which can be accessed through the USDA supported Web Soil Survey application. Additional information is available on the Dakota County online mapping tool.

2.3 Geology and Groundwater Resources

The City completed its Wellhead Protection Plan (WHPP) in 2006 following review by the Minnesota Department of Health. The primary goal of a WHPP is to protect the public water supply from harmful contaminants. Dakota County also has a comprehensive Environment and Natural Resource Management Policy Plan recognized by and approved by the BWSR as the new county groundwater management plan in October 2006. The City updated its WHPP in 2014 and the updated maps provide the basis for the prohibited and restricted infiltration zones established in the engineering standards in Appendix C.

From a physical standpoint, bedrock underlies Burnsville at a depth of between 0 and 500 feet, but averages between 100 and 200 feet. Bedrock at a depth of 0 feet corresponds to locations where the rock is exposed at the ground surface. This occurs in the watershed primarily at the bluffs along the Minnesota River. The bedrock is deepest (400 feet or more) beneath steep peaks of glacial till, such as Buck Hill. The uppermost bedrock units underlying the watershed are sedimentary rocks of the Prairie du Chien Group (primarily dolostone), St. Peter Sandstone, Platteville Formation (primarily limestone and dolostone), and the Glenwood Formation (shale). These formations date from the Ordovician Period (approximately 505 to 450 million years ago).

Beneath the uplands of the watershed are layers of shale and limestone, sandstone, dolostone and more sandstone under the outwash terrace. Much of the glacial till was deposited during the Pleistocene Epoch beginning approximately 2 million years ago. The

most recent glacial deposits were laid down about 10,000 years ago by the Wisconsinan glaciation. More detail on the regional stratigraphic column, the vertical relationship of the bedrock units and their approximate thicknesses can be found on the Unites States Geological Survey's (USGS) website.

2.3.1 Surficial Aquifers

Surficial aquifers are water-bearing layers of sediment, usually sand and gravel, which lie close to the ground surface. A map of the surficial geology is displayed in Figure 4. Many domestic and some irrigation wells in the watershed draw water from these aquifers. Since the surficial aquifers are more susceptible to pollution, they are not used for municipal or public supply wells. In some locations in Burnsville, the aquifers could provide sufficient water yield for some non-potable industrial users.

Recharge to the surficial aquifers is primarily through the downward percolation of local precipitation. Some surficial aquifers may also be recharged during periods of high stream stage. Surficial aquifers may discharge to local lakes, streams or to the underlying bedrock.

Met Council completed a study in 2010 which categorized surface water bodies in the metro area as being groundwater discharge features, groundwater recharge features, or groundwater flow through features. The study shows that ponds and lakes in Burnsville are distributed through all three categories.

2.3.2 Bedrock Aquifers

Five major bedrock aquifers are available for water supply in Burnsville. Historically, the major bedrock aquifers are, in order of use and development: 1) Prairie du Chien-Jordan, 2) Mount Simon-Hinckley, 3) Tunnel City-Wonewoc (formerly known as Franconia-Ironton-Galesville), 4) St. Peter, and 5) Platteville. The aquifer used most often for water supply in the area is the Prairie du Chien-Jordan aquifer. The Prairie du Chien-Jordan aquifer is high yielding, more easily tapped than deeper aquifers, has very good water quality, and is continuous throughout most of the area. As more data on the Prairie du Chien Group and the Jordan Sandstone has become available in recent years, it is now widely held that the units are actually two separate aquifers in most areas with the Oneota Dolomite at the base of the Prairie du Chien Group acting as the (sometimes leaky) aquitard between the two aquifers.

The former Franconia Formation is now known as the Tunnel City Group, the Ironton-Galesville Sandstones are now known collectively as the Wonewoc Sandstone. The Glenwood Formation (shale) lies between the Platteville Formation (limestone and dolostone) and the St. Peter Sandstone. Furthermore, the Franconia-Ironton-Galesville aquifer is now referred to as the Tunnel City-Wonewoc aquifer. Burnsville Well 9 is open to the Tunnel City-Wonewoc aquifer as well as to the Mt. Simon aquifer.

The groundwater level in the Prairie du Chien-Jordan aquifer varies from 700 feet to more than 900 feet above mean sea level as shown in the Dakota County Geologic Atlas. Where the Prairie du Chien is the uppermost bedrock unit, the aquifer is recharged in areas where thin permeable drift overlies the bedrock. Some recharge of this aquifer occurs locally from percolation through the St. Peter Sandstone. However, hydrogeologic considerations suggest this recharge would be a minimal contribution to the aquifer flow. Groundwater movement in the aquifer is generally from south to north, toward the Minnesota and Mississippi Rivers. On the north side of the City along the toe of the bluff and close to the Minnesota River, seeps and springs discharge to the surface from this aquifer.

The aquifer with the least connection to surface contamination and highest potential individual well yields is the Mt. Simon-Hinckley aquifer, but it is more expensive to use than the Prairie du Chien-Jordan because of its greater depth. In addition, there are limitations to its use. The transmissivity of the Jordan aquifer is about a factor of 5 higher than the estimated transmissivity of the Mt. Simon. Given the lower transmissivity in the Mt. Simon, wells may need to be spaced farther apart than in the Jordan to get the same total production from a well field. As for water quality in the Mt. Simon, water from this aquifer generally has concentrations of radionuclides that exceed the maximum contaminant levels (MCLs) so the water needs to be blended with water from another aquifer to reduce the concentrations or treated to remove the radionuclides. Water from the Mt. Simon also generally contains more iron than water from the Jordan. It is generally true that water from the Mt. Simon is less likely to be contaminated by manmade chemicals.

Minnesota statutes limit appropriations from the Mt. Simon-Hinckley aquifer in the Twin Cities metropolitan counties to potable water uses where there are no feasible or practical alternatives, and where a water conservation plan is incorporated with the appropriations permit. The water level of the Mt. Simon-Hinckley is approximately 700 feet above mean sea level. Recharge of the Mt. Simon-Hinckley takes place far north of the watershed, where the bedrock is closer to the surface, and occurs by percolation through the overlying drift and bedrock. Regional groundwater movement in the aquifer is to the southeast. The local direction of groundwater flow in the Twin Cities tends to be toward the Minneapolis-Edina area, due to pumping of the aquifer. The bedrock geology of Burnsville is illustrated in Figure 5.

2.4 Climate and Precipitation

The Twin Cities metropolitan area climate is a humid continental climate, with moderate precipitation, wide daily temperature variations, warm humid summers and cold winters. The growing season varies from 142 days to 202 days, averaging 166 days. Freezing temperatures may occur until the middle of May and after the middle of September.

The nearest “first order” weather recording station is the Minneapolis-St. Paul Metropolitan Airport Station of the U.S. National Oceanic and Atmospheric Administration. The data from this installation is of highest value and accuracy. The National Weather Service forecast office for the metropolitan area, located in Chanhassen, also records weather data. Several Minnesota State Climatological network stations also exist and provide more detailed local weather data, kept by the Minnesota State Climatologist.

The highest temperature on record at the airport station to date was 105°F, set in 1988, and the lowest temperature was –34°F, set in 1970. The extreme conditions tell little except that temperatures range from uncomfortably hot to bitterly cold. Average total annual precipitation at the airport is 30.6 inches (1981-2010 average). The State Climatology Office of the DNR has information about temperature, precipitation and other climate data. Table 1 gives the precipitation summary for the airport station. Generally, the summer precipitation far exceeds that of the winter, the summer rainfall usually being sufficient for proper plant growth. From May to September, the growing months, the average rainfall is 19.0 inches, or about 62 percent of the normal annual precipitation. The normal percent of possible sunshine received in the area is 58 percent.

The annual snowfall averages about 54.4 inches. The heaviest monthly snowfall recorded to date at the Minneapolis-St. Paul International Airport was 46.9 inches of snow for the month of November 1991. The area averages 54 days per year when the snow depth is 6 inches or greater and about 24 days per year when the snow depth is more than 12 inches. Runoff

from snowmelt can occur anytime during the winter, but the more severe snowmelt runoff conditions usually occur in March and early April.

Average weather imposes little strain on the typical drainage system. Extremes of precipitation and snowmelt are important for drainage design. The National Weather Service has data on extreme precipitation events that can be used to aid in the design of drainage systems. Extremes of snowmelt most often affect major rivers, the design of stormwater storage areas, and landlocked basins, while extremes of precipitation most often affect the design of conveyance facilities. Appendix D provides information on 100-year flood elevations, peak discharge rates, storage requirements, and other pertinent hydrologic information for the stormwater retention areas and the trunk conveyance system within the City.

Table 1
Precipitation Summary – Minneapolis/St. Paul Airport Station

Total Precipitation, Inches					Snow, Inches		Days with Precip	
Month	**Mean**	**High Year**	**Low Year**	**1-Day Max Year**	**Mean**	**High Year**	**≥0.01**	**≥1.00**
Jan	0.90	3.63 1967	0.10 1990	1.21 1967	12.2	46.4 1982	8.9	0.0
Feb	0.77	2.14 1981	0.06 1964	1.34 2012	7.7	26.5 1962	7.4	0.0
Mar	1.89	4.75 1965	0.32 1994	1.66 1965	10.3	40.0 1951	9.3	0.2
Apr	2.66	7.00 2001	0.16 1987	2.58 2006	2.4	21.8 1983	107	0.4
May	3.36	9.34 2012	0.53 2009	3.39 2012	0.0	3.0 1946	11.5	0.5
Jun	4.25	11.36 2014	0.22 1988	4.13 2014	0.0	T 2010	11.3	1.1
Jul	4.04	17.90 1987	0.58 1975	10.00 1987	0.0	T 2012	10.2	0.9
Aug	4.30	9.32 2007	0.43 1946	7.36 1977	0.0	T 2013	9.7	1.3
Sep	3.08	7.53 1942	0.30 2012	3.55 1942	0.0	1.7 1942	9.8	0.8
Oct	2.43	5.68 1971	0.01 1952	4.83 2005	0.6	8.2 1991	9.2	0.4
Nov	1.77	5.29 1991	0.02 1939	2.91 1940	9.3	46.9 1991	8.7	0.3
Dec	1.16	4.27 1982	0.00 1943	2.47 1982	11.9	33.6 2010	9.8	0.1
Annual	30.61	17.90 JUL 1987	0.01 OCT 1952	10.00 JUL 1987	54.4	46.9 NOV 1991	116.5	6.0
Notes: Averages 1981-2010, Extremes 1891-2015								

In 2013, the National Weather Service (NWS) released NOAA Atlas 14, Volume 8 which updates the 1961 TP-40 precipitation frequency estimates for the Midwestern states. The

new estimates are based on improvements with denser datasets, longer term datasets to include more recent precipitation trends, and advanced statistical methodologies. As a result of the updated rainfall frequency estimates, the City of Burnsville has updated its current design standards and ordinances to be consistent with this new information. An example of the significance of the new data relates to the total rainfall depth for a 100-year 24-hour storm event changing from 6.0 inches to a depth of 7.5 inches. Table 2 summarizes the precipitation frequency estimates obtained from the NOAA Precipitation Frequency Data Server (PFDS) for a data point in central Burnsville.

Table 2
Atlas 14 Precipitation Frequency Estimates (in inches)

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.35	0.42	0.54	0.64	0.79	0.91	1.04	1.18	1.37	1.52
10-min	0.52	0.62	0.79	0.94	1.16	1.34	1.53	1.73	2.00	2.22
15-min	0.63	0.75	0.96	1.14	1.41	1.63	1.86	2.10	2.44	2.71
30-min	0.88	1.06	1.36	1.62	2.02	2.34	2.68	3.04	3.55	3.96
60-min	1.15	1.37	1.78	2.15	2.74	3.23	3.77	4.37	5.22	5.91
2-hr	1.42	1.69	2.20	2.69	3.46	4.13	4.87	5.69	6.88	7.86
3-hr	1.59	1.88	2.45	3.02	3.93	4.74	5.64	6.66	8.14	9.37
6-hr	1.86	2.20	2.87	3.54	4.63	5.60	6.68	7.89	9.68	11.16
12-hr	2.14	2.50	3.21	3.90	5.00	5.98	7.07	8.27	10.04	11.51
24-hr	2.48	2.82	3.50	4.19	5.31	6.31	7.44	8.70	10.56	12.11
2-day	2.87	3.20	3.87	4.54	5.67	6.68	7.82	9.11	11.01	12.61
3-day	3.13	3.48	4.17	4.86	6.00	7.02	8.17	9.47	11.37	12.97
4-day	3.34	3.72	4.45	5.17	6.33	7.36	8.50	9.78	11.65	13.21
7-day	3.86	4.35	5.22	6.03	7.25	8.28	9.38	10.58	12.29	13.68
10-day	4.35	4.92	5.91	6.77	8.04	9.07	10.15	11.30	12.89	14.16
20-day	5.94	6.66	7.84	8.83	10.21	11.28	12.36	13.47	14.95	16.07
30-day	7.33	8.18	9.55	10.66	12.16	13.30	14.42	15.53	16.97	18.03
45-day	9.14	10.2	11.85	13.16	14.87	16.11	17.29	18.42	19.82	20.79
60-day	10.71	11.97	13.92	15.43	17.35	18.70	19.94	21.09	22.43	23.31
Notes: Latitude 44.7625° Longitude -93.2830° Date/time (GMT): Mon Apr 4 20:24:31 2016										

2.5 Surface Water Resources

The City of Burnsville (City) covers approximately 17,282 acres, of which approximately 2,821 acres, or 16 percent, are wetlands or other water features. These surface water resources include six lakes, 264 wetlands,47 stormwater or other created ponds, and portions of three streams that are located wholly or partially within the City. One of the most prominent features in the City is the Minnesota River and the extensive backwater and wetlands associated with it. This section of the plan discusses surface water resources in Burnsville and their various classifications and categories as well as provides a summary of significant water resources.

2.5.1 Public Waters

Public waters are designated as such to indicate which lakes, wetlands, and watercourses over which MnDNR has regulatory jurisdiction authorized by Minnesota Statutes, Section 103G.201. The statutory definition of public waters includes public waters and public waters wetlands. Figure 6 shows all the MnDNR public waters located within Burnsville based on the DNR public waters inventory.

2.5.2 Metropolitan Council Priority Lakes

The Metropolitan Council has also updated its priority lake list that was first developed in the 1980s as part of the *Water Resources Policy* update. Figure 7 shows the priority lakes for Burnsville. The Metropolitan Council uses the priority lake list to focus its limited resources and support the environmental review process for proposed development.

2.5.3 Wetlands

The City's first Wetland Protection and Management Plan (WPMP) was completed in 1988 (SEH). An updated Wetland Protection and Management Plan (SEH, 2008) was developed to provide the City with an updated wetland inventory and functions and values analysis, to provide enhanced management strategies to preserve and protect the wetland resources, and to comply with local watershed organizations plans. That 2008 Plan was updated in 2017 to incorporate additional clarification of recently adopted State requirements related to vegetative buffers. The regulatory framework developed in the WPMP has been incorporated into the City's existing planning and zoning regulations and implemented by ordinance.

2015 State Buffer Law

Under the Buffer Law signed by Governor Dayton in June 2015, the state has established new requirements to provide protective buffers along Minnesota rivers, streams, and ditches. These buffer strips filter sediment and nutrients, and are intended to improve water quality statewide. A 2016 amendment was also passed, which provided some clarification of the new rules.

The Board of Water and Soil Resources (BWSR) is tasked with the administration of the buffer law, and has established a webpage to serve as a repository for information on the new law. That webpage includes tracking tools, guidance on establishing buffers, implementation guidelines and tools, and updates on policy interpretations.

The Minnesota Department of Natural Resources (MNDNR) was tasked with providing a map of the lakes, rivers, streams, and ditches that are included under the buffer law. These maps are available via the MNDNR website (keyword buffersviewer) and are intended to be continuously updated to ensure that most current information is always available.

In essence, the buffer law requires maintenance of a buffer to protect the state's water resources identified and mapped on a buffer protection map, which are those features identified on the MNDNR buffer map. The buffer law requires the more restrictive of a 50-foot average width, 30–foot minimum width of continuous buffer of perennially rooted vegetation, or the state shoreland standards and criteria adopted by the commissioner under section 103F2.11 and for public drainage systems established under chapter 103E (ditch law) a 16.5-foot minimum width of continuous buffer. Public waters are required to be buffered by November 1, 2017, while public ditches are required to be buffered by November 1, 2018.

Exemptions to the law that are relevant to the City of Burnsville include areas that are used for public or private water access or recreational use areas, which include beach and watercraft access areas. Areas covered by a road, trail, building, or other structure are also exempt, but subject to local setback requirements. The exemption effective applies throughout the City as the City is regulated under the National Pollutant Discharge Elimination System permit and the City has provided water resource riparian protection under its MS4 program and its water resources program through this Plan.

The City of Burnsville contains all or portions of ten Public Water lakes, including Crystal, Keller, Horseshoe, Earley, Twin Lakes, Alimagnet, two ponds within Alimagnet park, Wood Park Pond and Black Dog Lake. Four tributaries to Black Dog Lake are the only stream features within the city limits, and there are no public ditch systems present.

In reviewing the standards, the maps, and the requirements of the buffer law, it appears that for the aquatic features currently identified within the Burnsville city limits, all of the state requirements are met. Additionally, the requirements for providing buffer area for public waters and waterways through the Surface Water Management Plan exceed the state requirements. Under these criteria, there is no further action required by the City of Burnsville to comply with the 2016 buffer law.

As a brief background relating to the City's wetland management program, is it important to recall the extent of water resources with the City. Wetlands and water features constitute 2,821 acres, or about 16 percent of the city area. One of the most prominent features is the Minnesota River and the extensive backwater and wetlands associated with it. The Minnesota River wetlands and Black Dog fen, within the Minnesota Valley National Wildlife Refuge, account for 913 acres. This represents just over half of the wetland habitat within the City.

The WPMP includes an update of the results of a complete field inventory of the City along with an assessment of the quality of the wetland resources completed in 1998. The main objective for the updated WPMP is to provide a current inventory of the wetland resources in the City, differentiate regulated wetlands from other water features, and develop a comprehensive approach to regulate and protect wetlands based on wetland functions and associated public values. It is intended to provide a guide for City staff and residents to make informed decisions about the future development and redevelopment of the City with respect to the protection, conservation, and management of wetland resources.

The WPMP was prepared following the requirements of Mn. Rule 8420.0650, Local Comprehensive Wetland Protection and Management Plans. The WPMP includes:

- Updated inventory of the wetlands in the City; including accurate mapping, functions and values analysis, and classification;
- Differentiation of jurisdictional and regulated wetlands from other water features;
- Development of regulatory and non-regulatory options for wetland preservation and protection;
- Identification of potential wetland mitigation sites within the city;
- Refinement of a GIS-based wetland management system;
- Wetland Buffer requirements updated for consistency with State Law updates passed in 2015.

2.5.3.1 Burnsville Wetland Inventory

An inventory of wetlands was performed in 1997, to assess the extent and distribution of wetlands and to collect data reflective of wetland quality in the City. Data for the function and value assessment was collected during a brief visit to each wetland basin or complex. Collected data include a physical description of the basin and characterization of the plant community, hydrologic characteristics and wildlife and fishery habitat. Characterization of adjacent upland areas was also performed including a description of adjacent land use, disturbances or other influences on each wetland. The field assessment resulted in collection of data on 314 wetlands including 2,681 acres of wetland habitat. These data are summarized in Table 3.

In contrast, there were 532 wetland basins identified on the National Wetland Inventory (NWI) totaling 2,790 acres of wetland habitat. Most of the NWI was mapped between 1982 and 1993 from aerial photography taken between 1974 and 1984. Comparison between the NWI and the 1997 inventory indicates a loss of 218 basins and 109 acres of wetland habitat. This represents a 22 percent loss in the number of wetland basins and a loss of four percent of the wetland habitat in the City since the National Wetland Inventory was assembled in the 1980s. That loss is in addition to the approximately 85.7 percent loss of wetland in Dakota County between the 1860s and the 1980s. Assuming the total wetland loss in the City is similar to that estimated for Dakota County (85.7 percent), there may have been as much as 19,510 acres of wetland habitat in the City of Burnsville in the 1860s. The 1997 inventory reveals a total loss of 86.3 percent of the historic wetland area.

The 1998 wetland inventory was reviewed and updated using recent high-resolution aerial photographs. The previous inventory used field-based attributes, but the boundaries were based on the National Wetlands Inventory (NWI). The NWI is a good reference, but is not accurate enough to substitute for a current wetland inventory. This revised database replaces the former inventory. Review and updating of the 1998 inventory was needed as many of the former basins were not mapped correctly, mapped basins were not present, and some wetlands may have been missed. The results of the 2008 inventory are shown in Figure 8, which includes the management classification for each wetland. The official inventory will reside within the City's GIS database. Table 4 lists the distribution of the wetlands identified in the 2008 inventory.

Table 3
Comparison Between the National Wetland Inventory and the 1997 Wetland Inventory

Wetland Type	Number of Basins			Total Area (Acres)		
	NWI	1997	Net Change	NWI	1997	Net Change
Type 1	24	18	-6	58	62	+4
Type 2	2	12	+10	14	8	-6
Type 3	179	97	-82	1108	944	-164
Type 4	95	66	-29	170	174	+4
Type 5	137	83	-54	1121	1103	-18
Type 6	34	10	-24	88	128	+40
Type 7	59	25	-34	136	166	+30
Riverine	2	3	+1	95	93	-2
Totals	**532**	**314**	**-218**	**2790**	**2678**	**-112**

Table 4
Summary of Basins Based on Wetland Type 2008 Update

Wetland Type	Description	Number of Basins	Total Area (acres)
Type 1	Seasonally Flooded	16	55
Type 2	Wet Meadow	11	12
Type 3	Shallow Marsh	72	1,041
Type 4	Deep Marsh	54	73
Type 5	Shallow Open Water	50	128
Type 6	Scrub Shrub	7	35
Type 7	Wooded Swamp	18	418
Riverine	Rivers and Streams	1	1
Pond	WCA-regulated Stormwater Ponds	35	31
Total		**264**	**1,794**

Figure 8 illustrates the location of various management classes of wetlands throughout the City as presented in the updated 2008 Wetland Protection and Management Plan

One of the requirements of a Wetland Protection and Management Plan was to provide a wetland inventory and functions and values analysis. This was completed with the 1998 Plan, but was reevaluated with the 2008 revision. This was necessitated by several issues that had been detected through review of the 1998 inventory. One of the biggest needs was to differentiate wetlands from other water features. The 1998 plan includes many stormwater treatment ponds, which may still be regulated under the WCA, but would not be subject to buffer, bounce, and water quality pretreatment standards. The 1998 inventory also included lakes, which would also not be regulated as wetlands, but would remain protected as Public Waters, and through the Water Resources Management Plan.

The primary goals of the updated wetland inventory were to:

- Improve the accuracy of the wetland inventory.
- Differentiate wetlands from other water features.
- Prioritize wetland regulations based on functions and values.
- Identify the status and trends of wetlands from the 1998 inventory through the 2008 revision.

Each wetland within the city has been classified into one of four categories. These categories are the basis for which protection standards have been established. The 1998 inventory attributed classifications based on the Natural Resource Evaluation, supplemented with data from the City's 1994 Stormwater Management Plan, the Dakota County Biological Survey and other sources.

The database and supplemental information were used to determine the classification of each wetland basin by sorting the data according to total points and applying the ranking strategy. The resulting classifications include the following categories:

Protection Areas - Basins with Native Grades of A or B, sites with complete Community Structure, any sites supporting rare species, and any sites within or

adjacent to significant natural communities as identified by the Dakota County Biological Survey. This is comparable to the Preserve Classification used in the MnRAM.

Improvement Areas - Basins with 3 of 4 of the Community Structure criteria, sites greater than ten acres in size, Minnesota Department of Natural Resources Protected Waters and Wetlands (Public Waters), and basins within existing City parks that are not classified as Protection Areas. Although there is some overlap, this classification is similar to the Manage I and Manage II MnRAM classifications.

Management Areas - Remaining wetlands, but generally of low quality and located outside of protected areas. Management wetlands are also likely to receive untreated stormwater runoff, but have not been altered to enhance treatment capabilities. This classification is comparable to the Manage II and Manage III MnRAM classifications.

Management II Areas – These basins include any of the water features that may have been historic wetlands, and would remain subject to the requirement of the Wetland Conservation Act. These basins will have minimal protection standards as they currently function primarily to provide stormwater management.

2.5.4 Major Waterbodies

The City no longer has a separate classification system for City Lakes. Instead, the City will adopt the respective watershed's classification for the lakes. The following subsections provide details on the lake water quality and fisheries in Burnsville's major Lakes. A summary of the physical lake data is provided in Table 5.

Table 5
Physical Lake Data Summary

Name	Surface Area (ac)	Watershed to Surface Area Ratio	Average Depth (ft)	Maximum Depth (ft)
Alimagnet	109	12.8	5	11
Crystal	292	7.4	10	37
Earley	28	31.4	4	8
Horseshoe	12	NA	NA	NA
Keller	63	22.4	5	7
Lac Lavon	60	3.2	15	32
Sunset Pond	60	21	4	9
North Twin	5	34	6.6	12
South Twin	12		3.6	11
Wood Pond	9	18	NA	18

2.5.4.1 Lake Alimagnet

Lake Alimagnet is the sole waterbody in Burnsville that is tributary to the Vermillion River and within the VRWJPO. The majority of the contributing area is in Apple Valley, as is the pumped-outlet. Table 6 summarizes lake quality statistics for Lake Alimagnet. Fish population and additional lake information can be found on MnDNR's Lake Finder by searching and selecting the lake of interest from the menu.

Table 6
Lake Alimagnet Data

Lake Quality Statistics[1]		
DNR Number		19-0021
Total Phosphorus- TP	µg/l	99
Chlorophyll a	µg/l	40
Water Clarity – Secchi Disk	Meters	1
Carlson'sTrophic Status Index	TSI	67
Watershed Area	Acres	1392
Lake Area	Acres	109
Maximum Depth	Feet	11
Average Depth	Feet	5
Public Access		West side of lake
WMO Classification		Recreational
City Classification		Protection
Inlet/Outlet		12 inlets (Burnsville and Apple Valley); pumped outlet in Apple Valley

[1]Based on data collected between June and September 2006 to 2015

2.5.4.2 Crystal Lake

Crystal Lake in southeast Burnsville is within the BDWMO and is considered a strategic water body by BDWMO. The 292-acre lake is highly valued for full contact recreational purposes. Table 7 summarizes lake quality statistics for Crystal Lake. Fish population and additional lake information can be found on MnDNR's Lake Finder by searching and selecting the lake of interest from the menu.

Table 7
Crystal Lake Data

Lake Quality Statistics[1]		
DNR Number		19-0027
Total Phosphorus- TP	µg/l	37
Chlorophyll a	µg/l	20
Water Clarity – Secchi Disk	Meters	2
Carlson's Trophic Status Index	TSI	56
Watershed Area	Acres	2155
Lake Area	Acres	292
Maximum Depth	Feet	37
Average Depth	Feet	10.0
Public Access		Beach, Boat Launch
WMO Classification		Category I
City Classification		Protection
Inlet/Outlet		Inlet from Keller; outlet to South Twin

[1]Based on data collected between June and September 2006 to 2015

2.5.4.3 Earley Lake

Earley Lake is a 23-acre water body located entirely within Burnsville and the BDWMO. The lake is classified as a shallow lake and has no public swimming beaches or public access. It is primarily used for aesthetic viewing and wildlife observation. Table 8 summarizes lake quality statistics for Earley Lake. Fish population and additional lake information can be found on MnDNR's Lake Finder by searching and selecting the lake of interest from the menu.

Table 8
Earley Lake Data

Lake Quality Statistics[1]		
DNR Number		19-0033
Total Phosphorus- TP	µg/l	42
Chlorophyll a	µg/l	8
Water Clarity – Secchi Disk	Meters	2
Carlson'sTrophic Status Index	TSI	54
Watershed Area	Acres	878
Lake Area	Acres	28
Maximum Depth	Feet	N/A
Average Depth	Feet	N/A
Public Access		None
WMO Classification		N/A
City Classification		Improvement
Inlet/Outlet		Inlet from Twin; outlet to Judicial, Sunset

[1]Based on data collected between June and September 2006 to 2015

2.5.4.4 Horseshoe Lake

Horseshoe Lake is referred to as a lake but is a 12-acre wetland located in the cities of Burnsville and Lakeville. The wetland is within the BDWMO, however, it is not a BDWMO strategic water body. There is very little physical lake data and water quality data available for this water body.

2.5.4.5 Keller Lake

Keller Lake is a 52-acre lake located in the cities of Burnsville and Apple Valley within the BDWMO and is considered a strategic water body by BDWMO. The lake is used primarily for fishing, canoeing, and wildlife viewing by the local residents. There is a park on the south side of Keller Lake but no beach or public access. Keller Lake currently discharges to the northeast side of Crystal Lake. Because the lake is so shallow, aquatic plants can grow over the entire lake bed.

Keller Lake is considered a shallow lake by the MPCA and is currently listed on the 303(d) impaired waters list for excess nutrients. The Keller Lake watershed is 1,447 acres (including the lake surface area) that is fully-developed. Roughly 46 percent of this drainage district enters Keller Lake without first passing through some form of water quality treatment. Table 9summarizes lake quality statistics for Keller Lake. Fish population and

additional lake information can be found on MnDNR's Lake Finder by searching and selecting the lake of interest from the menu.

Table 9
Keller Lake Data

Lake Quality Statistics[1]		
DNR Number		19-0025
Total Phosphorus- TP	µg/l	84.9
Chlorophyll a	µg/l	56.6
Water Clarity – Secchi Disk	Meters	1.3
Carlson's Trophic Status Index	TSI	60.5
Watershed Area	Acres	1409
Lake Area	Acres	63
Maximum Depth	Feet	7
Average Depth	Feet	4.6
Public Access		None
WMO Classification		Category III
City Classification		Protection
Inlet/Outlet		Outlets to Crystal Lake

[1]Based on data collected between June and September 2006 to 2015

2.5.4.6 Lac Lavon

Lac Lavon is a unique resource, not only in Burnsville, but also in the Metropolitan area. Lac Lavon's quality is similar to that of lakes in northern Minnesota. One reason for Lac Lavon's quality is its relatively small watershed to lake area ratio of approximately 3.2:1. The lake has an average depth of less than 15 feet and a maximum depth of 32 feet. The 60-acre lake within the BDWMO and is considered a strategic water body by BDWMO. Lac Lavon does not have a public access, nor does it have stormwater inlets or outlets. The former gravel pit area turned lake exemplifies the benefits of thoughtful planning for urbanization, setting a pattern the City hopes to repeat on future planning in the Minnesota River Quadrant relative to the future "Quarry Lake".

Lac Lavon has been stocked in the 1990's with rainbow trout. Trout are a cold water species and their presence is considered an indicator of very good environmental quality. The Black Dog WMO draft plan does not anticipate any increase in total phosphorus loading to the lake. Therefore, maintaining Lac Lavon in its present form, while one of Burnsville's highest priorities, should not require costly management. Lake information and lake quality data for Lac Lavon are summarized in Table 10. Fish population and additional lake information can be found on MnDNR's Lake Finder by searching and selecting the lake of interest from the menu.

Table 10
Lac Lavon Data

Lake Quality Statistics[1]		
DNR Number		19-0446
Total Suspended Solids – TSS	Mg/l	39.0
Total Phosphorus- TP	µg/l	15.4
Chlorophyll a	µg/l	4.8
Water Clarity – Secchi Disk	Meters	3.7
Carlson'sTrophic Status Index	TSI	41.0
Watershed Area	Acres	184
Lake Area	Acres	60
Maximum Depth	Feet	32
Average Depth	Feet	<15
Public Access		None
WMO Classification		Category I
City Classification		Protection
Inlet/Outlet		None
[1]Based on data collected between June and September 2006 to 2015		

2.5.4.7 Sunset Pond

Sunset Pond covers about 60 acres, with a 1,272-acre contributing watershed, or a watershed to lake area ration of 21:1. The pond has a maximum depth of about 9 feet; many areas have a depth of less than 4 feet. The outlet drains north through the Rudy L. Kraemer Nature Preserve and the Sue Fischer Memorial Youth Athletic Complex, where low flows are diverted into water quality ponds and wetland complexes. Table 11 summarizes lake quality statistics for Sunset Pond. Fish population and additional lake information can be found on MnDNR's Lake Finder by searching and selecting the lake of interest from the menu.

Sunset Pond was created by construction of a berm on the north end that is considered a dam under DNR regulations. The dam was the subject of a study in 2007-2008 that evaluated the potential impacts to downstream properties if the dam were to fail. The Sunset Dam study was also updated in 2011. The City coordinated this work with the City of Savage due to potential impacts to the Rose Bluff Development within both cities.

Table 11
Sunset Pond Data

Lake Quality Statistics[1]		
DNR Number		N/A
Total Suspended Solids – TSS	mg/l	52
Total Phosphorus- TP	µg/l	50.1
Chlorophyll a	µg/l	10.8
Water Clarity – Secchi Disk	Meters	2.4
Carlson'sTrophic Status Index	TSI	54.6
Watershed Area	Acres	1272
Lake Area	Acres	60
Maximum Depth	Feet	N/A
Average Depth	Feet	N/A
Public Access		None
WMO Classification		Category II
City Classification		Improvement
Inlet/Outlet		Inlet from Twin; outlet to Judicial, Sunset

2.5.4.8 Twin Lake

Twin Lake (North Twin and South Twin) covers a total of about 18 acres. These basins are very shallow and have minimal available water quality data. South Twin Lake is the primary receiving water for Crystal Lake's discharge. Table 12 summarizes lake quality statistics for Twin Lake. Fish population and additional lake information can be found on MnDNR's Lake Finder by searching and selecting the lake of interest from the menu.

Table 12
North and South Twin Lake Data

Lake Quality Statistics[1]		
DNR Number		19-0028
Total Suspended Solids - TSS	mg/l	N/A
Total Phosphorus- TP	µg/l	70
Chlorophyll a	µg/l	18.7
Water Clarity – Secchi Disk	Meters	1.7
Carlson'sTrophic Status Index	TSI	1.0
Watershed Area	Acres	N/A
Lake Area	Acres	18
Maximum Depth	Feet	N/A
Average Depth	Feet	N/A
Public Access		None
WMO Classification		N/A
City Classification		Improvement
Inlet/Outlet		Inlet from Crystal and Wood; outlet to Earley

2.5.4.9 Wood Pond

Wood Pond lies “off-line” of the Crystal Lake outlet system. The pond is located northeast of Earley Lake and is positioned to receive runoff only from its’ own direct contributing area. The 9-acre pond has a contributing area of 160 acres, or a watershed to lake area ratio of almost 18 to 1. The maximum depth of the pond is 15 feet. Wood Lake is used primarily for canoeing and fishing. There is no public beach or boat landing on the lake. Table 13 summarizes lake quality statistics for Wood Pond. Fish population and additional lake information can be found on MnDNR’s Lake Finder by searching and selecting the lake of interest from the menu.

Table 13
Wood Pond Data

Lake Quality Statistics[1]		
DNR Number		19-0024
Total Suspended Solids - TSS	mg/l	52
Total Phosphorus- TP	µg/l	39.8
Chlorophyll a	µg/l	14.5
Water Clarity – Secchi Disk	Meters	1.5
Carlson’s Trophic Status Index	TSI	53.2
Watershed Area	Acres	160
Lake Area	Acres	9
Maximum Depth	Feet	15
Average Depth	Feet	N/A
Public Access		None
WMO Classification		N/A
City Classification		Improvement
Inlet/Outlet		Outlets to Twin Lakes

2.5.5 Water-based Recreation Areas

Burnsville has numerous water bodies totally or partially within its borders that are used for water based recreation. The City has two water bodies which are used for a variety of motorized boat recreation: Crystal Lake and Alimagnet Lake. Crystal Lake has a public boat launch and is very heavily used by motorized boats. Alimagnet Lake only has a public canoe launch making motorized boat launching difficult and as a result of the motorized use tends to be limited to lakeshore owners. Internal combustion motors are prohibited on all other lakes and ponds in Burnsville with the exception of Keller Lake, which has a 5-horsepower limit. Electric trolling motors are allowed on all lakes except Sunset Pond.

The public does use other lakes in Burnsville for water-related recreation such as non-motorized boating, fishing, hiking on trails adjacent to water and birdwatching. The primary lakes are Keller Lake, Lac Lavon, Sunset Pond, Earley Lake and Wood Lake. The City has parkland adjacent to each of these as well as Crystal and Alimagnet Lakes.

2.6 Stormwater

2.6.1 Watersheds and Drainage Areas

Most of Burnsville lies within the larger Minnesota River Basin in east central Minnesota. The Minnesota River Basin includes several smaller watershed units including the Lower Minnesota and Black Dog (including the old Credit River watershed). About 6 percent of Burnsville is within the Vermillion River watershed, which is part of the Mississippi River

basin. Figure 9 shows the major subwatersheds, including an overview of the water resource inventory and storm sewer system. This information was from the City's Stormwater Management Plan, the WMO Plans, topographic data, and storm sewer as-built drawings. A more detailed map showing drainage areas and corresponding subcatchment identifications is provided in Figure D-1 in Appendix D of this Plan.

The Vermillion River Watershed dominates Dakota County. The watershed stretches from Elko/New Market in the southwest to Lake Alimagnet in Burnsville in the northwest to Hastings in the east before discharging to the Mississippi River upstream of Red Wing.

The Black Dog Watershed covers parts of Burnsville, Lakeville, Apple Valley, Eagan and Savage. It includes the old Credit River watershed that covers southwest Burnsville. About 67 percent of Burnsville is within the Black Dog Watershed, comprising about 72 percent of the total watershed area. One of the primary goals of the watershed management organization (WMO) is to maintain or improve quality in the key ("strategic") water bodies in the watershed. Three lakes in Burnsville have been identified as strategic water bodies by the Black Dog WMO: Crystal Lake; Keller Lake; and Lac Lavon. The WMO will monitor these waterbodies, but leave direct management in the hands of the City. None the less, Burnsville's water quality goals for these waterbodies must meet or exceed the reasonably attainable water quality goals established by the Black Dog WMO. The WMO will also facilitate solutions to inter-community problems.

The remaining 27 percent of Burnsville lies within the Lower Minnesota River Watershed District (LMRWD). The LMRWD stretches along the Minnesota River valley from St. Paul to Chaska, mirroring the river both north and south. Significant resources that lie within both Burnsville and the Lower Minnesota River Watershed District include the Minnesota Valley National Wildlife Refuge, and Black Dog Lake.

2.6.2 Discharge, Storage Areas, and Floodplains

Appendix D also provides information on 1% (100 year) flood elevations, peak discharge rates, storage requirements and other pertinent hydrologic information for ponds and wetlands, and for the trunk conveyance system. The information in Appendix D has been updated as part of this plan development process with a city-wide hydrologic/hydraulic model utilizing the updated Atlas 14 rainfall estimates. The information should be used as a starting point in the development planning process, recognizing that new information may be available for these water bodies relative to the potential risks of flooding.

In 2016, the Federal Emergency Management Agency (FEMA) published a revised Flood Insurance Study (FIS) for Dakota County. This study and corresponding Flood Insurance Rate Maps (FIRMs) supersede the previous county-wide FIS published in 2011. The initial (2011) county-wide FIS incorporated two Letters of Map Revision (LOMR). Updated base flood elevations were established for Twin Lakes and Earley Lake (SEH, 2004) in central Burnsville and for the Cam Ram Wetland Area (SEH, 2005) in southwest Burnsville. These LOMRs were reviewed and approved by the Minnesota Department of Natural Resources and FEMA. The Special Flood Hazard Areas for Burnsville are shown in Figure 10.

In 2016 FEMA revised the FIS for Dakota County. Burnsville's local flood ordinance does not specifically include elevations, but instead refers to the official FEMA map panels. The extent of the changes from 2016 are provided below showing both the 2011 and 2016 elevations for the major water bodies. All waters were adjusted by 0.1 foot to account a datum adjustment by the Department of Natural Resources (confirmation from DNR is pending).

Table 14
Base Flood Elevations (BFEs) for Major Water Bodies

Lake	2011 FEMA FIS 1% Chance Flood	2016 FEMA FIS 1% Chance Flood
Alimagnet Lake	959.0	959.1
Crystal Lake	936.0	936.1
Earley Lake	911.9	912.0
Keller Lake	936.0	936.1
North Twin Lake	923.8	923.9
South Twin Lake	923.5	923.6

2.7 Pollutant Sources

The MPCA identified numerous leaking underground storage tank (LUST) sites in Burnsville. The MPCA also has lists showing registered above and underground storage tanks, permitted feedlots, and permitted wastewater discharges.

Information on pollutant sources is available from the MPCA What's in My Neighborhood online application. This detailed information has not been included here as it is subject to frequent change and may be obtained by calling the MPCA or visiting the MPCA's website. Pollutant source information is also available from the Dakota County Environmental Management Department. The Department maintains maps and a database that display MPCA-reported LUSTs, MPCA-reported spills, MPCA-registered ASTs and USTs and Dakota County-licensed hazardous waste generators. This information may be accessed by the public upon reasonable request to the County.

In Burnsville, urban runoff is one of the primary pollutant sources of concern. Urban runoff pollutants include sediment, nutrients, oxygen-demanding substances, toxic chemicals, chloride, bacteria, and floatable trash and litter. The pollutant loads from urban surfaces will typically vary by land use and percent impervious surfaces. Stormwater runoff in Burnsville is regulated by the NPDES MS4 permit program.

2.8 Natural Resources

In 1999, Burnsville created its first Natural Resource Master Plan, and one of the first in all of the Minneapolis/St. Paul metropolitan area. This progressive act set in motion programs and policies to protect Burnsville's natural resources, such as a prairie management plan, and goose and deer management policies, and initiated a policy to direct the private development of remaining open space in an environmentally sound manner.

The City completed an update to the Natural Resources Master Plan (NRMP) in 2007. The work behind the NRMP assesses the current state of natural resources in Burnsville and makes recommendations for their preservation and restoration on both public and private lands. The updated plan also reviews and makes recommendations for Burnsville's various natural resources related plans and policies, in order to synchronize the effort to manage natural resources.

In creating this document, a study was conducted to survey the ecological status of Burnsville's publicly owned upland natural areas. New in this plan is an extensive urban forestry component which evaluates and makes recommendations for street trees, developed park trees and natural areas forests. The entire city, including private lands, was mapped for land cover type which maps developed and undeveloped land throughout the city. The

inventory found that Burnsville has made great strides in protecting and improving water resources, protecting and restoring prairies, and is taking an ecological approach in developing private open space.

Forces degrading Burnsville's natural resources, however, are mounting, and Burnsville should next direct attention to its upland natural resources, in particular its remaining natural woodlands and trees in built areas. Degradation caused by invasive species encroachment, and the stress put on native plant communities due to the urban heat island effect (caused by heat accumulated on pavement) and changes in climate have the potential to degrade Burnsville's natural areas. Communities throughout the metro area are all facing these challenges.

To complement Burnsville's current work to protect natural resources, the NRMP recommends actions to be taken to protect and enhance its vulnerable natural resources. The plan makes recommendations for monitoring, land management and restoration of publicly and privately owned lands.

2.8.1 Natural Communities and Rare Species

The Minnesota DNR produces the Minnesota County Biological Survey identifying natural communities and rare species. The Dakota County survey map was completed in 1997. It identifies where evidence indicates the presence of rare plant and animals as shown in Figure 11.

Based on information from the Minnesota Department of Natural Resources County Biological Survey, rare animal species documented in Burnsville are Peregrine falcon, Bell's vireo, Blanding's turtle, Acadian flycatcher, Hooded warbler, Red-shouldered hawk, and Cerulean warbler. The first three were all in the vicinity of the Minnesota River Valley within the Bluff Valley Resource Management Unit (RMU) and the others fall within the Southwest RMU. Additional rare species in Burnsville are plants. They are found in several locations but primarily together in undisturbed natural communities.

2.8.2 Trout Streams

Minnesota has 687 designated trout streams, totaling 3,782 miles. Another 1,923 designated trout stream tributaries add 2,715 miles of streams. Most streams are in the southeast and northeast. But there are trout streams as far to the southwest as Windom and as far to the northwest as Park Rapids. Designated trout streams have more stringent levels of permitting and regulatory programs that apply to those seeking water use appropriations and permits for work in a stream. And because a designated trout stream is a public water, all new designations would be required by state law to have a buffer of perennial vegetation or approved alternative practices that protect water quality.

Burnsville had three designated trout streams identified in the 2002 WRMP that were based on data from DNR's protected waters database and one (planned) future trout lake. These trout waters include:

- Unnamed Trout Stream #1
- Unnamed Trout Stream #4 (Naas Creek)
- Unnamed Trout Stream #7.

DNR has initiated work to better represent the actual waters that can sustain trout and update their official lists and mapping accordingly. Following DNR's proposed removal of trout streams from the official list, local residents and Trout Unlimited initiated efforts to investigate

the potential restoration of Unnamed Stream #4 (Naas Creek) and keep it on the list. The organization convinced the DNR to keep Naas Creek and nearby Harnack/Black Dog Creek in Eagan (which was also in danger of being removed from the list) as a protected waterway and to research both streams' potential for restoration.

New data revealed that Naas Creek, which is a tributary of Black Dog Lake in Burnsville, could potentially be restored. However, the restoration plan is not without challenges as a portion of the steam is blocked by sediment accumulation at culvert crossing the railroad tracks. In addition, native brook trout require water temperatures between 34 and 74 degrees Fahrenheit. Stormwater continues to flow into Naas Creek from nearby neighborhoods, which raises the temperature above the 74 degrees. If the DNR deems restoration feasible, efforts to restore the creek are expected to take years. The City of Burnsville will work cooperatively with these organizations if they move forward with restoration efforts.

DNR has prepared a draft assessment of each of the streams in the vicinity of Burnsville. A summary of the results of that preliminary assessment is provided below:

- Unnamed #1 would have limited potential to support trout to justify stocking due to the stream's length, width, area with sufficient base flow, and potential effects from beaver impoundments. Stream temperatures remained suitable for trout throughout the summer. The stream has abundant overhanging vegetation though little pool or spawning habitat was available.
- Unnamed #4 (Naas Creek) appeared to have flow, combination of substrate and habitats to marginally support trout and angling. Present opportunities to improve stream conditions for trout would need to include reducing conditions that cause stream warming. Most importantly these would need to include removing stormwater contributions and narrowing the ponds. Limitations would still exist due to stream length, beaver dams that would require active management to reduce the future potential for warming and Minnesota River flooding. The Minnesota River Valley has flooded the entirety of this stream. The floods could eliminate trout, if present, due to the limited length of the stream or available refuge habitat. If habitat improvement does occur management should be directed for Brook Trout and maximum stream temperatures should not exceed 72F.
- Unnamed #7 is a stream with limited potential for establishment of a permanent trout population. With this and previous investigations citing reasons such as a small stream with poor physical habitat, temperatures too high and low base flow. This investigation found stream temperatures suitable for trout throughout the summer, however during 2015 flow appeared to be inadequate even during a year with average rainfall.

2.8.3 Fens

During review of the River Ridge Boulevard/Cliff Road Walmart project in 2011, the DNR was consulted for input on potential new discharged to the Black Dog fen wetland complex. On August 25, 2011, DNR staff (Groundwater Hydrogeologist and Plant Ecologist) conducted a field review of the fen complex and found that the calcareous fen community that was previously mapped and included on DNR's official list of calcareous fens (Fen ID No. 242) was no longer present. The former fen areas were dominated almost entirely by invasive and/or undesirable species, primarily reed canary grass, common reed and stinging nettle. Although scattered pockets and individuals of native species were encountered, no plant species indicative of calcareous fens were identified. The ground surface was moist, but we observed no evidence of active groundwater discharge necessary to sustain a calcareous fen.

DNR indicated that it may not be possible to definitively determine the cause of the demise of the calcareous fen community, but suggested it is likely due to the combined effects of inundation by stormwater (nutrient laden, which has been shown to give reed canary grass a competitive advantage over native species) and disruption of groundwater hydrology possibly caused by some combination of reduced infiltration in the upland recharge areas, groundwater withdrawals, the ditch, the railroad tracks, and the sewer line that runs roughly east-west through the complex.

The calcareous fen is still on the official list of fens. DNR strongly encouraged the project proposer and the City of Burnsville to aggressively pursue alternatives that will further reduce the volume of runoff from this project (and future projects) to the wetland complex however this location is also within the city's WHPP area and infiltration is prohibited. Any chance of restoring the fen community will be compromised by additional stormwater input. The City provided information to DNR in 2011 that implementation of their new development and redevelopment runoff standards had reduced runoff volume to the fen complex by 18 acre-feet since 2005.

One of the Black Dog Lake Fen areas on DNR's official list of calcareous fens (Fen ID No. 31929) remains in relatively good condition. While this calcareous fen area was not likely to be affected by the Walmart project, it could be jeopardized by reduced infiltration and/or increased groundwater pumping within the watershed. DNR will continue to work with the MPCA and the City of Burnsville on their stormwater standards to further reduce discharges to the fen complex in order to protect the remaining fen area and to facilitate possible restoration of the fen that has been eliminated.

2.8.4 Greenways and Corridors

Greenways and corridors potentially serve as movement pathways for plants and animals and bridge disjointed complexes of natural communities. Often they are linear and follow streams and rivers.

The primary linear greenway or corridor running through Burnsville is the Minnesota River Valley, which runs along the northern border of the City. This area has been and should continue to be the focus of any efforts to connect areas managed by Burnsville and state and federal government agencies.

Other corridors in the City include McAndrews Road, a Dakota County greenway corridor that is intended to connect to the Lake Marion South Creek and Minnesota River greenways. The City is a partner with Dakota County and other cities in the Dakota County Greenway Collaborative. The most recent development in Burnsville along McAndrews Road is Costco which has green space incorporate along the roadway. At minimum, green space adjacent to McAndrews Road for other adjacent projects should be similar to the width and treatments at the Costco site.

2.8.5 Resource Management Units

Resource management units (RMUs) are high concentrations of natural resource sites and important lakes and rivers. Lakes and rivers are not listed in the sites database for the reasons explained under inventory. All lakes in RMUs are considered high priority natural resources and as such are justified for the same staff and funding as high priority resources in the sites database.

RMUs contain high (protection), medium (improvement), and low (management) priority sites. The focus of management activities will be on the high priority sites. From an ecological

perspective low and medium priority sites can have an effect on high priority sites and will be protected and managed to the extent that they affect high priority sites. All sites will be managed to at least maintain their current qualities to the extent possible.

The three categories of sites are:

High Priority Sites (Protection) - Sites with native community grades of A and B, any sites with rare species, and sites with complete community structure. These sites will receive priority for protection and management and priority for funding, regardless of whether or not they fall within a Resource Management Unit.

Medium Priority Sites (Improvement) - Sites with native community grades of C, all sites greater than 10 acres, and areas which meet 3 or 4 of the community structure criteria. These sites will be focused on for improvement when they are part of a Resource Management Unit.

Low Priority Sites (Management) - Sites with native grades of D, and areas which meet only 1 or 2 of the community structure criteria. Resources will be directed towards maintaining these sites, unless part of a Resource Management Unit Improvement Plan.

2.9 Land Use

Figure 12 shows existing land use in Burnsville. Intense commercial development is clustered along I-35W, County Road 42 and Highway 13. The anticipated future land use in Burnsville is illustrated in the Comprehensive Plan Future Land Use Guide Plan Map (available in the 2040 Comprehensive Plan).

Burnsville is completely within the Metropolitan Urban Service Area (MUSA), the area delineated by the Metropolitan Council for sanitary sewer service.

There were less than about 1,200 acres of vacant land in the City of Burnsville as of 2002. As of 2008, the number changed to 404 acres. Many of these properties contain or are adjacent to wetland habitat identified during the field inventory. Development of the properties, or purchase by the City, may produce opportunities for improvement or protection of existing wetlands or creation or restoration of wetland habitat. Development in these open areas will require final end use plans to be approved as part of the PUD zoning approvals.

2.9.1 Land Development Density

Only a small percentage of Burnsville remains to be developed. In general, smaller lot sizes and increased impervious surface coverage run counter to what would normally be recommended on a watershed management basis. For areas tributary to trout streams any time the level of impervious cover exceeds the 12-15% level, the resource will be permanently degraded (Galli, 1991).

The shoreland zoning standard established by the Minnesota Department of Natural Resources limits impervious cover to 25 percent. However, outside the shoreland zone, much higher levels of cover are allowed via existing zoning. Even if less than 10 percent of the City remains to be developed, long-term water resource impact of redevelopment as well as current and near term development are concerns. The Metropolitan Council strongly encourages increased residential densities and intensification of development to utilize regional infrastructure to its fullest potential. These objectives can conflict with other agencies seeking resource protection for waters, natural areas and impervious surface reduction. Redevelopment of the City will require careful attention to these factors and a balanced approach to maintain/enhance water resources. The City will need to retrofit and continue to improve treatment facilities to accommodate intensification of the urban landscape. Value

based decisions will be needed to balance the costs associated with increased urban development and implementation of the best practices to accommodate the development.

2.9.2 Minnesota Valley National Wildlife Refuge, Recreation Area and State Trail

The Minnesota Valley National Wildlife Refuge, Recreation Area and State Trail (shown on Figure 13) were established as a result of efforts of local citizen groups to protect the Lower Minnesota River Valley. The Big River Regional Trail was authorized by the state legislature in 1969. Federal legislation entitled “The Minnesota Valley National Wildlife Refuge Act of 1976” declared that the policy of the Congress would be to preserve the Minnesota River Valley and, as a federal action, establish the 9,500-acre Minnesota Valley National Wildlife Refuge and an adjacent 8,000-acre wildlife recreation area.

There are approximately 24,000 acres of existing and authorized wildlife refuge, parks, trails, and open space located along the Minnesota River corridor. These lands are managed in accordance with the “Minnesota Valley National Wildlife, Recreation Area, and State Trail: Comprehensive Plan, July 1984.” The plan was produced by the Department of the Interior, U.S. Fish and Wildlife Service, and the Minnesota Department of Natural Resources.

The refuge portion of the area is managed by the U.S. Fish and Wildlife Service with two main objectives: to provide habitat for a diversity of plants and animals and to provide opportunities for people to observe and learn about the valley’s wildlife.

The recreation area is managed by local, city, and county governments and by the DNR. These agencies are developing recreational and educational opportunities that are compatible with the valley’s natural resources.

2.9.3 Southwest Burnsville

The southwest area of the City contains rolling topography with areas of very steep slopes, as well as many of the largest remaining stands of trees in the community. The area is zoned rural residential requiring one-acre lots when City sewer services are available and two-acre lots when City sewer is not available.

As an update to the 1990 Comprehensive Plan, the City prepared a report entitled Southwest Public Services Study. The study reviewed natural conditions and explored the means and methods for extending public utilities to the area.

The key policy decision that resulted from the study was that the City adopted an official Master Plan for the future of this area and requires all future subdivisions to be consistent with this plan. The resulting plan incorporates a design for the extension of public sanitary sewer, public water service and provision for stormwater drainage improvements.

It is the intent to allow the area to remain unsewered for the foreseeable future. The City has addressed the southwest Burnsville area in more detail in the Master Plan for the area completed as part of the 1990 Comprehensive Plan. Due to updated regulations in the areas including the Wetlands Conservation Act, Shoreland Management, Stormwater Management, there is less development potential than shown in the 1990 Master Plan.

3.0 Goals and Policies

The Metropolitan Council's *2040 Water Resources Policy Plan* is targeted to achieve the following goal:

To protect, conserve, and utilize the region's groundwater and surface water in ways that protect public health, support economical growth and development, maintain habitat and ecosystem health, and provide for recreational opportunities, which are essential to our region's quality of life.

This section of the plan identifies local goals for water resources planning and management functions across 12 categories. The goals of this plan were established in conformance with the goals of the watershed organizations having jurisdiction in Burnsville including the Vermillion River Watershed Joint Powers Organization, Black Dog Watershed Management Organization and the Lower Minnesota Watershed District.

The plan utilizes the following framework for goals, policies, and standards:

- ***Goals*** are a desired end toward which water management efforts are directed. Each goal has several corresponding policies.
- ***Policies*** are governing principles that provides the means for achieving established goals.
- ***Standards*** are an extension of the policies. They provide specific, detailed guidance regarding water management practices. Plan standards are included in Appendix C of this Plan. Table C-1 in Appendix C also summarizes watershed management organization standards applicable to projects in each jurisdiction.

3.1 Goal 1: Water Quality

Goal: Achieve water quality goals in lakes, streams, and wetlands consistent with the intended use and classification.

The water quality goal setting process for Burnsville lakes revolves around their recreational suitability and strives to achieve water quality equal to or better than state water quality standards. The water quality objectives of the Plan are centered on Burnsville lakes that support a full range of recreation uses including swimming. The City of Burnsville has established specific water quality goals for significant water bodies based of community input and diagnostic studies.

To monitor the water quality, a Secchi disk is used to measure the transparency in bodies of water. The depth at which the disk is no longer visible is taken as a measure of the clarity of the water which is related to the water turbidity and abundance of algae. The City Council established the lake clarity goals shown in Table 15.

Table 15
Lake Water Clarity Goals

Lake	City of Burnsville Clarity Goal (meters)[2]	MPCA Clarity Standard (meters)	3-Year Average Clarity (meters)[1]
Alimagnet	1.3	1.0	0.8
Crystal	2.1	1.4	2.1
Earley	1.7	1.0	1.6
Keller[3]	1.8	1.0	0.7
Lac Lavon	3.6	1.4	4.0
Sunset Pond	1.7	1.0	1.9
Twin South	1.4	1.0	1.9
Wood Pond	1.7	1.0	1.7

[1]Based on years 2013, 2014, and 2015 of monitoring data.
[2]Summer Average secchi disk reading
[3] A Use Attainability Analysis is planned to reevaluate the goal for Keller Lake

It is important to note that the City's clarity goals differ from the MPCA's water quality standards which determine if a waterbody is classified as impaired. The City's goals are based on clarity and the city uses a 3-year average of the summer (June-September) average Secchi disk readings. Conversely, the MPCA looks at 10-year summer (June-September) averages and looks at three different metrics: total phosphorus (TP) concentration, chlorophyll-a concentration, and Secchi disk depth. For a waterbody to be classified as impaired, the 10-year average TP concentration must exceed the state standard in addition to one of the other metrics (chlorophyll-a or Secchi disk) not meeting the state standard. The MPCA Secchi disk standard for the lakes in Burnsville is ≥1.4 meters and ≥1.0 meters for Lakes and Shallow Lakes, respectively.

The plan recognizes that for any of the water bodies listed in Table 15, the water clarity goal(s) would be re-evaluated upon completion of any diagnostic studies completed. The basic premise behind revising these goals is to establish realistic clarity goals based upon the characteristics of the lake and its contributing watershed, such that when the goal is met, it will allow the water body (if impaired) to be removed from the impaired waters list. The revised clarity goals are based on the most recent lake monitoring data and lake management plans prepared for each water body.

The Plan allocates funding to implement the strategies identified in the lake management plans to achieve these goals. For waters that are impaired, the City plans to work cooperatively with the local watershed organizations and MPCA to convert the lake management plans in to Total Maximum Daily Load (TMDL) studies. For example, LMRWD implements a Cost Share Incentive Program and Water Quality Restoration Program which helps to provide financial assistance to implement BMPs or carry out studies which will aid in protecting and improving water resources within the LMRWD.

Table 16 presents the policies the city has developed to achieve the water quality goals of this Plan.

Table 16
Water Quality Policies

Subject:	
▸ Water quality in lakes, streams and wetlands.	
Purpose:	
▸ To protect and improve water quality.	
Goal:	
▸ Achieve water quality goals in lakes, streams, and wetlands consistent with their intended use and established classification.	
Water Quality Policies	
Policy 1.1:	Development that disturbs one-half acre or more, or creates 5000 square feet or more of new impervious surface, shall meet the standards of this Plan and the Comprehensive Wetland Protection and Management Plan.
Policy 1.2:	Development that meets the thresholds for coverage under the NPDES Construction Stormwater Permit, shall meet the requirements of the current version of the permit.
Policy 1.3:	Proposed developments must identify reasonable steps to avoid water quality impacts, and to mitigate impacts with appropriate best management practices (BMPs).
Policy 1.4:	The City shall maintain a Standard Operating Procedure to minimize the impact of hazardous spills.
Policy 1.5:	The City shall supplement its regulatory program with an education-based approach to reduce water quality impacts to lakes, creeks and wetlands.
Policy 1.6:	The City shall promote the reduction or minimization of impervious surface areas, and the use of alternative landscape techniques and materials and low impact development (LID)/green infrastructure systems to reduce water quality impacts.
Policy 1.7:	The City will balance protection of wetlands and utilization of wetlands to protect the water quality of other water resources (i.e., wetland, lake, stream) based on wetland classifications in the City Comprehensive Wetland Protection and Management Plan. The City recognizes that all stormwater ponds, and some wetlands, and will continue serve as water quality treatment systems to better protect high priority downstream water resources. These systems will not be part of the water clarity/water quality monitoring program.
Policy 1.8:	The City will manage public properties and facilities in accordance with its NPDES MS4 Program Policy Document.
Policy 1.9:	The City will play an active role in participating in TMDL studies for impaired waters to which the City has discharges.
Policy 1.10:	The City will work with the WMOs in developing and implementing water quality improvement plans and achieving the load reductions necessary to meet TMDLs. .

3.2 Goal 2: Water Quantity

Goal: Manage flooding and minimize related public capital and maintenance expenditure necessary to control excessive volumes and rates of runoff.

Traditional stormwater management deals with just one component of the hydrologic cycle; surface runoff. Large amounts of energy are directed towards alleviating significant negative impacts of surface runoff and flooding on the cultural, water, and natural resources. The

primary management strategy is shifting from detention in both existing natural (wetland) and constructed basins, to low impact development (LID) techniques and Best Management Practices (BMPs) that emphasize reduction of runoff volume and on-site runoff control via infiltration or small volume storage to mimic predevelopment hydrology for more frequent rainfall events. This trend will help remedy the negative impact of storm runoff on lake quality. With increased value placed on wetlands, the number and extent of wetlands that can be used for detention will decline. The approach to water quantity management relates directly to water quality, wetland management, erosion control, and land development strategies. By doing a better job at managing the quantity of runoff, the other goals of this Plan are more easily and efficiently achieved.

Table 17 present policies the City has developed to meet the water quantity goals of this plan.

Table 17
Water Quantity Policies

Subject:	
➢ Stormwater Runoff (Rate and Volume) Management	
Purpose:	
➢ Control runoff and reduce flood hazard risks	
Goal:	
➢ Manage flooding and minimize related public capital and maintenance expenditure necessary to control excessive volumes and rates of runoff.	
Water Quantity Policies	
Policy 2.1:	Low Impact Development (LID) techniques (or volume control/infiltration practices), along with conventional constructed detention ponds for large, infrequent rainfall events, should be relied upon to help mimic pre-development hydrology and to lessen the risks of downstream flooding.
Policy 2.2:	The City shall continue to implement the FEMA Flood Plain Management program and keep ordinances and standards up to date relating to flood hazard risks and management of those risks.
Policy 2.3:	Where volume control/infiltration practices are not feasible, the City prefers regional detention areas to small, on-site ponds. If regional detention is not feasible small-scale on site filtration is preferred.
Policy 2.4:	Emergency overflows or outlets to drainage systems shall be provided in basins or collection areas adjacent to structures to minimize the risk of flooding.
Policy 2.5:	Encroachment (placement of fill or structures) into the flood plain and flood way below the established 1-percent critical flood levels shall be prohibited except when it is shown to not increase the flood stage, prevent an increase in the flood profile, and minimize excessive velocities.
Policy 2.6:	The minimum building elevation shall be set in accordance with City code and the standards of this plan. Future development areas adjacent to landlocked basins should be evaluated in more detail through evaluations of updated hydrologic modeling tools.
Policy 2.7:	The City shall attempt to acquire easements covering public ponds, wetlands, flood plains and ditches as part of land development approvals.
Policy 2.8:	The City has and will continue to evaluate lift stations to manage lake levels and water quality and will not limit itself to the use of gravity flow stormwater conveyance systems.

3.3 Goal 3: Erosion Prevention and Sediment Control

Goal: Minimize soil erosion through increased education and enforcement.
Erosion and sediment is a major contributor to water pollution. Stormwater runoff from streets, parking lots, and other impervious surfaces carries suspended sediment consisting of fine particles of soil, dust, and dirt in moving water. Abundant amounts of suspended sediment are carried by stormwater runoff when erosion occurs.

Regulatory efforts by the City, State and watershed organizations will control a major portion of the sediment generated and delivered to water resources. Street maintenance and an effective sweeping program will also have a positive impact. The City does not control or regulate sediment generated from sources outside the limits of Burnsville. Where gully erosion has occurred and been identified as an issue the City will continue work to address these issues and implement restoration efforts.

Table 18 presents policies the City has developed to achieve the erosion control goals of this Plan.

Table 18
Erosion Prevention and Sediment Control Policies

Subject:	
➢ Erosion Prevention and Sediment Control	
Purpose:	
➢ To minimize erosion and sedimentation	
Goal:	
➢ Minimize soil erosion through increased education and enforcement	
Erosion Control Policies	
Policy 3.1:	Erosion and sedimentation control plans shall be prepared and followed for all projects subject to the standards of this plan.
Policy 3.2:	The City shall maintain and update as necessary its erosion control ordinance.
Policy 3.3:	The City shall provide education of erosion control needs and methods to prevent/reduce erosion and sedimentation.
Policy 3.4:	The City shall maintain its practice of inspecting sites prior to earthwork activities commencing on the site to ensure the proper practices are in place.
Policy 3.5:	Horizontal, terrestrial buffer zones are encouraged around existing wetlands and stormwater ponds. New development or redevelopment projects must provide a buffer zone around wetlands and are encouraged to provide buffers around existing stormwater ponds. Buffers are required around new storm ponds, resulting from new development or re-development. Buffers shall be maintained in native vegetation, to provide habitat for wildlife. (See also Table 19)
Policy 3.6:	The City will maximize the use of bioengineering approaches whenever practicable for slope stabilization and permanent erosion control projects.

3.4 Goal 4: Wetland Management

Goal: Maintain or increase the amount of wetland acreage, and increase the wetland functions and values within the City, in accordance with the adopted Comprehensive Wetland Protection and Management Plan.

The key to meeting the City's wetland goal is the implementation of its Comprehensive Wetland Protection and Management Plan (WPMP). The City completed a major update to the Wetland Protection and Management Plan (WPMP) in 2008 with a minor amendment in 2017 that focused on updates to the vegetative buffer requirements to be consistent with State requirements.

The purpose of the WPMP is to establish a wetland protection and management program that protects, conserves, and manages the quality of the wetlands within the City. The benefits of establishing a separate WPMP include having a current functions and values assessment for management activities, supporting wetland ordinance development, allowing greater flexibility in sequencing and replacement standards for wetlands, and establishing a baseline dataset for improvement and management of wetlands within the City.

2015 State Buffer Law

Under the Buffer Law signed by Governor Dayton in June 2015, the state has established new requirements to provide protective buffers along Minnesota rivers, streams, and ditches. These buffer strips filter sediment and nutrients, and are intended to improve water quality statewide. A 2016 amendment was also passed, which provided some clarification of the new rules. See Section 2.5.3 of this Plan for more information on the new law.

Table 19 provides a summary of the updated buffer requirements as they affect each of the different City wetland classifications and mapped DNR Public Waters. Because the City is covered under the NPDES MS4 Permit, the City is exempt from the 2015 Buffer Law as provided for in BWSR's MS4 Exemption Policy (June 2016). A map of the City's 2008 wetland inventory is provided as Figure 8, which is discussed in more detail in Section 2.5.3.1 of this plan.

Table 19
Summary of Buffer Requirements

City Wetland Classification	Permanent Buffer Strip Average Width (feet)	Minimum Permanent Buffer Zone Width (feet)	Vegetation
Protection	50	30	100% Native
Improvement	35	25	100% Native
Management	25	20	Majority Native
Management II	20	20	Majority Native
DNR Mapped[1] Public Waters (per 2015 Buffer Law[2])			
Waters, streams and ditches	City defers buffer requirements to State Buffer Law requirements		NA

[1]Mapped on MNDNR webpages key word "buffersviewer"
[2]Minnesota State Statutes Chapters 103B, 103E, 103C, 103D, 103F, and 103G

Table 20 presents policies the City has developed to help achieve the wetland management goals. Please refer to the Wetland Protection and Management Plan for more detail.

Table 20
Wetlands Policies

Subject: ➢ Wetland Management
Purpose: ➢ To utilize, protect, preserve and enhance wetlands.
Goal: ➢ Maintain or increase the amount of wetland acreage, and increase the wetland functions and values within the City, in accordance with the adopted Comprehensive Wetland Protection and Management Plan
Wetland Policies
Policy 4.1: The City shall administer wetland protection and mitigation in accordance with the Minnesota Wetland Conservation Act.
Policy 4.2: The City will distribute information on pertinent water and wetland management issues via it's typical means utilizing multiple sources. to communicate opportunities for residents to participate in wetland management activities.
Policy 4.3: The City will update its WPMP as needed and continue to implement the wetland regulatory standards included in the WPMP, the WRMP and City Code.

3.5 Goal 5: Public Participation, Information and Education

Goal: Increase public participation and knowledge in management of the water resources.

Public involvement is a strategy that recognizes people want to be involved in decisions that affect any facet of their life. It creates and implements opportunities for the public to participate in the processes that lead to decision-making.

The City's web site (www.burnsville.org) is an alternative medium to provide municipal information to both City residents and those people who live outside Burnsville. An electronic version of the water resources management plan will ultimately be accessible on the web. Because the Plan has such a wide audience from engineers and planners, to developers and citizens, to scientists and educators, electronic access to the text and mapping creates a better understanding of the goals, policies and activities of this Plan.

The City will continue to distribute information on pertinent water and wetland management issues via the Burnsville Bulletin. The Bulletin will promotes opportunities for residents to participate in water resources management activities.

The City will make an ongoing effort on both a City-wide and watershed level toward educating the public by distributing information to its residents on responsible practices they should employ to protect water resources within the community.

Table 21 presents policies the City has developed to achieve the public participation, information and education goals of this plan.

Table 21
Public Participation, Information and Education Policies

Subject:	
➢ Enhancement of Public Participation, Information and Education	
Purpose:	
➢ Encourage active community involvement in water resources management.	
Goal:	
➢ Increase public participation and knowledge in management of the water resources.	
Public Involvement Policies	
***Policy 5.1*:**	The City will use a public involvement process in resource management decision-making (i.e., the Parks and Natural Resources Commission).
***Policy 5.2*:**	The City will use a variety of media, including newsletters, brochures, local cable television and the City's Website and social media, to inform the community about water resource management program activities and concerns. The City will make an ongoing effort on both a local and regional level by distributing information to residents on practices they may implement to help protect and improve water resources.
Policy 5.3:	The City will work with existing public and private resources to increase public participation in water resources management and disseminate information regarding this Plan and the City's overall program.
Policy 5.4:	The City will establish model interpretive sites for public education.
Policy 5.5:	The City will continue to educate elected officials on water resources management needs and issues.
Policy 5.6:	The City will investigate methods of producing school educational events/programs and implement the program/methods if feasible.

3.6 Goal 6: Monitoring

Goal: Implement a comprehensive water resource monitoring program.

Water resources monitoring is not a one-dimensional activity. Monitoring takes different forms and has different characteristics, depending on its purpose and intended uses. The DNR, MPCA, Metropolitan Council, the Watershed Organizations and citizen volunteers have conducted monitoring in Burnsville. Volunteers are vital to Burnsville's water quality data collection efforts on lakes and wetlands. Two programs provide valuable data to the City so it can make appropriate water management decisions.

- Dakota County's **Wetland Health Evaluation Program (WHEP)** program utilizes volunteer citizen scientists to gather data about wetlands. Visit the WHEP website to see wetland monitoring reports.

- Volunteers in the Metropolitan Council's **Citizen-Assisted Monitoring Program (CAMP)** monitor eight Burnsville lakes, including, Crystal, Keller, Lac Lavon, Alimagnet, Sunset Pond, South Twin, Earley, and Wood Pond. They collect water samples and data such as water clarity and temperature. To see the CAMP lake water quality reports, please visit the CAMP website.

The City acknowledges the stream protection efforts in Burnsville by the Lower Minnesota River Watershed District and the DNR. Monitoring trout stream segments in the City will also be evaluated and coordinated with the Watershed Organizations and DNR. Table 22 summarizes the City's monitoring program strategy and Table 23 presents policies the City has developed to meet the monitoring goals of this plan.

Table 22
Water Resource Monitoring Program Summary

Monitoring Location	**Type of Monitoring**	**Monitoring and Follow-up Activities**
Black Dog Lake	Monitoring by Xcel	City to work with Xcel to analyze monitoring data.
Trout Streams	Temperature	Coordinated between local WMOs and DNR
Alimagent, Keller, Crystal, Lac Lavon, Wood Pond, Earely Lake, Sunset Pond, South Twin Lake	Annual participation in CAMP program	Five year cycle of aesthetic and habitat monitoring annually per BDWMO for Keller, Crystal, and Lac Lavon
Wetland Monitoring	Reference wetlands to be selected by the City	Four wetlands per year, two of which are reference wetlands
Stormwater Ponds/outfalls	Visual and Sediment accumulation surveys	Once in 5 years per NPDES MS4 Policy

Table 23
Monitoring Policies

Subject:	
➢ Water Resource Monitoring Program	
Purpose:	
➢ To make informed data-supported water resource management decisions at the local level.	
Goal:	
➢ Implement a comprehensive water resource-monitoring program.	
Monitoring Policies	
Policy 6.1:	The City will continue to conduct monitoring programs to develop baseline and long-term water quality records.
Policy 6.2:	The City will continue to cooperate with all public agencies to conduct monitoring projects and share monitoring data with them.
Policy 6.3:	The City will continue citizen-monitoring programs.

3.7 Goal 7: Maintenance and Inspection

Goal: Preserve the function of water resource facilities through routine inspection and regular maintenance activities.

Inspections help to spot potential problems before they become major problems. Routine maintenance reduces the long-term costs related to drainage system maintenance, while helping achieving water quantity and water quality goals. BMP maintenance agreements with private pond owners gives the City a tool in case private ponds are not maintained. In addition, documentation and acquisition of proper ponding easements over public ponds is very important.

The City of Burnsville's Public Works Department developed a Stormwater Drainage System Maintenance Plan in November 1992 (OSM, 1994). This plan was effectively replaced by the 2016 SWPPP policy. These plans assure that the City's 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 is a summary of the various inspection and maintenance activities the City intends to undertake in regard to achieving these goals. Inspections of the system are critical, and a requirement of the City's NPDES MS4 Permit Program.

- The City will inspect stormwater best management practices (BMPs), storm sewer outfalls and material storage and handling areas in accordance with its NPDES Program Policy.
- The City will sweep the streets in accordance with its NPDES Program Policy. Specifically, this will require prioritization of sweeping activities to be focused around areas draining to water bodies having high recreational use potential. Spring sweeping will occur as soon as possible after snow melt.

The City is responsible for maintenance of stormwater practices on City property and drainage easements, Dakota County and MnDOT are responsible for maintenance of practices on their respective properties and private systems are the responsibility of the property owners.

Table 24 presents policies the City has developed to achieve the maintenance and inspection goals of this plan.

Table 24
Maintenance and Inspection Policies

Subject:	
➢ Maintenance and inspection of the drainage system, ponds and water quality treatment practices	
Purpose:	
➢ To maximize system performance and comply with NPDES MS4 Program Permit requirements.	
Goal:	
➢ Preserve the function of water resource facilities through routine inspection and regular maintenance activities.	
Maintenance and Inspection Policies	
Policy 7.1:	The City will follow its MS4 Policy relating to inspection and maintenance of stormwater management facilities (ponds, rain gardens, sump manholes, etc.).
Policy 7.2:	The City shall require maintenance of privately constructed water quality treatment facilities through formal maintenance agreements.
Policy 7.3:	The City shall require adequate maintenance-related access for public and private water resources facilities (i.e., ponds, etc.).
Policy 7.4:	Pond clean-out activities shall be prioritized based on water quality benefits of downstream wetlands, lakes and streams and flood detention benefits.
Policy 7.5:	The City of Burnsville will sweep the streets at least two times annually per NPDES MS4 policy.
Policy 7.6:	The City will continue its snow plowing and snow/ice control policy that balances public safety and environmental protection. The City will evaluate new snow/ice control technologies and guidance from sources such as MnDOT on a regular basis.

3.8 Goal 8: Recreation, Fish, and Wildlife

Goal: Manage water recreation activities and improve fish and wildlife habitat.

The goal of the DNR Division of Fish and Wildlife (DFW) is to protect and enhance the fishery resource and the aquatic biological community for their long-term recreational, ecological, aesthetic, and economic benefits to the state. DNR has oversight and permitting responsibility for the management of fisheries in the waters of the state. The DNR also requires permits for controlling or removing aquatic plants or invertebrates in protected waters or wetlands. The concept of ecosystem management requires that not just a species of interest be managed in a given water body, but that all plants, animals, and the physical and chemical constituents of the environment be part of the management program.

The City has developed policies to achieve the goal of this section. The policies are presented in Table 25.

Table 25
Recreation, Fish and Wildlife Policies

Subject:	
➢ Water resource-based recreational activities and wildlife interests	
Purpose:	
➢ To enhance water recreational facilities, and fish and wildlife habitat.	
Goal:	
➢ Manage water recreation activities and improve fish and wildlife habitat.	
Recreation, Fish and Wildlife Policies	
Policy 8.1:	Natural areas, and wildlife habitat intended for preservation, shall be protected with appropriate BMPs during construction.
Policy 8.2:	Horizontal, terrestrial buffer zones required in the wetland standards shall be maintained in native vegetation, to provide habitat for wildlife. (See Table 19)
Policy 8.3:	The City shall support programs for controlling exotic and invasive species of plants and animals.
Policy 8.4:	The City shall balance water recreational activity with water quality and habitat issues.
Policy 8.5:	The City will seek to preserve the Priority Sites identified in the Natural Resources Master Plan when related to a water resources project/activity.
Policy 8.6*:*	The City will Promote intergovernmental cooperation in protecting and improving areas with shared responsibility
Policy 8.7:	The City will encourage changes to current landscaping requirements which will encourage the use of native plant materials, enhance pollinator habitat and maximizing biodiversity.
Policy 8.8:	The City will encourage development along the Minnesota River Valley Area which will enhance its use as a recreational area and support the preservation of natural resources in a manner consistent with this Plan.
Policy 8.9**:**	The City will provide management of aquatic plants on all lakes in accordance with its Aquatic Plant Management (APM) Policy. The City will provide technical support to homeowner groups that wish to control aquatic weeds on water bodies not specifically addressed in the APM Policy.

3.9 Goal 9: Groundwater Protection

Goal: Prevent contamination of the aquifers and promote ground water recharge and conservation.

The City completed its Wellhead Protection Plan (WHPP) in 2006 following review by the Minnesota Department of Health. The overall goal of a WHPP is to protect the public water supply from harmful contaminants. It is a preventative program, keeping harmful contaminants from entering the public water supply system. Dakota County also has a Ground Water Protection Plan that was adopted in April 2000. In 2006 the county decided to integrate all of its water management objectives, including groundwater protection, in a comprehensive Environment and Natural Resource Management Policy Plan. That plan was

recognized by and approved by the BWSR Board as the new county groundwater management plan in October 2006 and it serves as the current county groundwater protection plan. The City's Wellhead Protection Plan Amendment was approved by MDH on September 26, 2013. The updated maps provide the basis for the prohibited and restricted infiltration zones established in the engineering standards in Appendix C.

In June 2015, the City of Burnsville adopted a Drinking Water Protection Overlay District (DWPOD) ordinance [City Ordinance 10-8-12]. This ordinance is meant to help protect the City's drinking water supply in an area in the northern part of the City determined "highly vulnerable" to contamination. This determination was based on the type and location of wells, surface water supply areas, geomorphology and aquifer characteristics in the area. The ordinance established standards and regulations for landowners and businesses, whose uses have the potential to contribute to drinking water contamination - such as storage tanks, outdoor storage and chemical usage.

It is a high priority for the City to maintain a clean and safe public water supply. The primary purpose of the DWPOD is to establish acceptable land-use practices, and develop performance standards to minimize risks to the City's drinking water supply. Table 26 presents policies the City has developed to achieve the ground water goals of this plan.

Table 26
Ground Water Policies

Subject:	
➢ Ground Water Protection and Sustainability	
Purpose:	
➢ To protect and sustain ground water resources by understanding and accounting for ground water/surface water interactions and promoting conservation.	
Goal:	
➢ Prevent contamination of the aquifers and promote ground water recharge and conservation.	
Ground Water Protection and Sustainability Policies	
Policy 9.1:	The City shall use and maintain the Drinking Water Protection Environmental Overlay District (adopted in 2015) to protect groundwater and surface water resources.
Policy 9.2:	The City shall require and promote, according to City ordinances, proper well abandonment.
Policy 9.3:	The City will require and promote stormwater infiltration in areas of the City that are not highly susceptible to groundwater contamination.
Policy 9.4:	Design and installation of on-site wastewater systems shall be in accordance with the standards set forth in Minnesota Rules, Chapter 7080, the Individual Sewage Treatment System (ISTS) Act and the City adopted Subsurface Sewage Treatment Systems ordinance (adopted in 2011).
Policy 9.5:	The City will implement and enforce the existing Water Conservation policies. The City will work with surrounding communities to implement conservation goals as recommended in the "Regional Drinking Water Supply, Groundwater Recharge and Stormwater Capture and Reuse Study" (Southeast Metro Area Study).
Policy 9.6:	The City shall encourage the use of alternative landscape techniques and materials to reduce dependency on ground water supplies.
Policy 9.7:	The City will encourage the use of "gray water" and/or stormwater to reduce reliance on potable water in accordance with state and local standards and guidance.

3.10 Goal 10: Regulatory Responsibilities

Goal: Maintain regulatory authority at the local level while recognizing the role of other local, state and federal entities and complying with specified programs and requirements.

Several entities will have administrative responsibilities within the planning area. For a local water management effort to be successful, each entity's commitment and role must be clearly understood. Those currently having some level of administration responsibility include the City, Watershed Organizations, Dakota County, the Metropolitan Council, MnDNR, MPCA, the U.S. Army Corps of Engineers, BWSR, EPA, and FEMA.

The major task of administering this plan will be in the permitting process. It is the intent of the City to assume the role of permitting for all land alteration, thereby enforcing the policies and standards of this plan. The City's existing permit procedures include water management elements outlined in this Plan. Surface water management elements will be reviewed at the same time all other permits are reviewed. The stormwater elements will meet the design standards of this plan (Appendix C).

The City's administrative responsibilities include, but are not limited to the following:

- Comprehensive Plan update(s);
- Land use regulation;
- Ordinance review and amendment;
- Local plat review and amendments;
- Permits;
- Wetland Management as LGU;
- Groundwater - wells;
- Participation and cooperation with the programs of the WMOs, DNR and Dakota County;
- Hydrologic model updates;
- Financing Alternatives;
- Capital improvements; and
- Conveyance system/pond maintenance;

A summary of the key steps in the City's permit process for development activities is provided in Appendix F. A checklist for development projects is also included. Hydrologic and hydraulic analysis, design information and requirements are provided in Appendices C and D.

The City of Burnsville has several codes and ordinances that relate to surface water management. The City's regulatory controls satisfy state and local requirements for water resources management. No new regulatory controls are required to insure plan implementation per Minnesota Statutes 103B and 8410 Rules. Local WMOs have authority to review City regulatory controls that affect resources under WMO jurisdiction.

The City has developed the policies in Table 27 to help meet the regulation goals of this Plan.

Table 27
Regulatory Policies

Subject:	
➢ Regulatory Responsibility	
Purpose:	
➢ Align regulatory controls with stormwater practices to maximize the protection of water resources	
Goal:	
➢ Maintain regulatory authority at the local level while recognizing the role of other local, state and federal entities and complying with specified programs and requirements.	
Regulatory Responsibilities – Policies	
Policy 10.1:	The City shall continue to implement its stormwater management ordinance.
Policy 10.2:	The City shall update ordinances and programs as needed to remain consistent with local, regional and national programs related to stormwater management.
Policy 10.3:	The City shall inform WMOs of projects within the respective jurisdictions which impact strategic waterbodies or MnDNR Public Waters.

3.11 Goal 11: Finance

Goal: Establish funding sources to finance water resources management activities.

Paying for water management projects has become more complex in recent years. In the past, special assessments against benefited properties financed most of the necessary improvements. However, the financial options have broadened considerably. The question is: Which method(s) best suit the needs of the City? Discussion on the funding source options for water resources management is discussed more in Section 7.1 Funding Sources.

The City has developed policies to achieve the finance related goals of this Plan as shown in Table 28.

Table 28
Finance Policies

Subject:	
➢ Paying for Water Resources Management	
Purpose:	
➢ To adequately finance management activities in an equitable manner.	
Goal:	
➢ Establish funding sources to finance water resources management activities	
Finance Policies	
***Policy 11.1*:**	The City shall continue use of the Stormwater Utility Fund to fund the majority of water resources activities/projects and shall budget to ensure its longevity and cost effectiveness to City tax payers.
Policy 11.2:	The City will actively pursue grants, donations, and in-kind contributions to help fund water resources management.
Policy 11.3:	The City shall assist citizens and businesses in their efforts to improve water quality, decrease the volume of runoff leaving a property and improve wetlands through the water resource enhancement grant program.
Policy 11.4:	The City shall encourage the WMOs to finance inter-community issues and projects.
Policy 11.5:	The City shall support the establishment of Lake Improvement Districts formed by petition in cases where inter-community funding is necessary and WMO funding is not available. Lake Improvement Districts are established in accordance with Minnesota Statutes, section 103B.501-103B.581. Minimum guidelines and requirements for the formation of LIDs are found in Minnesota Rules Part 6115.0900-6115.0980.
Policy 11.6:	The city may determine cost allocation on a project by project basis if funding sources other than the Stormwater Utility grants are used. Contributing area, tax value, percent of runoff, total pollutant loading and/or other units of measure may also be considered as a basis for determining cost allocations.
Policy 11.7:	Private development shall be responsible for funding all on-site stormwater facilities and may be requested to contribute funds for construction, expansion and/or maintenance of off-site conveyance or ponding systems.

3.12 Goal 12: Land Use Management

Goal: Recognize the relationship between land use and water resources management.

One of the recent trends in planning for future growth is the concept of sustainable development. Sustainable development involves communities finding ways to meet their residents' needs for such things as good jobs, schools and housing without wasting or degrading the natural resources upon which future prosperity depends (Minnesota Planning, 1995). Although "growth" and "development" are often used interchangeably, they imply very different things for a community. "Growth" suggests bigger while "development" can mean

getting better or achieving potential. By following the path towards sustainable development, communities can:

- Save money on infrastructure costs, such as roads, sewers, schools and police and fire protection, by avoiding duplication and anticipating future needs.
- Help ensure that the public costs of supporting new growth do not outweigh the public benefits.
- Spur environmentally sustainable economic development by providing current and prospective businesses with information about areas' future.

Burnsville formally adopted a Sustainability Plan in 2009 and incorporated sustainable principles into the current 2030 Comprehensive Plan. Sustainability is defined by the Minnesota State Legislature as follows:

> *"Development that maintains or enhances economic opportunity and community well-being while protecting and restoring the natural environment upon which people and economies depend. Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs."*

Within Burnsville's Sustainability Plan there are fourteen Best Practice Areas (BPAs) of which, the following BPAs pertain to water resource management and the objectives of this Plan:

- Adopt land use policies that provide incentives to reduce sprawl, preserve open space, expand and enhance green corridors as redevelopment occurs and to create a walk- able community.
- Help educate public schools and private industry about sustainable practices utilizing the ARROW program to educate business about sustainability and provide an educational campaign that reaches out to the school districts, private industry and professional associations about how they can be sustainable and incorporate sustainable practices into daily operations.
    - Protect and improve surface and groundwater resources. Develop an educational program aimed at reducing water wasted through irrigation through smarter practices, investigate new design standards and incentives to emphasize the use of natural drainage systems over built stormwater systems and seek ways to modify street improvement projects to provide less impervious surface, utilize rainwater gardens, porous pavement and other techniques.

The City has developed policies to help meet the land use goals of this plan. These policies and activities are presented in Table 29.

Table 29
Land Use Policies

Subject:	
➢ Land Use Management	
Purpose:	
➢ Revise ordinances and policies to promote sustainable growth.	
Goal:	
➢ Recognize the relationship between land use and water resources management	
Land Use Policies	
Policy 12.1:	The City shall continue to promote the use of Low Impact Development practices to replicate pre-development hydrology.
Policy 12.2:	Burnsville will continue to encourage proof of parking and endorses shared-parking and green "snow storage" areas to minimize impervious surfaces.

4.0 Resolved Issues & Past Project Examples

As discussed previously, this Plan builds on the previous Plans adopted by the City in 1994, 2002 and 2008. Each of those previous Plans contained an assessment of problem areas and called for implementation actions to address those issues. The following sections provide descriptions of past example projects and resolved issues.

4.1 Yellow Freight Pond

Yellow Freight Pond is a regional pond that was completed in 2014 where no previous stormwater treatment practice existed. The 5.5-acre wet pond was created to provide Water Quality Volume (WQV) credits for development and redevelopment projects within the 208-acre contributing drainage area. Immediately adjacent to this project was a combined project between MnDOT, Dakota County and the City to reconstruct the TH13 and County Road 5 interchange as well as several adjacent local streets. The majority of the runoff from the MnDOT ROW continues to bypass the Yellow Freight Pond through a channel that extends along the west side of the pond. That channel was stabilized as part of the work on Yellow Freight Pond.

Yellow Freight Pond

MnDOT runoff bypass channel

Yellow Freight pond provides an estimated pollutant removal of 38 tons of Total Suspended Solid removal on an annual basis and 162 pounds of Total Phosphorus removal on an annual basis. The City will make WQV credits available to new and redevelopment projects in the contributing drainage area as they progress through the permitting process.

4.2 Black Dog Slope

Following an intense rainfall in 2014, severe erosion occurred in a wooded ravine situated between Bluff Court (at the top of the slope) and Black Dog Park (at the bottom of the slope near the football field parking lot). The eroded area was located on the upper portions of the ravine, spanning about 250 feet in length and varying in depth from 2 to 14 feet. The 18-inch corrugated metal pipe (CMP) storm sewer line that had been installed decades before was severely damaged by the erosion and

Before Project: Slope failure and damaged CMP pipe

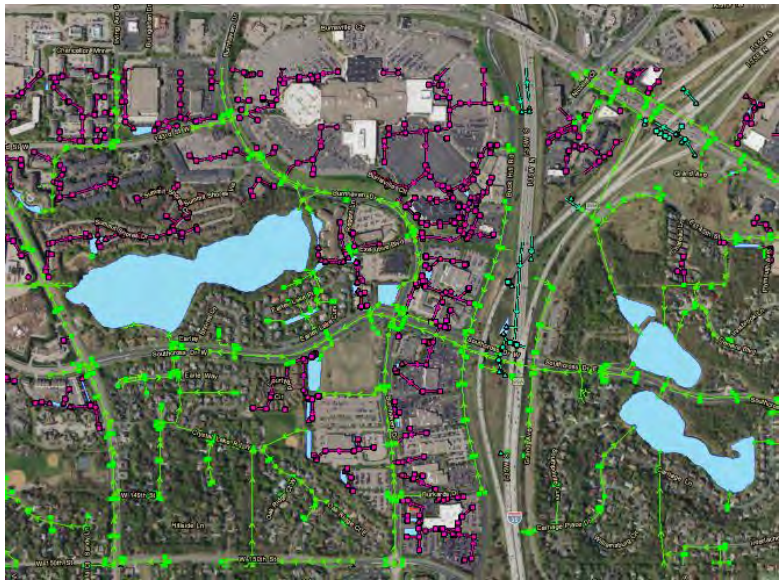
corrosion of the pipe may have contributed to the slope failure. Multiple pipe segments were completely exhumed and detached from one another and two manholes were severely damaged.

The condition of the CMP pipe likely contributed to the erosion and is a major reason what the City has a program specifically to assess and replace CMP pipes on a regular basis. Specifically, leakage from the rusted pipe bottom, pipe joints, or at pipe-manhole connections may have saturated and softened the soils around the pipe. The improvements consisted of placing a new and larger diameter High Density Polyethylene Pipe (HDPE) Pipe along the length of the slope and restoring the slope with native vegetation.

After Project: New HDPE Pipe installed and slope restored with native vegetation

4.3 Earley Lake

Earley Lake was listed on the MPCA's 2008 303(d) Impaired Waters List due to excess nutrients (phosphorus) and required a Total Maximum Daily Load (TMDL) study to be completed. The lake was first listed on the MPCA's 303(d) list in 2002, prior to the MPCA establishing water quality standards specifically for shallow lakes. However, based on the 10-years of water quality data from about 2001 to 2010, Earley Lake was meeting the MPCA's shallow lake standards, and the MPCA ultimately removed Earley Lake from the 303(d) Impaired Waters list in September 2011.



Much of the credit for removing Earley Lake from the impaired waters list and improving the quality of the water body goes to the City for projects and activities they completed in the contributing watershed. Projects such as the following each played a role, and will continue to provide treatment of stormwater that enters Earley Lake:

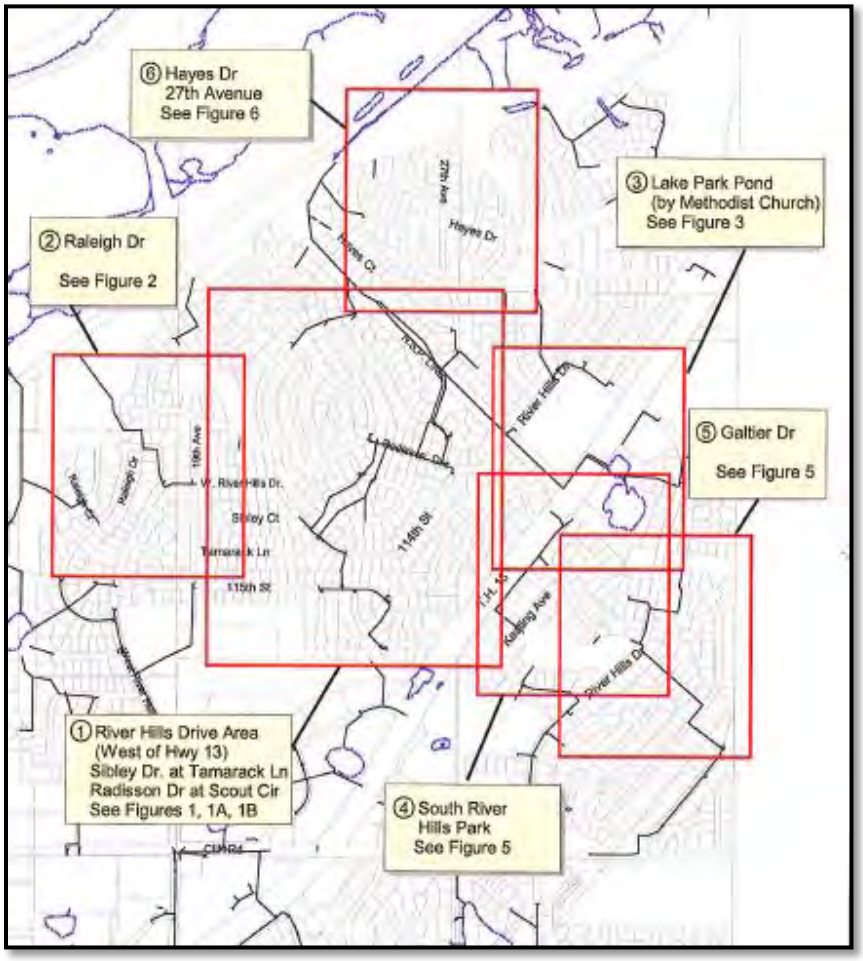
- Regent at Burnsville Diversion and Pond (2002). This project involved installing a low flow diversion structure and pipe in the existing 78-inch storm sewer that comes from the Burnsville Center Area. The diverted water routes to a pond that was built to treat this runoff before discharging to the lake.

- North Twin Pond (2014). While this was contructed after delisting of the lake, the project will have an impact on the ongoing load reductions to Earley Lake. This pond treats previously untreated flows from the Golden Triangle area before entering North Twin Lake and North Twin routed directly into Earley Lake.

- Additional Ponds and BMPs installed including: Burnhaven-Southcross Pond located at the northeast corner of Burnhaven and Southcross, Toyota Pond and many others in the contributing watershed.

4.4 Northeast Burnsville flooding prevention

An extreme rainfall event hit Burnsville in July of 2000, in the midst of working on the 2002 WRMP, and resulted in the identification of some significant problems areas throughout the City. One of the areas of focus was northeast Burnsville, for which the City completed a detailed field review and modeling analysis of issues in the area and developed recommended improvements to address the flooding that occurred in 2000. The Report "Northeast Burnsville – Comprehensive Flood Study: Proposed Engineering Solutions for Improving the Drainage System" (SEH 2001) identified specific improvements throughout the area that have all been completed, except for the final project which is planned for early 2017. Since improvements have been made little to no issues have been reported for extreme event rainfalls in recent years, confirming that the system is largely working as intended.



5.0 Assessment of Current Issues

As required by the new Minnesota Rules Chapter 8410, adopted in July of 2015 and Minn. Stat. 103B.235, local water management plans need to include an assessment of both existing and potential water resource-related problems/issues. This section outlines the existing issues the City has identified while section 6.0 identifies emerging and potential future problems.

Based on survey results from the public input process, an assessment of known issues by City staff and in consideration of regulatory responsibilities, the following items have been identified as the leading existing water-resource related problems the community of Burnsville faces:

- water quality
- water quantity/flooding
- vegetation management

These issues, as well as erosion and sedimentation are discussed in the following sections. The same topics are also tied to the City's Goals and Policies in section 3.0 and actions to move toward resolving these issues are identified in section 7.0.

5.1 Water Quality

Improving and maintaining water quality within receiving water bodies is the highest priority issue for the City in the years ahead. Water quality is driven by several factors including the type of land use and impervious cover within the contributing watershed and the extent of water quality treatment practices (or BMPs) installed or implemented throughout the watershed. Where receiving water bodies currently do not meet current state water quality standards or City goals, the primary mechanism to get the desired result is to implement additional physical BMPs, maintain and/or improve the function of existing physical BMPs and/or improve the effectiveness of management practices within the watershed.

Where this Plan refers to receiving water bodies, the water features included are the natural lakes, wetlands, streams and rivers that are managed for water quality. The physical BMPs that are installed within the watersheds to improve water quality before it reaches these waters are the City system that removes and collects pollutants before it reaches downstream water bodies. For example, a stormwater pond may look and in some ways function like a natural water body even though it is functioning as a treatment device to remove sediment, debris and pollutants from the surface water runoff and accumulate these materials for removal at a later date. In Burnsville, many of these stormwater ponds are natural water bodies that have been altered in some way to serve the function of a stormwater pond. These manmade and natural basins that serve as treatment systems are not managed for water quality, but instead are managed to maintain a designed level of treatment function. When that level of function is reduced over time, the City programs a maintenance project (i.e., pond clean program) to restore or improve the treatment device's function.

5.1.1 Impaired Waters

The MPCA has updated the 303(d) Impaired Waters list every two years, with the most recent draft list published for 2016. Table 30 summarizes the waters within Burnsville on the draft 2016 Impaired Waters list.

Table 30
2016 Draft Impaired Waters Summary

Water body name	Affected designated use	Pollutant or stressor	TMDL Plan Approval Year
Crystal Lake	Aquatic Consumption	Mercury in Fish Tissue	
Crystal Lake	Aquatic Recreation	Nutrient/eutrophication biological indicators	2011
Keller Lake	Aquatic Recreation	Nutrient/eutrophication biological indicators	2011
Lac Lavon	Aquatic Consumption	Mercury in fish tissue	2007
Minnesota River	Aquatic Consumption	Mercury in fish tissue/water column	2008
Minnesota River	Aquatic Consumption	PCB in fish tissue	
Minnesota River	Aquatic Life	Dissolved oxygen	2004
Minnesota River	Aquatic Life	Nutrient/eutrophication biological indicators, turbidity	
Lake Alimagnet	Aquatic Recreation	Nutrient/eutrophication biological indicators	2015

The City has taken an active role in developing TMDL studies and implementation plans for the nutrient/eutrophication impairments to these waters (the MPCA is leading the efforts to address mercury impairments on a much larger scale). Water quality is often directly related to the level of nutrients in the water body. While nutrients comprise only one category of substances that can effect water quality, nutrients, principally phosphorous, must be controlled to achieve the water quality goals of this Plan. Phosphorous is almost always the limiting factor to plant growth. Increase the phosphorous and the plant species dominating the lakeshore, open water, or marsh will certainly shift to favor those plants which can best take advantage of the increased supply of phosphorous.

The City partnered with the Black Dog WMO to complete TMDL studies on Crystal and Keller Lakes which was approved by the EPA in September 2011. Earley Lake was also assessed during this study but was delisted and taken off of the 303(d) Impaired waters list in 2010. The VRWJPO completed the Vermillion River Watershed Restoration and Protection Strategy project in 2015 which addressed 27 impaired water bodies, one of which was nutrient impairment for Lake Alimagnet.

The portion of the City that drains to the Vermillion River also has E. Coli bacteria and dissolved oxygen impairments. As part of the City's NPDES permit program, the City will continue to track activity related to TMDL studies on each of these waters and respond according to the requirements of the permit program as well as continuing cooperative relationships with watersheds and other cities in managing flows and pollutant loads to intercommunity and downstream waterbodies.

5.1.2 Pollution Prevention

Good “Housekeeping” practices are a way for individuals and the City to make a difference in water quality. Many people do not realize that organic materials, like leaves and grass clippings, fertilizer and pesticides, and pet waste can disrupt the ecosystem of a lake or wetland. One of the six main elements of what the City needs to follow to comply with the NPDES MS4 Permit Program is Good Housekeeping for Municipal Operations. This includes practices such as street sweeping, good lawn mowing practices, reducing the use of chemicals and fertilizers and many others. These same type of practices are great examples of things each individual resident or business owner in the City can also do.

5.1.2.1 Street Sweeping

Leaves and grass clippings that make their way to lakes are doing even more damage than fertilizers, pesticides and motor oils. Once in the lakes, these organic materials decay, releasing phosphorus. The excess phosphorus increases algae growth, inhibiting the growth of other aquatic plants. When algae die and decay, they exert a biochemical oxygen demand (BOD) on the lake, depleting available oxygen for fish.

The City currently sweeps streets a minimum of twice per year, with more frequent sweeping completed as staff resources are available. Fall leaf sweeping of the whole City was conducted for the first time in 2001.The street-sweeping plan focuses resources on areas around the highest quality resources first, before moving out farther into the watershed.

5.1.2.2 Ice Control Priorities

In 2006-2007 the City revised its policy on street sanding and went to all salt application for ice control. Only on very rare occasions does the City use sanding to supplement the salt applications. The City has been pre-wetting the pavements and using anti-icing agents. The City has identified the four high-priority snow and ice control areas and has established a priority system for street deicing activities. The system generally follows the order below.

- Thoroughfares;
- Commercial/Industrial;
- Collectors and steep grades; and
- Residential intersections.

MPCA recommends a low-salt diet for Minnesota waters. When snow and ice melts, the salt goes with it, washing into our lakes, streams, wetlands, and groundwater. It takes only one teaspoon of road salt to permanently pollute 5 gallons of water. Once in the water, there is no way to remove the chloride, and at high concentrations, chloride can harm fish and plant life. Less is more when it comes to applying road salt. The MPCA webpage has more detailed information on salt use and best practices to reduce use and manage ice including an online tool to help winter maintenance organizations assess operations, identify opportunities to reduce salt use using proven BMPs and track progress. The goal is to maintain performance while reducing salt use and saving money.

5.1.2.3 Fertilizer Application

Fertilizer may be necessary for a healthy lawn, but the nutrients in fertilizer can be harmful to lakes and wetlands. Phosphorus from fertilizers runs off lawns and ultimately discharges to area lakes and wetlands. One pound of phosphorus can yield 500 pounds of algae. Algae can turn a lake green and damage or even kill the lake’s ecosystem.

Fifteen to thirty percent of phosphorus in urban runoff comes from lawns. In general, the soils in Burnsville are already rich in phosphorus. Applying the right fertilizer, in the right amount,

ensures a healthier lawn and healthier lakes and healthier wetlands. The City adopted a phosphorus free fertilizer ordinance in 2001 in direct response to this planning process and in advance of the State law enacted in stages between 2002 and 2005. The City's fertilizer ordinance prohibits fertilizers near water bodies, requires commercial applicators to be licensed, and requires everyone to use phosphorus-free fertilizer unless a soil test is conducted to verify the need for phosphorus.

5.1.2.4 Animal Waste

From time to time, metro area beaches are occasionally closed for short periods during the peak swim season as a result of high fecal coliform bacteria levels. Fecal coliform is a direct result of pet and migratory waterfowl (especially Canadian geese) waste. An education-based approach can reduce this problem. Although many people enjoy seeing Canadian geese, the geese often wear out their welcome when they become too numerous on lawns, parks and golf courses. Yards, beaches and docks become fouled with their feces. The fecal matter contributes to poorer water quality by increasing nutrient loading. The City has a Canada Goose Management Plan to address nuisance goose populations. Information on the program is available on the City website.

In addition to being an aesthetic issues, pet waste can also be a significant concern if allowed to runoff directly into surface waters resulting in added nutrient and fecal bacteria loading. The City has pet waste bags available at the Alimagnet off-leash dog park to help reduce the extent of pet waste subject to runoff and regularly publishes articles in local newsletters regarding the need to pick up after pets.

5.1.3 NPDES MS4 Permit

The City has implemented the USEPA's Phase II Stormwater Regulations (Title 40 Code of Federal Regulations, Part 122). The approach of the Phase II permit is to address water quality by focusing on six specific programming elements as shown in the inset below, for implementation of Best Management Practices (BMPs).

Six Minimum Control Measures for the NPDES Permit

(1) Public education and outreach on stormwater impacts;
(2) Public involvement/participation;
(3) Illicit discharge detection and elimination;
(4) Construction site stormwater runoff control;
(5) Post-construction stormwater management in new development and redevelopment; and
(6) Pollution prevention/good housekeeping for municipal operations.

The Minnesota Pollution Control Agency is the NPDES permitting authority for the federal rule implementation. The MPCA implemented the Municipal Separate Storm Sewer System (MS4) permit program in 2003 and made revisions to the permit in 2006. The City prepared its original Stormwater Pollution Prevention Plan (SWPPP) in 2003 and applied for coverage under the permit as required by MPCA. The City's 2003 SWPPP was approved and the City operated under the permit by completing the measurable goals identified in each of the Best Management Practices (BMPs) within the SWPPP.

The MPCA finalized revisions to the permit again in 2013 and required permit holders to apply for reauthorization of coverage for the revised permit. The revisions included additional

water quality treatment provisions, additional work on inventories of the storm system and updating ordinances and official controls to be consistent with the new permit requirements. The City applied for coverage in December of 2013 and the MPCA placed the City's proposed updates on Public Notice in February 2014. Following the public notice period the City received approval of coverage under the new permit in April 2014.

5.1.3.1 Anti-degradation Assessment

The reissuance of the permit by MPCA in 2006 required cities to revise their SWPPPs and reapply for permit coverage. The City reapplied and obtained coverage based on the 2006 SWPPP and has since added BMPs that address Anti-Degradation (referred to in 2006 as Nondegradation) requirements and a process for tracking impaired waters within the City and responding to planned or competed Total Maximum Daily Load (TMDL) studies and implementation programs.

In 2007, the City evaluated the past, current and potential impacts of land use on loading of various pollutants to City waters. The City was one of 30 cities required to complete a Nondegradation Assessment and Report that looked at the average annual loading of three pollutants (listed below) at 1988, 2005 and projected 2020 land use conditions. The three pollutants are:

- Total Suspended Sediment (TSS)
- Total Phosphorus (TP)
- Annual Runoff Volume

A new Anti-degradation Rule was adopted by MPCA in November 2016. The proposed standards within this WRMP establish runoff volume control for both new development and redevelopment that meet the expectations of the Anti-degradation requirements for the MS4 Program. Any new requirements would be addressed in revisions to the MS4 General Permit when that permit update (which starts in 2018) is completed.

5.1.4 Individual Sewage Treatment Systems

The Individual Sewage Treatment System (ISTS) Act was signed into law on May 10, 1994 (Anon., 1994), to reduce contamination of surface and ground water caused by inadequate septic systems. The law includes requirements for minimum sewage treatment standards, new construction, replacement of ISTS, disclosure of sewage-system information to property buyers and a mandatory licensing program for all ISTS professionals, including designers, site evaluators, installers, inspectors and pumpers. In Burnsville, these systems are regulated by City Code Chapter 11, Subsurface Sewage Treatment Systems (SSTS) that was adopted in 2011.

Approximately 229 properties in southwest Burnsville continue to be served by on-site waste water systems. A poorly maintained system can represent a significant threat to water quality, especially when the system is adjacent to significant wetlands and/or lakes. It is the responsibility of the property owner to maintain the system in proper working order.

5.1.5 Subwatershed Assessments

5.1.5.1 Alimagnet Lake Subwatershed

In 1991, a diagnostic Feasibility study was prepared for Lake Alimagnet. As part of that study, specific lake goals were established for the lake. The total phosphorus goal was set at 81 µg/l. The lake is aging rapidly, with chronic occurrences of blue-green algae and a past history of fish kills. The data suggests that a reduction of external phosphorus loading was necessary to reduce the blue-green algae blooms. There are 12 storm sewer inlets to the

lake within Burnsville and Apple Valley, three of which contribute 71 percent of the runoff. The 81 µg/l goal was to be achieved after all identified watershed improvements were made.

In 2005, the Cities of Burnsville and Apple Valley funded a Lake Management Plan which included a lake assessment of the estimated annual total phosphorus load and in-lake modeling to re-evaluate the lake goal and implementation of improvement projects. Phosphorus concentrations in Alimagnet are higher than lakes in the North Central Hardwood Forest ecoregion (one of seven areas within Minnesota defined as having a large expanse of land containing a geographically distinct collection of plants, animals, natural communities and environmental conditions). At the time of the 2005 lake assessment, the recent 2003 growing season phosphorus average was 113 µg/l for Alimagnet while the predicted average phosphorus concentration across the ecoregion is 54 µg/l. The more recent 10-year summer average total phosphorus concentration (from June 2006 to September 2015) is 99 µg/l.

An important finding of the watershed and in-lake modeling was that Alimagnet Lake will need both watershed and lake projects to meet the predicted ecoregion phosphorus concentration of 54 µg/l. This should produce a summer average Secchi disc reading of 1.2 m (4.0 ft). The water quality of a shallow lake system, like Alimagnet Lake, is greatly affected by in-lake processes such as internal recycling of nutrients that have accumulated in bottom sediment and relationships between fish, rooted aquatic plants, and algae.

More recently in 2015, the VRWJPO published the Vermillion River Watershed Restoration and Protection Strategy report which set an allowable TP wasteload allocation of 62.4 lbs/yr for Burnsville. Estimated load reduction required for Burnsville is 25.6 lbs/yr (29% of the current estimated load of 88.0 lbs/yr). A total load reduction of 167.5 lbs/yr from all sources is estimated to achieve a state water quality standard of a total phosphorus concentration of equal to less than 60 µg/l and a clarity equal to or greater than 1.0 meter.

5.1.5.2 Crystal Lake Subwatershed

In the 1990's, water quality concerns on Crystal Lake lead to the development of a hypolimnetic (bottom) withdrawal and chemical treatment system by the Black Dog WMO. The system was installed in 1995 and began operating in 1996. The plan was to remove water from the bottom of the Crystal Lake water column where phosphorus was present, mix in ferric chloride and allow the mixture to safely settle in Keller Lake before the water returned through the existing culvert connecting the two lakes.

From the beginning, the system was plagued with odor problems. Hydrogen sulfide that naturally occurs in the lower water column was being released when the water was withdrawn for treatment, resulting in citizen complaints. Use of the system was discontinued indefinitely in 1999. In reviewing the decision, the Black Dog WMO reasoned that there might be more cost effective means to accomplish water quality improvements on Crystal Lake. An unexpected benefit was a significant, though short-term improvement in Keller Lake's water quality due to the injection of treated water. The system did not produce the desired improvements on Crystal Lake.

During a July 2000 public meeting, Crystal Lake residents indicated that their preference was to first address water quality issues on Crystal Lake in advance of potential modifications to the outlet system identified in a hydraulic study to address high water level concerns. While no improvements were proposed as part of the 2002 Plan update process, the study suggested that if the project is pursued, the BDWMO would complete a cost allocation analysis to determine if other cities will contribute funding for the project. The BDWMO may also be involved in assigning costs to the parties involved.

The City believes that the revised (2008) water clarity of 2.1 meters (from 2.6 in the 2002 Plan) is an appropriate long-term goal for Crystal Lake. This revised goal is based on the findings of the Crystal and Keller Lake Use Attainability Analysis (2003). The City is committed to continuing work with the WMO to prioritize implementation projects under consideration in the watershed.

In 2011, the BDWMO published the EPA approved Crystal, Keller, Lee and Earley Lakes - Final TMDL Report which set an allowable TP wasteload allocation (WLA) of 67 lbs/year for Burnsville. The existing conditions TP load for Burnsville is estimated to be 67 lbs/yr which is equal to the WLA so the load reduction goal is to meet anti-degradation requirements (i.e. no load increase). The majority (94%) of the phosphorus reduction needed to achieve the water quality standards for Crystal Lake would need to come from controlling the internal sources of phosphorus loading. The MPCA has started the process of re-evaluating Crystal Lake to determine if it can be de-listed from the impaired waters list.

5.1.5.3 Earley Lake Subwatershed

In the mid-to-late 90's, Earley Lake had a clarity range of less than 1.5 meters. Due to its position in the watershed, Earley Lake receives a considerable inflow and pollutant loading both from direct runoff from large impervious areas like Burnsville Center as well as from the upstream discharge from the Crystal-Keller Lake systems. In 2002, a diversion structure was installed in the trunk storm line coming for Burnsville Center and that diverted flow to a sedimentation basin within the Regent at Burnsville property. As a result of that project along with significant efforts and implementation activities since the 2002 WRMP was adopted, Earley Lake was removed from the impaired waters list in 2010. See Section 4.3 for more information on improvements within the Earley Lake Subwatershed and the removal of Earley Lake from the impaired waters list in 2011..

There has been considerable interest in Earley Lake as expressed by an active Lake Shore owners association. The Black Dog WMO Plan indicates that contact recreational activities like swimming are not supported by current lake quality due to excessive algae blooms in mid-to-late summer. The lake is not considered a strategic water resource by the WMO. Because so much of the contributing watershed is comprised of high value, commercial real estate, watershed controls may be very costly to implement. A goal of maintaining Earley Lake clarity at 1.7 meters is achievable and challenging at the same time.

5.1.5.4 Keller Lake Subwatershed

Keller Lake has typically been rated by Metropolitan Council as having clarity less than 1 meter and high to severe levels of algae. The lake has an average depth of only 4.6 feet and a maximum depth of only 7 feet. The 63 acre lake has a watershed to surface area ration of 22 to 1 which helps to explain its current quality (as example, Lac Lavon has a ratio of 3.2 to 1). Aside from 1998 when Keller's water quality improved significantly as a result of the Crystal Lake hypolimnetic withdrawal system discharges (see Section 5.1.5.2), the lake has had a very high phosphorus concentration. At the same time water quality improved, the lake experienced explosive plant growth. Based on current transparencies, the recreational suitability index would indicate very limited recreation uses based on citizen perception.

Keller Lake's predicted phosphorus load could increase by about 7 percent without additional treatment or BMPs. With BMPs implemented in the watershed, the BDWMO estimates that the phosphorus load would increase approximately 4 percent. The predicted future in-lake total phosphorus concentration is expected to change very little. It is important to recognize that both Burnsville and Apple Valley, both with contributing watershed to the lake are permitted MS4s and are required to meet their waste load allocation as established in the

TMDL by implementing BMPs within the watershed. While these improvements will improve water quality entering the lake, they will not address the significant internal load to the lake.

Additional efforts should be undertaken to re-establish citizen expectations for intended uses. The BDWMO set an action level for Keller Lake at 0.7 meters of clarity.

In 2011, the BDWMO published the EPA approved Crystal, Keller, Lee and Earley Lakes - Final TMDL Report which set an allowable TP wasteload allocation of 82 lbs/yr for Burnsville. Estimated load reduction required for Burnsville is 74 lbs/yr (47% of the current estimated load of 156 lbs/yr). This reduction is estimated to achieve a total phosphorus concentration of equal to less than 54 µg/l and a clarity equal to 1.4 meters. The City completed a project in 2017 that will remove an estimated 74 lbs/yr and will meet the City' load reduction target identified in the TMDL Report. The City's lake quality goal for Keller Lake is 1.8 meters of clarity. This goal will be re-evaluated as part of a Use Attainability Analysis study of the lake to be completed in 2018-2019.

5.1.5.5 Twin Lake Subcatchment

Any increase in Crystal Lake water quality should also result in an improvement in the water quality in both North and South Twin Lakes. In general, Twin Lake has very limited active recreational suitability. The 2002 WRMP stated that the water quality goal should be 0.9 meters based on conditions at the time. However, based on the desire for better quality and in consideration of proposed improvements in contributing drainage areas, the clarity goal was established at 1.7 meters.

Since that time the City has separated the management of Twin Lake into two parts and created unique goals for South Twin and North Twin. A goal of 1.7 meters has been retained on North Twin, while a goal of 1.4 meters has been established for South Twin.

In the early 2000's, the City experimented with barley straw bundles at the inlet to South Twin with some limited short-term success. The chemical reaction between the water and the straw helps to control filamentous algae which is prevalent on South Twin. The City continues to support resident efforts to use barley straw to improve water quality of small ponds throughout the City.

In 2013, the City constructed a new regional stormwater basin named North Twin Pond to treat stormwater inflow in the northwest corner of North Twin Lake. The basin treats previous untreated inflow and provides a portion of the treatment credit for the undeveloped land in the immediate contributing drainage area and helps to improve the water quality in North Twin Lake as well as in downstream Earley Lake.

5.1.5.6 Sunset Pond Subcatchment

Sunset pond has a current 3-yr average summer water clarity of 1.9 meters. The pond's history and purpose in the overall drainage system must be considered when developing a management strategy for the Pond. The primary natural focus of the water body is wildlife viewing from the perimeter trail system. Therefore, intensive efforts to improve the pond water quality are probably not warranted when one considers the fact that this is a created and not a natural water body, and that quality is "average". The City's water clarity goal is established as 1.7 meters.

5.1.5.7 Wood Pond Subcatchment

In the mid-1990's, a citizen-driven study was completed by the City. The study addressed water quality and water levels concerns. One major issue was that ponding easements did

not exist over the properties adjacent to the pond. As a result, easement purchases were executed with the property owners.

In October 1997, the Lake was treated with aluminum sulfate (alum). From April 1996 to October 1997, pre-alum treatment sampling identified a mean total phosphorus value of 51.2 µg/l. Similar post-monitoring from April to October 1998 showed total phosphorus values of 30.8 µg/l. Over the same one year period, chlorophyll-a concentrations actually increased while overall transparency improved only slightly. The monitoring period also showed above average precipitation, which often produces an increased watershed loading and related poorer quality.

The 1998 summertime grade for the pond improved from less than 2 meters of clarity to over 2 meters of clarity, but the values returned to less than 2 meters level in 1999. Year 2000 monitoring (Metropolitan Council, 2001) shows nutrient and Secchi disc readings reverted to pre-project levels in Wood Pond. Secchi disc transparency for the past 3 years (2013-2015) have averaged 1.7 meters matching the goal for Wood Pond of 1.7 meters.

5.2 Flooding

Through the public input process developing this plan in 1999 to early 2000 there was a clear consensus that water quantity issues should be a high priority in the plan. In the original draft of the plan in 2002, water quantity was set as Goal number 2, indicating it was the second highest priority. In July of 2000, a significant storm event hit much of Burnsville, resulting in several major areas of flooding. This event prompted the City to make flooding the highest priority and Goal 1 in that 2002 WRMP.

Since that time, the flooding areas identified in the 2002 plan have largely been addressed or improved. While areas of flooding and flood risk remain, the issue of water quality has moved to priority number 1 (Goal 1) for the 2017 plan, with flooding a close second as priority 2 (Goal 2). Flooding in several areas of the City resulting from another large rainfall event in August 2015 played a key role in maintaining water quantity (i.e., flooding) issues as a high priority of this Plan.

Figure 14 illustrates the location of flooding resulting from the August 2015 storms. These areas have been assessed by staff on a preliminary basis and have either been resolved, are in the process of evaluated further or are included in the Capital Improvements Program section of this plan.

Several of the more substantial historic flooding issue areas have been subject to extensive analyses and capital improvements such that they no longer pose a significant risk. However, in order to provide some background on these areas and some of the work that has been done over the past 15 years, a few of the City's highest profile water quantity issues are summarized in the following paragraphs.

5.2.1 River Hills/ Northeast Burnsville

Heavy rains in July 2000 focused attention on area-wide drainage problems in northeast Burnsville. A detailed model of pipe capacities was completed as part of the planning process and are summarized in the report titled Northeast Burnsville – Comprehensive Flood Study: Proposed Engineering Solutions for Improving the drainage System (SEH, March 2001).

The majority of storm sewer improvements needed to address flooding problems in northeast Burnsville were completed prior to 2007 as part of the City's street reconstruction program.

The final project to be completed near 11024 Bluff Court is scheduled to be completed in 2017.

5.2.2 Keller-Crystal-Twin-Earley Lake System

Starting in southeast Burnsville with Keller and Crystal Lakes, the City has a chain of connected water bodies that are connected through a series of storm sewer pipes. The system routes to the north and west through South and North Twin Lakes, then through Earley Lake and Sunset Pond before discharging through a large box culvert into the Minnesota River. This system has been the subject of extensive modeling and evaluation of high waters for decades. Any improvement or change in one of the upstream water bodies to reduce flooding or high water levels has the potential to create unintended consequences downstream. Therefore, as the discussions in the following subsections elude to, any future improvement studies will need to consider the system as a whole.

5.2.2.1 Keller Lake

In the mid-90s, a study was prepared to evaluate options to increase the discharge from Keller Lake to Crystal Lake (SEH, 1996). No improvements to the system were made. The conditions that precipitated the study appear to have been short-term. However, improvements to Crystal Lake's outlet may also improve the conditions observed on Keller Lake in 1996. The analysis of the 1996 study and the more extensive 2001 study will be reevaluated with the updated model and new rainfall data.

5.2.2.2 Crystal Lake

The City's first comprehensive drainage plan (Barr, 1966) addressed extreme fluctuations in water level on Crystal Lake. The City ultimately decided to install a deep gravity storm sewer outlet. The next major hurdle was to construct a large lake/pond north of County Road 42 near the Savage City border. Sunset Pond was created, in part, to accept surface water from the homes and businesses in west central Burnsville and also the outflow of water from the Crystal Lake system. The development of Sunset Pond required a dam to be built to hold back the water. Shortly after completion of Sunset Pond the downstream pipes were installed and the Crystal Lake outlet was finally in-place. The Sunset Pond dam represents a hazard if it breaks or breaches. The City regularly inspects and maintains the dam.

Crystal Lake's high water levels have created concerns relative to lost recreational opportunities and shoreline erosion. Potential modifications to the outlet system were identified that will significantly reduce the duration of high water levels on the lake in a special study of the Crystal and Keller Lake systems. The recommended (future) improvements included replacement of nearly 1,000 lineal feet of existing storm sewer immediately downstream of Crystal Lake, ending at Crystal Lake Road and Eileen Circle. The proposed 48 inch diameter outlet would replace the in-place 36 inch pipe and would lower the pipe elevation at Crystal Lake by one-foot. The results would increase the peak discharge by nearly 100 percent, decrease the 100 year peak by 0.75 feet and reduce the duration of high water levels above 934 from an estimated 18 days to about 7 days. These improvements were not completed in larger part due to the significant cost of replacing 1000 feet of large diameter pipe. The recommendations of the 2001 study will be reevaluated with the updated model and new rainfall data.

5.2.2.3 South Twin Lake

Local flooding relative to existing flood easements continues to be a concern, although, to date, no structures (homes or buildings) have been impacted by the high water levels. Proposed modifications to the existing outlet structures could increase the discharge capacity at lower water levels. However, during further evaluation of this system, it was determined

that those changes would not result in substantial improvements, without major modifications to the downstream conveyance system in Southcross Drive. Improvements were completed to install a trash guard at the outlet to help reduce the plugging of the outlet by floating debris. In 2014 a regional water quality pond was constructed in the northwest inlet area to North Twin. While this pond was primarily focused on providing water quality benefits, the project also reduces the risk of significant debris in North Twin that would otherwise tend to plug the outlet for the combined lakes.

Quantity issues will be addressed to some extent in the larger connected system by the outlet improvements and similar improvements at Crystal Lake, Earley Lake and future controls from the "golden triangle" tributary northwest of North Twin. Through extensive study, the conclusion has been reached that there is not a cost-effective way to significantly reduce the bounce in South Twin Lake. One of the recommendations of the 2001 Lake Level Analysis was to increase the outlet weir length on North Twin to increase the rate of discharge from the system and reduce the duration of high water levels on North and South Twin. These recommendations will be reevaluated in light of new rainfall frequency data and the updated model.

5.2.2.4 Earley Lake

Prior to improvements completed in 2002, the duration of high water levels on Earley Lake had caused frequent citizen complaints and the upstream drainage system improvements were not expected to mitigate the problem. The 28-acre lake has an 878-acre direct contributing area, or a watershed-to-lake-area-ratio of 31:1. Following a flood event in July 2000, of the City completed improvements in the spring of 2002. The results of these improvements yielded a reduction in the peak high water level on the order of 3 feet. With the increases in rainfall depths as evident in the data in Atlas 14, the risk of high water levels on Earley Lake remain for extreme rainfall events.

5.3 Recreation, Wildlife, and Habitat

5.3.1 Goose Control

Although many people enjoy seeing Canada geese, the birds often wear out their welcome when they become too numerous on lawns, parks and golf courses. Yards, beaches and docks become fouled with their feces, and the fecal matter ultimately contributes to poorer water quality.

The City has prepared a comprehensive goose control plan (Burnsville, Canada Goose Management Program, July 2001). Burnsville has limited quality breeding sites for Canada geese, as many of the City's ponds are deep, have steep slopes and are without islands. These conditions limit the amount of emergent vegetation that normally provides ideal goose habitat. One exception is Sunset Pond, which is considered among the top three Canada goose breeding sites in the Metropolitan area.

The following list summarizes the key activities of the City's goose management program:

- Document goose damage through a complaint/damage recording system;
- Maintaining an ordinance to prohibit water fowl feeding;
- Removal of aggressive geese or problem geese that may create traffic hazards;
- Reduce population of geese near beaches to fewer than 15 birds;

- For safety purposes, reduce population of geese to fewer than 10 birds in the summer near elder care facilities;
- Reduce population to fewer than 30 birds near Alimagnet, Crystal, Kraemer, and Sunset Pond Parks; and
- Reduce population to fewer than 15 birds near small parks, wetlands, residential and commercial areas and cemeteries where damage has been noted.

5.3.2 Aquatic Plant Management

Aquatic plants are an essential part of lake and wetland communities and managing aquatic plants is an important factor in achieving the City's water resources goals. Managing aquatic plants can help towards improving water quality, creating or maintaining healthy aquatic habitat conditions, improving recreational use and enhancing the aesthetic value of Burnsville's lakes. More specifically, healthy aquatic plant communities:

- Remove coliform bacteria and nutrients from the water and lake bottom;
- Help prevent shoreline erosion by breaking up wave action;
- Provide natural food and shelter for fish and wildlife; and
- Are one of the primary producers in the aquatic food chain; and affect the chemical, physical and biological -characteristics of our lakes. For instance, a one-acre stand of bulrush can remove an amount of phosphorus equal to that present in wastewater created by 33 persons during the four-month growing season.

The City has had an Aquatic Plant Management (APM) Policy (Policy 5.147) that provides the basis for the City's overall strategies and program to manage aquatic plants. The policy was updated as part of this 2017 WRMP Plan update based on extensive input from lakeshore residents and lake users during the public input process in 2016-2017. The primary strategies include education and technical assistance as well as completing aquatic plant management in portions of selected water bodies.

Based on the level of interest and comments relating to this topic during the 2016-2017 WRMP Update public input process, the City will be developing more information on the program strategies, especially in the areas of providing educational materials and technical support information. The City will allocate funds to its operating budget for removal of aquatic vegetation. The City will also work with local partners such as Dakota County to implement invasive species management efforts (e.g. signage, education, inspection, and enforcement) in the City's lakes. Aquatic invasive species are discussed more in section 5.3.3.

Grant funding is available for some lake management activities through the City's Water Resources Enhancement Grant Program. This program may fund development of lake management plans and lake assessments, shoreline improvements and buffers, for example. This program does not fund aquatic plant management activities.

5.3.2.1 Permitting

The DNR requires permits for controlling or destroying aquatic plants or invertebrates in protected waters or wetlands. The permit program is based on Minnesota Rules, Chapter 6280 Aquatic Nuisance Control. While more detail is available on the DNR's website, there is generally a 150 foot zone from the shoreline out that is the responsibility of the lakeshore owners to manage, while outside of that 150 foot zone, the City may complete aquatic vegetation control in selected areas.

5.3.2.2 Chemical Control of Aquatic Plants Near Shore

According to Chapter 6280, the lesser of fifteen percent (in home rule charter or statutory City, or a town only) of the littoral area or 100 feet of shoreline per individual riparian property owner may be treated. There is an associated fee with the permit.

5.3.2.3 Controlling Algae and Excess Vegetation in Lakes

5.3.2.3.1 *Alum Treatment*

Historically alum (aluminum sulfate) has been widely used to clarify and purify drinking water. Twenty years ago, the rule of thumb was that a single treatment with alum could prevents algae blooms for two to five years or more, depending on how much phosphorus enters the lake and its hydraulic residence time. The length of time that alum can be effective has improved in recent years. While some improvement in managing algae blooms may be seen, the improved water clarity generally allow increased light penetration into the water column and may result in increased aquatic vegetation growth in the water body. Alum treatment requires extensive planning, in particular to determine the amount of alum needed and appropriate permits from the DNR are needed.

5.3.2.3.2 *Copper Sulfate*

Some locales treat lakes with copper sulfate ($C_USO_4\,5H_2O$). The cupric ions (C_{u2}^+) inhibit both respiration and photosynthesis in algae. Copper sulfate is more toxic in soft, acid water than in alkaline water. Copper sulfate is an excellent algaecide, but it is without appreciable residual toxicity. Although copper sulfate may be quite effective in reducing phytoplankton abundance in lakes and ponds, it does little for the long-term condition. In other words, phytoplankton photosynthesis quickly returns to pre-treatment levels. As dead algae fall to the bottom and decompose, their phosphorus content is released to support another round of plant growth. In addition, the dissolved oxygen content (DO) of the lake/pond may be lowered or be completely depleted. Concentrations of copper sulfate used for phytoplankton control are seldom directly toxic to fish, but they do kill large numbers of invertebrate fish food organisms.

5.3.2.4 Weed Harvesting

Weed harvesting falls into two categories; mechanical and non-mechanical. Mechanical harvesting entails a barge-like machine to cut and collect lake weeds. Harvesters need at least two feet of freeboard to operate, creating a lot of floating vegetation. Most operations dispose of aquatic plants by using a shore conveyor, a transport barge or by making multiple trips to shore. Mechanical harvesting can produce weed fragments. Approximately 5 to 15 percent of the total cutting cannot be cleaned up immediately because of wind and wave action that washes the vegetation away. A partial solution is to use a cutter, because plants are not stacked on the back of the unit weighing it down like they are with a harvester. A cutter can work in as little as 9 inches of water.

Non-mechanical harvesting includes hand harvesting (pulling), raking, hand-held weed cutters and dragging. Non-mechanical harvesting can be highly effective. Careful pulling and hand raking can remove roots as well as stems and leaves, thereby minimizing re-growth of the plants for several years. The City uses mechanical methods to harvest vegetation.

5.3.2.5 Aeration

Whole-lake or hypolimnetic (bottom water) aeration has been utilized to improve water quality by creating an oxygen rich zone directly above the lake bottom that reduces the release of phosphorus from the sediments. In general, whole lake aeration is used to avoid winter fish kill. *Winter Aeration* is generally supported by DNR when it benefits and/or does not harm the fishery. *Summer Aeration* should be used with caution, because the impacts these systems

have on nutrient dynamics and fisheries is difficult to predict on individual lakes. Summer aeration may be beneficial, neutral, or detrimental to the fishery, depending on the lake and the system.

5.3.3 Aquatic Invasive Plant Species

5.3.3.1 Purple Loosestrife

Purple loosestrife *Lythrum salicara* L. is a perennial plant of European origin that is invading and degrading wetlands all across North America. Purple loosestrife forms dense, monotypic stands that replace native plant species in wetlands and lake shore habitats, degrading food, shelter, and nesting sites for native wildlife. The plant will grow in up to seven feet of water. Purple loosestrife's high seed production (each plant can produce 120,000 seeds) produces large seed banks that can last for many years, allowing the plant to recover quickly after disturbance.

Common native plants such as cattails, sedges, smartweed and others cannot compete with purple loosestrife. Consequently, animals that rely on native plant vegetation for food, shelter, and breeding areas are displaced. Loosestrife infested wetlands are also less suitable to waterfowl because of the elimination of nesting sites and valuable food plants (waterfowl do not feed on loosestrife). Wetland mammals, like muskrats cannot utilize the plant in any way. Loosestrife is thought to be a poor nutrient assimilator.

Currently there is no chemical or mechanical means that provide long-term control of established stands of purple loosestrife. However, biological control, the use of natural enemies to control a pest, shows promise as a long-term method of reducing the effects of purple loosestrife on native aquatic environments.

Efforts to control these infestations mechanically or with herbicides are very costly, must be repeated annually and do not provide long-term control. Conventional control, including cutting, burning, water level manipulation and herbicide treatment, have been largely unsuccessful except where small, isolated stands can be removed by hand or treated with herbicide. While conventional methods do kill purple loosestrife plants, once it has become established, its large seed banks, which are nearly impossible to destroy, allow rapid reestablishment. Each cut segment can generate a new plant.

Biological techniques reunite pest species, like purple loosestrife, with their natural enemies, such as insects, can keep many plant species from becoming pests. Successful biological control will not eradicate purple loosestrife, but it will significantly reduce the plant's negative effects on native species.

Four species of European insects have been released in North America to control purple loosestrife since 1992; one root-mining weevil, one flower-feeding weevil, and two leaf eating beetles. Of the species, the root-mining weevil and the leaf eating beetles will be the most important for the control of purple loosestrife due to the damage they cause to plant roots, leaves and stems. Burnsville has tried biological control of purple loosestrife at Crystal West Park and Alimagnet Park with somewhat limited success.

5.3.3.2 Eurasian Watermilfoil

Eurasian watermilfoil can severely limit water recreational activities such as swimming, boating and fishing. It forms dense rooted mats of vegetation that reach the water surface. It can shade and crowd out native plants, reducing the biodiversity of aquatic ecosystems and harming fish and wildlife. There is little hard evidence so far for negative ecological impacts. However, given these concerns, it is necessary to confine this exotic plant and limit its spread in Minnesota.

Eurasian watermilfoil is a submerged aquatic plant native to Europe and Asia. Since its introduction to North America, during the 1940's, it has spread to nearly 40 states and three Canadian provinces. In Minnesota, milfoil was first discovered in Lake Minnetonka in 1987. By 1992, 55 Minnesota lakes had Eurasian watermilfoil infestations.

Eurasian watermilfoil is a perennial plant that spreads by vegetative propagation. It spreads when the plant fragments into pieces, which can take root and grow into new plants. Milfoil plants break into fragments naturally or when watercraft got through milfoil beds. Water currents can carry fragments within and between water bodies.

Current attempts to eradicate or control milfoil in Minnesota rely primarily on herbicides. However, in consideration of public and professional concerns regarding herbicides, DNR has begun to investigate alternative control methods. According to DNR (Anon., 1993), efforts should now be made towards an Integrated Pest Management (IPM) approach for milfoil control that could ultimately include a combination of biological controls, improved use of herbicides and alternative methods such as mechanical control.

The DNR plan includes four major goals:

- Contain milfoil in Minnesota to existing water bodies and prevent the establishment of new infestations;
- Eradicate or control milfoil infestations in Minnesota in a way that does as little harm as possible to lake ecosystems;
- Support and conduct research needed to improve milfoil management; and
- Ensure that milfoil is considered in lake management.

Table 31 displays the Eurasian watermilfoil infestations that are documented and listed by the DNR for Burnsville Lakes.

Table 31
Eurasian Watermilfoil Infested Waters

Water body name	Year listed as infested	Year species was first confirmed
Alimagnet	2014	2012
Crystal	1995	1991
Earley	2006	2005
Keller	2006	2005
Lac Lavon	1995	1988
Sunset Pond	2004	2002
Twin Lakes	1997	1996

5.3.3.3 Curly-leaf Pondweed

Curly-leaf pondweed looks similar to native pondweeds but it is often the first pondweed to come up in early spring forming dense mats that appear reddish-brown in the water and dies by mid-summer. The leaves of the plant, which are actually green, are approximately 2-3 inches long and arranged alternating on a stem. The leaves have small serrations around the edges which distinguishes it from claspingleaf pondweed. Similar to Eurasian watermilfoil, it can shade and crowd out native plants, reducing the biodiversity of aquatic ecosystems.

The MNDNR does not see the eradication or elimination of curly-leaf pondweed from lakes as a realistic goal although dense mats than interfere with lake recreation can be managed with mechanical harvesting or treatment with endothall herbicide. Partial-lake treatments done in early spring when water temperatures are between 50 and 60°F are most effective in controlling curly-leaf pondweed.

5.4 Erosion and Sedimentation

Phosphorus is often transported to surface water through soil erosion but can also be transported to waters in a variety of other mechanisms. Nevertheless, erosion control is extremely important in the effort to improve water quality. Soil erosion and sediment deposition also can create pond performance and maintenance issues.

Ponds and drainage facilities are impacted by erosion and sediment from a variety of sources including construction sites and street sanding in the winter. The coarse sediment accumulates in ditches and ponds where runoff velocities are low. Usually a sand delta appears at a storm sewer outfall that is a visible indication of the effectiveness of erosion and sediment control measures and road maintenance activities of the past winter. As the sediment builds up over time, it reduces the capacity of the drainage system and the pollutant removal capabilities of ponds by reducing storage volume below the outlet, and reduces infiltration rates. Extending the life of facilities involves source control and elimination of the material that causes the problem.

Although stream bank erosion and sedimentation is a natural process, they can be accelerated as a result of human actives which increase peak flow rates and can severely damage stream bank vegetation, cause bottom scour and accelerate the erosion process. Each of the Watershed Organizations in Burnsville is specifically addressing this issue. Burnsville's efforts to control the rates of discharge provide adequate control at this time. The City Plan may be amended in the future, as necessary, to remain consistent with future stream protection strategies of the Watershed Organizations.

5.4.1 Sediment Resuspension

Studies dating back to the early 1970's found powerboat engines could produce significant stirring of bottom sediments in shallow lakes. (Wright, 1991).

Those same studies, according to Wright (1991), found that the activity of a 100-hp outboard motor causes significant increases in turbidity, ortho-phosphorus and total phosphorus. As powerboats stir up the nutrient-rich bottom sediments, phosphorus can be released, accelerating algae growth. The same studies establish a clear relationship between engine size and mixing depth as illustrated in Table 32. Mixing depth is defined as the maximum depth at which the engine stirred up the water.

Wright (1991) concludes by indicating that although the scientific literature cannot resolve the political issues related to powerboat controls, power boating is likely to have harmful impacts on shallow lakes.

Table 32
Mixing Depths of Power Boats

(Reported by Wright, 1991, based on Yousef. 1974)

Horsepower	Mixing Depth

10	6 feet
28	10 feet
50	15 feet

Power boating restrictions were discussed with the public during the preparation of the 2002 WRMP. Based on the discussions, powerboat restrictions were not adopted as a current water quality tool. The topic was not raised during either open house or in the online comments for the 2017 WRMP Update.

6.0 Assessment of Emerging/Future Issues

As required by the new Minnesota Rules Chapter 8410, adopted in July of 2015 and Minn. Stat. 103B.235, local water management plans need to include an assessment of both existing and potential water resource-related problems. This section outlines the emerging and potential future problems the community is likely to face within the next 10 years.

As the City strives to increase the overall awareness and understanding of water resources management with in the City, providing information on emerging issues and anticipated future issues will put the City in a better position to reduce potential impacts and be better able to respond as these potential emerging issues become the issue of the day. This plan provides some basic background to a few of the known future issues the City is or will be facing. One of the methods the City plans to get ahead of these issues and to increase awareness is to develop education programs in the local schools on an annual basis. The topics below provide a good starting point for such a program.

6.1 Invasive Species

Invasive species are species which are not native and cause economic or environmental harm, or harm to human health. The MnDNR is the heading the State's efforts to curb the spread and minimize harmful effects of nonnative species. One aquatic invasive species of particular concern throughout Minnesota is zebra mussels which are discussed further in the following section.

6.1.1 Zebra Mussels

Zebra mussels are a devastating aquatic invader that once introduced, can quickly overtake a lake. Just one of the zebra-striped, clam-like creatures – which grow to the size of a fingernail – can produce 30,000 to 40,000 eggs per season. Zebra mussels can form dense colonies on rocks, wood, metal and cement surfaces. They out-compete native mussel species for food and oxygen.

Zebra mussels feed on algae and water fleas, out-competing fish and potentially impacting the fishery by improving water clarity which allows young fish or small fish to be more easily preyed upon. The overall impact of an infestation would be a diminished recreation use of a particular lake.

As of August 2016, the MnDNR has confirmed zebra mussels in 121 lakes, rivers and wetlands. Currently none of the bodies of water in Burnsville have confirmed zebra mussel infestations. To help stop the spread of this invasive species the MnDNR recommends the following activities regardless of whether a water bodies is infested or not:

- Clean all aquatic plants, zebra mussels, and other invasive species from boats, trailers, and water-related equipment.
- Drain water from your boat, ballast tanks, motor, live well and bait container. Remove drain plugs and keep drain plugs out while transporting equipment.
- Dispose of unwanted bait in the trash. To keep live bait, drain the water and refill the bait container with bottled or tap water.

The City has signs posted at designated boat launch areas to inform and educate boaters on these requirements.

6.2 Groundwater Sustainability

The most basic definition of sustainability is “meeting our current needs without sacrificing the ability of future generations to meet their own needs.” One of these needs of our community now and for future generations is a safe and reliable source of drinking water which makes it essential to preserve and protect the groundwater aquifers which supply the City’s drinking water.

Burnsville has developed a multi-layered groundwater model focusing on the Burnsville well field, Kraemer Quarry, Black Dog Fen and Savage Fen. The model will be utilized in design of groundwater withdrawal and minimization of impacts to protected surface waters. The City is currently working with the Minnesota Department of Natural Resources and Metropolitan Council in developing a groundwater management plan.

6.3 Climate Change

Minnesota experiences a wide variation in climate conditions (droughts and floods, heat and cold), however, even with these wide variations, climatologist have found four significant climate trends in the Upper Midwest (Minnesota Weather Almanac, Seeley, 2006):

- Warmer winters
- Higher minimum temperatures
- Higher dew points
- Changes in precipitation trends

The City recognizes the importance of resiliency and in a water resources context resiliency can be attributed to the ability to adapt to the climate-related variability and reduce the vulnerability of the community to extreme events. The City has for example amended the stormwater management standards to recognize the updated Atlas 14 depths and distributions and will endeavor to continue to adapt its policies and standards with the climate change trends.

6.4 Maintenance of the Stormwater System

6.4.1 Removal and Disposal of Accumulated Sediment

The City owns and operates more than 240 stormwater ponds and sediment collection devices throughout the City. The sediment collected in these ponds has been found to contain potentially hazard metals and other chemicals. Prior to removal of the sediment, it must be tested for the level of chemicals present. If found to exceed regulatory levels, the material excavated must be placed in a licensed landfill.

In June 2015, the MPCA published the document Managing Stormwater Sediment Best Management Practice Guidance to provide municipalities guidance on when sediment removal is needed and what steps to consider during the course of managing a sediment removal project. The City has also developed a pond assessment tool that prioritizes potential pond cleanout and maintenance activities based in part on the estimated pollutant removal efficiency of each pond. At the initiation of a pond assessment, the City shall evaluate the City owned and operated stormwater treatment ponds to determine the highest priority pond for clean out or maintenance. Prioritization may be based on the following factors:

- Age of pond.
- Value of sediment removal – an analysis of how much phosphorus is removed per dollar spent

- Contributing drainage area characteristics. (Size, land use, upland treatment, etc.)
- Known concerns based on inspections.
- Type and location of receiving water.
- Sensitivity of receiving water.

The City reviews potential pond maintenance needs and opportunities on an annual basis. Based on that review and the availability of funds, the City implements projects on an annual basis. The City adjusts the number of pond maintenance work based on available budget, staff availability, and other factors that may affect the process.

6.4.2 Environmental Manhole Cleaning

Sump manholes have been constructed in strategic areas to trap coarse sediment. As of 2017, the City has a total of 102 sump (environmental) manholes that are cleaned annually unless complaints are received or patterns of maintenance indicate a greater frequency is necessary. The locations listed below are the priority areas near lakes having environmental manholes, with these structures scattered throughout the City.:

- Lac Lavon Drive;
- Blue Bill Bay;
- Pershing Circle;
- Maple Island;
- East Crystal Lake Road;
- Sue Fischer Memorial Park (Youth Athletic Complex); and
- Burn-Haven Drive at the Regent at Burnsville Senior Housing Community.

6.4.3 Stormwater Facility Maintenance Agreements

Many communities require pond maintenance agreements with private pond owners for ponds constructed to meet City standards due to development. An example stormwater facility maintenance agreement that is used by the City is available in the City's NPDES MS4 Program Policy document. The agreement is intended to give the City a tool to require the property owner to maintain BMPs if they are no longer functioning as they were originally designed and approved. The agreement is intended to be used as a model for establishing maintenance agreements on ponds and non-pond stormwater facilities (e.g., rain gardens, bioretention areas, porous pavements, etc.) and is set up to transfer to Developer's successors and assigns with respect to the Subject Property of the agreement.

7.0 Implementation Program and Funding

From the goals and subwatershed assessments, a related Implementation Plan has been established. The implementation plan includes identification and prioritization of capital improvements, administration, maintenance and inspections, permitting, plan amendments, financing alternatives, public involvement and monitoring programs. Prioritization of improvements was based on a review of all recommended actions.

The Implementation Plan is not a hard and fast commitment to complete each and every activity in the time frame suggested. Rather, it is a suggested course of action that will accomplish the major goal of this plan, to accommodate growth in the community while protecting and improving Burnsville's water resources. The Implementation Plan should be reviewed on an annual basis. At that time, each proposed improvement is to be reconsidered, City budgets adjusted, and additional improvement projects or management activities added to or removed from the program. The City Council is required to specifically approve a project or budget prior to making the funds available for the project or activity. The funding source for the implementation program is the stormwater utility.

Table 33 displays the Water Resources Implementation Plan for the years 2018-2027.

Table 33
Water Resources Implementation Plan

Line	Implementation Project	2018	2019	2020	2021	2022
1	Public Outreach (Elem Ed) Consultants/Educators	10,000	10,000	10,000	10,000	10,000
2	Trout Stream #4 Restoration Development Cost Sharing	10,000				
3	Aquatic Vegetation Management Communication Plan	15,000				
4	Trail Corridor Water Resources Public Education		10,000			
5	Private Pond Maintenance Options Study and Report			20,000		
6	H&H Model Evaluation - HWL vs EOF with ATLAS 14	50,000				
7	Resiliency Assessment of Major Drainage Systems	40,000				
8	Resiliency Improvements		350,000			
9	Keller Lake to MN River Water Level H&H Analysis and Report		75,000			
10	KMM Levee Inspection and Report				10,000	
11	MRQ Stormwater and Floodplain Study and Report					50,000
12	Keller Lake UAA			35,000		
13	Stormwater System Asset Management Risk Analysis	50,000				
14	TMDL & WQ BMP CIP Maintenance Plan	20,000				
15	Park Drainage Improvements Neill and Alimagnet	155,000	150,000			
16	Bicentennial Park Outlet Repair	25,000				
17	Street Reconstruction	450,000	450,000	500,000	500,000	500,000
18	Street Rehabilitation	100,000		120,000		120,000
19	Maintenance Overlays				70,000	
20	Street Project Storm Sewer Televising	40,000	40,000	40,000	50,000	50,000
21	Host Landfill Projects	40,000	30,000	30,000	30,000	40,000
22	Lateral Drainage Modifications	90,000	90,000	90,000	90,000	90,000
23	Pond Cleanout/Outfall Imp. Program	330,000	345,000	345,000	360,000	360,000
24	CMP Rehabilitation	30,000	30,000	30,000	30,000	30,000
25	County Overlays	55,000	65,000	65,000	65,000	65,000
26	Lift Station Rehab	250,000		250,000		250,000
27	Future Ponds/Water Quality			1,000,000		1,100,000
28	Ravine Restoration		500,000		500,000	
29	WRMP Update				50,000	
30	Contract Patching	60,000	60,000	70,000	70,000	70,000
31	Alum Treatment			25,000		
	STORMWATER MANAGEMENT TOTAL	**1,820,000**	**2,205,000**	**2,630,000**	**1,835,000**	**2,735,000**

Table 33 (Continued)
Water Resources Implementation Plan

Line	Implementation Project	2023	2024	2025	2026	2027
1	Public Outreach (Elem Ed) Consultants/Educators	10,000	10,000	10,000	10,000	10,000
2	Trout Stream #4 Restoration Development Cost Sharing					
3	Aquatic Vegetation Management Communication Plan					
4	Trail Corridor Water Resources Public Education					
5	Private Pond Maintenance Options Study and Report					
6	H&H Model Evaluation - HWL vs EOF with ATLAS 14					
7	Resiliency Assessment of Major Drainage Systems					
8	Resliency Improvements					
9	Keller Lake to MN River Water Level H&H Analysis and Report					
10	KMM Levee Inspection and Report					
11	MRQ Stomrwater and Floodplain Study and Report					
12	Keller Lake UAA					
13	Stormwater System Asset Management Risk Analysis					
14	TMDL & WQ BMP CIP Maintenance Plan					
15	Park Drainage Improvements Neill and Alimagnet					
16	Bicentennial Park Outlet Repair					
17	Street Reconstruction	500,000	500,000	550,000	550,000	550,000
18	Street Rehabilitation	120,000	120,000	120,000	140,000	140,000
19	Maintenance Overlays	70,000		70,000		70,000
20	Street Project Storm Sewer Televising	50,000	50,000	50,000	50,000	50,000
21	Host Landfill Projects					
22	Lateral Drainage Modifications	100,000	100,000	100,000	100,000	100,000
23	Pond Cleanout/Outfall Imp. Program	375,000	375,000	390,000	390,000	405,000
24	CMP Rehabilitation	30,000	30,000	30,000	30,000	30,000
25	County Overlays	65,000	75,000	75,000	75,000	75,000
26	Lift Station Rehab		300,000		300,000	
27	Future Ponds/Water Quality	1,100,000			1,200,000	
28	Ravine Restoration		600,000			600,000
29	WRMP Update				100,000	100,000
30	Contract Patching	70,000	70,000	80,000	80,000	80,000
31	Alum Treatment	30,000			35,000	
	STORM WATER MANAGEMENT TOTAL	2,520,000	2,230,000	1,475,000	3,060,000	2,210,000

7.1 Funding Sources

The financial goal for this WRMP is to establish equitable funding sources to pay for water resources management activities. For the activities called out in this Plan, planning-level estimates of capital expenditures have been made. The major categories of funding sources are (1) Ad Valorem Taxes; (2) Special Assessments; (3) System Development Charges (Building Permits, Land Development Fees); (4) User charges; and (5) Grants. Following is a description and financing principles used with each of these financing mechanisms.

City policies and financial plan regarding water resources management plan activities are based upon overall property contributions to runoff and pollutant loading.

Roughly 40% of the respondents in the 2016 Water Resources Program Public Input Survey indicated that the get the sense that the City (local) program is under-funded while 58% get the sense it is adequately funded or don't know. Of the respondents, 55% were Lakeshore Residents and the most significant issue identified in the comments was aquatic vegetation weed control. This is largely a nuisance issue that is currently funded at levels that the City believes is sufficient for long term management of aquatic vegetation.

A renewed focus will be placed on securing grants, enlisting regional watershed funding, seeking local partnerships with adjacent communities and private entities.

Table 34 illustrates the advantages and disadvantages of the different financing methods and each method is discussed in more detail in the following subsections.

Table 34
Advantages and Disadvantages of Different Funding Alternatives

Funding Method	Advantages	Disadvantages
User Charges or Stormwater Utility (already in-place in Burnsville)	• Properties causing or contributing to the need for runoff management pay relative to their contribution to the problem. • Self-financing system not in competition with general services funds. • Existing and new developments both pay. • Flexibility in the system. • Continuous source of revenues. • Specific dedicated fund. • Administrative structure for collection already in place.	• Some initial costs in development of rate formula and philosophy. • May require an expanded administrative structure. • Not all payees into the system may benefit equally from their contributions.
Ad Valorem Tax	• Administrative structure for collection in place. • Simple and accepted source of revenue. • Allows for a larger revenue base. • Through tax districts contributors pay.	• No incentive to reduce runoff or pollution. • No relationship to level of benefits received. • Discontinuous source of revenue. • Limitations on amount of expenditures due to budget constraints. • Competition with other City services (i.e., police, fire).
Special Assessments	• Only benefited properties pay. • Revenues from assessment are applied to a specific project cost. No competition with general services. • Benefits directly related to cost for service. • Assessment can be deferred in hardship cases.	• Rigid procedural requirements. • Runoff contributions cannot be assessed. • Difficult to determine and prove benefit. • May place an unfair burden on some segments of the population.
System Development Charges	• New development generating runoff pays for runoff management. • Administrative structure for reviewing plans and collecting fees is in place. • Systems can be tailored to the specific needs through regulatory changes. • Revenues are applied to water management. No competition with general services.	• Only addresses problems within the vicinity of the new development, not usually in existing developments. • Only address prevention not correction of major problems. • Limited usefulness as a financing mechanism.
Grants	• Reduce cost burden to residents in the community.	• Undependable source of revenue. • Increase administrative costs for securing and managing the funds. • Most often grants require cost sharing and thus additional funding source. This results in double administrative costs due to several funding sources. • Limited availability on an irregular schedule. • Requires considerable lead-time from application to receiving funds.

7.1.1 Ad Valorem Tax

General taxation is the most common revenue source used to finance government services including minor maintenance measures for drainage and water quality facilities. Using property tax has the effect of spreading the cost over the entire tax base of a community.

7.1.2 Special Assessments

Municipalities are familiar with the use of special assessments to finance special services from maintenance to construction of capital improvements. The assessments are levied against properties benefiting from the special services. The philosophy of this method is that the benefited properties pay in relation to benefits received. The benefit is the increase in the market value of the properties.

7.1.3 User Charges or Stormwater Utilities

User charges, which support stormwater utilities, are a mechanism by which a City can generate funds through billings similar to water and sewer billings. The principle is to charge for services rendered to properties generating runoff, as well as the service to properties being protected from the effects of runoff, without consideration to an increase in market value of the property. Eight different land use classifications are used to calculate specific rates.

7.1.4 Grants

A wide range of grants are available for surface water management and nonpoint source pollution. However, it is generally not a good financial practice to rely on grants for a service program. This source of revenue is not dependable and requires constant speculation as to its availability. Grants are useful but should only be used to supplement a planned local revenue source. Examples of some available granting agencies and past grant programs are shown in Table 35. More compete and up-to-date grant program information is available on MPCA's and BWSR's websites. Local watershed organizations and the City may also have programs for specific activities.

Table 35
Example Grant Programs

Granting Agency	Grant Program
Environmental Protection Agency	Urban Waters Small Grants
	Environmental Education Grant
	Section 319 – Clean Water Act
U.S. Army Corps of Engineers	Section 22 Planning Assistance to States
U.S. Fish and Wildlife Service	Wildlife Restoration Program
	Sport Fish Restoration Program
Minnesota Department of Natural Resources	Flood Hazard Mitigation Program
	Conservation Partners Legacy Grant
	Outdoor Recreation Grant Program
	Dam Safety Grant Program
	Water Recreation Cooperative Acquisition and Development Program
	Fishing Pier Grant Program
	Natural and Scenic Area Grant Program
	Aquatic Invasive Species Grants
Metropolitan Council	Water Efficiency Grant Program
	Regional Parks Operation and Maintenance Funds
	Livable Communities Grant
	Pilot Green Infrastructure Grant Program
Minnesota Pollution Control Agency	Clean Water Partnership
	Surface Water Assessment Grants
Minnesota Public Facilities Authority	Point Source Implementation Grants
Minnesota Board of Water and Soil Resources	Clean Water Fund Grants

8.0 Amendment Process

The Water Resources Management Plan is intended to extend through the year 2027. For the plan to remain dynamic, an avenue must be available to implement new information, ideas, methods, standards, management practices, and any other changes which may affect the intent and/or results of the Plan. Amendment proposals can be requested any time by any person or persons either residing or having business within the City.

Staff's intent is to revisit the goals, policies, tools and progress of the Plan on a five-year basis. The five-year average water quality results will be reviewed, the effectiveness of regulatory programs will be evaluated, and the success of public improvement projects will be assessed. Based on the five-year reviews, the WRMP will be updated to produce a truly dynamic plan.

This plan and all subsequent amendments will become part of the City's Comprehensive Plan (adopted by reference) as part of the adoption process for this plan and Comprehensive Plan update. The plan does not have to be re-submitted as a formal comprehensive plan amendment, subject to additional review, at a later date. The adopted City Plan will satisfy Metropolitan Council's requirements and will be thereby recognized as an amendment to the City's Comprehensive Plan. Minor amendments include the following changes:

- formatting or reorganization of the plan;
- revision of a procedure meant to streamline administration of the plan;
- clarification of existing plan goals or policies;
- inclusion of additional data not requiring interpretation;
- expansion of public process; or
- adjustments to how an organization will carry out program activities within its discretion.

Conversely, major amendments include such things that change the essence of goals, policies, and other significant procedural components of the plan.

8.1 Request for Amendments

Written requests for a plan amendment are submitted to the City staff. The request shall outline the need for the amendment as well as additional materials that the City will need to consider before making its decision.

8.2 Staff Review

A decision is made as to the validity of the request. Three options exist;

- Reject the amendment;
- Accept the amendment as a minor issue, with minor issues collectively added to the plan at a later date; and
- Accept the amendment as a major issue, with major issues requiring a formal amendment including communications with the WMOs and Dakota County. In acting on an amendment request, staff shall recommend to the City council whether or not a public hearing is warranted.

8.3 Council Consideration

The amendment and the need for a public hearing shall be considered at a regular or special Council meeting. Staff recommendations should also be considered before a decision(s) on an appropriate action(s) is made.

8.4 Public Input and Council Approval

This step allows for public input based on public interest. Council shall determine when and how the public input should occur in the process. Based on the public input, Council could approve of the amendments and direct staff to proceed with the Agency Review process.

In Burnsville, the Parks and Natural Resources Commission (PNRC) is responsible for reviewing the Plan and making recommendations to Council. The public input process is generally completed through a series of open house meetings and in 2016, an online survey was used, to gather additional input.

8.5 Agency Review Process

8.5.1 Metropolitan Council and Dakota County Review

The Draft Plan is sent to Metropolitan Council to be reviewed for consistency with the requirements under the new Minnesota Rules Chapter 8410, adopted in July of 2015 and Minn. Stat. 103B.235. Plan and Comments from Metropolitan Council are due to the City within 45 days and are concurrently sent to each of the three watershed organizations for consideration during their review.

The Draft Plan is sent to Dakota County to be review for consistency with the County Water Plan. The County has 60 days to complete their review and provide comments directly to the City.

8.5.2 Watershed Organization Approval

All proposed amendments must be reviewed and approved by the appropriate WMOs prior to final adoption of the amendments. Draft and final amendments may be sent electronically to the WMO and draft amendments must show deleted text as stricken and new text as underlined. The watershed organizations have 60 days to complete their review and to provide comments directly to the City.

The City finalizes the Plan based on addressing the comments in consultation with WMO staff. The WMO then takes formal Board action to approve the Plan, generally contingent upon the City making the final edits agreed to through the comment process.

8.6 Council Adoption

Final action on an amendment, following approval by the watershed organizations is Council adoption. However, prior to the adoption, an additional public hearing may be held to review the Plan changes and notify the appropriate stakeholders.

9.0 Definitions and Acronyms

9.1 Definitions

Ambient Monitoring: Monitoring which focuses on baseline conditions and possible trends.

Aquatic Bench: A relatively flat sloped area or bench, generally having a width of 10- to 15-feet around the inside perimeter of a permanent pool that is approximately one-foot deep. Normally vegetated with emergent plants, the bench augments pollutant removal, provides habitat, conceals trash and water level drops, and enhances safety.

Aquatic Macrophytes: Rooted plants, either submerged, floating leafed, or emergent, and floating or floating leaf plants growing in public waters.

Aquatic Nuisance: The presence of leeches, snails that carry swimmer's itch, or any growth of aquatic vegetation or algae in such numbers or such abundance as to interfere with boating, swimming, or other aquatic recreation or beneficial water use.

Base Flood Elevation (BFE): The elevation shown on the Flood Insurance Rate Map for Zones AE, AH, A1-A30, AR, AR/A, AR/AE, AR/A1-A30, AR/AH, AR/AO, V1-V30, and VE that indicates the water surface elevation resulting from a flood that has a one percent chance of equaling or exceeding that level in any given year (also commonly referred to as the 100-year event). See also Flood (and related definitions).

BMP (Best Management Practice): A combination of land use, conservation practices, and management techniques, which when applied to a unit of land will result in the opportunity for a reasonable economic return with an acceptable level of water quality or water quantity improvements.

Biodiversity: The variety of interrelated plant and animal life forms that occur in a water body.

Biological Monitoring: Periodic surveys of aquatic biota as an indicator of the general health of a water body. Biological monitoring surveys can span the trophic spectrum, from macro-invertebrates to fish species.

Bog: A mat, either attached to or resting on the bottom or floating, that is normally made up of dead organic matter held together by various types of living plants.

Buffer: The use of land, topography, difference in elevation, space, fences, or landscape planting to screen or partially screen a use or property from the vision of another use or property, and thus reduce undesirable influences such as: sight, noise, dust, and other external effects. For a vegetative buffer, the use of natural and/or established vegetation that receive or intercept sheet flow runoff thus slowing runoff velocities and allowing sediment within runoff to settle or be filtered by the vegetation

Buffer Strip: An area of vegetated ground cover abutting a water body that is intended to filter sediment or other pollutants from runoff.

Chlorophyll: The green pigment of plants necessary for photosynthesis, the process by which plants produce energy from sunlight.

Comprehensive Plan: As defined in Minnesota Statutes 394.21, the policies, statements, goals and interrelated plans for private and public land and water use, transportation and community facilities that guide future development (and growth).

Design Storm: A rainfall event of specified size and return frequency that is used to calculate the peak discharge rate at selected locations in a stormwater system.

Detention: The temporary storage of runoff from rainfall and snowmelt events to control peak discharge rates and provide an opportunity for physical, chemical and biological treatment to occur.

Development: The construction, installation or alteration of any structure, the extraction, clearing or other alteration of terrestrial or aquatic vegetation, land or the course, current or cross section of any water body or water course or division of land into two (2) or more parcels (source: Burnsville City Code 10-8-2 and 10-4-2). See also re-development and new development.

De-Watering: Process used in detention/retention facilities whereby water is completely discharged or drawn down to a pre-established pool elevation by way of a perforated pipe. De-watering allows the facility to recover its design storage capacity in a relatively short time after a storm event. Dewatering is also used to temporarily remove surface or ground water from a construction site in order to allow the construction to take place.

Disturbed Area (or Disturbance): An area which is susceptible to erosion because the vegetative or non-vegetative cover has been temporarily or permanently removed or altered. This may be accompanied by mixing or removal of some soil horizons. For the purposes of this Plan and associated development standards, disturbed area includes all areas of the project site that are within the construction limits.

Drawdown: The gradual reduction in water level in a pond BMP due to the combined effects of outflow from an outlet structure, infiltration and evaporation.

Draining: The removal of surface water or ground water from the surface of the land or from within the soil profile.

Dredging: To enlarge or clean accumulated sediment out a water body, watercourse, or wetland.

Drop Structure: Placement of logs with a weir notch across an open channel. Water flowing through the weir creates a plunge pool downstream of the structure which dissipates energy and can also create beneficial fish habitat. A drop structures may also be a storm sewer manhole that has a drop of six to eight feet or more between the inlet pipe and outlet pipe invert elevations. Drop structure manholes require a more detailed hydraulic analysis to evaluate the forces of flows in the structure and the potential reduction in flow capacity due to air entrainment.

Easement: A grant of one or more property rights by a property owner for use by the public, a corporation, or another person or entity.

Ecologically Harmful Exotic Species: Non-native aquatic plants or wild animals that can naturalize, have high propagation potential, are highly competitive for limiting factors, and cause displacement of, or otherwise threaten, native plants or native animals in their natural communities.

Ecosystem: A complex, interdependent system of humans, their built environments, other animals, plants and other organisms, and the natural physical and chemical environment upon which life depends.

Emergent Plant: An aquatic plant that is rooted in the sediment but whose leaves are at or above the water surface. Such wetland plants provide habitat for wildlife and waterfowl in addition to removing urban pollutants.

End of Pipe Control: Water quality control technologies suited for the control of existing urban stormwater at the point of storm sewer discharge to a stream. Due to typical space constraints, these practices are usually designed to provide water quality control rather than quantity control.

Erosion: The process by which the land's surface is worn away by the action of wind, water, ice or gravity.

Excessive Algae Bloom: Some or all of the following conditions are present: algae population is dominated by glue-green algae; secchi disc reading is typically 2 feet or less; floating mats or scums of algae have accumulated on the downwind shore; or decomposition of accumulated algae has occurred releasing a blue-green pigment and causing an offensive odor.

Exfiltration: The downward movement of runoff through the bottom of an infiltration BMP into the subsoil.

Exotic: A species which is not native to Minnesota but has been introduced from other states or continents to Minnesota.

Extended Detention: A stormwater design feature that provides for the gradual release of a volume of water over a period of 24 to 48 hours or more to increase settling of urban pollutants, and protect channels from high water levels and flooding.

Extended Detention (ED) Ponds: A conventional ED pond temporarily detains a portion of stormwater runoff for up to 24 hours after a storm using a fixed orifice. Such extended detention allows urban pollutants to settle out. The ED ponds are normally "dry" between storm events and do not have any permanent standing water. An enhanced ED pond is designed to prevent clogging and resuspension. It provides greater flexibility in achieving target detention times. It may be equipped with plunge pools near the inlet, a micropool at the outlet, and utilize an adjustable reverse-sloped pipe at the ED control device.

Fen: A wetland featuring grasses and sedges, created when a high water table and a lack of runoff keep the ground continuously moist and deprived of oxygen. Plants that die in these conditions do not break down into the soil because there is not enough oxygen to support the microorganisms and bacteria that do this work. Dead plants build up and compress over thousands of years into thick, partially decayed mats of peat. Fen's are kept continuously wet and cool by the ground water supply.

Filling: The act of depositing any rock, soil, gravel, sand or other material so as to fill a water body, watercourse, or wetland.

Flood (and related definitions): A temporary rise in the water level of lake, pond or wetland, or in the stream flow or stage of an open channel that results in inundation of the areas adjacent to the main waterway or water body. Other commonly referred to flood-related terms include:

- Floodplain: Floodplains are lowland areas adjoining lakes, wetlands, and rivers that are susceptible to inundation of water during a flood and that are included on the City's Flood Insurance Rate Map. The mapped floodplain is the area covered by the

100-year flood and it is usually divided into districts called the floodway and flood fringe. Areas where floodway and flood fringe have not been determined are called approximate study areas or general floodplain areas. Any development within a floodplain area requires a Conditional Use Permit from the City and/or FEMA.

- General Floodplain Area: The general floodplain area is determined using the best available data, in lieu of performing a detailed engineering study. These data may be from soils mapping, experienced high water profiles, aerial photographs of previous floods, or other appropriate sources. There are no associated published 100-year flood elevations with general floodplain delineations, unlike detailed study areas. General floodplain area is synonymous with approximate study area and unnumbered A-Zone.
- Flood Fringe: That portion of the 100-year floodplain outside of the floodway.
- Floodway: The floodway is the channel of a river or other watercourse and the adjacent land areas which would actively convey the 100-year flood plus 0.50-foot.

- Flood Frequency: The average frequency, statistically determined, for which it is expected that a specific flood stage or discharge may be equaled or exceeded.
  - 1% Chance Flood: The flood having a one-percent (1%) chance of being equaled or exceeded in any given year. A one-percent (1%) chance flood is synonymous with Base Flood, Regional Flood, or 100-year flood. Any development within this area requires a Conditional Use Permit from the City.
  - 100-Year Flood: The flood having a one-percent (1%) chance of being equaled or exceeded in any given year. A 100-year flood is synonymous with Base Flood, Regional or 1% Chance Flood. Any development within this area requires a Conditional Use Permit from the City.
  - Regional Flood**:** A flood which is representative of large floods known to have occurred generally in Minnesota and reasonably characteristics of what can be expected to occur on an average frequency in the magnitude of the 100-year recurrence interval. Regional flood is synonymous with the term “base flood" used in the Flood Insurance Study. Any development within this area requires a Conditional Use Permit from the City.

- Flood Obstruction: Any dam, well, wharf, embankment, levee, dike, pile, abutment, projection, excavation, channel rectification, culvert, building, wire, fence, stockpile, refuse, fill, structure or matter in, along, across or projecting into any channel, watercourse or regulatory flood hazard area which may impede, retard or change the direction of the flow of water, either in itself or by catching or collecting debris carried by such water, or that is placed where the flow of water, either in itself or by catching or collecting debris carried by such water, or that is placed where the flow of water might carry the same downstream to the damage of life or property.
- Flood Proofing: A combination of structural provisions, changes or adjustments to properties and structures subject to flooding primarily for the reduction or elimination of flood damages to properties, water and sanitary facilities, structures and contents of buildings in a flood hazard area in accordance with the Minnesota State Building Code.
- Regulatory Flood Protection Elevation (RFPE)**:** The elevation established by local ordinance to which all new floodplain development must be protected against flood

damage. In Burnsville, the required low building elevation may be higher than the RFPE for some water bodies.

Forebay: An extra storage area provided near an inlet of a pond or BMP to trap incoming sediments, reducing the amount that accumulates in a pond or BMP.

Freeboard: A factor of safety usually expressed in feet above a certain flood level. Freeboard compensates for the many unknown factors (e.g., waves, ice, debris, etc.) that may increase flood levels beyond the calculated level. The vertical distance between the regulatory high water level determined by hydrologic modeling and flood protection elevation (e.g., low floor or opening of a building, overflow elevation of a road).

Herbicide: A chemical which is designed to kill vascular plants; vascular plants are those which have internal systems for transporting nutrients, water and gases.

Impervious Surface: The portion of the buildable parcel which has a covering which does not permit water to percolate into the natural soil. Impervious surface shall include, but not be limited to, buildings, all driveways and parking areas (whether paved or not), sidewalks, patios, swimming pools, tennis and basketball courts, covered decks, porches, and other structures. Open, uncovered decks are not considered impervious for the purposes of this ordinance. The use of patio blocks, paver bricks or class 5 gravel material are considered impervious surfaces as a majority of water runs-off the surface rather than being absorbed into natural soils underneath.

Infiltration Basin: An impoundment where incoming stormwater runoff is stored until it gradually infiltrates into and through the soil of the basin floor.

Infiltration Trench: A conventional infiltration trench is a shallow, excavated trench that has been backfilled with stone to create an underground reservoir. Stormwater runoff diverted into the trench gradually exfiltrates from the bottom of the trench into the subsoil and eventually into the water table. An enhanced infiltration trench has an extensive pretreatment system to remove sediment and oil. It requires an on-site geotechnical investigation to determine appropriate design and location.

Infrastructure: Public facilities and services, including transportation, water and sewer, telecommunications, recycling and solid waste disposal, parks and other public spaces, schools, police and fire protection, and health and welfare services.

Integrated Management Practice (IMP): A range of small-scale stormwater controls or practices distributed throughout a site and intended to maintain flow patterns, filter pollutants and re-create or maintain existing site hydrology.

Littoral Area: Any part of a body of water 15 feet deep or less.

Lowest Floor: The lowest floor of the lowest enclosed area (including a basement). An unfinished or flood-resistant enclosure, usable solely for parking of vehicles, building access, or storage in an area other than a basement area, is not considered a building's lowest floor provided that such enclosure is not built so as to render the structure in violation of requirements.

Lowest Floor Elevation (LFE) or Low Building Elevation (LBE): The elevation of a building's lowest allowable floor above the one percent chance flood elevation established in this plan or the BFE defined by FEMA.

Low Impact Development (LID): An approach to stormwater management intended to protect water resources, reduce storm sewer infrastructure costs and provide a more attractive stormwater management system. LID practices include reduced impervious surface coverage, disconnected impervious areas, infiltration systems, bioretention areas, rain barrels, green roofs, porous pavements and a long list of additional innovative stormwater treatment practices which are intended to mimic the natural hydrology of a site and minimize the resulting impacts to receiving waters.

Monotypic: A pure stand of one type of vegetation with few other aquatic plant species present.

Native: A plant or animal species that naturally occurs in Minnesota and has not been introduced from another state or continent.

Natural Community: A community developed over time through natural ecosystem processes. Some natural communities are climax and some are perpetually successional due to ever-changing environmental factors. An extreme example of the latter is a river or lake beach where persistent wave or flooding action restricts significant vegetation establishment and succession towards a climax community.

Natural Resource Analysis: A report in map and text form identifying the existing natural features of a parcel of land and the relationship of a proposed use to the existing natural conditions of the parcel. Used in the determination of appropriate means to preserve and manage areas unsuitable for development in their natural state due to physical constraints or special protection status.

New Development: Development of a property or portion thereof that is currently not developed.

NURP: Nationwide Urban Runoff Program, a study by the U.S. Environmental Protection Agency. A key component of this program was to assess the effectiveness of urban runoff detention/retention basins (e.g., wet ponds and other BMPs) in removing pollutants from stormwater runoff. NURP ponds are generally accepted in the area as ponds which have a pollutant removal efficiency on the order of 60 % for total phosphorus and 90 % for total suspended solids.

Nutrient Spiraling: The cumulative effect of nutrient loading on water resources in moving from headwaters of watershed to the most down stream end.

Off-Line BMP: A water quality facility designed to treat a portion of stormwater (for example: 0.5 to 1.0 inches per impervious acre) which has been diverted from a stream or storm drain.

Off-Line Treatment: A BMP system that is located outside of the stream channel or drainage path. A flow diverter is used to divert runoff from the channel and into the BMP for subsequent treatment.

Ordinary High Water 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 flowage, the ordinary high water level is the operating elevation of the normal summer pool. This elevation is set by the Minnesota department of Natural Resources.

Peat Sand Filter: BMP, utilizing the natural adsorptive features of fabric or hemic peat, which consists of a vertical filter system with a grass cover crop, alternating layers of peat and sand and a sediment forebay feature. The peat sand filter is presently used for municipal waste treatment systems and is being adapted for use in stormwater management.

Permanent Pool: A 4 to 10-foot deep pool in a stormwater pond system between the bottom of the pond and the elevation of the outlet pipe or structure. The permanent pool provides removal of urban pollutants through settling and biological uptake. Also referred to as the dead storage component of a wet pond.

Perennial: A plant that persists from year to year and usually produces reproductive structures in two or more different years.

Pondscaping: A method of designing the plant structure of a stormwater wetland or pond using inundation zones. The proposed wetland or pond system is divided into zones which differ in the level and frequency of inflow. For each zone, plant species are chosen based on their potential to thrive, given the inflow pattern of the zone.

Porous Pavement: An alternative to conventional pavement whereby runoff is diverted through a porous asphalt, concrete or paver block layer and into an underground stone reservoir. The stored runoff then gradually infiltrates into the subsoil.

Potential Stormwater Hotspots (PSH). Commercial, industrial, institutional, municipal and/or other operations that may produce or present a higher risk of spills, leaks or illicit discharges. PSH may include gas stations, petroleum wholesalers, vehicle maintenance and repair, auto recyclers, recycling centers, scrap yards, landfills/solid waste facilities, wastewater treatment plants, airports, railroad stations and highway maintenance facilities.

Predevelopment: Predevelopment is defined as the conditions on the project site prior to the proposed improvements.

Public Waters: Water basins assigned a shoreland management classification by the Commissioner under Sections 103F.201 to 103F.221, except wetlands less than eight (8) acres in size that are classified as natural environment lakes. Waters of the state that have been finally determined to be public waters or navigable waters by a court of competent jurisdiction. Meandered lakes, excluding lakes that have been legally drained. Water basins previously designated by the Commissioner for management for a specific purpose such as trout lakes and game lakes pursuant to applicable bylaws. Water basins designated as scientific and natural areas under Section 84.033. Water basins located within and totally surrounded by publicly owned lands.

Water basins where the State of Minnesota or the federal government holds title to any of the beds or shores, unless the owner declares that the water is not necessary for the purposes of the public ownership. Water basins where there is a publicly owned and controlled access that is intended to provide for public access to the water basin. Natural and altered water courses with a total drainage areas greater than two (2) square miles. Natural and altered water courses designated by the Commissioner as trout streams. Public waters wetlands, unless the statute expressly states otherwise.

Reach: A hydraulic engineering term to describe a longitudinal segment of a stream or river influenced by the natural or man-made obstruction. In an urban area, the segment of a stream or river between two (2) consecutive bridge crossings would most typically constitute a reach.

Redevelopment: Any development including but not limited to rebuilding, renovation, revision, remodel, reconstruction or redesign of or at an existing development.

Retention: The permanent storage of runoff from rainfall and snowmelt events with volume reduction coming from infiltration evaporation or emergency release.

Retrofit: The creation/modification of stormwater management systems in developed areas through the construction of wet ponds, infiltration systems, wetland plantings, steam bank stabilization, and other BMP techniques for improving water quality and creating aquatic habitat. A retrofit can consist of the construction of a new BMP in the developed area, the enhancement of an older stormwater management structure, or a combination of improvement and new construction.

Riprap: A combination of large stone, cobbles and boulders used to line channels, stabilize banks, reduce runoff velocities, or filter out sediment.

Riser: A vertical pipe extending from the bottom of a pond BMP that is used to control the discharge rate from a BMP for a specified design storm.

Runoff (Stormwater): The overland and near surface flow from stormwater and snowmelt.

Runoff Conveyance: Methods for safely conveying runoff to a BMP to minimize disruption of the stream network, and promote infiltration or filtering of the runoff.

Runoff Pretreatment: Techniques to capture or trap coarse sediments before they enter a BMP to preserve storage volumes or prevent clogging within the BMP. Examples include forebays and micropools for pond BMPs, and plunge pools, grass filter strips and filter fabric for infiltration BMPs.

Surface Area-to-Voids Ratio (SA/V): The surface area to volume ratio is a useful measure of the capacity of stormwater wetland to remove pollutants via sedimentation, adsorption, and microbial activity. The SA/V ratio can be increased by either increasing the surface area of a wetland or increasing the internal structural complexity within the wetland.

Sand Filter: A relatively new technique for treating stormwater, whereby the first flush or runoff is diverted into a self-contained bed of sand. The runoff is then strained through the sand, collected in underground pipes and returned back to the stream or channel.

Secchi Disc: An 8-inch, white metal plate, attached to a calibrated rope use as a standard measure of water transparency.

Sediment Forebay: Stormwater design feature that employs the use of a small settling basin to settle out incoming sediments before they are delivered to a stormwater BMP. Particularly use full in tandem with infiltration devices, wet ponds or marshes. See also Forebay.

Shoreland: Land located within the following distances from public waters: one thousand feet (1,000') from the ordinary high water level of a lake, pond, or flowage; and three hundred feet (300') from a river or stream, or the landward extent of a floodplain designated by ordinance on a river or stream, whichever is greater. The limits of shoreland may be reduced whenever the waters involved are bounded by topographic divides which extend landward from the waters for lesser distances and when approved by the Commissioner of the DNR.

Short Circuiting: The passage of runoff through a BMP in less than the theoretical or design treatment time.

Slope: The degree of deviation of a surface from the horizontal, usually, expressed in percent or degrees.

Stormwater Treatment: Detention, retention, filtering or infiltration of a given volume of stormwater to remove urban pollutants, reduce the runoff volume and/or reduce the potential for flooding.

Stream Buffer: A variable width strip of vegetated land adjacent to a stream that is preserved from development activity to protect water quality aquatic and terrestrial habitats. See also buffer and buffer strip.

Structure: Anything which is built, constructed or erected; an edifice or building of any kind; or any piece of work artificially built up and/or composed of parts joined together in some definite manner whether temporary or permanent in character. Among other things, structures including but not limited to buildings, gazebos, decks, retaining walls, walls, fences over six feet (6') in height, and swimming pools.

Treatment Volume (Vt): The volume of stormwater runoff that is treated within a BMP. Typically expressed in terms of inches (i.e., depth) over the impervious area or inches over the contributing drainage area to a treatment system.

Underdrain: Plastic pipes with holes drilled through the top, installed on the bottom of an infiltration BMP, or sand filter, which are used to collect and remove excess runoff.

Undeveloped Property: Any property within the City on which no development (as defined in City Code 10-4-2) has occurred.

Vacuum Sweeping: Method of removing quantities of coarse-grained sediments from porous pavement in order to prevent clogging. Not effective in removing fine-grained pollutants.

Vegetated Filter Strip: A vegetated section of land designed to accept runoff as overland sheet flow from upstream development. It may adopt any natural vegetated form, from grassy meadow to small forest. The dense vegetative cover facilitates pollutant removal. A filter strip cannot treat high velocity flows; therefore, they have generally been recommended for use in agriculture and low-density development. A vegetated filter strip differs from a natural purpose of pollutant removal. A filter strip can also be an enhanced natural buffer, however, whereby the removal capability of the natural buffer is improved through engineering and maintenance activities such as land grading or the installation of a level spreader. A filter strip also differs from a grassed swale in that a swale is a concave vegetated conveyance system, whereas a filter strip has a fairly level surface.

Vegetation, Native: The pre-settlement group of plant species native to the North American continent that were not introduced as a result of European settlement.

Vegetative Propagation: Plant reproduction by means other than seeds, such as by fragments.

Watershed: The 81 major watershed units delineated by the State of Minnesota Watershed Boundaries 1979 map.

Wetland: Lands transitional between terrestrial and aquatics systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this definition, wetlands must have three (3) of the following attributes:

- A predominance of hydric soils.

- Inundation or saturation by surface or ground water at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions.
- Under normal circumstances, support a prevalence of such vegetation.

Wetland Classification System: The City of Burnsville's Wetland Protection and Management Plan classifies wetland basins according to the following system:

Protection Areas - Basins with Native Grades of A or B, sites with complete Community Structure, any sites supporting rare species, and any sites within or adjacent to significant natural communities as identified by the Dakota County Biological Survey. This is comparable to the Preserve Classification used in the MnRAM.

Improvement Areas - Basins with 3 of 4 of the Community Structure criteria, sites greater than ten acres in size, Minnesota Department of Natural Resources Protected Waters and Wetlands (Public Waters), and basins within existing City parks that are not classified as Protection Areas. Although there is some overlap, this classification is similar to the Manage I and Manage II MnRAM classifications.

Management Areas - Remaining wetlands, but generally of low quality and located outside of protected areas. These wetlands are also likely to receive untreated stormwater runoff, but have not been altered to enhance treatment capabilities. This classification is comparable to the Manage II and Manage III MnRAM classifications.

Management II Areas – These basins include any of the water features that may have been historic wetlands, and would remain subject to the requirement of the Wetland Conservation Act. These basins will have minimal protection standards as they currently function primarily to provide stormwater management.

Wetland Mitigation: Regulatory requirement to replace wetland areas destroyed or impacted by proposed land disturbances with artificially created wetland areas.

Wet Pond: A conventional wet pond has a permanent pool of water for treating incoming stormwater runoff.

Zoning District: An area or areas of the City (as delineated on the Zoning Map) set aside for specific uses with specific regulations and provisions for use and development

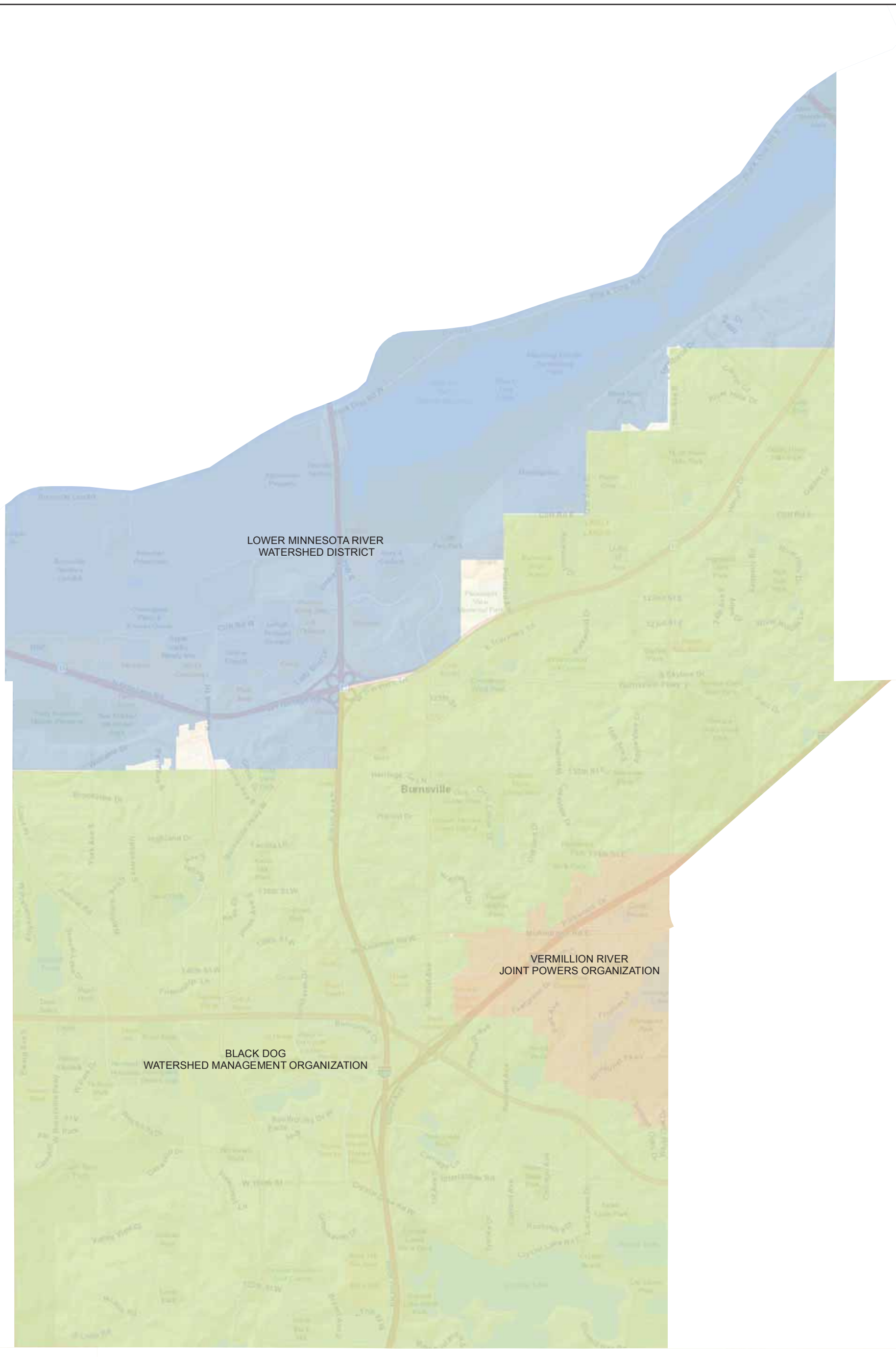
Zoning District Overlay: A zoning district containing regulations superimposed upon other zoning district regulations and superseding the underlying zoning district use regulations.

9.2 Acronyms

BMP	Best Management Practices
BWSR	Minnesota Board of Water and Soil Resources
DNR	Department of Natural Resources
EPA	United States Environmental Protection Agency
EPI	Effective Percent Impervious
EQB	Environmental Quality Board
EQC	Environmental Quality Committee
GIS	Geographic Information System
SWCD	Soil and Water Conservation District
IMP	Integrated Management Practice
LID	Low Impact Development
MPCA	Minnesota Pollution Control Agency
MS4	Municipal Separate Storm Sewer System
MUSA	Metropolitan Urban Services Area
NPDES	National Pollutant Discharge Elimination System
NURP	Nationwide Urban Runoff Program
ppb	parts per billion (equivalent to µg/l)
SWPPP	Stormwater Pollution Prevention Plan (or Program)
TMDL	Total Maximum Daily Load
TP	Total Phosphorus
TSS	Total Suspended Solids
WD	Watershed District
WMO	Water Management Organization
WRMP	Water Resources Management Plan

List of Figures

Figure 1 – Local Watershed Organizations
Figure 2 – Hillshaded Surface Elevation
Figure 3 – Hydrologic Soil Group
Figure 4 – Surficial Geology
Figure 5 – Bedrock Geology
Figure 6 – Public Water Inventory
Figure 7 – Metropolitan Council Priority Lakes
Figure 8 – Burnsville 2008 Wetland Inventory
Figure 9 – Subwatershed
Figure 10 – Special Flood Hazard Areas
Figure 11 – Natural Plant Communities
Figure 12 – Existing Land Use
Figure 13 – Big River Regional Trail
Figure 14 – August 2015 Reported Flooding



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Map by: rnestingen
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LOCAL WATERSHED ORGANIZATIONS

WATER RESOURCES MANAGEMENT PLAN
Burnsville, Minnesota

Figure 1

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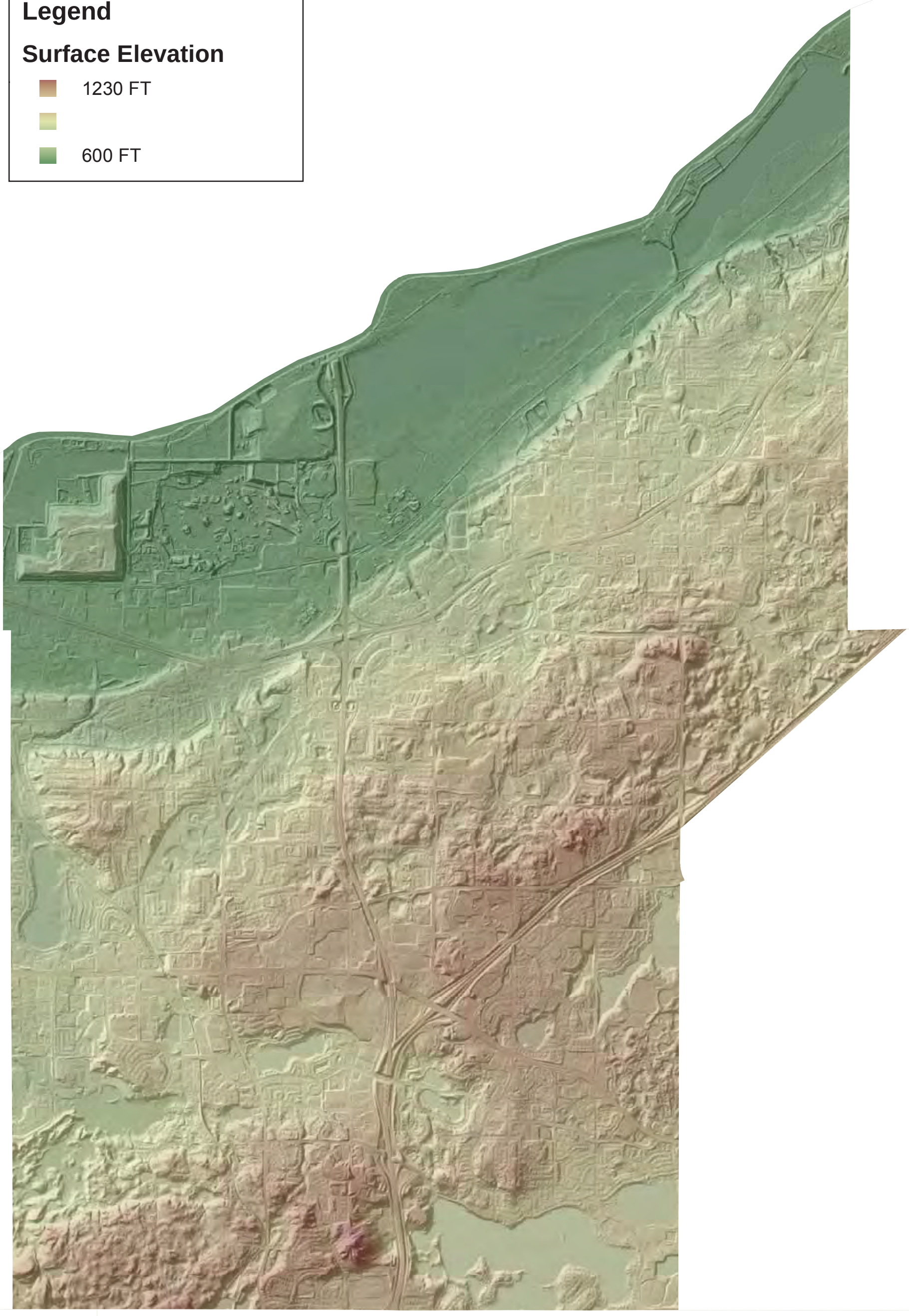
Legend

Surface Elevation

1230 FT

600 FT



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HILLSHADED SURFACE ELEVATION

WATER RESOURCES MANAGEMENT PLAN
Burnsville, Minnesota

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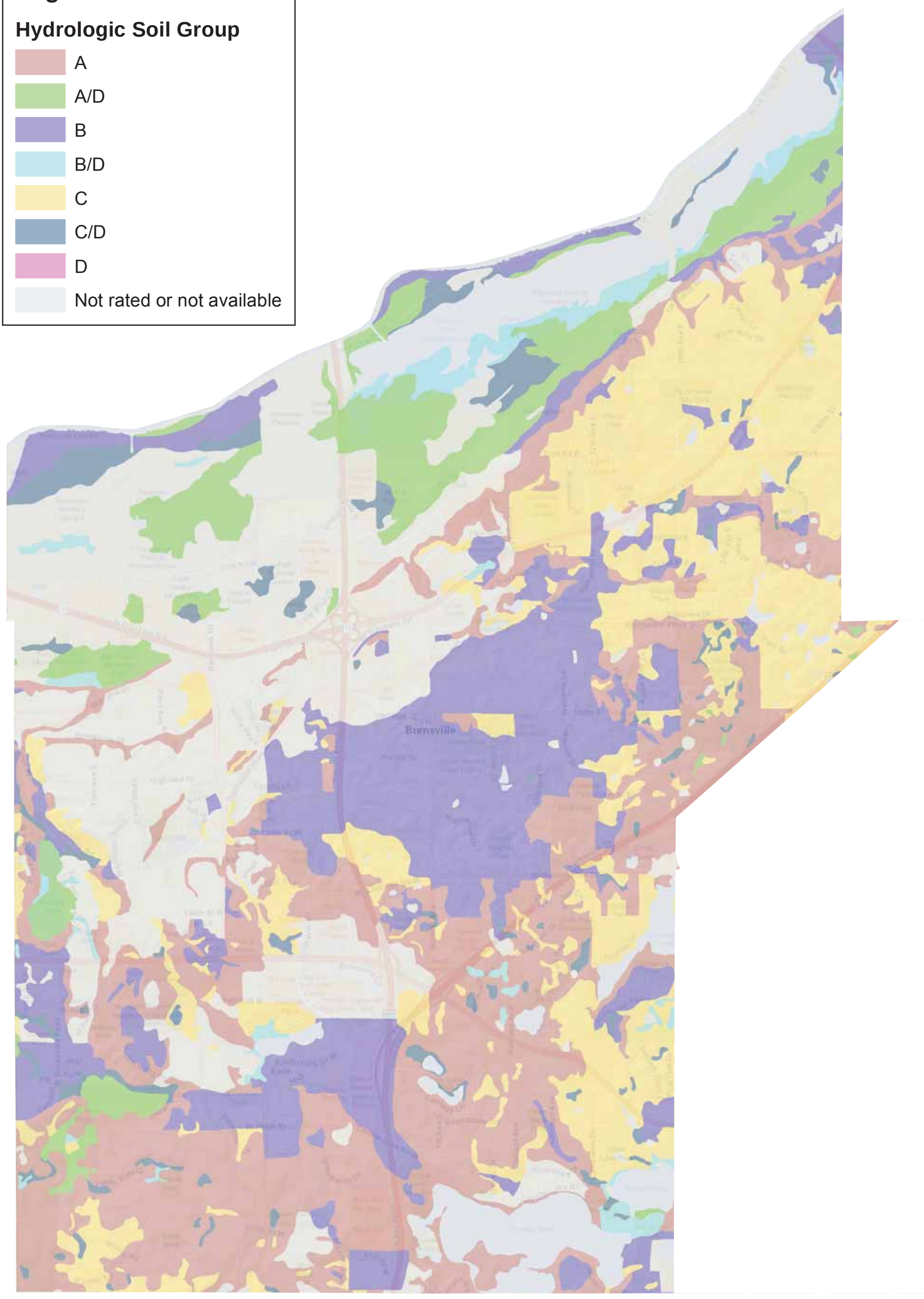
Legend

Hydrologic Soil Group

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available



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HYDROLOGIC SOIL GROUP
WATER RESOURCES MANAGEMENT PLAN
Burnsville, Minnesota

Figure
3

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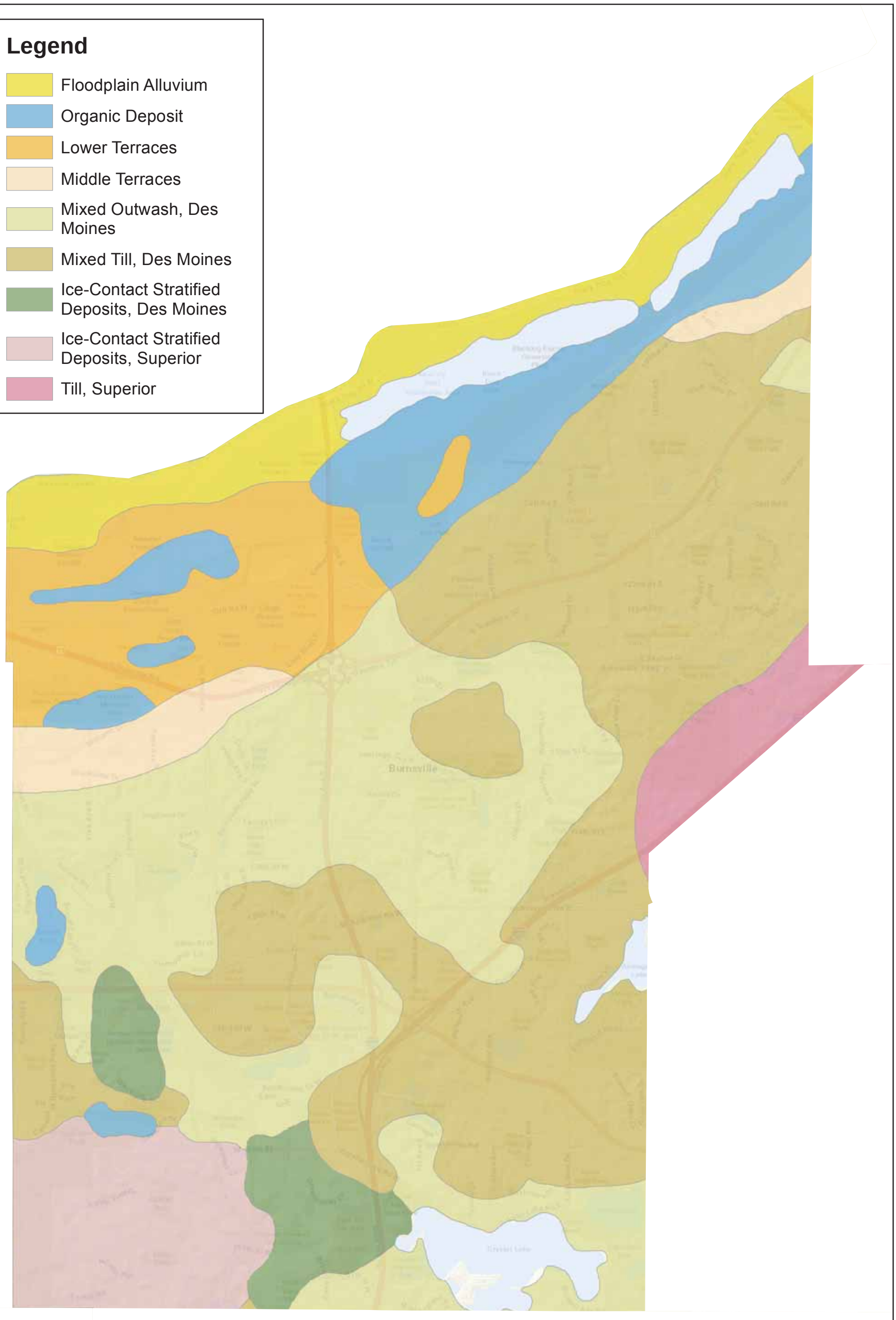
Legend

- Floodplain Alluvium
- Organic Deposit
- Lower Terraces
- Middle Terraces
- Mixed Outwash, Des Moines
- Mixed Till, Des Moines
- Ice-Contact Stratified Deposits, Des Moines
- Ice-Contact Stratified Deposits, Superior
- Till, Superior



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SURFICIAL GEOLOGY

WATER RESOURCES MANAGEMENT PLAN
Burnsville, Minnesota

Figure 4

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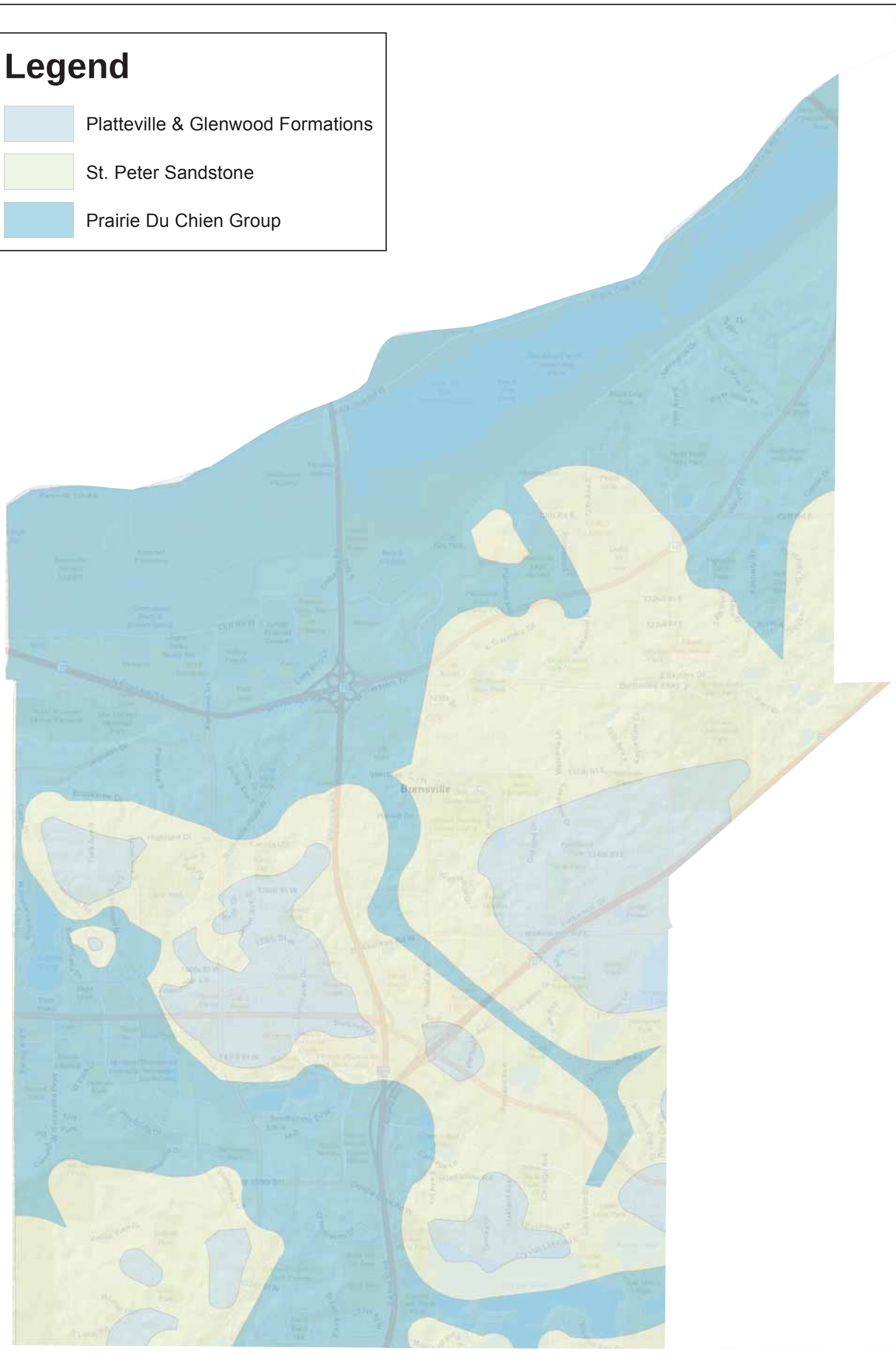
Legend

- Platteville & Glenwood Formations
- St. Peter Sandstone
- Prairie Du Chien Group



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BEDROCK GEOLOGY
WATER RESOURCES MANAGEMENT PLAN
Burnsville, Minnesota

Figure
5

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Legend

- Public Water Watercourse
- Public Ditch/Altered Natural Watercourse
- Public Waters Basins

Trout Stream #1
Trout Stream #4
Trout Stream #7
Black Dog (19008300)
Unnamed (19010900)
Unnamed (19011000)
Unnamed (19015200)
Unnamed (19017000)
Unnamed (19017200)
Unnamed (19011100)
Unnamed (19017100)
Unnamed (19017400)
Unnamed (19019100)
Unnamed (19011300)
Unnamed (19019300)
Unnamed (19019400)
Unnamed (19011400)
Unnamed (19019200)
Unnamed (19021000)
Unnamed (19021100)
Unnamed (19011600)
Unnamed (19011500)
Unnamed (19011700)
Alimagnet (19002100)
Unnamed (19036400)
Wood Park (19002400)
Unnamed (19034300)
Earley (19003300)
Unnamed (19035700)
Twin (19002800)
Unnamed (19038000)
Unnamed (19038100)
Keller (19002500)
Crystal (19002700)
Horseshoe (19003200)
Unnamed (19035900)

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PUBLIC WATERS INVENTORY
WATER RESOURCES MANAGEMENT PLAN
Burnsville, Minnesota

Figure 6

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Legend

Metropolitan Council 2014 Priority Lakes

Burnsville

Crystal

Laclavon

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Source:

MET. COUNCIL PRIORITY LAKES

WATER RESOURCES MANAGEMENT PLAN
Burnsville, Minnesota

Figure 7

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Legend

Restorable Wetlands

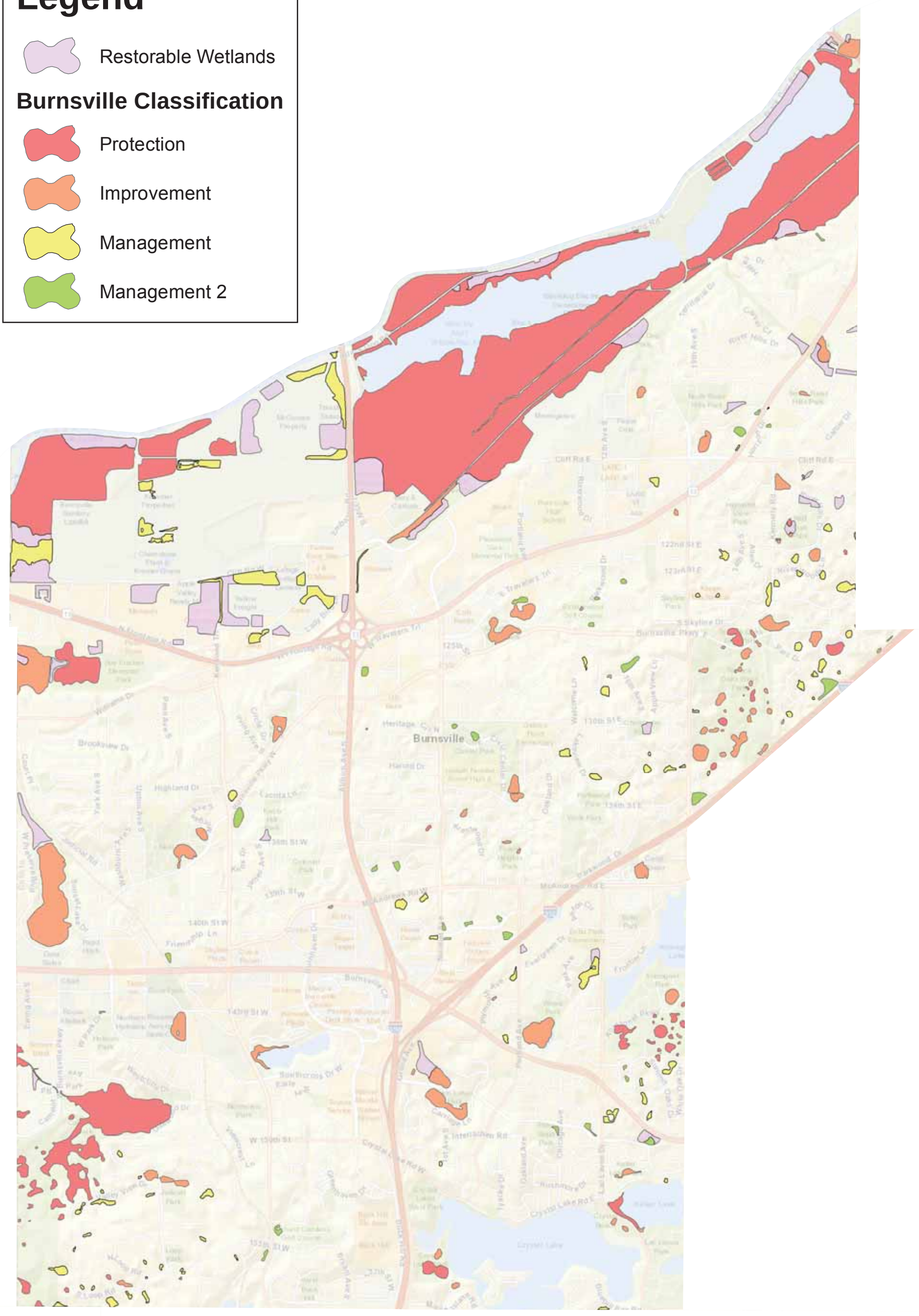
Burnsville Classification

Protection

Improvement

Management

Management 2



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BURNSVILLE 2008 WETLAND INVENTORY

WATER RESOURCES MANAGEMENT PLAN

Burnsville, Minnesota

Figure 8

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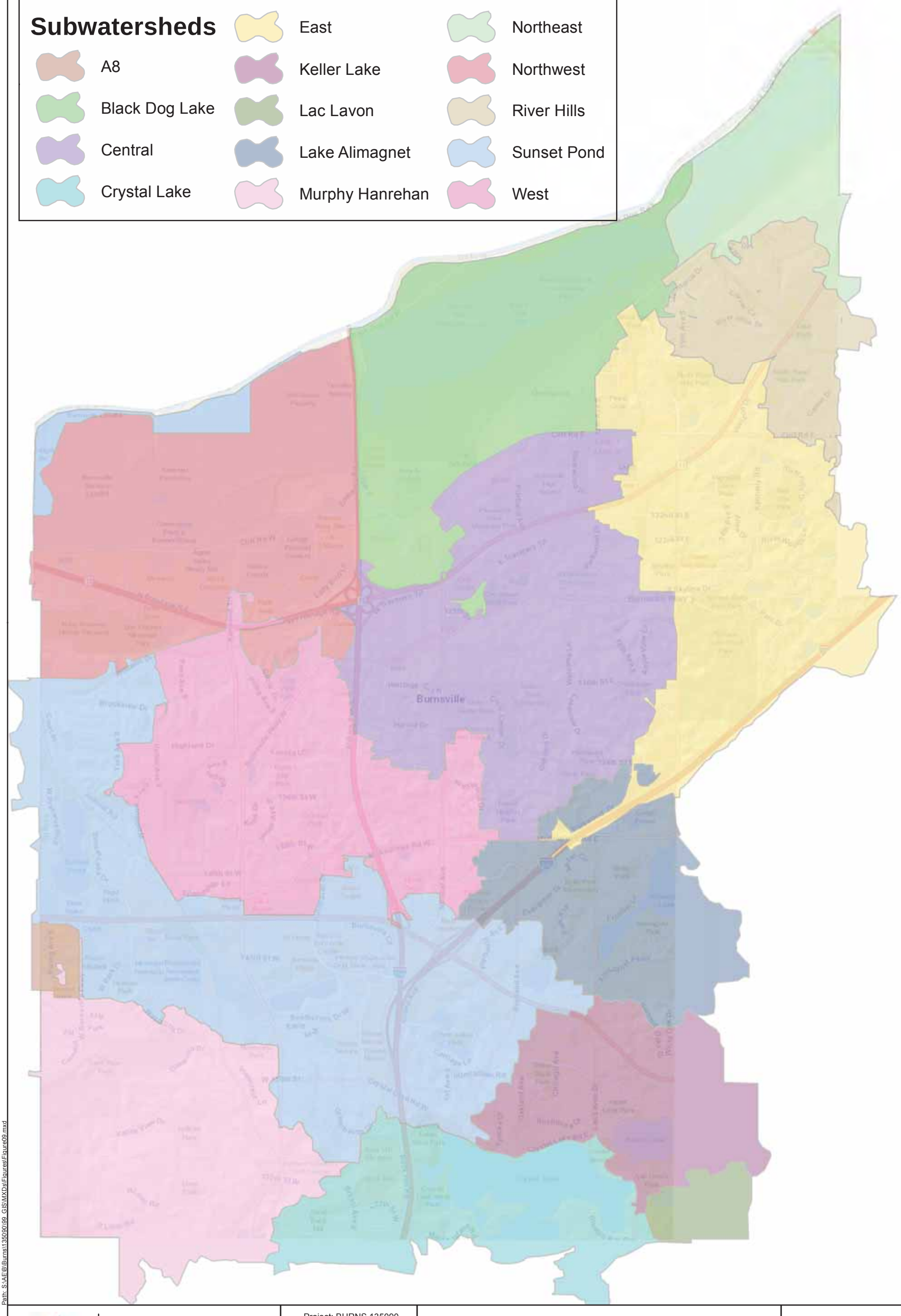
Legend

Subwatersheds

- A8
- Black Dog Lake
- Central
- Crystal Lake
- East
- Keller Lake
- Lac Lavon
- Lake Alimagnet
- Murphy Hanrehan
- Northeast
- Northwest
- River Hills
- Sunset Pond
- West



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Source:

SUBWATERSHEDS
WATER RESOURCES MANAGEMENT PLAN
Burnsville, Minnesota

Figure 9

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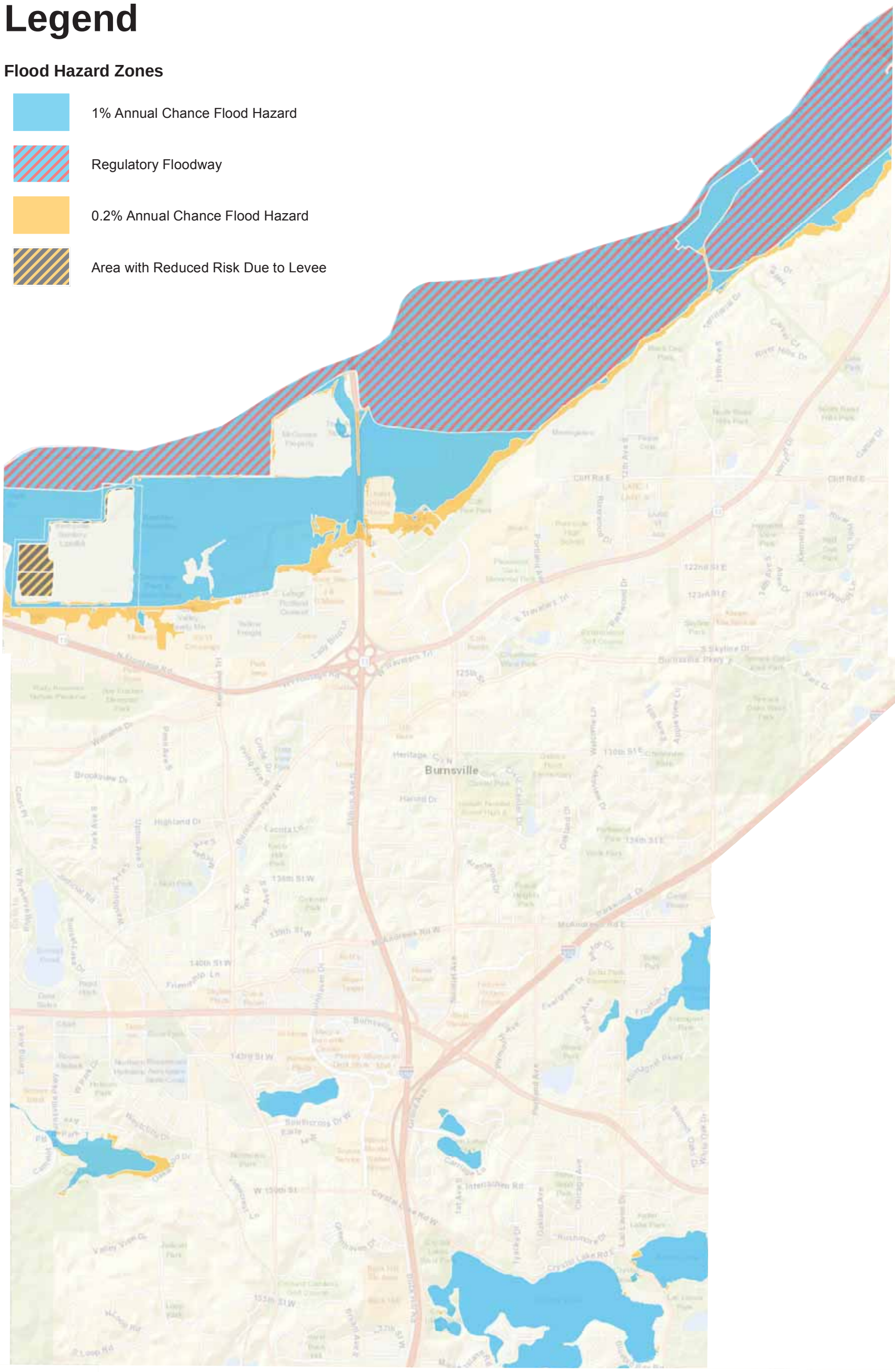
Legend

Flood Hazard Zones

- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- 0.2% Annual Chance Flood Hazard
- Area with Reduced Risk Due to Levee



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SPECIAL FLOOD HAZARD AREAS
WATER RESOURCES MANAGEMENT PLAN
Burnsville, Minnesota

Figure 10

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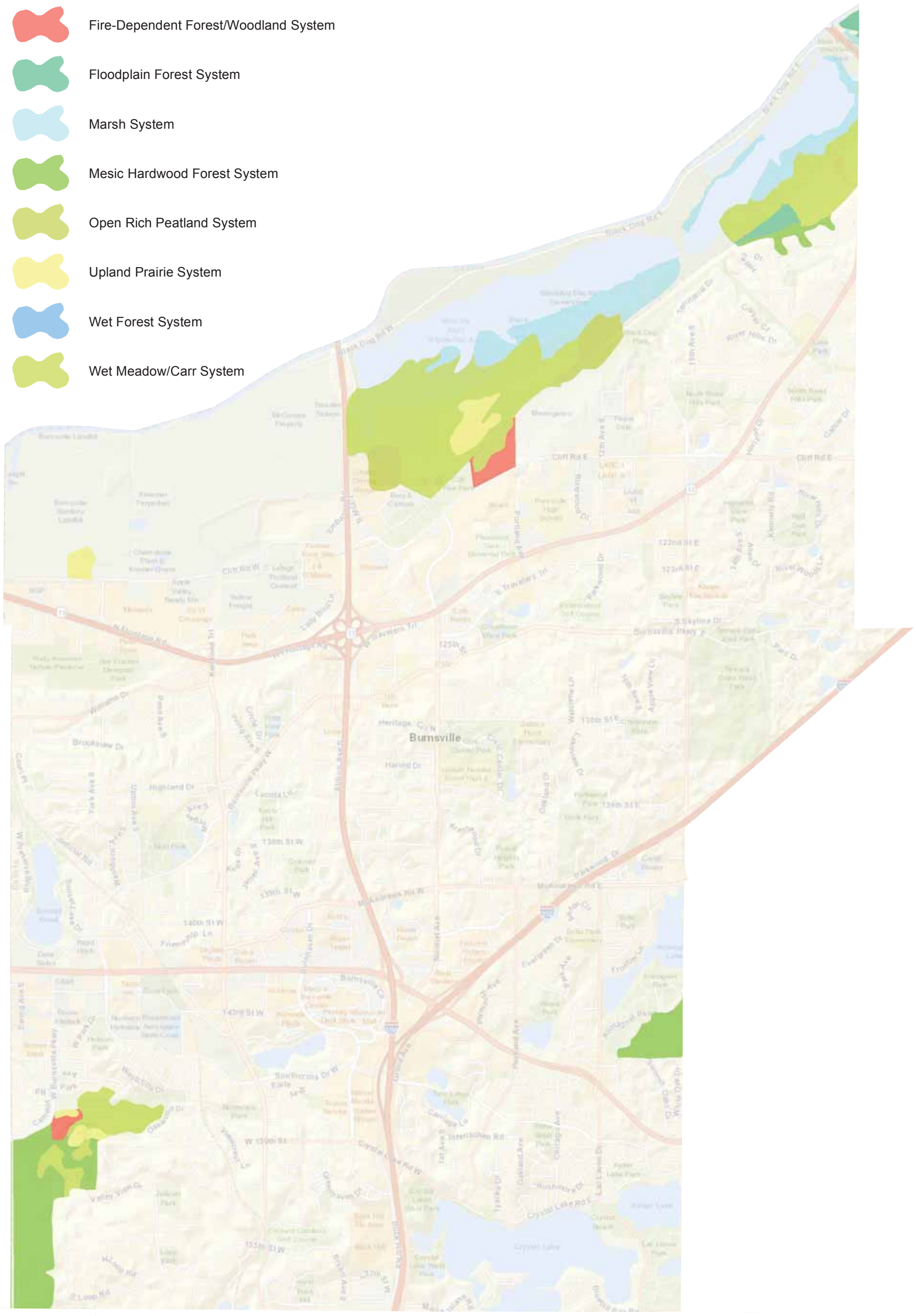
Legend

- Fire-Dependent Forest/Woodland System
- Floodplain Forest System
- Marsh System
- Mesic Hardwood Forest System
- Open Rich Peatland System
- Upland Prairie System
- Wet Forest System
- Wet Meadow/Carr System



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NATURAL PLANT COMMUNITIES

WATER RESOURCES MANAGEMENT PLAN
Burnsville, Minnesota

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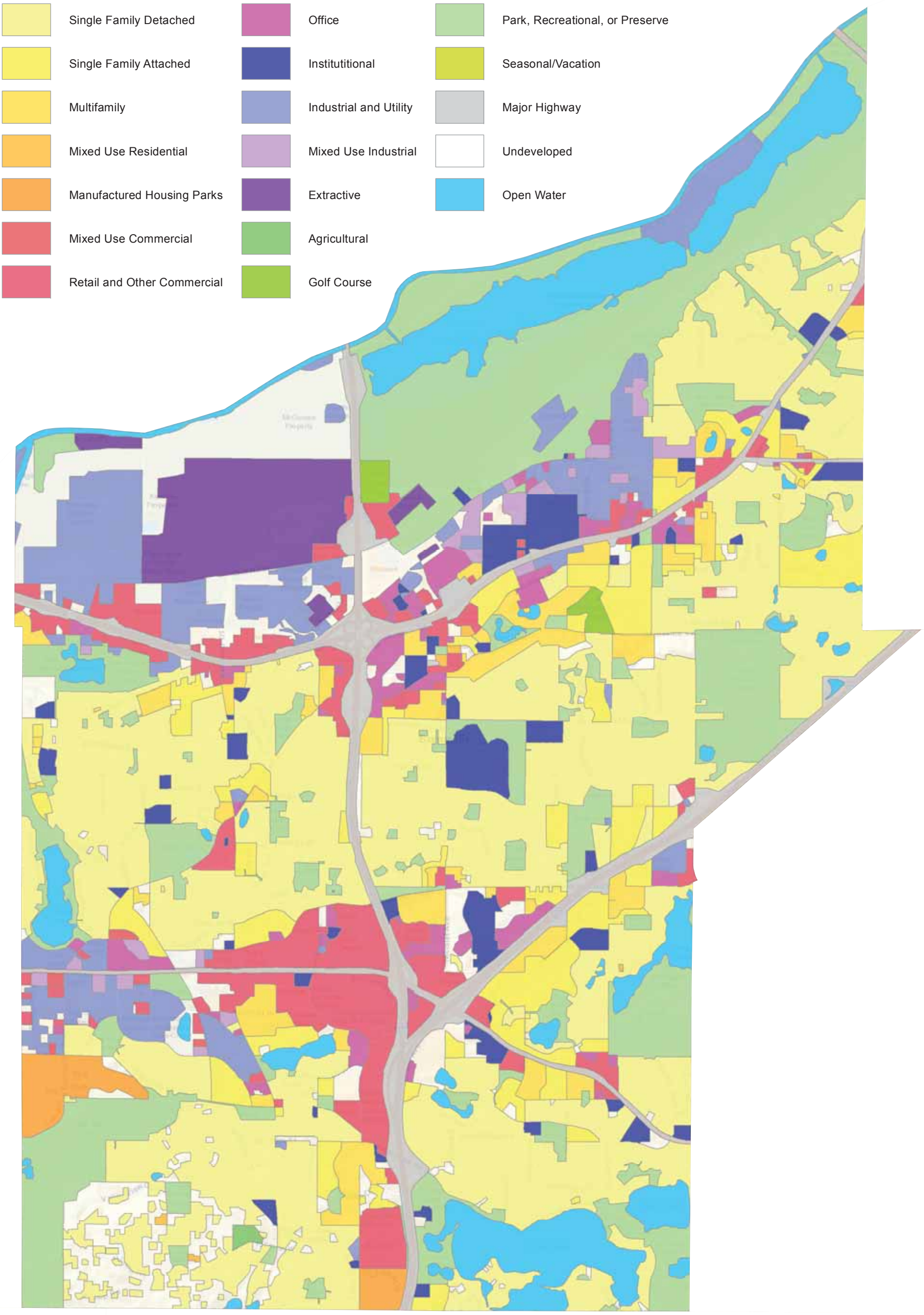
Legend

- Single Family Detached
- Single Family Attached
- Multifamily
- Mixed Use Residential
- Manufactured Housing Parks
- Mixed Use Commercial
- Retail and Other Commercial
- Office
- Institutitional
- Industrial and Utility
- Mixed Use Industrial
- Extractive
- Agricultural
- Golf Course
- Park, Recreational, or Preserve
- Seasonal/Vacation
- Major Highway
- Undeveloped
- Open Water



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Source:

EXISTING LANDUSE
WATER RESOURCES MANAGEMENT PLAN
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Figure 12

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Legend

August 2015 Reported Flooding Issues

Burnsville

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Print Date: 1/11/2017

Map by: mestingen
Projection:
Source:

AUGUST 2015 REPORTED FLOODING
WATER RESOURCES MANAGEMENT PLAN
Burnsville, Minnesota

Figure 14

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Appendix A

Minnesota River Quadrant Analysis

Building a Better World for All of Us®

MEMORANDUM

TO: WRMP - MRQ File

FROM: Ron Leaf, PE | Sr. Water Resources Engineer

DATE: February 9, 2017

RE: MRQ Issues Summary
SEH No. 135090 14.00

The Minnesota River Quadrant (MRQ) is an area of Burnsville consisting of approximately 825 acres situated in the northwest corner of the City. The area is bounded on the south by TH 13, on the east by I-35W, on the north by the Minnesota River, and extends just past the Waste Management Landfill to the west. In January 2006, the City of Burnsville contracted with DSU to prepare a land use plan for the MRQ that assumed full development of the MRQ area. The plan detailed the future land uses, creation of the future Quarry Lake, road locations and even conceptual stormwater pond locations. The intent of this memorandum is to summarize the current and anticipated future stormwater issues that will need to be considered as the area redevelops. The issues identified below correspond to the items highlighted in the attached Exhibit 1.

Stormwater Standards

The entire area within the MRQ flows north into the Minnesota River. The Minnesota River is a protected resource, and all development activities within the corridor must conform to the City's most strict storm water management standards. In order to protect the City's existing drinking water source, the City has identified areas of high vulnerability for drinking water contamination and prohibited infiltration within these areas. Much of the eastern portion of the MRQ area is located within the prohibited infiltration boundary. Additionally, any development disturbing more than one acre must complete and obtain a Minnesota Pollution Control Agency (MPCA) National Pollutant Discharge Elimination System (NPDES) permit.

Future Quarry Lake

Future Quarry Lake is situated at the existing Kraemer quarry location and the current south sump area serves as a surface water source for the City of Burnsville's drinking water system. Once current quarry (mining) activities have ceased, groundwater will recharge the cavity and form Quarry Lake. Steps have already taken place to protect the south sump from negative impacts and the future long term plan for the MRQ will need to continue those efforts. One of the key recommendations for future consideration of the lake is to allow for, or create, sufficient shallow water zones that are established with a primary goal of supporting fish habitat.

Flood Hazard Areas

The areas shown in Exhibit A for designated Federal Emergency Management Agency (FEMA) floodplain include 1% Chance Flood Zone (100 Year Flood), the 0.2% Chance Flood Zone (500 Year), Floodway and an area that has reduced flood hazard risk due to protection by a FEMA Certified Levee. The levee is inspected annually by City staff to identify any required maintenance needs. City Code establishes the requirements for projects with these designated flood hazard areas.

Landfills

There are two landfills within the MRQ including the Waste Management (WM) Landfill in the western portion of the MRQ, and the Freeway Landfill in the far northeastern extent of the MRQ. The WM landfill is currently still in operation and is protected on the west boundary by the levee system mentioned above.

The Freeway Landfill has been the subject of extensive study in the past decade. The MPCA's Closed Landfill Program (CLP) evaluates landfill data and uses a scoring model to determine risk at each site. Landfills with high risk scores receive a high ranking on the CLP's Risk Priority List. In a report by the MPCA titled *Closed Landfill Program: 2013 Report to the Legislature* (December 2013), the Freeway Landfill was ranked number six in site risk priority list for landfills within the State. In 2016 the Freeway Landfill had moved up to priority ranking number two.

Yellow Freight Pond and Lady Bird Pond - Regional Ponds

City and SEH staff completed several studies intended to evaluate options for regional ponding to meet future water quality treatment needs in the MRQ. The initial Minnesota River Quadrant Memorandum (SEH, July 18, 2006) looked at the extent of ponds within the DSU Land Use Plan and estimated treatment relative to required treatment standards in place at that time. That memorandum was revised in February 2008 to account for the City's revised storm water treatment standards.

A second study of possible pond locations was completed and summarized in the Minnesota River Quadrant (MRQ) Pond Options Memorandum (SEH, July 25, 2007). That memorandum was the basis for refining regional pond implementation projects including Yellow Freight and Lady Bird Pond. These ponds effectively provide water quality treatment credit for all areas within the area shown in Exhibit A and labelled Regional Treatment Area. A more detailed memorandum is available for each pond and is intended to serve as the basis for individual sites being able to demonstrate that water quality treatment requirements are met for the purposes of the City standards and the NPDES Construction Permit requirements.

rbl
Exhibit A – Minnesota Rover Quadrant. Issues Summary

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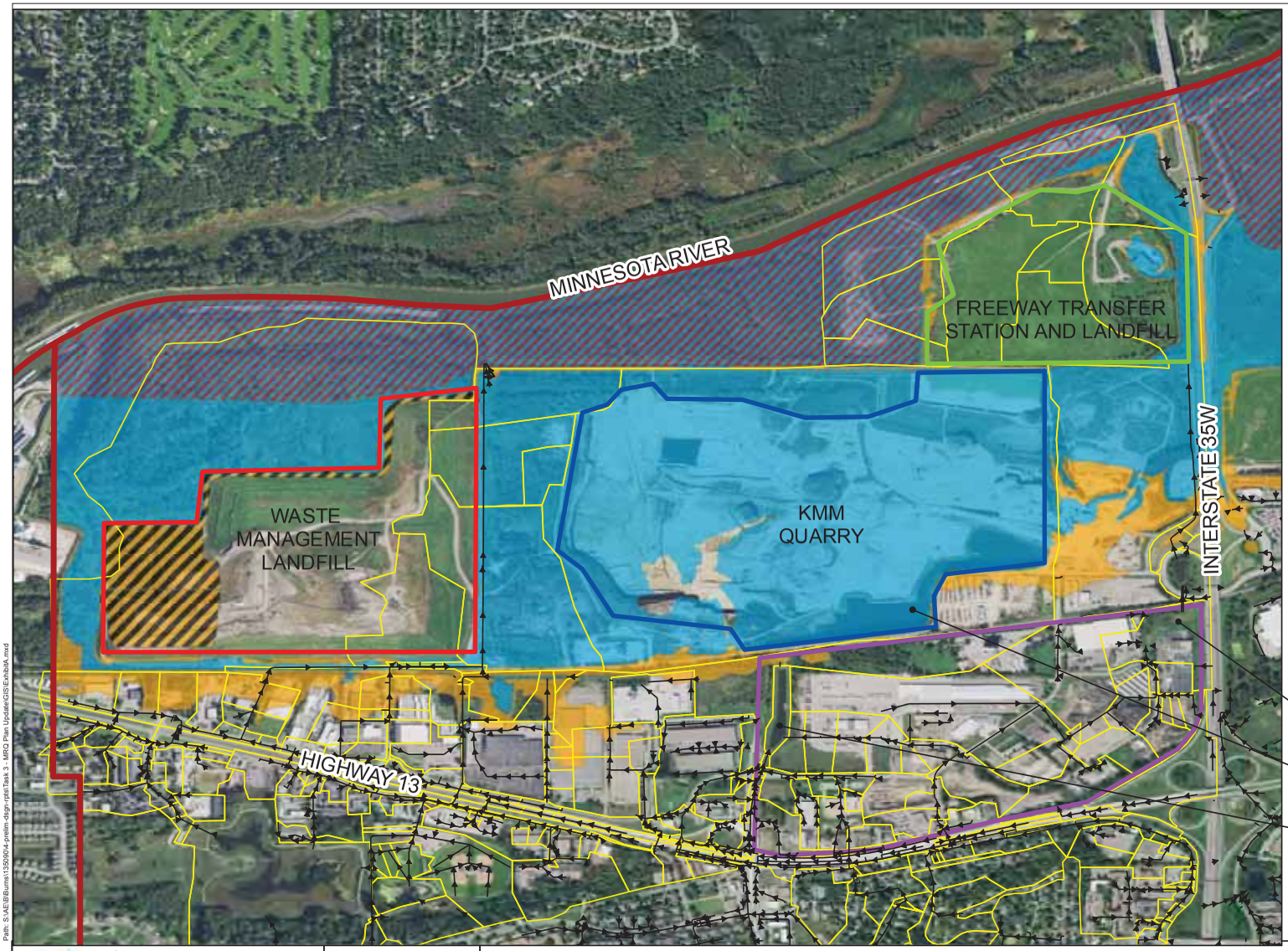

Legend

- City Boundary
- CITY STORM SEWER (18" AND GREATER)
- MAINTAIN ANNUAL LEVEE
- REGIONAL TREATMENT AREA
- FREEWAY LANDFILL
- FUTURE QUARRY LAKE
- DRAINAGE AREAS
- 1 PCT ANNUAL CHANCE FLOOD HAZARD (100-YR)
- FLOODWAY
- 0.2 PCT ANNUAL CHANCE FLOOD HAZARD (500-YR)
- AREA WITH REDUCED FLOOD RISK DUE TO LEVEE
- LADY BIRD POND
- SOUTH SUMP SURFACE WATER SUPPLY INTAKE
- YELLOW FREIGHT POND

0 0.1 0.2 0.4 0.6 0.8 Miles

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Project: BURNS 135090
Print Date: 2/9/2017

Map by: EKE
Projection:
Source:

MINNESOTA RIVER QUADRANT

ISSUES SUMMARY
BURNSVILLE, MINNESOTA

EXHIBIT A

This map is neither a legally recorded map nor a survey map and is not intended to be used as one. This map is a compilation of records, information, and data gathered from various sources listed on this map and is to be used for reference purposes only. SEH does not warrant that the Geographic Information System (GIS) Data used to prepare this map are error free, and SEH does not represent that the GIS Data can be used for navigational, tracking, or any other purpose requiring exacting measurement of distance or direction or precision in the depiction of geographic features. The user of this map acknowledges that SEH shall not be liable for any damages which arise out of the user's access or use of data provided.

Appendix B

Volume Control/Infiltration Worksheet

Volume Control / Infiltration Practice Worksheet – Revised 2017

Burnsville, MN

Owner / Developer Name: _____

Site Name/Block or Outlot ID:_____

Step 1: Determine the site areas for your project.

a. Total site area in acres. _____ acres

b. For New Development Projects:

1. What is the proposed new impervious area within the site. _____ acres

c. For Redevelopment Projects:

1. Site area to be redeveloped. _____ acres

2. Percent of site redeveloped (= 100*(1.c.1 / 1.a)). _____ %

3. New impervious area within the redevelopment. _____ acres

4. Redeveloped impervious area within the redevelopment. _____ acres

Step 2: New Development Projects - Calculate volume required for infiltration/filtration.

a. New Impervious Volume = Step 1.b.1 x 1.1 inch x 1/12 (ft./inch) x 43,560 (sq.-ft./acre)

= _____ x 1.1 x 1/12 x 43,560 = _____ cu.-ft

Step 3: Redevelopment Projects < 50% Redevelopment - Calculate volume required for infiltration/filtration.

a. New Impervious Volume = Step 1.c.3 x 1.1 inch x 1/12 x 43,560

= _____ x 1.1 x 1/12 x 43,560 = _____ cu.-ft

b. Redevelopment Volume = Step 1.c.4 x 0.55 inch x 1/12 x 43,560

= _____ x 0.55 x 1/12 x 43,560 = _____ cu.-ft

c. Total Volume = Step 3.a + Step 3.b = _____ cu.-ft.

Step 4: Redevelopment Projects > 50% Redevelopment - Calculate volume required for infiltration/filtration.

a. New Impervious Volume = Step 1.c.3 x 1.1 inch x 1/12 x 43,560

= _____ x 1.1 x 1/12 x 43,560 = _____ cu.-ft

b. Redevelopment Volume = Step 1.c.4 x 1.1 inch x 1/12 x 43,560

= _____ x 1.1 x 1/12 x 43,560 = _____ cu.-ft

c. Total Volume = Step 4.a + Step 4.b = _____ cu.-ft.

Volume Control / Infiltration Practice Worksheet – Revised 2017

Step 5. Infiltration Rate and Maximum Draw Down Time

Infiltration practices must be designed to draw down to the bottom of the practice within 48 hours. The maximum ponding depth shall be based on the soil infiltration rate determined from site-specific soils investigation data taken from the location of proposed infiltration practices on the site. The soils investigation requirement may be waived for smaller property practices (such as residential systems) where the maximum ponding depth is one (1) foot or less.

Infiltration Rate = _____ in/hr. (refer to the Minnesota Stormwater Manual for Guidance)

Step 6. Determine water quality volume for infiltration practices.

For each of the practices you will use, enter the data in the table provided below to summarize total water quality volume and total annual phosphorus removal. Note that TP removal data is not required if infiltration practices fully satisfy the water quality volume requirements for the site. Provide detail in the plans to support the data noted.

BMP Name / ID	Water Quality Volume (cubic-feet)	Annual Total Phosphorus (TP) Removal (lbs)
Totals =		

Step 7. Determine water quality volume and TP Removal for non-infiltration BMPs

For each of the non-infiltration practices you will use, enter the data in the table provided below to summarize total water quality volume and total annual phosphorus removal. Note that TP removal data is required if infiltration practices do not fully satisfy the water quality volume requirements for the site. Provide detail in the plans to support the data noted.

BMP Name / ID	Water Quality Volume (cubic-feet)	Annual Total Phosphorus Removal (lbs)
Totals =		

Step 8. Confirm Water Quality Volume Requirements Are Met.

The total volume provided in Step 6 must be equal to or greater than the volume required in Step 2 (New Development), Step 3 (Redevelopment disturbing less than 50% of the site) or Step 4 (Redevelopment Disturbing 50% or more of the site).

For projects where infiltration practices listed in Step 6 do not fully satisfy the water quality volume requirement, pollutant removal standards apply. New development portions of a site are required to achieve 75% TP removal on an annual basis and redevelopment portions of a site are required to achieve 60% TP removal on an annual basis. See Appendix C for more detailed information.

Appendix C

Engineering Standards

Appendix C – Development Standards

The City of Burnsville has developed specific requirements in this section that apply to development and redevelopment projects. These standards are intended to help achieve the water resource goals of the City's Water Resources Management Plan (WRMP) and help the City maintain compliance with the National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit program and the related NPDES/SDS General Construction Stormwater Permit. This summary highlights important aspects of the requirements for storm water quality, discharge rate and volume control, wetland management and erosion control.

> This summary does not provide a complete listing of the requirements of this Plan or City Code. Note that other state and local watershed management organization rules and standards may also apply to development and redevelopment projects. For the convenience of users of this document a summary of the watershed rules and standards having jurisdiction within Burnsville is provided at the end of this Appendix in Table C-1. For a more detailed listing of requirements see the specific policies of the WRMP, the applicable City ordinances and watershed standards, or consult with City staff on your specific project.

To accomplish these goals, it is important to the City to have consistent approaches to evaluating proposed development projects. Therefore, all hydrologic, hydraulic and water quality analyses must be prepared and submitted in a format that will allow for a timely and efficient review by City staff. Project designers and/or developers are encouraged to schedule and complete a pre-design meeting with the City before any data will be accepted. The purpose of the meeting is to specifically address approvals and permits, pond requirements, trunk storm drain analysis, wetland impacts, water quality treatment, erosion control and discharge to lakes and sensitive wetland resources.

The stormwater management performance standards the City of Burnsville has adopted are similar to the MPCA Minimal Impact Design Standards (MIDS). The MIDS standards enable and promote the implementation of low impact development and other stormwater management techniques. Controlling a post-development runoff volume equivalent to 1.1 inches from the impervious surfaces is utilized as an approach to mimic the site's natural, pre-development hydrology. In addition to the hydrologic and water quality benefits anticipated through adoption of performance standards similar to MIDS, the MIDS performance criteria are being promoted and implemented statewide by many communities and watershed management organizations to standardize and streamline stormwater management regulatory programs for developers and communities. This enables developers to utilize standardized modeling methods and credit calculation tools such as the MIDS calculator.

1) <u>General</u>

   a) Water quality treatment, volume control, water quantity and rate control requirements apply to any project which results in one-half acre or more of disturbed area or 5,000 square feet or more of new impervious area. For the purposes of these standards, the new impervious area shall be considered the cumulative new impervious area.

   b) All maintenance, repair, resurfacing, reconditioning, or reconstruction activities on impervious surfaces, which do not involve constructing impervious surfaces outside of the existing impervious surfaces are exempt from rate, water quality, water quantity and volume control standards.

c) Construction Site Erosion and Sediment Control standards apply to all projects.

d) Additional requirements applicable to projects in Shoreland Areas are defined in City Code Section 10-8-10.

e) Any project within a floodplain area requires a permit from the City, County, MnDNR, and/or FEMA.

f) The owner shall submit the information listed in Section 10 of these Standards for review by the City.

g) Any project within the jurisdiction of the Vermillion River Watershed JPO that has obtained a variance from these standards by the City, must be reviewed and approved by the Vermillion River JPO.

2) Water Quality Treatment.

a) Infiltration / Volume Control Requirement:

i) For all new impervious portions of a project, a runoff volume of 1.1 inch must be treated in infiltration practices. The extent of infiltration / volume control practices required shall be determined using the worksheet in Appendix B.

ii) For all redevelopment impervious portions of a project on sites that redevelop greater than 50% of the site, a runoff volume of 1.1 inches from the reconstructed impervious surfaces must be treated in infiltration practices. The extent of infiltration / volume control practices required shall be determined using the worksheet in Appendix B.

iii) For all redevelopment impervious portions of a project on sites that redevelop less than or equal to 50% of the site, a runoff volume of 0.55 inches from the reconstructed impervious surfaces must be treated in infiltration practices. The extent of infiltration / volume control practices required shall be determined using the worksheet in Appendix B.

iv) Projects in the Vermillion River Watershed that create one or more acre of new impervious surface must control runoff volume for the 2-year, 24-hour storm event (2.75 inches) to the predevelopment volume.

b) Pollutant Removal Requirements. For projects that have met the infiltration/volume control requirements above, the pollutant removal requirements are considered to be met. For projects where infiltration is prohibited or restricted (see Items 3.a. and 3.b.), the following pollutant removal standards apply prior to reaching a downstream receiving water:

i) For new development portions of a site, provide treatment to remove 75% TP as modeled on an annual basis.

ii) For redevelopment portions of a site, provide treatment to remove 60% TP as modeled on an annual basis.

iii) Design engineers and developers shall determine the pollutant removal efficiency of the BMP(s) incorporated into the site plan using the available industry standard models including P8 (and using a standard NURP 50th percentile particle size distribution for the analysis), MIDS calculator, WinSLAMM or a comparable model approved by the City. As an alternative to preparing a site-specific model, the development may provide a treatment volume (dead storage) of not less than 2.5 inches calculated over the contributing drainage area to the

pond. For example, a 1-acre site that drains to a common treatment pond would be required to provide a dead storage volume of 0.21 acre-feet or 9,000 cubic feet.

3) Volume Control / Infiltration Practices.

a) Infiltration systems are prohibited:

i) Where industrial facilities are not authorized to infiltrate industrial stormwater under an NPDES/SDS Industrial Stormwater Permit issued by MPCA.

ii) Where vehicle fueling and maintenance occur.

iii) Where the bottom of the infiltration basin is less than 3 feet to bedrock or seasonally saturated soils.

iv) Where high levels of contaminants in soil or groundwater will be mobilized by infiltration.

v) Within the areas designated as Very High Vulnerability and High Vulnerability within the Drinking Water Supply Management Area (DWSMA) identified in Figure C-1

b) The City restricts the use of infiltration systems in areas:

i) With low permeability soils (i.e., Hydrologic Soil Group D soils) or where a confining layer exists below the proposed basin. Filtration or conservative drawdown rates should be considered in designing systems in HSG C soils.

ii) Within 1,000 feet upgradient or 100 feet down gradient of active karst features.

iii) Within the areas designated as: Moderate Vulnerability; and Low to Very Low Vulnerability within the Drinking Water Supply Management Area (DWSMA) identified in Figure C-1;

iv) Where soil infiltration rates are more than 8.3 inches per hour.

c) For linear projects not meeting the exemption in Part 1.b., and where the lack of right-of-way precludes the installation of volume control practices that meet the requirements in Part 2 (Water Quality Treatment) and Part 3 (Volume Control/Infiltration Practices), the City may allow a lesser volume control on the construction site provided a reasonable attempt has been made to obtain right-of-way during the project planning process and:

i) One or more of the prohibited or restricted site conditions listed above exists; and

ii) The owner implements other practices (e.g., evapo-transpiration, reuse, conservation design, green roofs, etc.) on the construction site that may not fully meet the volume control requirements of Part 2 (Water Quality Treatment).

d) Infiltration practices shall provide for pretreatment of the runoff. Examples of pretreatment include a mowed grass strip between a curb-cut and a small rain garden, a sump manhole or manufactured sediment trap prior to an infiltration basin and a sediment forebay as the first cell of a two-cell treatment system. Where the infiltration system captures only clean runoff (e.g., from a rooftop) pretreatment may not be required.

e) Infiltration practices must be designed to draw down to the bottom elevation of the practice within 48 hours. The maximum ponding depth shall be based on the soil infiltration rate determined from site-specific soils investigation data taken from the location of proposed infiltration practices on the site. The soils investigation requirement may be waived for

smaller residential property practices where the maximum ponding depth is one (1) foot or less.

f) The design shall incorporate a diversion or other method to keep construction site sediment from entering the infiltration system prior to final stabilization of the entire contributing drainage area.

g) The design shall incorporate provisions that will prohibit construction equipment from compacting the soils where infiltration practices are proposed.

h) A plan for maintenance of the system must be submitted that identifies the maintenance activities and frequency of activities for each infiltration practice on the site.

i) See part 8 for additional basin design details.

4) Water Quantity / Flood Control.

a) The low building elevation shall be set to the higher of the following:

i) Where an effective Base Flood Elevation (BFE) has been established and is included in the City's FIRM, the low floor elevation adjacent to a surface water body shall be established in accordance with the City's Floodplain ordinance. The ordinance establishes the Regulatory Flood Protection Elevation (low floor elevation) at not less than one (1) foot above the BFE plus any increase due to encroachment of the floodway.

ii) The low floor elevation shall be two (2) feet or more above the 100-year/24-hour event as determined by a technical evaluation by a qualified engineer or hydrologist.

b) An emergency overflow shall be incorporated into the site design at or above the BFE or modeled high water level to convey a 100-year discharge away from buildings to the next downstream water body. Existing, natural or man-made emergency overflows shall be analyzed as part of the design process. The lowest opening shall be at least 1.5 feet above the emergency overflow elevation of the adjacent water body, unless the analysis shows that adequate storage volume exists within the basin to provide a reasonable level of protection from potential flooding. Where a natural overflow does not exist, the designer shall consider the possibility of long duration events, such as multiple-year wet cycles and high runoff volume events (e.g., snowmelt events that last for many weeks) when evaluating high water elevations and outlets from landlocked basins.

c) Fill around a building or structure shall be above the BFE and extend a horizontal distance of at least 15 feet in all directions.

d) For underground parking structures with a low floor elevation below the high water level or emergency overflow elevation, the drainage system within the parking structure shall include anti-backflow devices and flood protection to minimize the impacts of high ground water levels during flood events.

e) Projects in the Vermillion River Watershed must not result in a net loss in floodplain storage.

f) For landlocked basins, where additional stormwater volume is proposed to be routed, consideration shall be given to the effects of increased flood levels on trees and vegetation and potential for erosion.

5) Rate Control.

a) Discharge rates leaving the site must not exceed the existing rates for the 2, 10 and 100-year, critical duration (24-hour) storm events, using the updated Atlas 14 rainfall depths and antecedent moisture conditions 2 (AMC-2). The storm distribution shall be a NRCS MSE 3 MN distribution or the nested distribution for Atlas 14 based data. Discharge rates leaving the site should be reduced from existing rates where feasible. Predevelopment is defined as the conditions on the project site prior to the proposed improvements.

   i) For projects in the Vermillion River Watershed, discharge rates leaving the site must not exceed the predevelopment rates for the 1-year critical duration storm in addition to, the 2-year, 10, and 100-yr, 24-hour events. Predevelopment is defined as the conditions on the project site that existed in 2005.

b) On-site rate controls may not be needed if downstream (regional) facilities can be shown to adequately detain/retain the runoff to existing conditions and in accordance with the rates established in Appendix D of this Plan. In this case, the developer or design engineer shall submit a technical evaluation completed by a qualified engineer or hydrologist which must be review and approved by the City Engineer.

c) Where a flow rate variance involves inter-community issues or significant water bodies, the regulatory jurisdiction shall have a review role. Any variances shall be reflected in subsequent plan submittals.

d) Project sites discharging directly to the Black Dog Fen must not increase the discharge rate from the site for the 1-year event.

e) For proposed outlets from landlocked basins, an analysis of the water quality and flooding impacts on intercommunity flows or any downstream strategic waterbodies shall be prior to construction of the outlet. If analyses indicate a potential adverse effect on water quality or increased flood potential, the city must notify the watershed organization prior to approving the outlet.

6) Special Waters and Wetlands.

a) Developments shall meet the requirements of the National Pollutant Discharge Elimination System (NPDES) permit program for all applicable requirements of the most recent permits including, but not limited to the following:

   i) Sites discharging to Trout Stream #1, #4 or #7, must incorporate BMPs that address: runoff temperature requirements; maintain an undisturbed buffer zone of at least 100 feet between the project site and the trout stream; and cover exposed slopes that are steeper than 3:1 (H:V) within three days of the disturbance.

b) Horizontal vegetated buffer zones shall be established and/or maintained around existing wetlands and storm water treatment ponds. New development and redevelopment projects shall provide a buffer zone around wetlands in accordance with the requirements in the City's Wetland Protection and Management Plan. Storm water ponds with a permanent pool of water (i.e., wet ponds) shall have an average 20-foot buffer around the perimeter of the basin. The buffer shall extend form the normal water level to the top of the pond slope.

Wetland Classification	Permanent Buffer Strip Average Width (feet)	Minimum Permanent Buffer Zone Width (feet)	Percentage Native Vegetation

Protection	50	30	100% Native
Improvement	35	25	100% Native
Management	25	20	Majority
Management II	20	20	Majority

c) Water level fluctuations in wetlands shall be managed in accordance with the City's Comprehensive Wetland Protection and Management Plan. A rise (bounce) in elevation greater than 12 inches during a 10-year storm shall be avoided.

d) New discharge points to all wetlands and waters must include pretreatment. New direct discharges to Management II wetlands must have at least grit removal prior to discharge.

e) State of Minnesota Buffer Law (Minnesota Statutes 2014, sections 103B.101, subdivision 12; 103E.315, subdivision 8; Minnesota Statutes 2015 Supplement, sections 103B.101, subdivision 12a; 103F.48, subdivisions 1, 3, 4, 7, 8, 10 and CHAPTER 85--S.F. No. 2503l 2016 amendments) requires the establishment of either a 50-foot average, 30-foot minimum, continuous buffer of perennial rooted vegetation around all public waters, streams, and public ditches as identified and mapped on a buffer protection map. The buffer protection map is maintained by the Minnesota Department of Natural Resources, through a buffer mapping website (http://arcgis.dnr.state.mn.us/gis/buffersviewer/). The buffer law is administered by the Board of Water and Soil Resources (BWSR), with technical support for land owners provided by the Dakota County Soil and Water Conservation District. Resources requiring protection under the buffer law are present in the City of Burnsville, but are limited to ten public waters, and four unnamed streams draining into Black Dog Lake. These aquatic resources currently meet the standards of the buffer law, and no action is required to comply with the recently implemented legislation. The current buffer standards incorporated in the Burnsville Surface Water Management Plan exceed the state requirements for the aquatic resources, which protects these resources should adjacent land use change.

7) Design Computations.

a) All hydrologic data shall be completed using NRCS methodology; i.e. HydroCAD or TR20/TR55, XP-SWMM or a comparable, City approved method. Hydraulic calculations will be accepted in the rational method format or in commonly used software packages such as FHWA HY-8, or XP-SWMM or a compatible, City approved method. These computations shall be submitted to the City, upon request.

b) Rainfall amounts for hydrologic analysis shall be based on Atlas 14 data. Burnsville analyses shall use the values in the following table for 24-hour design events.

Return Frequency	Rainfall Depth (inches)
2-year	2.9
10-year	4.3
100-year	7.5

c) Local storm sewer systems shall be designed for the 10-year storm event. The Rational Method shall be the preferred methodology for the design of local systems. Culvert crossings or storm systems in County or State right-of-way may have a design frequency which differs from the City's 10-year design storm. The designer shall contact each agency/unit of government to

determine the appropriate design frequency for hydrologically-connected systems.

d) For culvert outlet velocities less than or equal to 4 fps, check shear stress to determine if vegetation or riprap will be adequate. If vegetation is used, temporary erosion control during and immediately follow construction shall be used until vegetation becomes established. For velocities greater than 4 fps, energy dissipaters shall be designed in accordance with MnDOT Design Criteria.

e) High water elevations for landlocked areas (basins where no outlet exists) shall be established by first estimating the normal or initial water surface elevation at the beginning of a rainfall or runoff event using a documented water budget, evidence of mottled soil, and/or an established ordinary high water level. The high water level analysis shall be based on runoff volume resulting from a 100-year/10-day runoff (7.2 inches and saturated or frozen soil conditions [CN=100]) and/or the runoff resulting from a 100-year back-to-back event. The high water elevation shall be the higher of these two conditions.

8) Additional Pond and Infiltration System Design Criteria. Newly constructed or expanded/modified ponds and basins shall be designed and constructed to meet the following:

a) Any storm water pond constructed within the prohibited infiltration zone in Figure C-1, must meet the following criteria:

i) The basin bottom and side walls shall be constructed by compacting at least a 1-foot thickness of soils having at least 20 percent fines (at least 20% passing a #200 sieve). The bottom must have at least a 3-foot vertical separation to the seasonally-high groundwater elevation and/or bedrock.

ii) If a 3 foot separation to bedrock or the seasonally-high groundwater elevation cannot be obtained, the basin bottom and sidewalls shall be constructed of materials and methods that are approved by the City Engineer. Possible liner materials may include compacted cohesive soils, geosynthetic materials, plastic liner, soil additives or other materials.

iii) The seasonally-high groundwater elevation shall be determined by assessing soil mottling or soil coloration that indicates temporary saturation of the soil.

b) All ponds or basins shall:

i) If the pond will have a permanent pool of water, have an aquatic bench having a 10:1 (H:V) slope for the first 10 feet from the normal water level into the basin.

ii) Have a 3:1 maximum slope (above the NWL and below the 10:1 bench, if a wet pond);

iii) Maximize the separation between inlet and outlet points to prevent short-circuiting of storm flows;

iv) Be made accessible for maintenance and not be entirely surrounded by steep slopes or retaining walls which limit the type of equipment that can be used for maintenance. Vehicle access lane(s) of at least 10 feet shall be provided, at a slope less than 15 percent from the access point on the street or parking area to the pond, to accommodate maintenance vehicles. Maintenance agreements will be required when the pond is not located on City property.

v) Have a skimming device designed to remove oils and floatable materials up to a five-year

frequency event. The skimmer shall be set a minimum of 12 inches below the normal surface water elevation shall control the discharge velocity to 0.5 feet per second.

c) For wet ponds, an average 4 feet of permanent pool depth (dead storage depth) shall be provided. This constraint may not be feasible for small ponds (less than about 3 acre-feet in volume or less). In such cases, depths of 3-4 feet may be used. To prevent development of thermal stratification, loss of oxygen, and nutrient recycling from bottom sediments, the maximum depth of the permanent pool should be less than or equal to 10 feet.

d) Structural BMPs proposed as a stand-alone device or as part of the overall treatment system, shall be designed in accordance with standard engineering principles and practices.

9) Construction Site Erosion and Sediment Control.

a) The City's Erosion Control Ordinances shall be followed for all projects, including those not regulated under the NPDES construction permit. Construction site erosion and sediment control practices shall be consistent with those required by the NPDES Construction Stormwater General Permit Section IV-Construction Activity Requirements, however, formal permit coverage is not required for sites disturbing less than one acre.

b) Prior to the start of any excavation or land disturbing activity for the site, the owner or contractor must have in place and functional an approved method of erosion control. The contractor must have received authorization from the City prior to commencing construction activities.

c) Development projects shall meet the requirements of the National Pollutant Discharge Elimination System (NPDES) construction permit program, including the requirement to prepare and follow a storm water pollution prevention plan (SWPPP). The owner shall submit proof of receipt and approval by MPCA of the permit application prior to commencing construction. A copy of the SWPPP prepared in accordance with the NPDES permit requirements, shall be submitted to the City if requested by the City Engineer. Site plans shall include:

i) Best management practices (BMPs) to minimize erosion.

ii) BMPs to minimize the discharge of sediment and other pollutants.

iii) BMPs for dewatering activities.

iv) Site inspections and keeping records of rainfall events.

v) Maintenance of BMPs during construction.

vi) Management of solid and hazardous wastes.

vii) Final stabilization of the site including the use of perennial vegetation and/or other methods on all exposed soils.

viii) Computations and documentation regarding the sizing and location of temporary sediment basins.

10) Storm Water Plan Submittals.

a) Property lines and delineation of lands under ownership of the project proposer.

b) Delineation of the subwatersheds contributing runoff from off-site, and proposed and existing subwatersheds on-site.

c) Location, alignment and elevation of proposed and existing stormwater facilities.

d) Delineation of existing on-site wetlands, shoreland and/or floodplain areas. Removal or disturbance of stream bank and shoreland vegetation should be avoided. The plan shall address how unavoidable disturbances to this vegetation will be mitigated.

e) Existing and proposed 100-year high water level elevations on-site.

f) Existing and proposed site contour elevations related to NAVD 1988 datum.

g) Construction plans and specifications of all proposed stormwater management facilities.

h) Stormwater runoff volume and rate analyses for existing and proposed conditions.

i) All hydrologic and hydraulic computations completed to design the proposed stormwater quality management facilities. Computations shall include a summary of existing and proposed impervious areas.

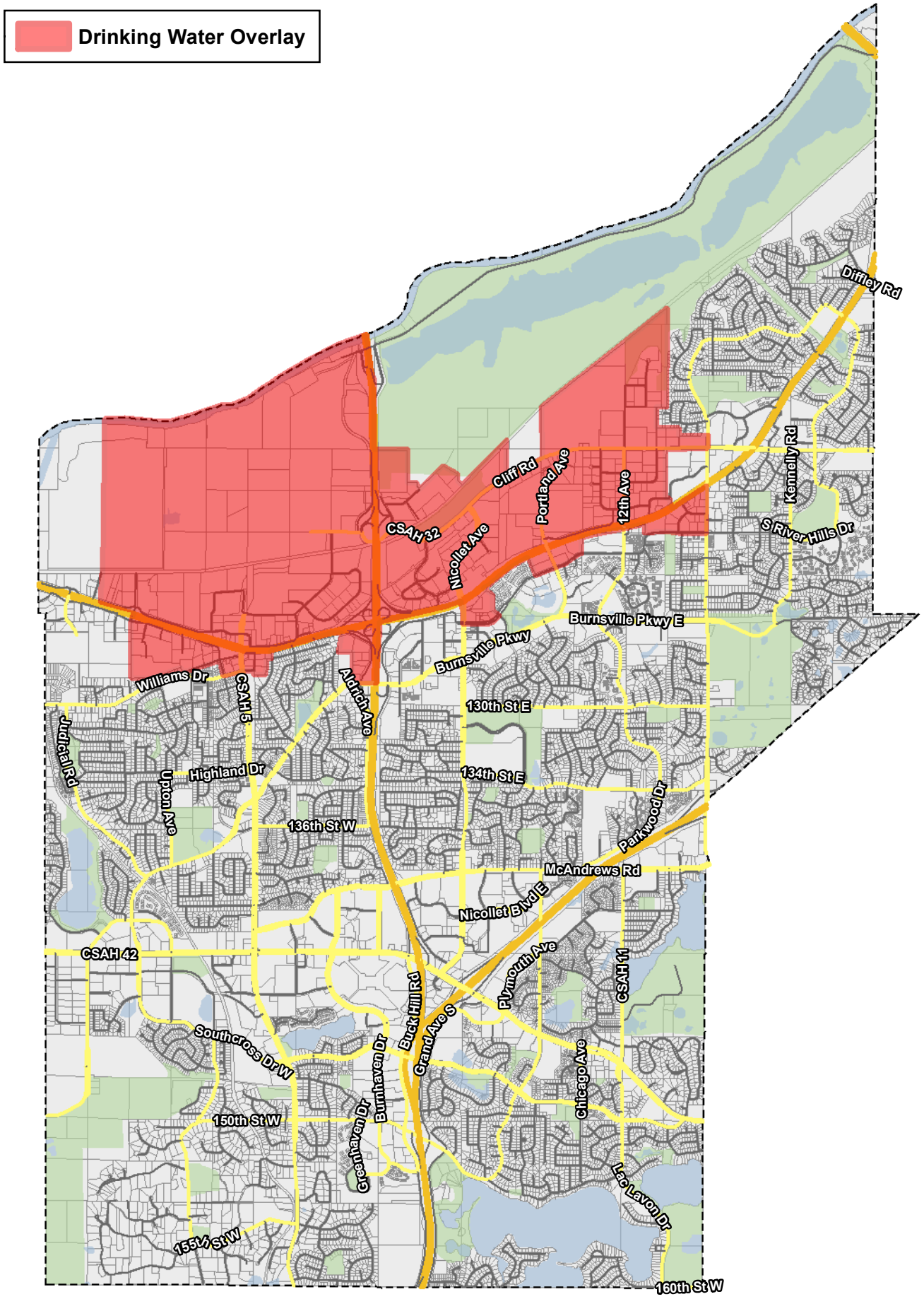
j) Provision of outlots or easements for maintenance access to detention basins, constructed wetlands and other stormwater management facilities.

k) Maintenance agreement between developer and city which addresses sweeping, pond inspection, sediment removal and disposal, etc.

l) Inlets to detention basins, wetlands, etc., shown at or below the outlet elevation.

m) Identification of receiving water bodies (lakes, streams, wetlands, etc.).

n) Documentation indicating conformance with this Plan



City of Burnsville

Drinking Water Overlay

FIGURE C-1

1 inch = 4,300 feet

N

WSB & Associates, Inc.

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Table C-1
Local Watershed Standards Summary

	VRWJPO	LMRWD	BDWMO[2]
Stormwater Management Standards	Applicability: All land disturbing activities (disturbance of <5000 sf may be exempt) Water Quality: Must meet water quality standards established by the MPCA NPDES Construction Stormwater permit Runoff Temperature Control: No specific criteria since other standards (volume control, buffers, etc.) emphasize approaches to control runoff temperature Peak Runoff Rate Control: Proposed peak runoff rates must not exceed the existing (2005 baseline) runoff rates for the 1-, 10-, and 100-yr critical duration storm events. Runoff Volume Control: Development creating ≥ 1 ac of new impervious surface must control the increase in runoff volume from the 2005 conditions for a 2-yr, 24-hr storm event.	Applicability: The disturbance of ≥1 acre of land or creating of ≥10,000 sf new impervious within the High Value Resource Area Overlay District[1] Water Quality: No net increase from existing conditions in TP or TSS to receiving waterbodies Runoff Temperature Control: Stormwater facilities must be designed to minimize an increase in the temperature of receiving trout waters for the 1- and 2-yr, 24-hr events. Peak Runoff Rate Control: The stormwater runoff rate shall not exceed the existing ratefor the 1- or 2-, 10-, and 100-year return frequency storms. Runoff rates shall not accelerate on or off-site watercourse erosion, downstream nuisance, flooding, or damage. Runoff Volume Control: Must comply with the MPCA NPDES Construction Stormwater permit requirements for stormwater runoff volume retention equivalent to 1 in of runoff from impervious surfaces. Regional ponds and practices can be used provided the design is based on the ultimate conditions for the contributing watershed and practices are constructed and operational prior to constructing impervious surfaces within the contributing drainage area.	Applicability: The disturbance of ≥1 acre of land Water Quality: Must meet water quality standards established by the City of Burnsville Peak Runoff Rate Control: Must meet peak runoff rate control standards established by the City of Burnsville Runoff Volume Control: Must meet runoff volume control standards established by the City of Burnsville All new or replaced stormwater management systems and structural BMPs must conform to current standards and engineering practices. Pretreatment is required for stormwater discharge points/outfalls and existing inlets to the stormwater system.

Table C-1 (continued)
Local Watershed Standards Summary

<table>
<tr><th></th><th>VRWJPO</th><th>LMRWD</th><th>BDWMO[2]</th></tr>
<tr><td>Erosion and Sediment Control Standards</td><td>Applicability: All land disturbing activities > 5000 sf, > 30 cy of soil, or changing existing drainage

Standards: Erosion and sediment controls shall meet the standards of the MPCA NPDES Construction Permit and have a SWPPP for projects disturbing more than 1 ac. Erosion and Sediment control plans shall be used for sites disturbing < 1 ac.</td><td>Applicability: The disturbance of ≥1 acre of land or ≥ 5,000 sf within the High Value Resource Overylay District

Standards: Erosion and sediment controls shall meet the standards of the MPCA NPDES Construction Permit and stormwater conveyances must be designed to a 10-year design storm.</td><td>Applicability: All land disturbing activities of ≥ 1 acre.

Standards: Erosion and sediment controls shall meet the standards of the MPCA NPDES Construction Permit</td></tr>
<tr><td>Buffer Standards</td><td>Applicability: Any new lot created by the subdivision of an existing property must maintain a buffer around all wetlands, watercourses, and pubic waters wetlands

Standards: Buffer width varies upon stream classification,
<table>
<tr><th></th><th>Avg.</th><th>Min.</th></tr>
<tr><td>Conservation Corridor</td><td>150</td><td>100</td></tr>
<tr><td>Aquatic corridor principal connector & trout stream</td><td>NA</td><td>100</td></tr>
<tr><td>Aquatic corridor principal connector</td><td>100</td><td>65</td></tr>
<tr><td>Aquatic corridor tributary connector</td><td>50</td><td>35</td></tr>
<tr><td>Water quality corridor</td><td>30</td><td>20</td></tr>
</table>
Or wetland classification
<table>
<tr><th></th><th>Avg.</th><th>Min.</th></tr>
<tr><td>Exceptional quality</td><td>50</td><td>30</td></tr>
<tr><td>High quality</td><td>40</td><td>30</td></tr>
<tr><td>Medium quality</td><td>30</td><td>25</td></tr>
<tr><td>Low quality</td><td>25</td><td>16.5</td></tr>
</table></td><td>NA</td><td>Applicability: Any development maintain a buffer around all wetlands

Standards: Member cities will continue to enforce wetland management standards. Buffer width varies upon wetland classification.
<table>
<tr><th></th><th>Avg.</th><th>Min.</th></tr>
<tr><td>Protect</td><td>50</td><td>30</td></tr>
<tr><td>Improve</td><td>35</td><td>25</td></tr>
<tr><td>Manage 1</td><td>25</td><td>20</td></tr>
<tr><td>Manage 2</td><td>20</td><td>20</td></tr>
</table></td></tr>
</table>

Table C-1 (continued)
Local Watershed Standards Summary

	VRWJPO	LMRWD	BDWMO[2]
Wetland Alteration Standards	Applicability: Whenever there is a proposed activity that may affect a wetland. Standards: Any wetland alteration must comply with the Minnesota Wetland Conservation act (WCA) and other applicable State and Federal regulations	NA	Applicability: Whenever there is a proposed activity that may affect wetland hydrology. Standards: Limits on changes in hydrology and water level bounce during storm event based upon the wetland management classification as defined by the City of Burnsville.
Floodplain Alteration Standards	Applicability: Any change in the floodplain below the 100-year flood elevation. Standards: No net decrease in flood storage capacity below the 100-year flood elevation. New structures must have sufficient freeboard over the BFE as required by local floodplain ordinances.	Applicability: Any alteration below the 100-year flood elevation of any wetland, public water, or subwatershed. Standards: No filling is allowed within the 100-yr floodplain which causes a rise in the 100-yr flood elevation without providing compensatory floodplain storage ≥ the volume of fill. Structures must be 2 ft above 100-yr HWL or 1 ft above EOF, whichever is greater. No permanent structure may be located within the floodway.	Applicability: All new structure construction adjacent to inundation areas. Standards: The BDWMO requires cities to set minimum building elevations at least 1 ft above the critical 100-yr flood elevation for structures adjacent to inundation areas.
Drainage Alteration Standards	Applicability: Any outlet of a landlocked basin with a contributing drainage area of ≥ 100 acres or a drainage alteration to a watercourse, public water or wetland that drains ≥ 640 acres Standards: Sound H&H analysis ensures no adverse downstream flooding, stability or water quality impacts, and runoff volume and peak rate criteria are met.	See Floodplain alteration standards.	Standard: BDWMO requires member cities to protect and maintain downstream drainage systems to provide permanent and safe conveyance of stormwater, and to reduce the frequency and/or duration of downstream flooding. Planned level of protection for trunk conveyors, streams, channels and around wetlands ponds and detention basins shall be based on the 100-year flood. Non-trunk conveyance systems shall provide a min. 5-yr frequency event level of service, preferably a 10-yr frequency event. EOFs shall be incorporated where feasible in designs for events larger than a 100-yr frequency. Multi-stage outlets for smaller storms and maintenance of base flows is encouraged.

Table C-1 (continued)
Local Watershed Standards Summary

	VRWJPO	LMRWD	BDWMO[2]
Shoreline and Streambank Alteration Standards	NA	Applicability: Any shoreline or streambank alteration Standard: Bioengineering techniques shall be used in place of traditional stabilization. Retaining walls shall only be used when no adequate alternative exists.	NA
Stream and Lake Crossing Standards	NA	Applicability: Any road, utility, or structure placed on the bed or bank of a watercourse or waterbody Standards: Hydraulic impact analysis is completed by a qualified PE demonstrating the crossing will retain adequate hydraulic and navigational capacity. Minimum culvert width shall be ≥ bankfull width. Culvert length shall extend beyond side slope toe, alignment and slope should match the stream, and inverts shall be buried 1/6 of height.	NA
Water Appropriation Standard	NA	Applicability: Surface or groundwater appropriation and issuance of a DNR appropriation permit (≥10,000 gal per day or 1M gal per year) Standards: The effects of the proposed appropriation must be defined and a copy of any DNR appropriations permit must be provided to the District. Known non-compliant ISTS within the WHPA shall be upgraded within 3 years.	NA

Table C-1 (continued)
Local Watershed Standards Summary

	VRWJPO	LMRWD	BDWMO[2]
Bluff Standard	NA	Applicability: Any land disturbing activity or land alterations on bluffs within the LMRWD Bluff Overlay District Standards: All grading, clear cutting, removal of vegetation and/or other land-disturbing activities are prohibiting on the bluff and/or bluff impact zone. A minimum of 40 ft setback from the top of bluff/bluffline is required for: • structures, • ISTS and CSTS, and • stormwater ponds, swales, basins or other soil saturation-type features	NA
See For More Information	See Standards for the VRWJPO (2016) for details.	See Appendix K of the LMRWD (2017 draft) plan for details.	See BDWMO Watershed Management Plan (2012) for details.

[1]See Appendix K of the LMRWD (2017 draft) plan for stormwater management standards in High Value Resource Area (HRVA) Overlay district.

[2]The BDWMO reserves the right to review regulations of member cities affecting the BDWMO water resources for compliance with BDWMO performance standards.

Appendix D

Hydrologic and Hydraulic Model Summary

Appendix D - Hydrologic System Information

The City of Burnsville developed this Water Resources Management Plan (WRMP) to analyze its water resources and to establish an overall program to achieve their water resource management goals. These goals are generally intended to reduce or minimize the future impacts of development on the City's natural and water resources and improve the quality of the City's resources.

In 2016 as part of the 2017 WRMP update, the City developed a City-wide xp-swmm hydrologic/hydraulic model. The 2017 model incorporated more detail in the pipe networks for much of the City than had previously been modeled. In general, pipes having a diameter of 18-inches or greater were included in the model and the majority of smaller pipes were excluded. Lake, ponds, wetland and selected depressional storage areas were also included in the City-wide model. For the data presented in the Hydrologic Summary Data Table D-1 in Appendix D, the source of the data for building the model consisted of the following:

- City owned and inventoried ponds (from City provided GIS Database in January 2016) that outlet to the City storm sewer and that had complete storm sewer data available in City GIS Database (i.e., pipe size, inverts).
- Privately owned and inventoried ponds (from City provided GIS Database in January 2016 that outlet to the City storm sewer with complete storm sewer data available in City GIS database.
- Some natural depression areas that were not included in the GIS water body database were developed from available LIDAR data.

The following systems and features were not included in the model:

- Underground Systems.
- Infiltration or filtration Systems (with a few exceptions)
- Privately owned and inventoried ponds without complete storm sewer data available in the City GIS database (i.e., missing pipe size and/or inverts)
- Non-inventoried ponds.

The following descriptions correspond to the information presented in the hydrologic summary table. Note that while the data table report that elevations are in NAVD 88 datum, largely due to the use of the data from the City's GIS data is reported in NAVD 88 datum. Data should be checked by users to confirm elevations noted in as-built plans and site specific surveys.

Storage Area ID

These columns identify the unique storage area ID for each row within the table and corresponds to the drainage areas and the specific pond/water body/storage areas shown Map Figure Series D-1.1 to D-1.12 and D-2.1 to D-2.12. The subwatershed boundaries were generally determined using available contour mapping and storm sewer networks. The boundaries should be considered approximate and should be review during subsequent and more detailed analyses.

Water Body Common Name

The water body common name is listed for lakes and key water bodies.

Surface Area at NWL

The water surface area at normal water level (in square feet) is determined from Lidar data based on the elevation of the water body normal water level, outlet structure, pump control elevation or a DNR established elevation. The surface area at NWL shown are those listed in the City GIS Pond/Water Body data.

Approximate Outlet Size

The approximate outlet size is the approximate outlet pipe size of the associated water body. The approximate outlet sizes shown are those listed in the City GIS Pond/Water Body data. This information should be used for planning purposes only and not for final design.

NWL

The normal water level of the pond is the lowest controlling elevation. It is usually taken as the invert of the outlet structure or the pump control elevation and is the elevation that the pond will drain down to after a rainfall event. The NWL does not reflect the lowest elevation that may be attained naturally by infiltration, evaporation or transpiration. The elevation is listed in National Geodetic Vertical Datum (NAVD 88). The NWL data shown are those listed in the City GIS Pond/Water Body data.

Ordinary HWL

The OHWL listed represents the level reported in the DNR's Lake Finder database for the water body listed in the comments column of the table. The OHWL data shown are those listed in the City GIS data.

100-Year Event (7.45" Rainfall Event)

The 100-year event is also referred to as a rainfall event that has a 1% chance of occurrence in a given year.

> The 100-year high water level data presented in these tables should be viewed as an approximate elevation and the user/designer is encouraged to complete additional analysis prior to initiating site planning, design and obtaining approvals. In general, the City may complete detailed updated modeling upon the initial contact with a project owner and provide the owner with updated high water level and low building elevation information.

HWL (NAVD 88)

The highest water level achieved in a storage area as predicted by the 2017 model for a 100-year event. The model assumes that the water body elevation is equal to the NWL at the beginning of the storm event. The HWL is affected by the accuracy of the data such as drainage area, storage capacity, outlet description and condition, and run-off factors. All of these factors should be reviewed when HWL is considered critical.

BFE from FEMA (NAVD 88)

The regulatory base flood elevation as defined in the most recent flood insurance study or flood insurance rate map. This number is only reported for water bodies that have a defined base flood elevation. The BFE may be more or less than the HWL listed in the previous column if more recent modeling was completed that has not yet been incorporated into an official map change by FEMA. These numbers will not change as a result of any additional analysis requested or required by the City to reevaluate the effects of updated Atlas 14 precipitation data.

Bounce in Pond/Water Body. The difference in elevation between the NWL and the modeled HWL.

Storage. The volume of water stored in the pond between the NWL and the HWL.

Peak Outflow Rate. The maximum discharge rate from a pond through the outlet. This normally occurs when the pond is at the HWL and it assumes the full efficiency of the outlet structure(s).

Approximate Overflow Elevation

The elevation at which the pond would overflow from the surface if the storage capacity is exceeded. The approximate overflow elevations shown are those listed in the City GIS Pond/Water Body data.

Approximate Existing Low Building Elevation

This elevation was determined from the "House-Print" on the contour mapping and does not indicate low-floor or basement elevations. These elevations should be considered approximate due to possible inaccuracies in the mapping and buildings that have been constructed or modified after the mapping was completed. The approximate existing low building elevation shown are those listed in the City GIS Pond/Water Body data.

Low Building Elevation

This elevation is determined based on the standards presented in Appendix C. This should be considered a planning level minimum elevation that is required by City standards. The developer should review the source and quality of data available and evaluate the low building elevation for each site directly to ensure a reasonable level of protection is provided. The low building elevations shown are those listed in the City GIS data.

Freeboard (LBLDG – HWL)

The difference between the low building and 100-year high water level elevations. A negative number indicates that the HWL is higher than the LBLDG. This dimension along with the comments column is intended to highlight areas in the City that could experience problems with flooding. Actual low building elevations, and other pertinent hydrologic data,, should be field verified to determine the extent of the problems. It should be noted that LBLDG elevation may be different elevation than the low floor elevation per City Ordinance.

Risk of Inundation

This column provides a relative risk of inundation of adjacent structures. The relative risk is not intended to take the place of detailed analyses to evaluate risk. Instead it is intended as an initial planning-level starting point. Almost any structure adjacent to a water body may have a risk of inundation during certain hydrologic events. The data is based on approximate overflow elevations and not on actual surveyed field conditions.

Relative Risk of Inundation

Distance Low Bldg. Elevation is Above the BFE or AOE (feet) (1)	**Base Flood Elevation (BFE) or 100-Year HWL**	**Approximate Overflow (AOE)**	**Overall Risk**
≤ 0	HIGH	HIGH	HIGH
0 to 1.5	MODERATE	HIGH	HIGH
1.5 to 2.0	MODERATE	LOW	MODERATE
2.0 or more	LOW	LOW	LOW

1. A value of zero means the low building elevation is at the same elevation of the BFE or EOF. A negative number means the elevation is below the BFE or EOF.

Notes

This column provides miscellaneous notes relating to the drainage area.

Table D-1 Hydrologic Summary Data for the 100-Year Design Storm

Storage Area ID	Water Body Common Name	Surface Area at NWL[1] (Acre)	Surface Area at NWL[1] (Square Feet)	Approx. Outlet Size[1] (inches)	NWL[2]	Ordinary HWL DNR[2] (NGVD 29)	100-Year Event (7.45 in Rainfall Event)					Approximate Overflow Elevation[1]	Approx. Existing Low Building Elevation (LBE)[1]	Low Building Elevation[2]	Freeboard (LBE-HWL) (ft)	Risk of Inundation	Notes[1]
							HWL[2]	BFE from FEMA (NAVD 88)	Bounce (ft)	Storage (acre-ft)	Peak Outflow Rate (cfs)						
BLACK DOG LAKE SUBWATERSHED																	
BDW1-A		1.13	49,034				732.61			9.56	94.1			734.61			
BDW1-B		0.09	3,812							0.00							Cliff Fen Park Rain Garden Cell 1
BDW1-C		0.11	4,633				831.74			0.52	16.7			833.74			
BDW1-E		0.23	10,220		824.00		827.30		3.30	0.67	15.4			829.30			
BDW1-F		0.10	4,279		824.50		827.61		3.11	0.23	5.6			829.61			
BDW1-H		0.09	4,036				843.85			0.15	5.2			845.85			
BDW1-I		0.21	8,935				730.97			0.18	10.7			732.97			
BDW1-J		0.38	16,349		730.00		732.08		2.08	2.38	0.0			734.08			
BDW1-K		0.19	8,226		730.00		734.34		4.34	0.51	0.0			736.34			
BDW1-L		0.49	21,159				738.25			1.43	0.0			740.25			
BDW3-E		0.22	9,522				721.37			1.04	31.3			723.37			
CENTRAL SUBWATERSHED																	
C1-A		0.15	6,706		923.50		927.97		4.47	1.23	38.6			929.97			
C1-B		0.18	7,691				934.33			0.31	0.0			936.33			
C1-C		0.17	7,422				922.86			2.20	2.6			924.86			
C1-D		0.17	7,588		880.00		887.73		7.73	2.16	15.0			889.73			
C1-E		0.26	11,528		878.20		883.00		4.80	1.44	19.6	882.80		885.00			
C1-F		0.54	23,641				926.39			1.21	14.9			928.39			
C1-G		0.12	5,343				853.45			1.80	27.1			855.45			
C1-H		0.42	18,332				742.54			0.94	89.9			744.54			
C1-J		0.05	2,063				744.48			0.40	3.2			746.48			PRIVATE
C1-K		0.15	6,341				836.55			0.63	32.0			838.55			
C1-L		0.75	32,787				840.60			13.18	19.1			842.60			
C1-M		0.58	25,236				877.77			1.91	5.1			879.77			PRIVATE
C1-N		0.18	7,742				744.85			0.27	12.6			746.85			PRIVATE
C1-O		0.04	1,682	8			871.80			0.00	0.7			873.80			
C2-A		0.55	23,929		844.70		854.77		10.07	6.03	22.2			856.77			
C2-B		0.20	8,628		841.50		845.38		3.88	1.09	28.1			847.38			
C2-C		0.21	9,210				854.77			0.37	17.6			856.77			PRIVATE
C2-D		0.14	6,245				863.50			0.42	35.1			865.50			PRIVATE
C4-A	Gateway Pond	1.03	44,806	18	840.00		858.63		18.63	23.62	17.9	859.00	864.00	860.63	5.37	Low	
C4-B		0.08	3,269				931.00			0.00	0.0			933.00			PRIVATE
C5-A	Crosstown West Park Pond	6.58	286,504	48	865.00		872.58		7.58	74.58	38.4	870.00	878.00	874.58	5.42	Low	RECEIVING WATER
C5-B		0.34	14,939				931.35			0.28	89.7			933.35			
C5-C		0.41	17,953		926.50		931.43		4.93	3.19	18.8			933.43			
C6-A		5.06	220,422		869.80		870.31		0.51	24.87	3.0	870.00	876.00	872.31	5.69	Low	RECEIVING WATER
C6-B		1.40	60,768				877.77			0.52	11.3			879.77			
C6-C		0.13	5,789				891.51			1.09	5.4			893.51			
C7-A		0.42	18,389	6	957.10		961.43		4.33	5.54	1.3	961.00	971.00	963.43	9.57	Low	
C8-A		1.35	58,645	no outlet	965.00		971.34		6.34	8.19	4.6			973.34			
C8-B		0.20	8,924				965.00			0.00	0.0			967.00			NO PIPE DISCHARGE
C9-A		2.21	96,149	15	970.00		979.64		9.64	8.09	11.1	978.00	976.00	981.64	-3.64	High	
C11-A		0.79	34,545	24	1014.20		1016.40		2.20	3.28	19.6	1028.00	1022.00	1018.40	5.60	High	
C11-B		0.07	3,047				1017.97			0.15	0.0			1019.97			
C12-A		1.57	68,195	18	1002.40		1003.25		0.85	13.19	2.5	1017.00	1018.00	1005.25	14.75	High	
C13-A		0.99	43,106	12	989.00		992.51		3.51	4.38	3.5	999.00	1000.00	994.51	7.49	High	
C14-A		4.33	188,403	24	963.00		970.44		7.44	44.10	49.1	974.00	972.00	972.44	1.56	High	RECEIVING WATER
C14-B		0.12	5,391				1012.62			3.56	0.0			1014.62			

Table D-1 Hydrologic Summary Data for the 100-Year Design Storm

Storage Area ID	Water Body Common Name	Surface Area at NWL[1] (Acre)	Surface Area at NWL[1] (Square Feet)	Approx. Outlet Size[1] (inches)	NWL[2]	Ordinary HWL DNR[2] (NGVD 29)	100-Year Event (7.45 in Rainfall Event)					Approximate Overflow Elevation[1]	Approx. Existing Low Building Elevation (LBE)[1]	Low Building Elevation[2]	Freeboard (LBE-HWL) (ft)	Risk of Inundation	Notes[1]
							HWL[2]	BFE from FEMA (NAVD 88)	Bounce (ft)	Storage (acre-ft)	Peak Outflow Rate (cfs)						
C14-C		0.64	27,662				1013.12			6.30	3.0			1015.12			
C15-A		1.44	62,760	12	968.50		974.35		5.85	10.03	0.0	978.00	976.00	976.35	1.65	High	
C16-A		0.85	36,862	36	959.50		961.17		1.67	5.06	0.0	961.00	962.00	963.17	0.83	High	
C16-B		0.34	14,647				963.36			0.86	7.7			965.36			
C16-C		0.06	2,667				961.17			1.34	9.2			963.17			
6934		0.00					968.58			0.22	25.8			970.58			Swale W of The Garage
1234002		0.00					986.84			2.51	0.0			988.84			Low spot N of E 130th, W of Welcome Ln
1234003		0.00					972.12			0.04	0.0			974.12			Low spot N of 134th, E of Walnut Dr
CRYSTAL LAKE SUBWATERSHED																	
CL3-A		0.84	36,768	30	983.10		1,031.88		48.78	2.65	13.0	986.80		1033.88			
CL4-A		6.01	261,651				934.55			3.43	0.0			936.55			NO PIPE DISCHARGE
CL4-B		0.02	670		937.80		951.03		13.23	2.89	59.3			953.03			
CL4-C		0.03	1,292				1,026.66			0.34	11.2			1028.66			
CL4-D		0.24	10,334		1039.00		1,039.33		0.33	0.15	7.3			1041.33			PRIVATE
CL4-E		0.34	14,805		1040.00		1,041.79		1.79	1.98	14.2			1043.79			PRIVATE
CL5-A		0.76	33,251	15	938.00		944.24		6.24	7.22	0.0	944.00	950.00	946.24	5.76	Low	
CL6-A	Crystal Lake	290.46	12,652,561	36	933.40	934.50	931.37	936.10	-2.03	228.54	6.9	938.00	940.00	933.37	8.63	Low	RECEIVING WATER
CL6-B		0.10	4,210		935.00		940.50		5.50	0.63	37.7			942.50			
CL6-C		0.92	39,931		933.40		934.65		1.25	0.71	0.0			936.65			
CL7-A		2.02	87,942				942.77			15.24	18.2			944.77			NON CITY
EAST SUBWATERSHED																	
E1-A	Raleigh Pond	1.37	59,628	36	853.20		859.82		6.62	12.94	138.1	867.00	863.00	861.82	3.18	High	
E1-C		1.47	64,125				724.24			3.77	38.4			726.24			
E1-F		0.18	7,945				894.84			1.83	7.0			896.84			
E1-G		0.17	7,360				884.38			0.69	19.4			886.38			
E2-A		1.53	66,515	18	879.00		893.79		14.79	18.06	5.3	903.00	901.00	895.79	7.21	High	
E2-B		0.28	12,258				895.82			1.35	29.1			897.82			
E2-C		0.03	1,238				897.62			0.89	21.0			899.62			
E3-A	Millpond	3.36	146,234	18	879.00		895.89		16.89	80.00	26.3	903.00	901.00	897.89	5.11	High	
E3-B		0.28	12,270		902.00		906.37		4.37	1.31	6.9	906.00		908.37			
E3-C		0.12	5,099				911.43			0.71	28.4			913.43			
E3-D		0.10	4,474				954.56			0.35	0.0			956.56			NO PIPE DISCHARGE
E3-E		0.32	14,095							0.00							NO APPARENT PIPE DISCHARGE
E3-F		0.99	42,931				900.16			9.23	18.6			902.16			
E3-G		0.13	5,707				922.22			0.77	27.4			924.22			
E3-I		0.05	2,284		933.00		935.75		2.75	0.22	12.5			937.75			PRIVATE
E3-J		0.06	2,459		937.00		938.16		1.16	0.12	5.1			940.16			PRIVATE
E3-N		0.05	2,245				918.98			0.20	40.8			920.98			
E3-O		0.14	6,283		922.50		924.40		1.90	0.51	14.5			926.40			
E4-A		2.92	127,098	24	925.00		931.60		6.60	24.34	22.8	933.00	932.00	933.60	0.40	High	
E4-B		0.47	20,445				939.57			0.90	-7.8			941.57			
E4-C		0.02	985				955.08			0.00	0.0			957.08			PRIVATE
E4-D		0.40	17,209				936.00			0.77	0.0			938.00			
E4-E		0.22	9,774				964.10			0.42	12.5			966.10			
E4-F		0.13	5,625				956.50			2.14	14.5			958.50			
E4-G		0.40	17,209				933.53			0.46	0.0			935.53			
E8-A		0.66	28,648				946.90			3.02	0.0			948.90			
E8-B		0.20	8,788	18	958.00		963.26		5.26	0.89	17.4	968.00	970.00	965.26	6.74	Low	
E9-A		2.45	106,551	18	935.50		938.70		3.20	8.65	-14.2	946.00	948.00	940.70	9.30	Low	
E9-B		0.88	38,449	12	953.00		955.14		2.14	3.98	5.2	962.00	968.00	957.14	12.86	Low	

Table D-1 Hydrologic Summary Data for the 100-Year Design Storm

Storage Area ID	Water Body Common Name	Surface Area at NWL[1] (Acre)	Surface Area at NWL[1] (Square Feet)	Approx. Outlet Size[1] (inches)	NWL[2]	Ordinary HWL DNR[2] (NGVD 29)	100-Year Event (7.45 in Rainfall Event)					Approximate Overflow Elevation[1]	Approx. Existing Low Building Elevation (LBE)[1]	Low Building Elevation[2]	Freeboard (LBE-HWL) (ft)	Risk of Inundation	Notes[1]
							HWL[2]	BFE from FEMA (NAVD 88)	Bounce (ft)	Storage (acre-ft)	Peak Outflow Rate (cfs)						
E10-A		0.85	36,886	15	935.50		936.72		1.22	3.60	-10.9	940.00	942.00	938.72	5.28	Low	
E11-A		0.45	19,751	18	935.50		937.66		2.16	1.13	6.0	940.00	944.00	939.66	6.34	Low	
E12-A		0.50	21,608	21	935.80		938.58		2.78	1.80	-10.2	939.60	942.00	940.58	3.42	Low	
E13-A		1.79	77,827	18	935.20		939.30		4.10	7.84	5.1	938.00	948.00	941.30	8.70	Low	
E14-A		1.18	51,234	21	924.40		931.14		6.74	11.62	-14.6	931.00	932.00	933.14	0.86	High	
E14-B		0.29	12,615							0.00	4.3						
E15-A		2.20	95,700		957.10		955.98		-1.12	2.04	-3.6	962.00	966.00	957.98	10.02	Low	
E15-B		0.11	4,978				978.65			0.11	0.0			980.65			NO PIPE DISCHARGE
E16-A	Utecht Pond	5.56	242,102	18	944.00		945.52		1.52	10.49	5.9	948.00	952.00	947.52	6.48	Low	RECEIVING WATER
E16-B		0.28	12,119				950.52			0.40	1.4			952.52			
E16-C		0.44	18,983				950.49			0.32	1.1			952.49			
E16-D		0.11	4,893				958.72			0.73	0.0			960.72			
E16-E		0.10	4,268				954.13			0.19	0.0			956.13			
E17-A		2.56	111,527	36	935.00		935.09		0.09	12.26	0.0	940.00	940.00	937.09	4.91	High	
E18-A		8.18	356,423	21	936.70		939.86		3.16	36.94	6.3	962.00	944.00	941.86	4.14	High	RECEIVING WATER
E19-A		1.69	73,476	42	938.50		940.81		2.31	7.16	38.3	942.00	946.00	942.81	5.19	Low	
E19-B		0.14	6,011				957.63			0.18	0.0			959.63			
E20-A		0.65	28,506	42	946.00		947.47		1.47	0.55	0.0	949.00		949.47			
E21-A		3.26	141,983	12	933.00		935.20		2.20	8.09	-1.5	935.00	950.00	937.20	14.80	Low	
E22-A	Wind Cave Pond	1.04	45,492	12	935.00		935.97		0.97	2.36	5.8	939.00	936.00	937.97	0.03	High	
E23-A		1.40	60,798		957.10		957.92		0.82	3.46	-4.7	962.00		959.92			NO PIPE DISCHARGE
E23-B		0.31	13,692		957.10		972.09		14.99	0.02	0.0	962.00		974.09			NO PIPE DISCHARGE
E23-C		0.45	19,654		957.10		998.13		41.03	0.29	0.0	962.00		1000.13			NO PIPE DISCHARGE
E23-D		0.31	13,692		957.10		972.04		14.94	0.08	0.0	962.00		974.04			NO PIPE DISCHARGE
E23-E		0.31	13,692		957.10		972.02		14.92	0.33	0.0	962.00		974.02			NO PIPE DISCHARGE
E24-A		0.79	34,471	12	988.00		987.21		-0.79	3.64	-1.2	992.00	1014.00	989.21	26.79	Low	
E24-B		0.04	1,660	12	988.00		987.21		-0.79	0.05	0.0	992.00	1014.00	989.21	26.79	Low	
E25-A		1.41	61,416	no outlet			1,002.25			0.35	38.2			1004.25			NO PIPE DISCHARGE
E25-B		0.28	12,068	no outlet			1,014.04			0.48	0.0			1016.04			NO PIPE DISCHARGE
E25-C		0.06	2,722	no outlet			999.74			0.14	0.0			1001.74			NO PIPE DISCHARGE
E26-A		0.23	9,976				975.76			0.65	0.0			977.76			NO PIPE DISCHARGE
E27-A		0.12	5,335				950.69			1.93	0.0			952.69			NO PIPE DISCHARGE
E28-A		0.96	41,846	12	945.00		947.93		2.93	4.51	4.5	948.00	950.00	949.93	2.07	Low	
E29-A		1.40	61,061	15	935.00		935.50		0.50	3.55	3.0	938.00	942.00	937.50	6.50	Low	
E29-B		0.31	13,699				942.06			2.25	0.0			944.06			
E30-B		0.56	24,412	12	960.00		958.84		-1.16	1.74	3.7	962.00	966.00	960.84	7.16	Low	
E31-A		0.39	17,149	12	969.00		969.64		0.64	1.85	0.0	976.00		971.64			NO PIPE DISCHARGE
E32-A		1.14	49,790	12	971.00		976.18		5.18	0.09	0.0	976.00		978.18			NO PIPE DISCHARGE
E32-B		1.14	49,790	12	971.00		976.15		5.15	0.07	0.0	976.00		978.15			NO PIPE DISCHARGE
E32-C		1.14	49,790	12	971.00		971.75		0.75	1.51	0.0	976.00		973.75			NO PIPE DISCHARGE
E33-A		4.28	186,511	12	989.50		992.08		2.58	13.34	2.6	1002.00	1006.00	994.08	13.92	Low	RECEIVING WATER
E33-B		0.66	28,615				996.86			2.91	0.0			998.86			
E34-A		0.63	27,553	12	992.00		991.43		-0.57	1.88	3.4	996.00	1002.00	993.43	10.57	Low	
E35-A		2.39	103,925	24	943.10		968.37		25.27	39.72	0.0	950.00	952.00	970.37	-16.37	Moderate	
E35-B		0.06	2,721				973.84			0.85	60.1			975.84			
E35-C		0.10	4,484				976.15			0.16	1.0			978.15			
E35-D		0.80	35,026	no outlet			966.19			2.53	0.0			968.19			NO PIPE DISCHARGE
E35-F		3.33	145,245				949.04			15.64	-26.8	950.00		951.04			
E35-G		0.10	4,484				973.92			0.15	67.0			975.92			

Table D-1 Hydrologic Summary Data for the 100-Year Design Storm

Storage Area ID	Water Body Common Name	Surface Area at NWL[1] (Acre)	Surface Area at NWL[1] (Square Feet)	Approx. Outlet Size[1] (inches)	NWL[2]	Ordinary HWL DNR[2] (NGVD 29)	100-Year Event (7.45 in Rainfall Event)					Approximate Overflow Elevation[1]	Approx. Existing Low Building Elevation (LBE)[1]	Low Building Elevation[2]	Freeboard (LBE-HWL) (ft)	Risk of Inundation	Notes[1]
							HWL[2]	BFE from FEMA (NAVD 88)	Bounce (ft)	Storage (acre-ft)	Peak Outflow Rate (cfs)						
KELLER LAKE SUBWATERSHED																	
KL1-A		0.12	5,377	12	1,008.00		1010.68		2.68	0.81	6.0	1014.00	1015.00	1012.68	4.32	High	
KL2-A		0.27	11,887	12	994.00		997.28		3.28	0.67	9.1	1001.00	1006.00	999.28	8.72	Low	
KL2-B		0.29	12,705				997.28			0.67	0.0			999.28			
KL3-A		0.18	8,045	12	1,000.00		1004.42		4.42	1.70	4.3	1008.00	1006.00	1006.42	1.58	High	
KL5-A		0.88	38,421	12	978.70		982.88		4.18	1.15	4.1	981.00	986.00	984.88	3.12	Low	
KL6-B		0.06	2,691		996.00		999.07		3.07	0.15	0.0			1001.07			
KL6-C		0.06	2,554		993.30		998.93		5.63	1.18	31.7			1000.93			
KL7-A		0.36	15,755	12	972.70		971.00		-1.70	0.00	0.0	976.00	988.00	973.00	17.00	Low	
KL8-A		0.01	647	15	979.70		982.49		2.79	0.28	8.9	982.00	983.20	984.49	0.71	High	
KL9-A		1.00	43,753	18	954.00		961.92		7.92	9.51	0.0	963.00	988.00	963.92	26.08	Low	
KL9-B		0.36	15,467		988.10		987.98		-0.12	0.29	36.6			989.98			
KL9-C		0.33	14,503		984.80		987.97		3.17	0.77	26.4			989.97			
KL9-D		0.55	23,888		986.40		987.97		1.57	0.74	28.6			989.97			
KL10-A		0.67	29,221	30	972.00		979.72		7.72	7.32	57.5	980.00	976.00	981.72	-3.72	High	
KL10-B		0.16	6,760				984.10			0.47	0.0			986.10			
KL11-A		1.53	66,773	42	944.50		951.63		7.13	9.48	117.3	952.00	951.00	953.63	-0.63	High	
KL11-B	Paha Sapa Park Pond	0.46	20,101		966.30		974.46		8.16	2.53	5.2			976.46			
KL13-A	Keller Lake	55.90	2,435,075	72	934.30	934.50	936.34	936.10	2.04	159.11	37.0	940.00	939.00	938.34	2.66	High	RECEIVING WATER
LAKE ALIMAGNET SUBWATERSHED																	
LA1-A		0.63	27,425		1,015.00		1,016.58		1.58	0.47	43.5			1018.58			
LA2-A		3.31	144,191				966.16			35.10	8.8			968.16			
LA2-B		0.09	3,784				967.53			0.22	7.8			969.53			PRIVATE
LA2-C		0.18	7,741				966.57			0.21	23.6			968.57			PRIVATE
LA3-A		4.01	174,841	18	958.00		966.40		8.40	40.62	35.6	960.00	972.00	968.40	5.60	Low	
LA3-B		2.47	107,794				1,025.11			7.64	0.0			1027.11			NON CITY
LA3-C		1.04	45,261				1,030.24			4.24	73.1			1032.24			
LA3-D		0.39	17,185				1,051.09			0.93	16.9			1053.09			
LA3-E		0.27	11,844				1,053.89			0.27	0.0			1055.89			PRIVATE
LA3-F		0.02	1,022				1,037.84			0.05	7.6			1039.84			
LA3-H		0.06	2,543		1,042.50		1,042.90		0.40	1.46	0.2			1044.90			PRIVATE
LA3-I		0.30	12,881		957.00		967.22		10.22	2.84	108.2			969.22			
LA3-J		0.07	2,979				1,065.08			0.07	0.0			1067.08			
LA3-Q		0.11	4,647		1,047.40		No data			0.00	No data						PRIVATE, No available stage storage
LA3-R		0.11	4,633		1,045.50		1,040.90		-4.60	0.00	3.1			1042.90			
LA3-S		0.12	5,430		1,047.00		1,048.45		1.45	0.02	3.3			1050.45			
LA3-T		0.20	8,592		1,046.50		1,044.71		-1.79	0.01	7.4			1046.71			
LA3-U		0.08	3,422		1,047.50		1,049.96		2.46	0.05	4.1			1051.96			
LA3-V		0.04	1,959		1,047.00		1,049.43		2.42	0.10	3.2			1051.43			
LA3-W		0.02	956		1,047.45		1,048.82		1.37	0.09	15.3			1050.82			
LA3-X		0.03	1,099		1,048.00		1,046.79		-1.21	0.09	21.1			1048.79			
LA4-A	Lake Alimagnet	107.99	4,704,097	30	954.50	954.80	955.19	959.10	0.69	161.37	0.0	958.00	968.00	957.19	12.81	Low	RECEIVING WATER
LA4-B		2.53	110,214				993.49			5.99	0.0			995.49			
LA4-C		2.82	122,681				1,003.89			2.41	0.0			1005.89			RECEIVING WATER
LA4-D		0.58	25,190				1,002.57			1.40	0.0			1004.57			
LA4-E		0.28	12,142				981.02			0.30	0.0			983.02			
LA4-F		1.03	44,730				1,008.21			0.48	0.0			1010.21			RECEIVING WATER
LA4-G		0.93	40,557				1,005.87			1.70	0.0			1007.87			
LA5-A		0.33	14,583	12	1,006.00		1,011.70		5.70	1.23	0.0	1015.00		1013.70			

Table D-1 Hydrologic Summary Data for the 100-Year Design Storm

Storage Area ID	Water Body Common Name	Surface Area at NWL[1] (Acre)	Surface Area at NWL[1] (Square Feet)	Approx. Outlet Size[1] (inches)	NWL[2]	Ordinary HWL DNR[2] (NGVD 29)	100-Year Event (7.45 in Rainfall Event)					Approximate Overflow Elevation[1]	Approx. Existing Low Building Elevation (LBE)[1]	Low Building Elevation[2]	Freeboard (LBE-HWL) (ft)	Risk of Inundation	Notes[1]
							HWL[2]	BFE from FEMA (NAVD 88)	Bounce (ft)	Storage (acre-ft)	Peak Outflow Rate (cfs)						
LA6-A		1.50	65,160	15	1,010.00		1,011.14		1.14	3.48	0.4	1018.00		1013.14			
LA7-A		0.02	987	12	979.90		1,010.58		30.68	0.63	0.0	981.00		1012.58			
SP8-B		0.34	14,707	24	1,036.00		1,038.17		2.17	0.79	47.1			1040.17			
SP8-C		0.28	12,392	36	1,040.00		1,039.00		-1.00	0.09	36.3			1041.00			
LAC LAVON SUBWATERSHED																	
LL1-A	Lac Lavon	67.57	2,943,328	no outlet						0.00		948.00					
MURPHY HANREHAN SUBWATERSHED																	
MH1-A		0.10	4,499				855.75			0.36	0.0			857.75			
MH1-B		0.09	4,114		891.00		893.84		2.84	0.13	7.3			895.84			PRIVATE
MH2-A		0.17	7,456				863.86			0.25	22.0			865.86			
MH2-B		0.26	11,530				857.37			0.33	68.2			859.37			
MH3-A		2.57	111,964	CHANNEL	858.00		863.85		5.85	90.21	78.3		867.00	865.85	3.15	Moderate	
MH3-C		0.40	17,639				905.17			0.30	0.0			907.17			
MH3-D		0.05	2,391				906.00			0.00	0.0			908.00			
MH3-E		0.28	12,294				924.54			1.13	13.0			926.54			
MH3-F		0.22	9,487		911.40		914.54		3.14	0.65	19.9	913.50		916.54			
MH3-G		0.00	200				903.09			0.00	3.9			905.09			
MH3-H		0.32	13,880				924.56			1.50	0.0			926.56			
MH4-A		3.17	137,879				882.98			2.17	0.0			884.98			NO PIPE DISCHARGE
MH7-A		1.69	73,473				1001.43			2.93	0.0			1003.43			
MH7-B		0.16	6,926				1046.88			1.25	0.0			1048.88			
MH8-A		1.12	48,809				1035.34			2.58	0.0			1037.34			
MH8-B		0.36	15,750				1022.10			0.68	0.0			1024.10			NO PIPE DISCHARGE
MH8-C		0.14	6,119				1051.18			1.06	0.0			1053.18			
MH8-D		0.05	2,005				1039.97			3.69	0.0			1041.97			
MH9-A		1.31	57,154	12	940.00		943.13		3.13	7.57	0.0	946.00	950.00	945.13	6.87	Low	
MH9-B		0.23	10,068		944.00		948.38		4.38	1.17	11.5			950.38			
MH10-A		0.43	18,925	30	940.00		945.85		5.85	12.06	0.0	950.00	958.00	947.85	12.15	Low	
MH11-A		0.34	14,697	42	943.50		956.46		12.96	2.70	116.2	945.00	980.00	958.46	23.55	Low	
MH11-B		0.02	975				1007.18			0.18	7.7			1009.18			
MH13-A		0.24	10,626				992.53			5.11	0.0			994.53			
MH13-B		0.17	7,422				981.75			0.26	0.0			983.75			
MH13-C		0.21	9,302				981.41			0.12	0.0			983.41			
MH13-D		0.21	9,302				985.36			0.64	0.6			987.36			
MH14-A	Orchard Gardens Park Pond	0.62	26,918	12	981.00		1007.00		26.00	6.69	4.7	1004.00	1024.00	1009.00	17.00	Low	
MH14-B		0.01	614				1050.16			0.01	0.0			1052.16			NO PIPE DISCHARGE
MH14-C		0.07	3,127				1010.03			0.85	-6.5			1012.03			
MH15-A	Horseshoe Lake	6.13	267,056				988.13			6.98	0.0			990.13			RECEIVING WATER
MH15-B	Horseshoe Lake	5.31	231,304				987.86			4.66	0.0			989.86			RECEIVING WATER
8000008		0.00					1041.10			2.98	0.0			1043.10			S of Loop Road S
NORTHWEST SUBWATERSHED																	
NW10-A		1.53	66,440				693.38			0.62	41.7			695.38			PRIVATE
NW10-B		3.04	132,454	No Data			691.97			15.10	0.0			693.97			PRIVATE
NW10-C		1.53	66,440		733.00		697.97		-35.03	3.85	0.0			699.97			PRIVATE
NW10-D		1.53	66,440		715.00		698.15		-16.85	0.26	0.0			700.15			PRIVATE
NW11-A		0.29	12,652	No Data	723.00		716.64		-6.36	1.18	77.7			718.64			PRIVATE
NW14-A		0.23	10,020	12	729.00		736.45		7.45	0.74	2.4	736.90		738.45			
NW14-B		1.32	57,386				717.27			3.84	11.0			719.27			PRIVATE

Table D-1 Hydrologic Summary Data for the 100-Year Design Storm

Storage Area ID	Water Body Common Name	Surface Area at NWL[1] (Acre)	Surface Area at NWL[1] (Square Feet)	Approx. Outlet Size[1] (inches)	NWL[2]	Ordinary HWL DNR[2] (NGVD 29)	100-Year Event (7.45 in Rainfall Event)					Approximate Overflow Elevation[1]	Approx. Existing Low Building Elevation (LBE)[1]	Low Building Elevation[2]	Freeboard (LBE-HWL) (ft)	Risk of Inundation	Notes[1]
							HWL[2]	BFE from FEMA (NAVD 88)	Bounce (ft)	Storage (acre-ft)	Peak Outflow Rate (cfs)						
NW14-C		0.29	12,524				732.51			3.98	8.5			734.51			PRIVATE
NW14-D		0.08	3,476				729.30			0.07	7.8			731.30			
NW15-B		0.03	1,329		737.50		733.50		-4	0.00	193.6			735.50			
NW15-C		0.12	5,337		720.00		746.17		26	0.48	4.1			748.17			PRIVATE
NW15-D		0.72	31,452		820.00		720.98		-99	5.11	7.3			722.98			PRIVATE
NW15-E		0.18	7,786				740.75			0.66	4.9	744.50		742.75			PRIVATE
NW15-F		0.48	20,723		940.00		724.23		-215.77	1.72	3.7			726.23			PRIVATE
NW15-G		0.06	2,540				826.22			0.73	10.0			828.22			
NW15-H		2.90	126,400				729.91			17.23	106.7			731.91			
NW16-A		0.43	18,655	No Data			719.35			4.09	187.3			721.35			
NW17-A		0.84	36,551	No Data			716.66			5.05	190.3			718.66			
NW19-A		1.58	69,032				748.56			18.61	0.0			750.56			
NW20-A		0.87	38,003				748.56			9.57	42.1			750.56			
NW21-A		29.70	1,293,582				733.71			29.91	5.4			735.71			
RIVERHILLS SUBWATERSHED																	
RH1-A		0.29	12,609	18	797.60		801.90		4.30	0.21	10.4	801.50	808.00	803.90	6.10	Low	
RH3-A		0.30	12,999	12	748.00		755.04		7.04	4.43	8.2	763.00	764.00	757.04	8.96	High	
RH3-B		0.06	2,596	12	797.00		805.01		8.01	0.47	9.4	805.00	809.00	807.01	3.99	Low	
RH9-A	Lake Park Pond	2.66	116,080	12	873.00		878.48		5.48	18.81	35.3	877.00	880.00	880.48	1.52	Moderate	
RH9-D	Lake Park Pond	0.67	29,109	12	873.00		878.44		5.44	6.65	35.2	877.00	880.00	880.44	1.56	Moderate	
RH10-A		0.32	14,119							0.00							NO PIPE DISCHARGE
RH10-B		0.04	1,935	18	892.00		898.27		6.27	11.34	7.5	901.00	902.00	900.27	3.73	High	
RH10-C		0.08	3,564				961.46			0.22	5.6			963.46			
RH10-D		0.06	2,802				971.85			0.17	5.7			973.85			
SUNSET POND SUBWATERSHED																	
SP1-A	Sunset Pond	48.42	2,109,337	48	851.00	850.00*	850.28		-0.72	128.80	143.1	860.00	860.00	852.28	9.72	High	
SP1-B		0.21	9,054				896.73			3.33	15.4			898.73			
SP1-C		0.21	9,142				899.49			0.12	0.0			901.49			PRIVATE
SP1-D		0.04	1,829				913.07			0.05	8.1			915.07			
SP1-E		0.05	2,291				911.38			0.02	3.2			913.38			PRIVATE
SP1-F		0.06	2,770		912.00		915.19		3.2	1.05	5.5			917.19			PRIVATE
SP1-G		0.68	29,808		899.00		897.36		-1.6	0.60	52.1			899.36			PRIVATE
SP1-H		0.10	4,376		960.00		862.83		-97.2	0.33	0.8			864.83			PRIVATE
SP1-I		0.51	22,072		874.00		877.45		3.4	1.92	8.0			879.45			
SP1-J		0.03	1,259				910.13			0.02	15.9			912.13			
SP5-A	Judicial Pond	6.80	296,375	48	893.00		901.85		8.85	41.42	66.6	900.00	920.00	903.85	18.16	Low	RECEIVING WATER
SP5-B		0.63	27,383				908.87			7.36	46.4			910.87			
SP5-C		0.05	2,174				908.73			0.42	34.0			910.73			
SP5-D		0.14	6,196				909.33			0.01	0.0			911.33			PRIVATE
SP5-E		0.32	13,869				915.78			1.50	72.3			917.78			PRIVATE
SP5-G		0.04	1,685				940.18			0.09	12.7			942.18			
SP5-H		0.03	1,207				1006.11			0.00	0.4			1008.11			
SP5-I		0.02	1,013				1007.57			0.01	0.0			1009.57			
SP5-J		0.04	1,567				1018.01			0.02	0.0			1020.01			
SP6-A	Earley Lake	28.16	1,226,718	36	905.00	906.70	912.36	912.00	7.4	262.62	75.0	916.00	914.00	914.36	1.64	High	RECEIVING WATER
SP6-AD		0.12	5,380		926.00		926.24		0.2	0.06	21.1			928.24			
SP6-AE		0.08	3,421				921.52			0.00	6.7			923.52			
SP6-AF		0.04	1,760		902.50		904.06		1.56	0.02	0.0			906.06			
SP6-AG		0.16	6,818				942.29			0.06	15.1			944.29			

Table D-1 Hydrologic Summary Data for the 100-Year Design Storm

Storage Area ID	Water Body Common Name	Surface Area at NWL[1] (Acre)	Surface Area at NWL[1] (Square Feet)	Approx. Outlet Size[1] (inches)	NWL[2]	Ordinary HWL DNR[2] (NGVD 29)	100-Year Event (7.45 in Rainfall Event)					Approximate Overflow Elevation[1]	Approx. Existing Low Building Elevation (LBE)[1]	Low Building Elevation[2]	Freeboard (LBE-HWL) (ft)	Risk of Inundation	Notes[1]
							HWL[2]	BFE from FEMA (NAVD 88)	Bounce (ft)	Storage (acre-ft)	Peak Outflow Rate (cfs)						
SP6-AH	Toyota Regional Pond	0.83	36,343				928.67			1.90	27.9			930.67			
SP6-AJ		0.05	2,141		938.00		940.25		2.25	0.07	27.8			942.25			
SP6-AL		0.09	3,913				998.35			0.14	0.0			1000.35			
SP6-AM		0.19	8,369		965.00		964.40		-0.60	0.28	24.3			966.40			
SP6-B		0.30	13,048		911.00		915.44		4.44	1.17	9.6			917.44			
SP6-C		0.14	5,970				919.81			0.24	36.5			921.81			
SP6-D		0.15	6,400		918.00		913.54		-4.46	0.28	78.2	924.80		915.54			
SP6-E	Summit Shores Pond	0.37	16,090				912.36			1.22	42.3			914.36			
SP6-F		0.33	14,177				991.63			0.01	2.7			993.63			PRIVATE
SP6-G		0.26	11,468				954.37			1.14	103.0			956.37			
SP6-H		0.29	12,773				958.28			0.26	23.5			960.28			PRIVATE
SP6-I		0.14	5,944				972.20			0.15	0.0			974.20			PRIVATE
SP6-J		0.07	3,103				958.42			0.37	106.9			960.42			PRIVATE
SP6-L		0.35	15,042				916.55			0.63	35.7			918.55			
SP6-M		0.05	2,293				1003.79			0.26	9.6			1005.79			PRIVATE
SP6-N		0.05	2,100				1002.37			0.39	13.5			1004.37			PRIVATE
SP6-O		0.04	1,717				1009.86			0.82	17.2			1011.86			PRIVATE
SP6-P		0.09	4,109		1064.00		1065.07		1.07	0.04	0.0			1067.07			PRIVATE
SP6-Q		0.13	5,775		1004.00		1009.07		5.07	0.39	5.9			1011.07			PRIVATE
SP6-R		0.10	4,185		966.00		969.34		3.34	0.31	24.1			971.34			PRIVATE
SP6-S		0.10	4,464		1035.00		1034.73		-0.27	1.25	0.7			1036.73			PRIVATE
SP6-T		0.05	2,108		1027.00		1025.34		-1.66	0.01	9.0			1027.34			PRIVATE
SP6-U		0.06	2,635		1018.00		1020.76		2.76	0.34	10.3			1022.76			PRIVATE
SP6-V		0.82	35,540		922.50		927.10		4.60	1.82	53.4	927.00		929.10			
SP6-W		0.20	8,839		996.00		998.33		2.33	0.61	0.0			1000.33			PRIVATE
SP6-X		0.08	3,630	12	993.00		998.25		5.25	0.23	5.3			1000.25			PRIVATE
SP6-Y		0.11	4,826		920.50		922.11		1.61	0.65	13.2			924.11			
SP6-Z		0.02	1,061				1004.43			0.43	10.0			1006.43			
SP7-A		0.12	5,294				1044.35			0.09	9.0			1046.35			PRIVATE
SP7-C		0.18	7,790				1006.16			0.25	18.5			1008.16			PRIVATE
SP8-A	Wood Park Pond	13.55	590,445	18	1001.00	998.80	1000.02		-0.98	32.35	0.0	1012.00	1010.00	1002.02	9.98	High	RECEIVING WATER
SP8-D		0.27	11,881		1018.90		1021.58		2.68	0.75	10.3			1023.58			
SP9-A		0.70	30,641	12	1009.00		1016.60		7.60	8.98	5.6	1011.00	1018.00	1018.60	1.40	Moderate	
SP9-B		0.14	6,209	18	1043.00		1046.17		3.17	0.03	11.0			1048.17			
SP9-C		0.08	3,678	12	1052.00		1053.05		1.05	0.24	4.8			1055.05			
SP10-A	North Twin Lake	5.67	247,077	36	914.50		922.36	923.90	7.86	33.17	29.3	926.00	930.00	924.36	7.64	Low	RECEIVING WATER
SP10-B		1.44	62,570				929.65			19.99	63.6			931.65			
SP11-A	South Twin Lake	10.47	456,125	36	914.50		921.42	923.60	6.92	49.81	37.2	926.00	926.00	923.42	4.58	High	RECEIVING WATER
SP12-A		0.24	10,342	27	932.70		936.91		4.21	1.82	39.4	936.00	946.00	938.91	9.09	Low	
4535SP		0.00					888.82			0.13	12.7			890.82			Pond at Cross Fit South Metro
WEST SUBWATERSHED																	
W1-A		0.20	8,529		792.00		793.36		1.36	0.41	3.6			795.36			PRIVATE
W1-B		0.06	2,703		785.50		788.13		2.63	0.03	5.3			790.13			PRIVATE
W2-A		1.53	66,859	36	867.70		871.36		3.66	7.00	78.1	877.00	878.00	873.36	6.64	High	
W3-A	Cherokee Pond	2.17	94,725	21	882.00		891.62		9.62	21.95	9.5	890.00	891.00	893.62	-0.62	High	
W4-A	Neill Pond	4.95	215,634	21	882.00		893.34		11.34	64.34	19.0	890.00		895.34			RECEIVING WATER
W4-B		0.09	3,836		886.00		893.16		7.16	0.01	0.8			895.16			

Table D-1 Hydrologic Summary Data for the 100-Year Design Storm

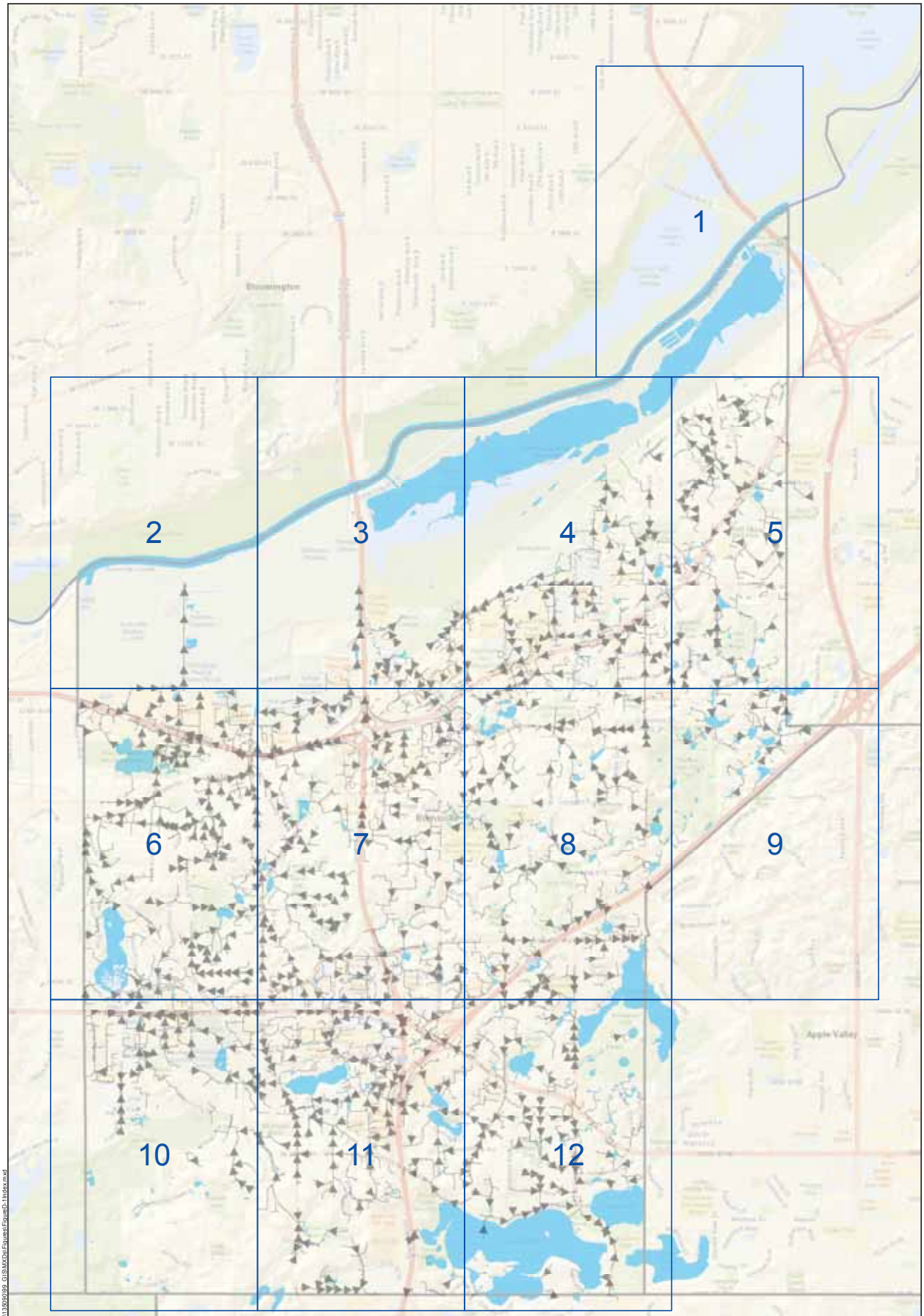
Storage Area ID	Water Body Common Name	Surface Area at NWL[1] (Acre)	Surface Area at NWL[1] (Square Feet)	Approx. Outlet Size[1] (inches)	NWL[2]	Ordinary HWL DNR[2] (NGVD 29)	100-Year Event (7.45 in Rainfall Event)					Approximate Overflow Elevation[1]	Approx. Existing Low Building Elevation (LBE)[1]	Low Building Elevation[2]	Freeboard (LBE-HWL) (ft)	Risk of Inundation	Notes[1]
							HWL[2]	BFE from FEMA (NAVD 88)	Bounce (ft)	Storage (acre-ft)	Peak Outflow Rate (cfs)						
W4-C		0.13	5,512		886.00		893.16		7.16	0.36	10.0			895.16			
W5-A	Vista View Park Pond	4.78	208,268				850.89			28.26	0.0			852.89			
W5-B		1.16	50,566	12	887.88		896.15		8.27	11.96	5.0			898.15			
W5-C		2.58	112,472	60	845.30		876.25		30.95	49.22	0.0	855.00	854.00	878.25	-22.25	High	
W5-D		0.20	8,587		1006.40		1010.89		4.49	1.40	5.6			1012.89			PRIVATE
W5-E		0.10	4,153				1014.14			0.13	4.2			1016.14			PRIVATE
W5-F		0.04	1,783				1013.25			0.05	0.0			1015.25			PRIVATE
W5-H		0.11	4,907				1009.95			0.21	10.0			1011.95			
W6-B		0.02	947				1010.34			0.04	10.6			1012.34			
W6-C		0.32	14,041		980.00		983.89		3.89	1.52	19.3			985.89			
W7-A	Krestwood Park Pond	0.69	29,995	12	979.50		985.21		5.71	6.21	-4.5	986.00	990.00	987.21	4.79	Low	
W8-A		0.40	17,548	30"" force main	945.60		959.15		13.55	14.47	-64.1	954.00	958.00	961.15	-1.15	Moderate	
W8-B		0.54	23,709	30"" force main	940.00		960.59		20.59	20.06	0.0	954.00	960.00	962.59	-0.59	Moderate	
W8-C		0.69	29,929				1001.42			0.57	0.0			1003.42			
W9-A		2.03	88,371	30	948.00		963.80		15.80	27.09	-0.6	976.00	990.00	965.80	26.20	Low	
W10-A		0.77	33,641	21	969.00		983.37		14.37	29.68	27.1	978.00	996.00	985.37	12.63	Low	
W10-B		0.08	3,540		1007.00		1007.08		0.08	0.09	13.8			1009.08			PRIVATE
W11-A		0.48	20,740	30	1009.20		1012.56		3.36	1.28	40.9	1012.00		1014.56			
W12-A		0.54	23,404	18	1035.00		1040.65		5.65	1.04	13.5	1042.00	1051.00	1042.65	10.35	Low	
W13-A		0.34	14,665	24	1017.00		1021.42		4.42	1.77	37.5	1023.00	1046.00	1023.42	24.58	Low	
W13-B		0.04	1,682		1036.75		1037.18		0.43	0.05	0.0			1039.18			

[1]Data obtained from City GIS data.

[2]All elevation data in City GIS is noted as NAVD 88 datum. OHWL from DNR is in NGVD 29 datum. Users should recognize that low building elevations may have been taken from as-builts in other datums and should be verified for site specific analyses.

The data in Table D-1 included ponds in the City inventory that had complete storm sewer data. Ponds in the inventory that do not appear in the table were any of the following:

- Underground Systems
- Infiltration/Filtration Systems



Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

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www.sehinc.com

Project: XXXXX 000000
Print Date: 1/12/2017

Map by: rmestingen
Projection:
Source:

DRAINAGE SYSTEM INDEX MAP

WATER RESOURCES MANAGEMENT PLAN
Burnsville, Minnesota

Figure
D-1.I

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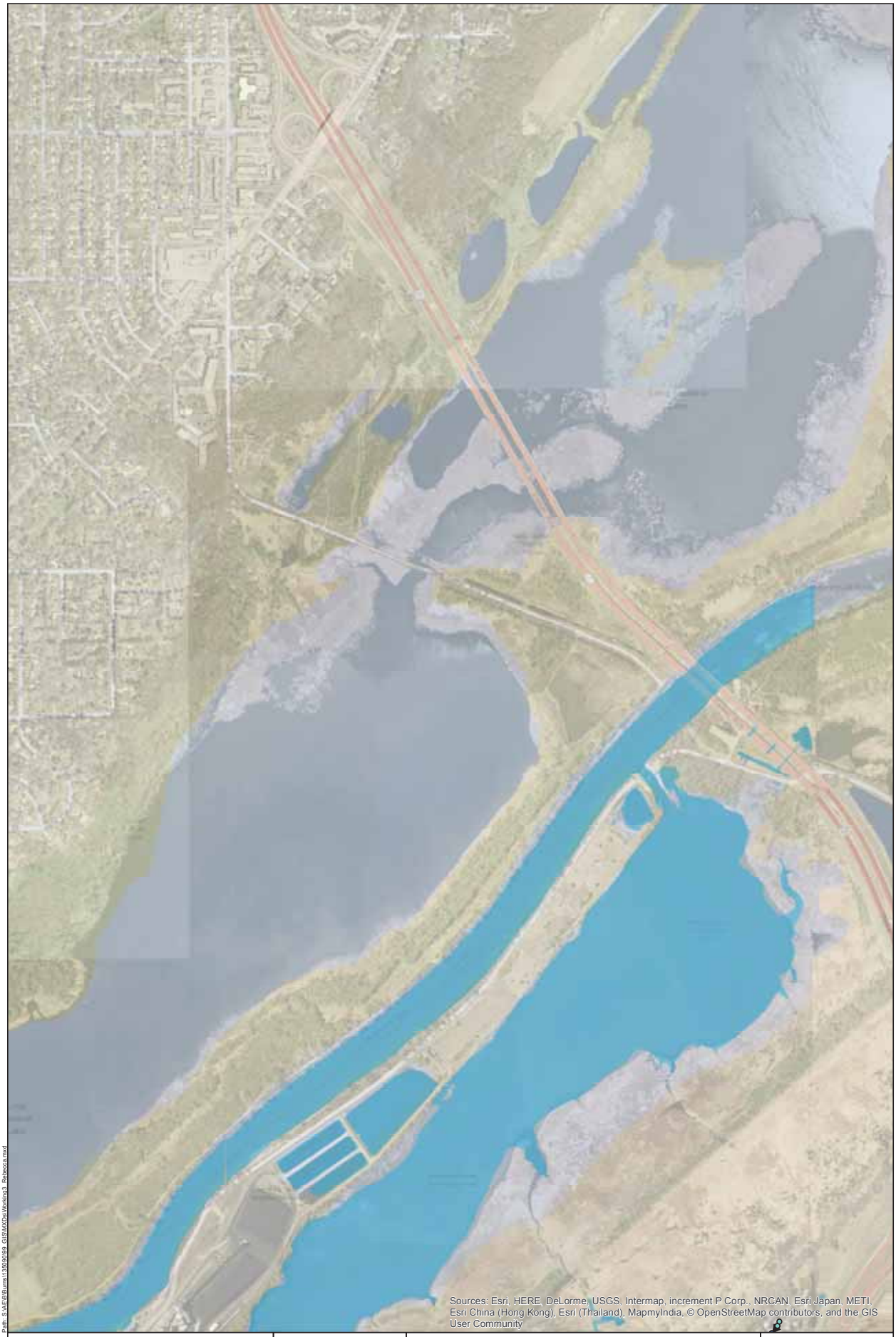

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DRAINAGE SYSTEM

WATER RESOURCES MANAGEMENT PLAN
Burnsville, Minnesota

Figure
D-1.1

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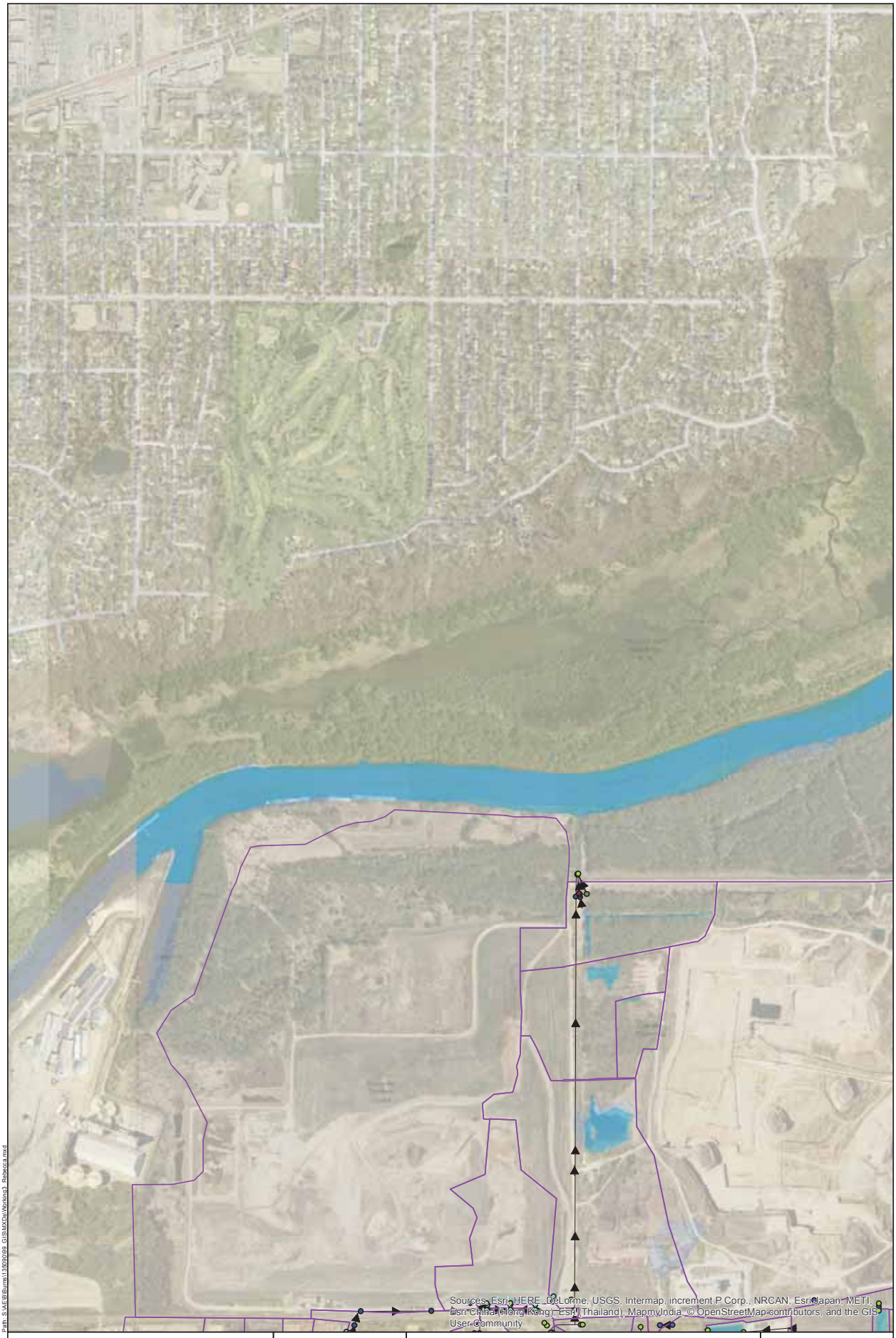

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Map by: rmestingen
Projection:
Source:

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WATER RESOURCES MANAGEMENT PLAN
Burnsville, Minnesota

Figure
D-1.2

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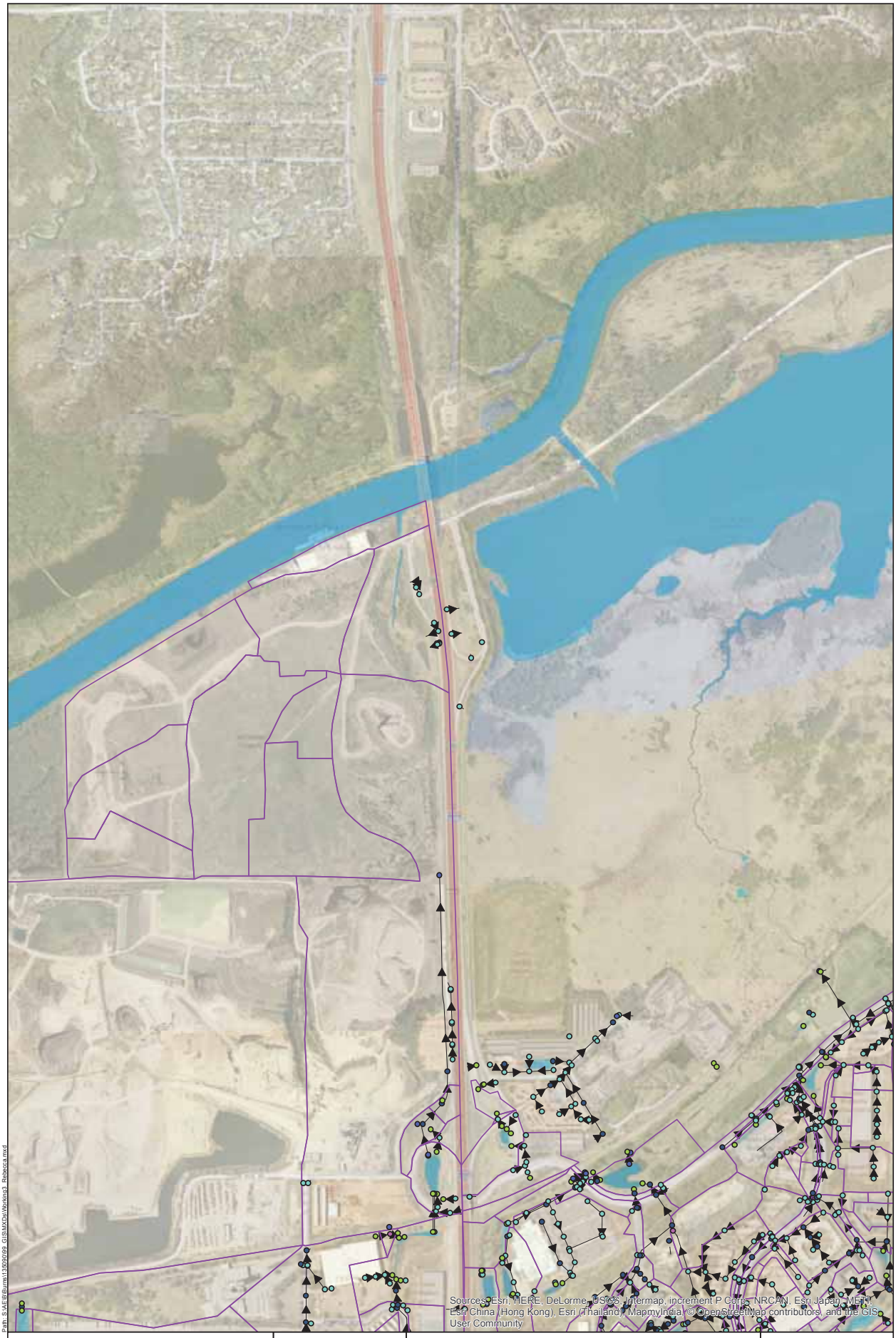

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Burnsville, Minnesota

Figure
D-1.3

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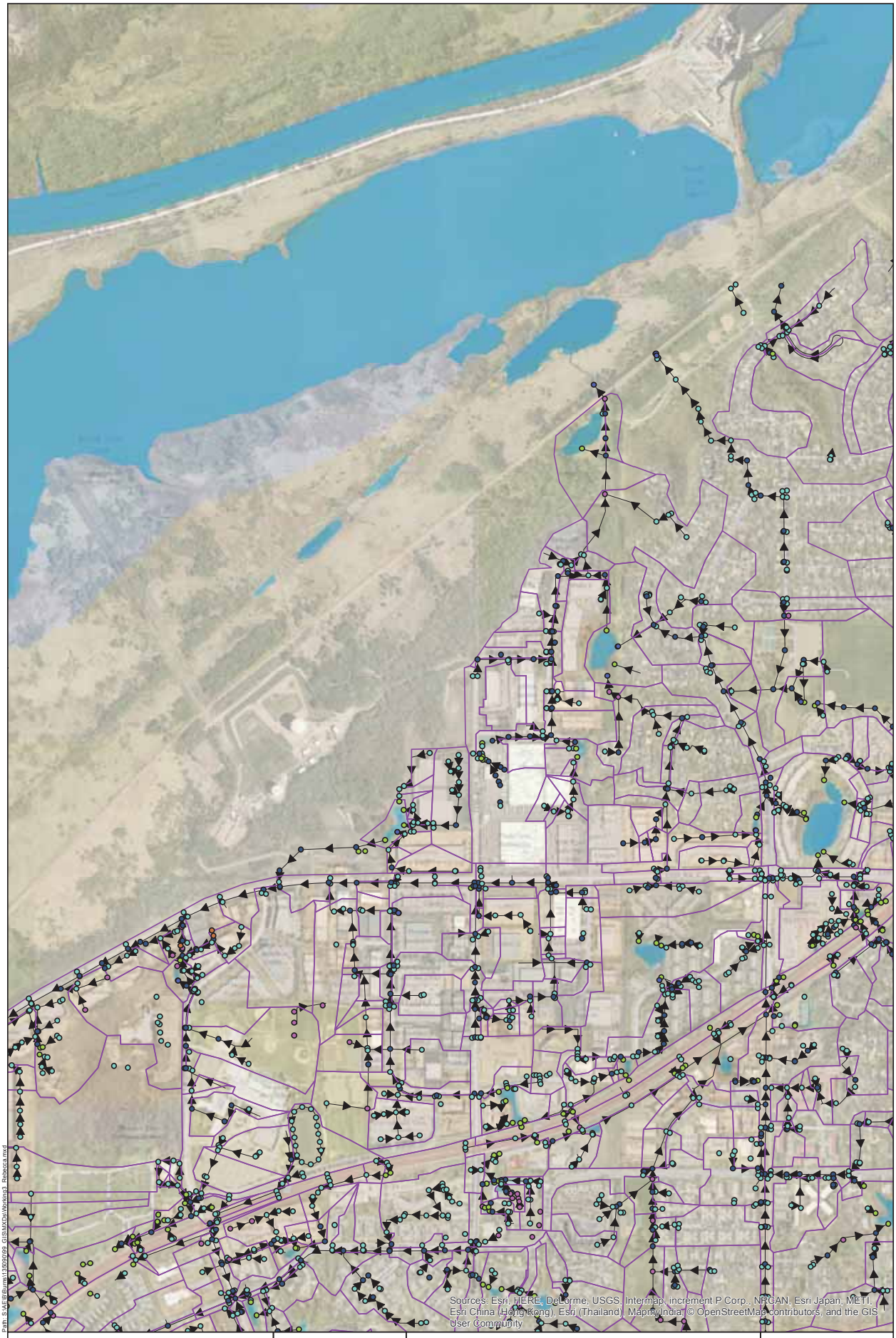

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Figure
D-1.4

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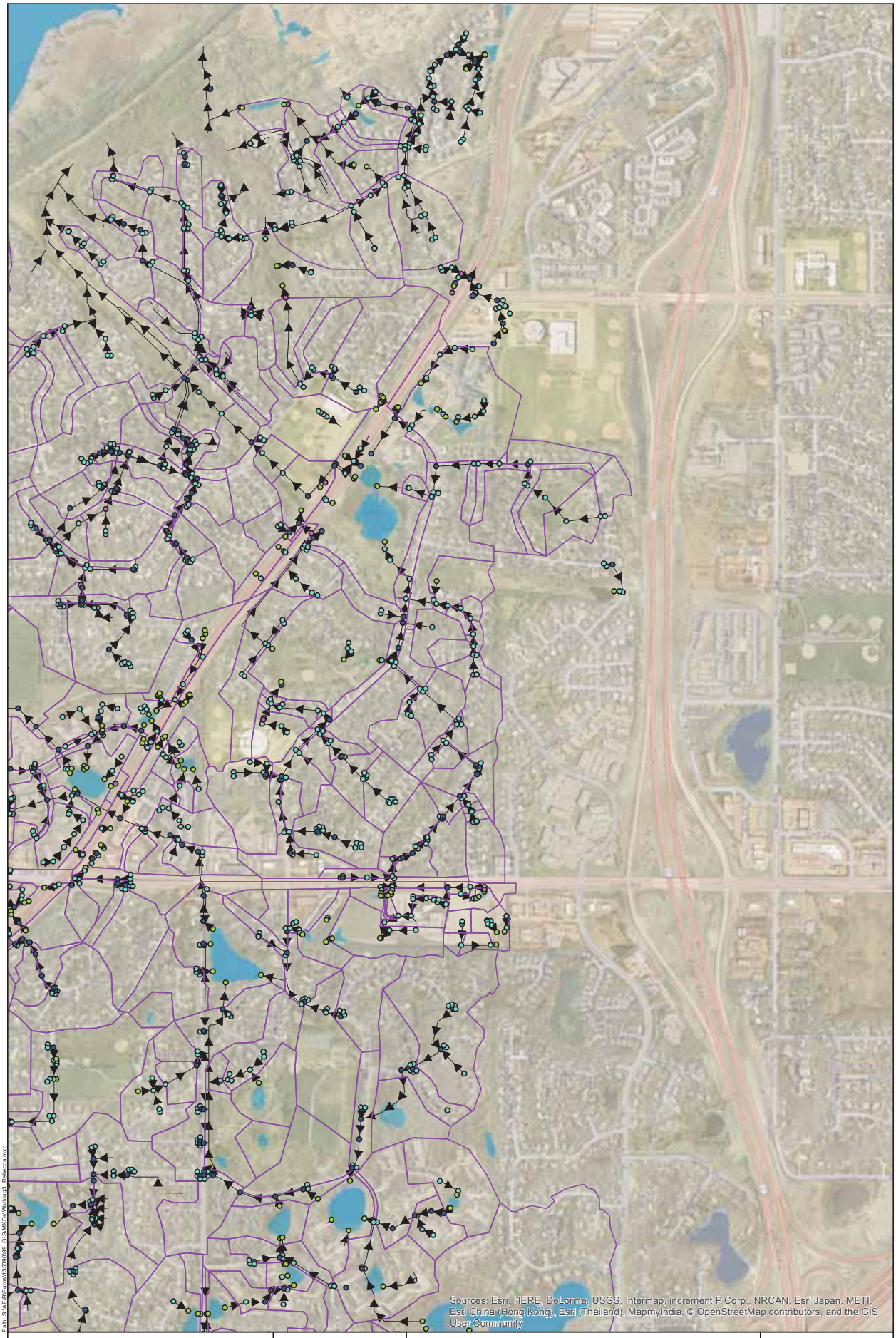

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Figure
D-1.5

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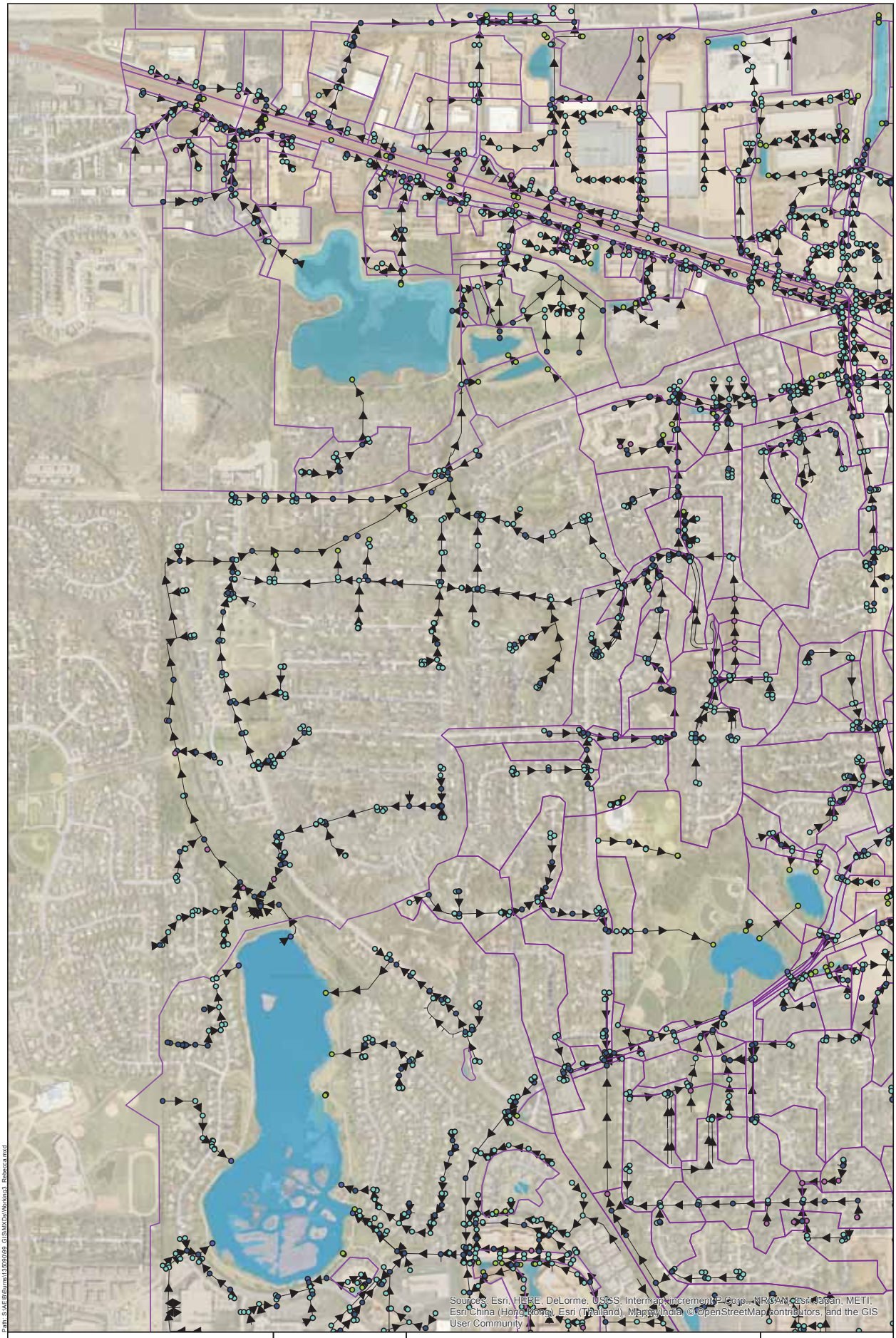

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Figure
D-1.6

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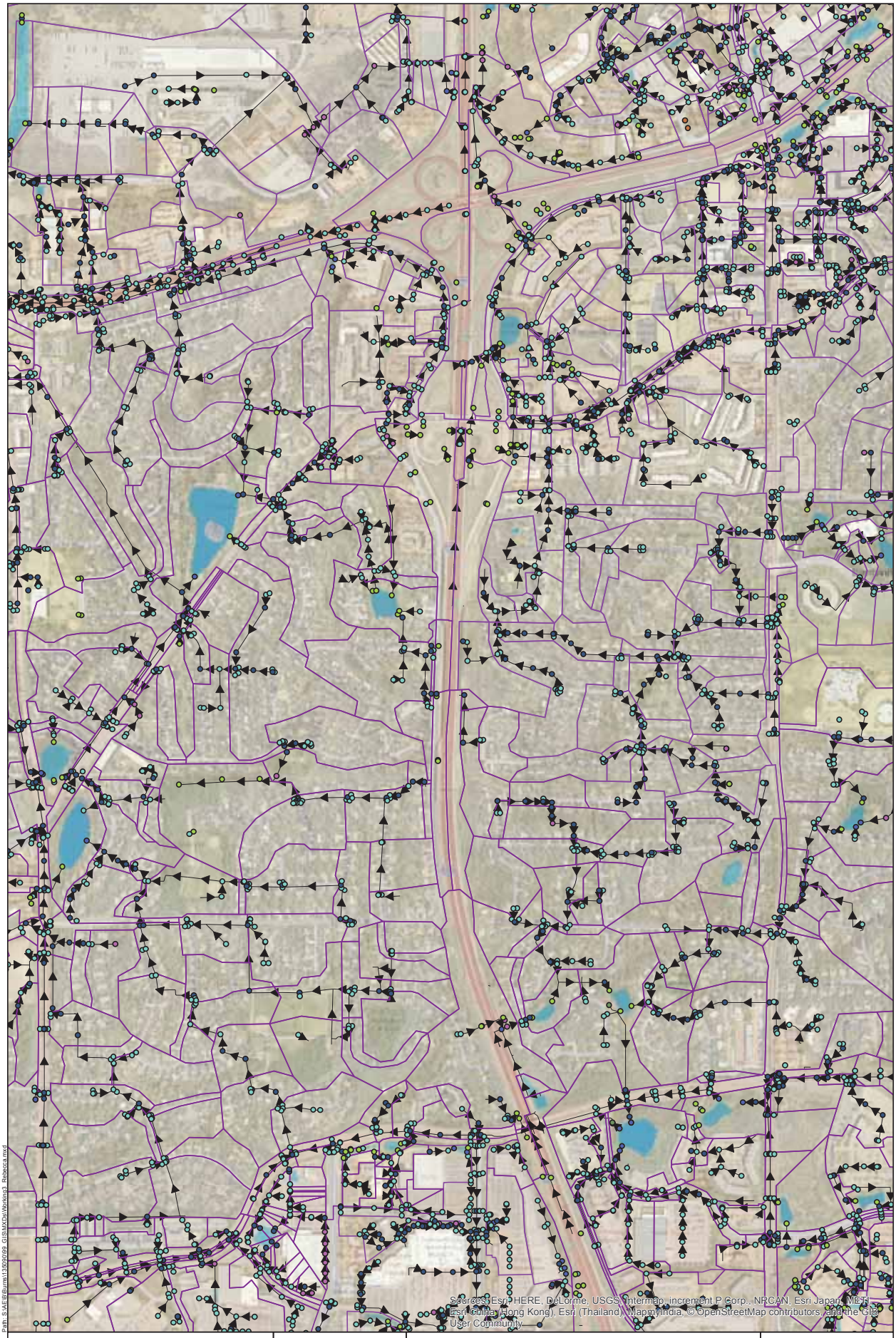

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Figure
D-1.7

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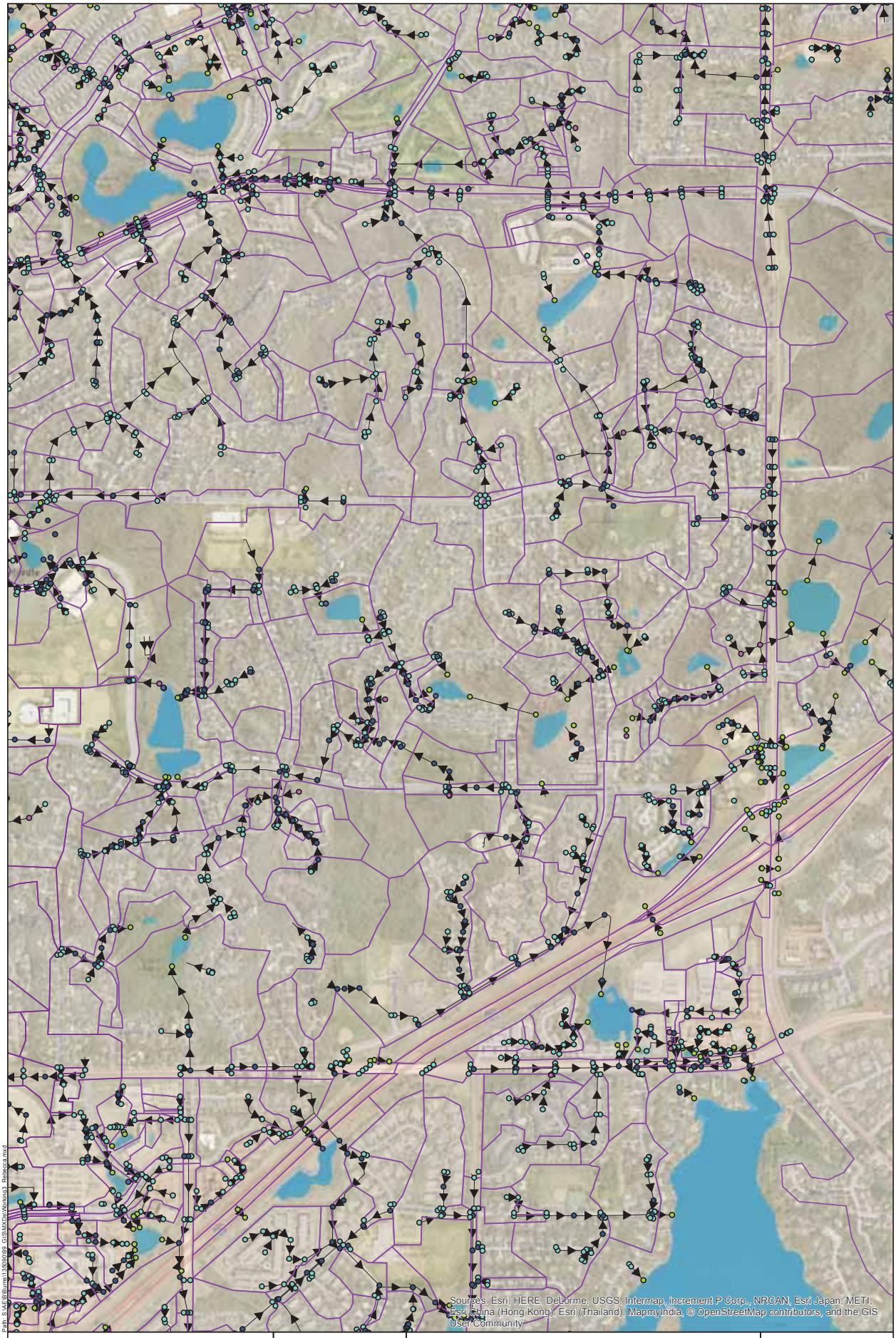

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Figure
D-1.8

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Figure
D-1.9

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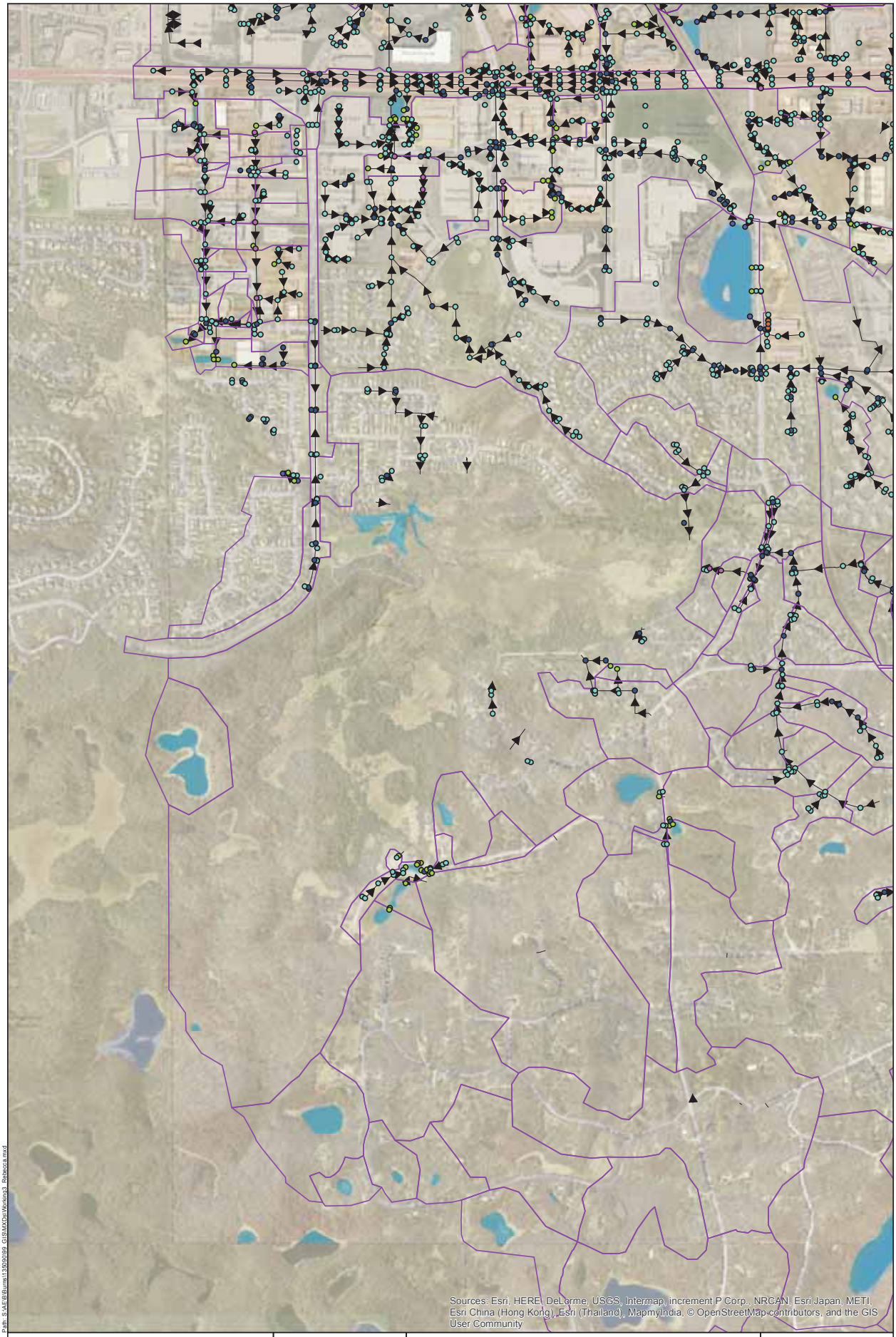

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Figure
D-1.10

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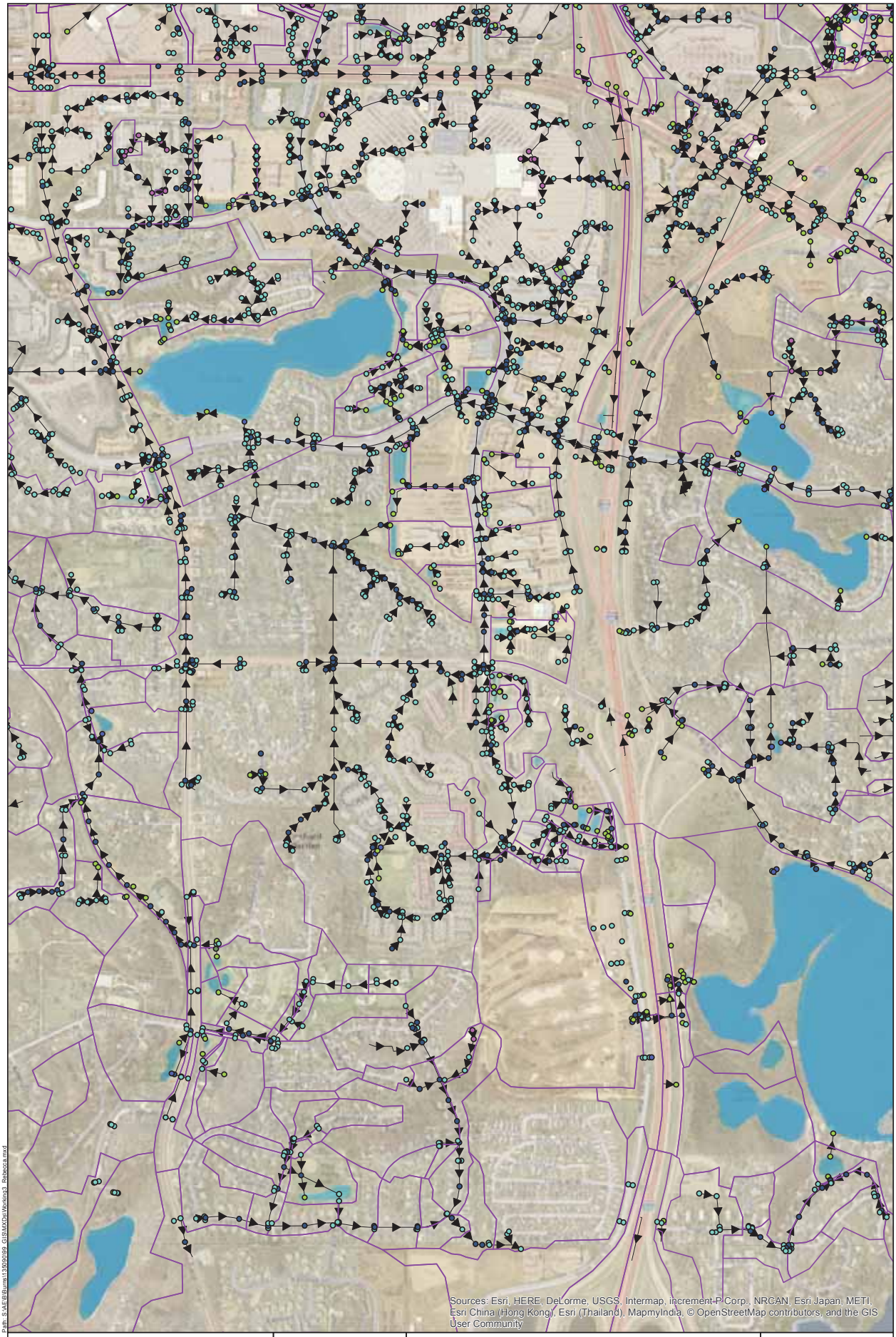

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Figure
D-1.11

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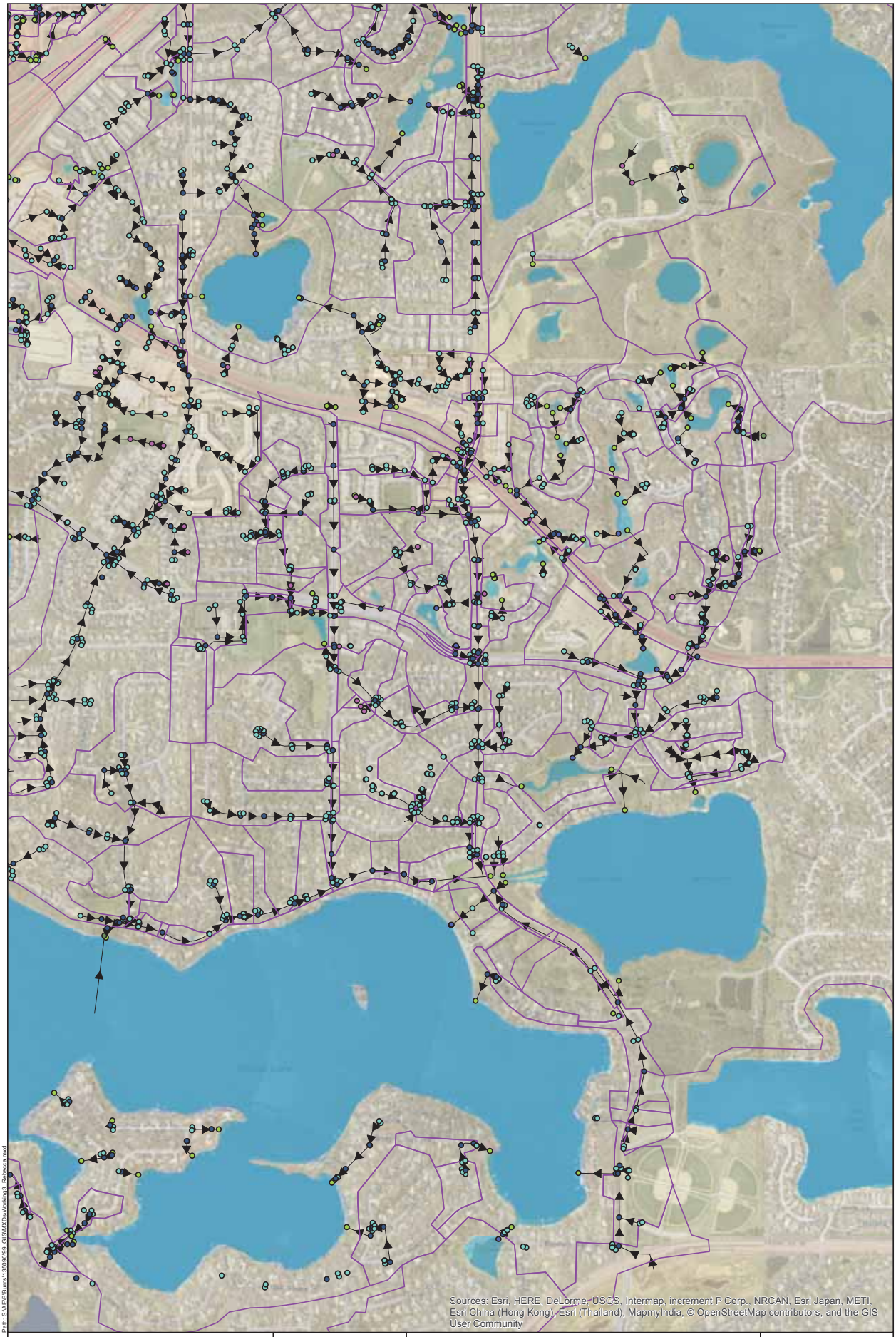

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Figure
D-1.12

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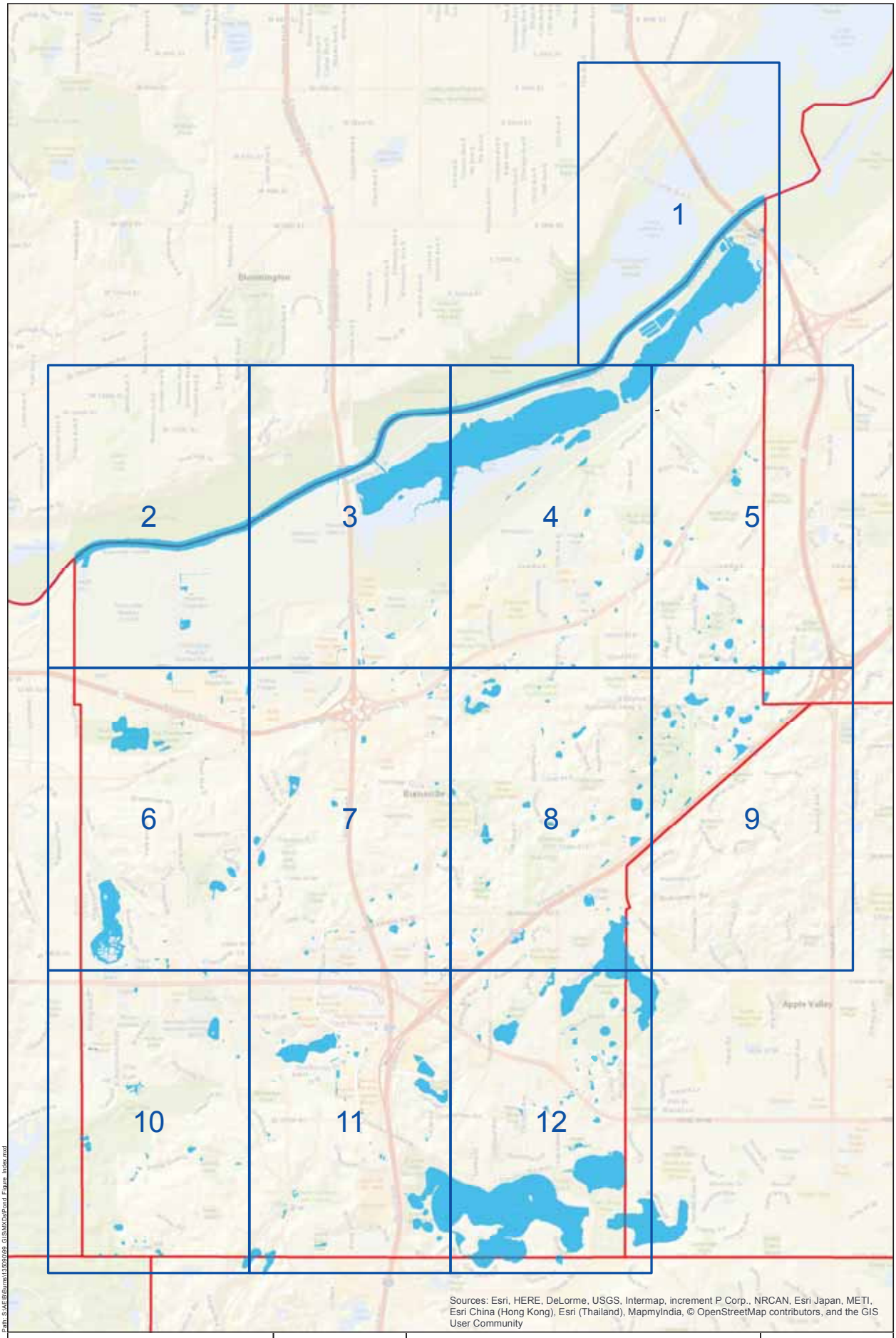

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Map by: eerdahl
Projection:
Source:

Pond Inventory Index Map

City of Burnsville, Minnesota

Figure
D - 2.I

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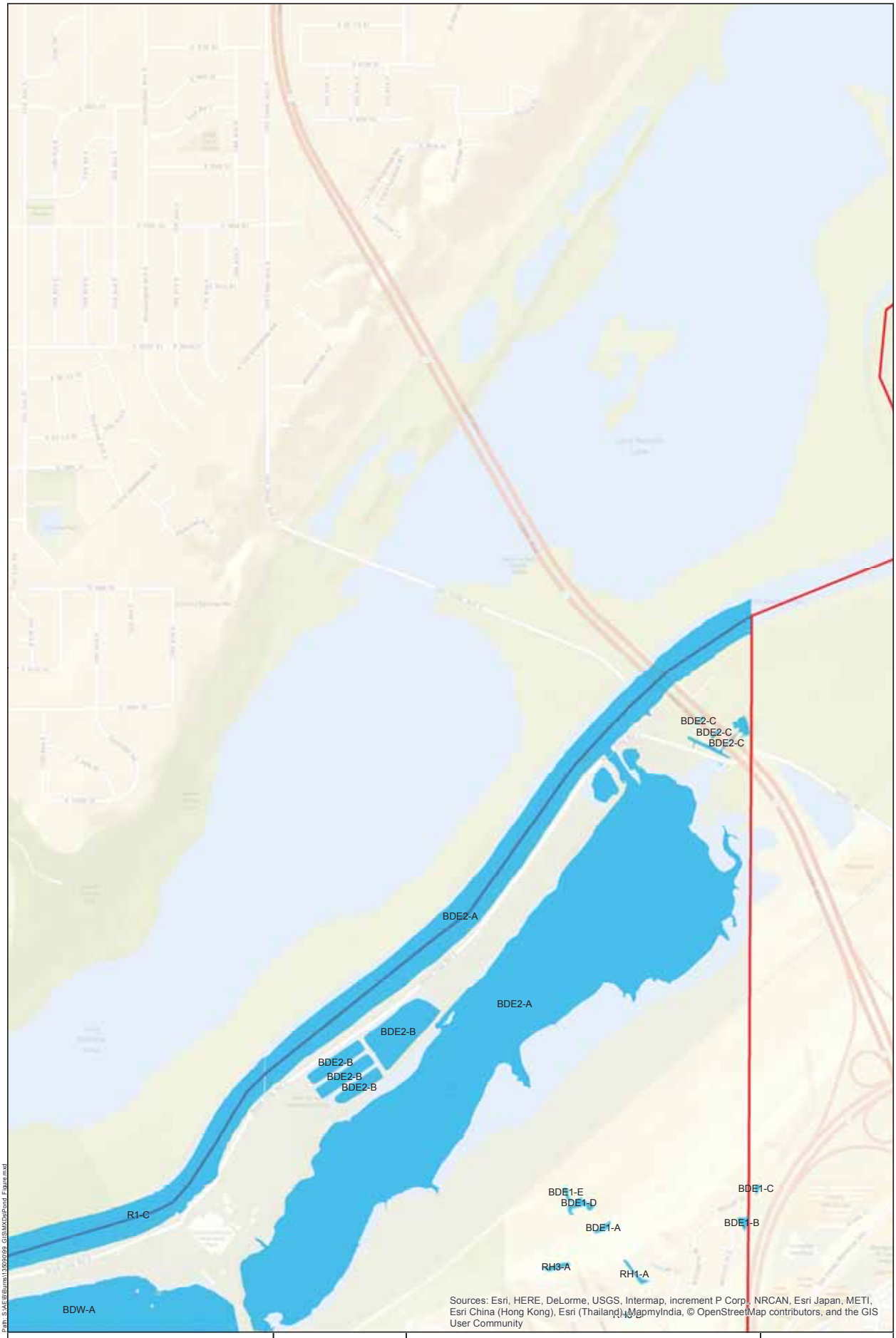

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Map by: eerdahl
Projection:
Source:

Pond Inventory Map

City of Burnsville, Minnesota

Figure
D - 2.1

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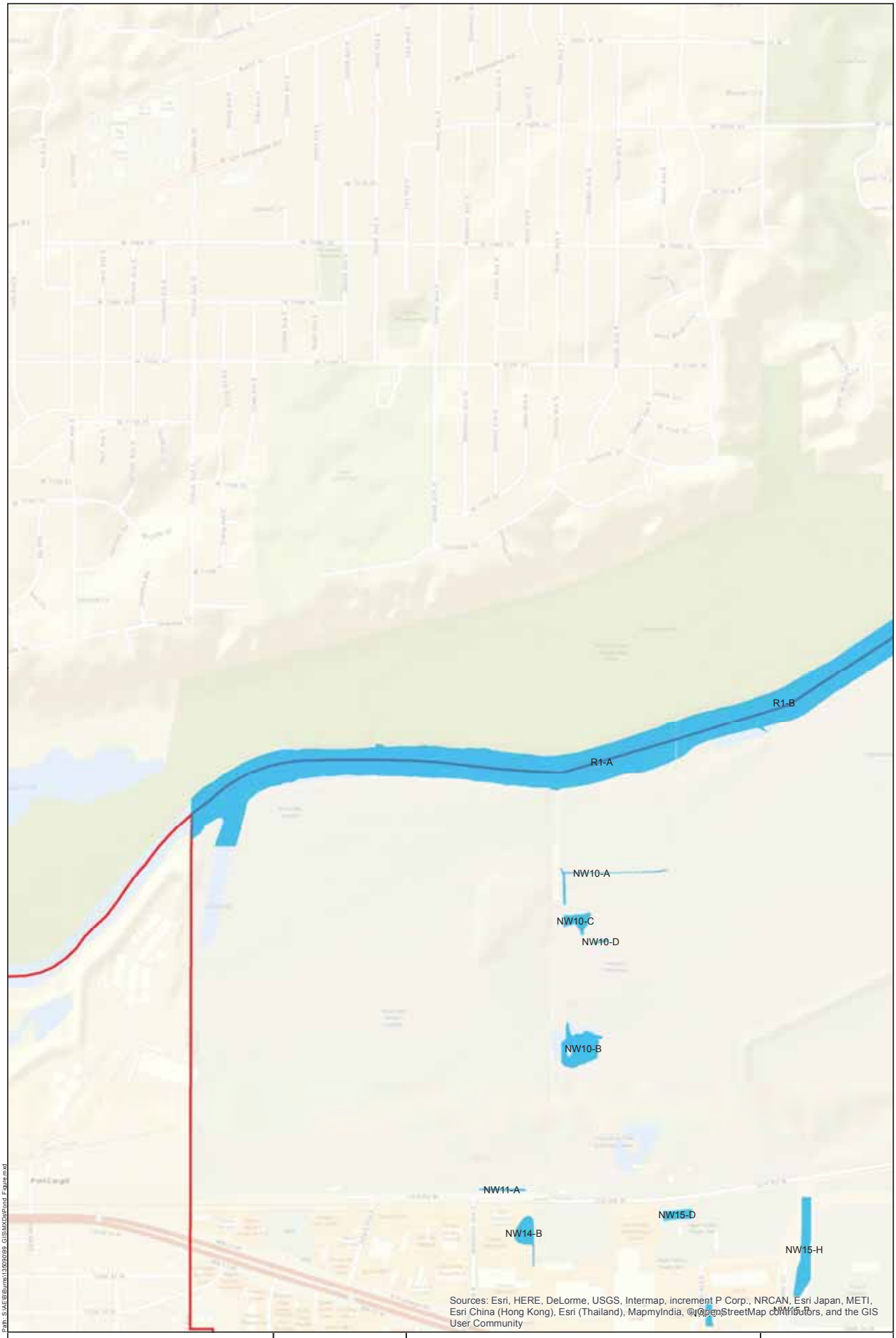

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Map by: eerdahl
Projection:
Source:

Pond Inventory Map

City of Burnsville, Minnesota

Figure
D - 2.2

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Map by: eerdahl
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Pond Inventory Map

City of Burnsville, Minnesota

Figure
D - 2.3

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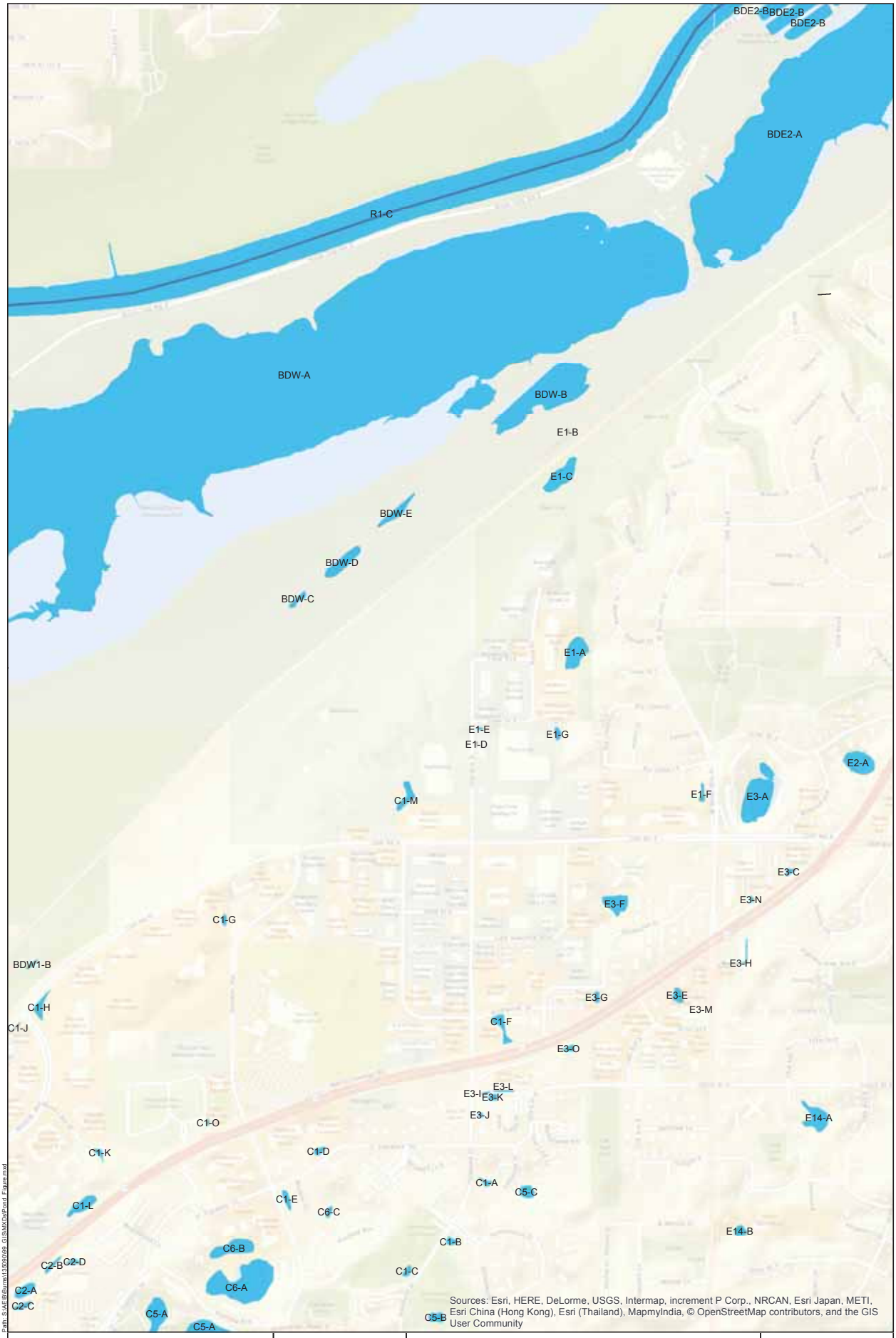

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Map by: eerdahl
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Pond Inventory Map

City of Burnsville, Minnesota

Figure
D - 2.4

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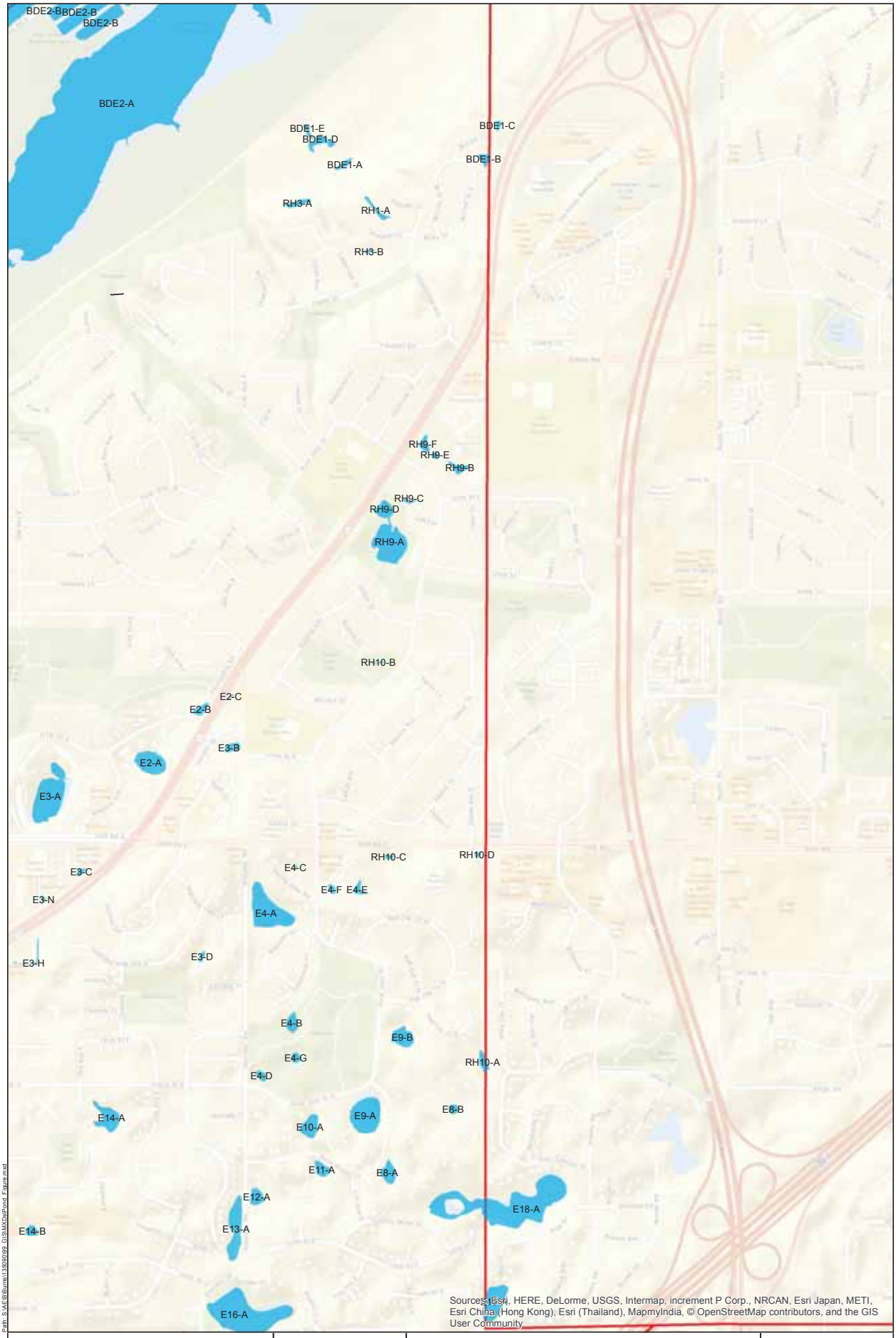

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Map by: eerdahl
Projection:
Source:

Pond Inventory Map

City of Burnsville, Minnesota

Figure
D - 2.5

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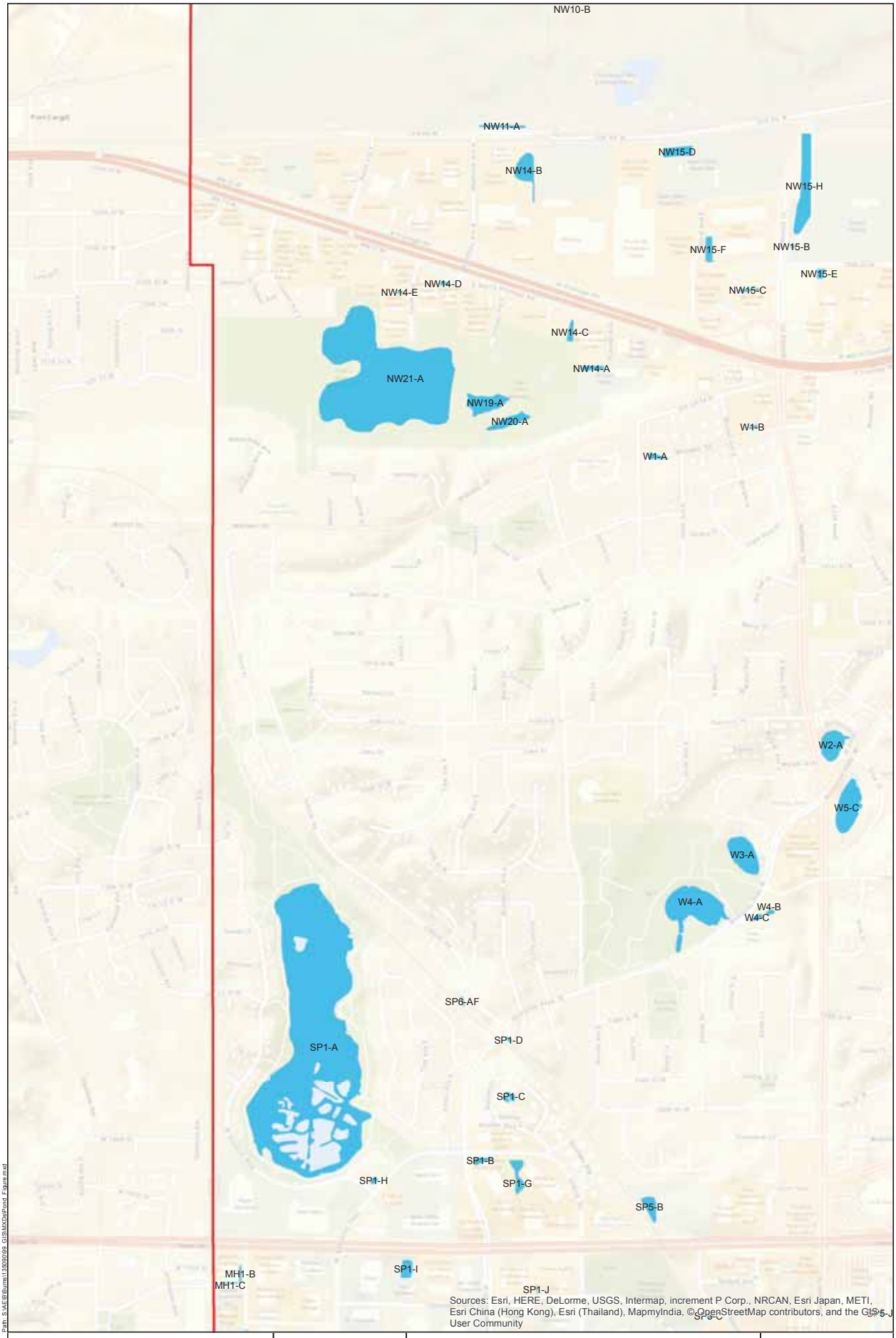

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Pond Inventory Map

City of Burnsville, Minnesota

Figure
D - 2.6

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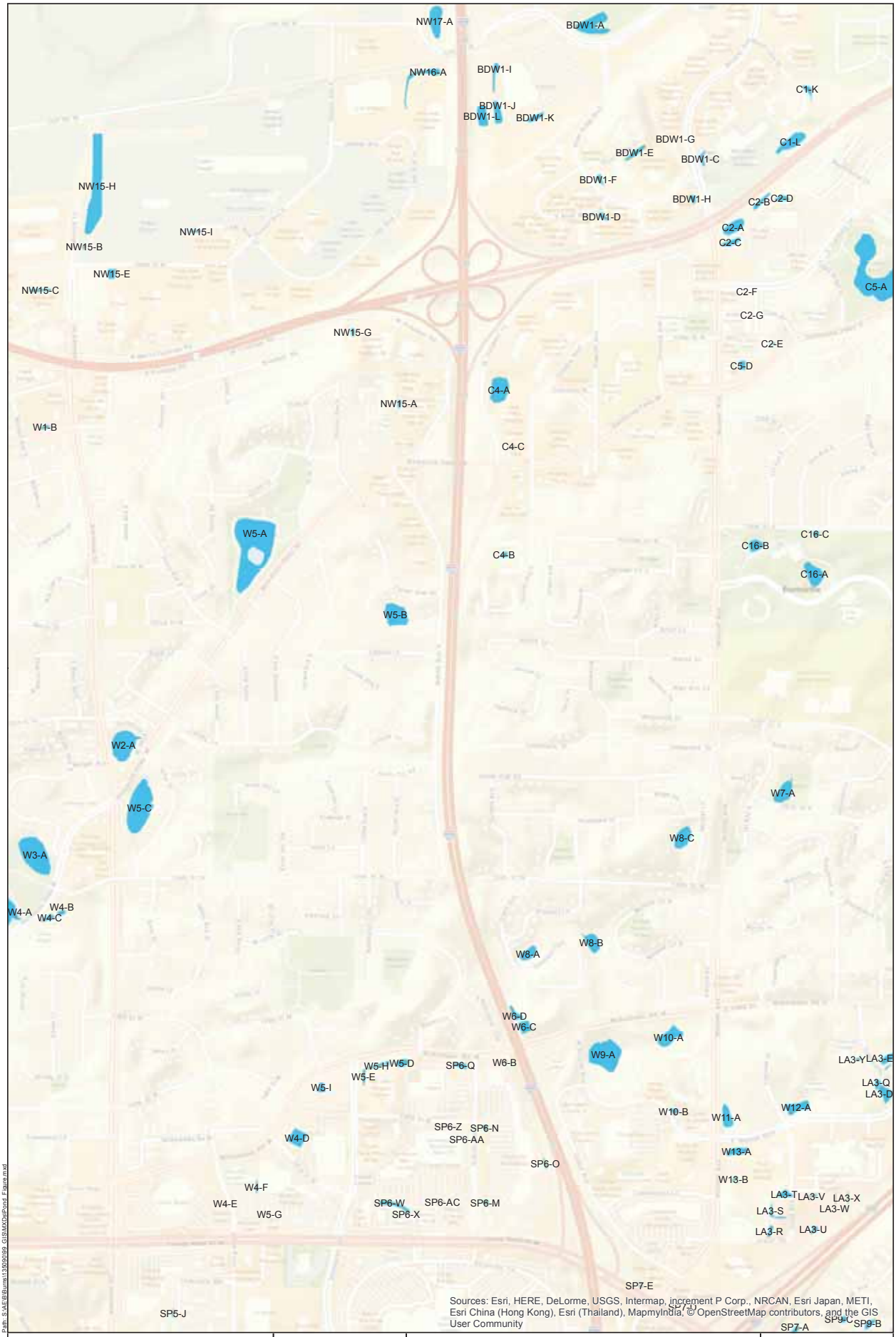

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www.sehinc.com

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Print Date: 1/11/2017

Map by: eerdahl
Projection:
Source:

Pond Inventory Map

City of Burnsville, Minnesota

Figure
D - 2.7

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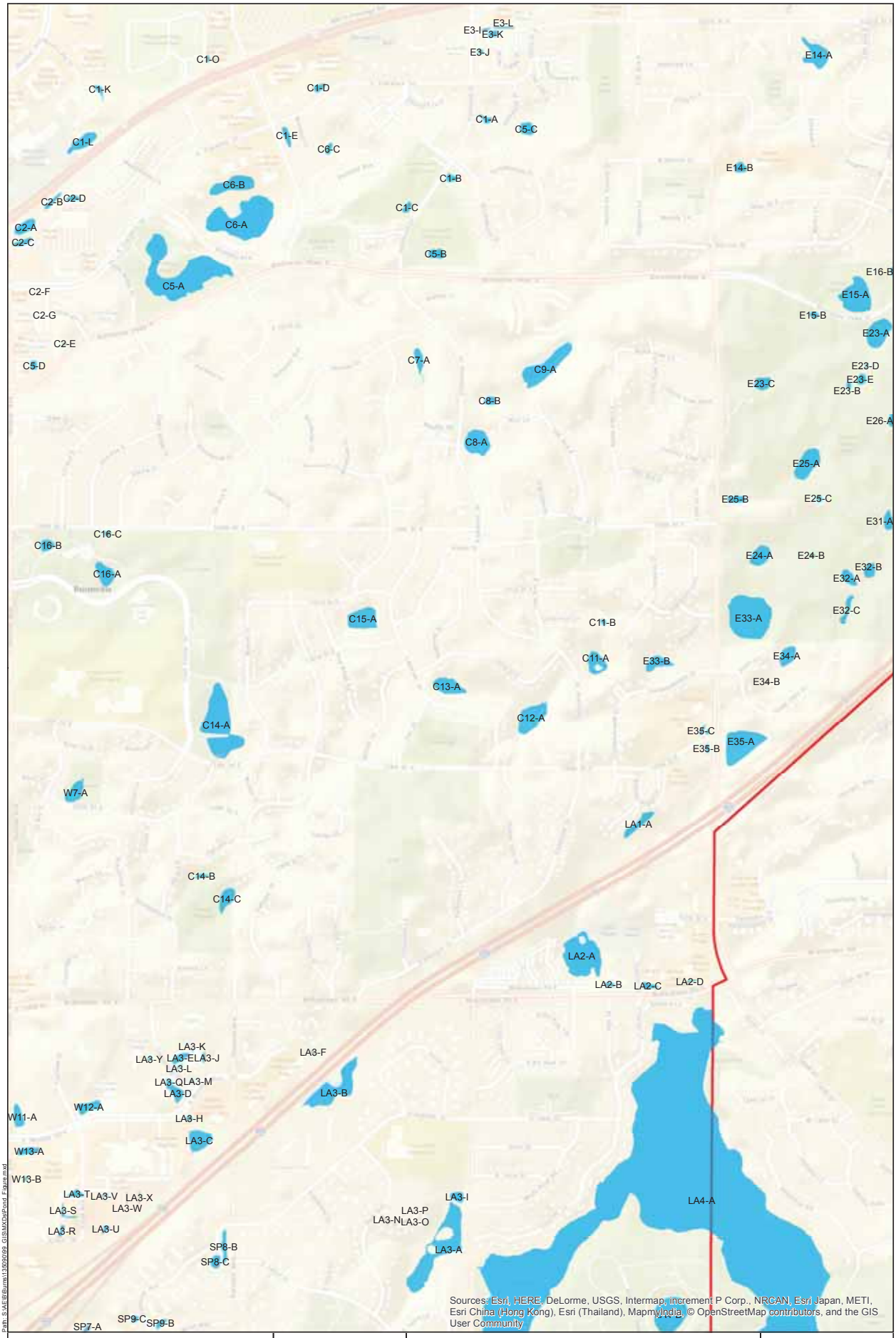

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Figure
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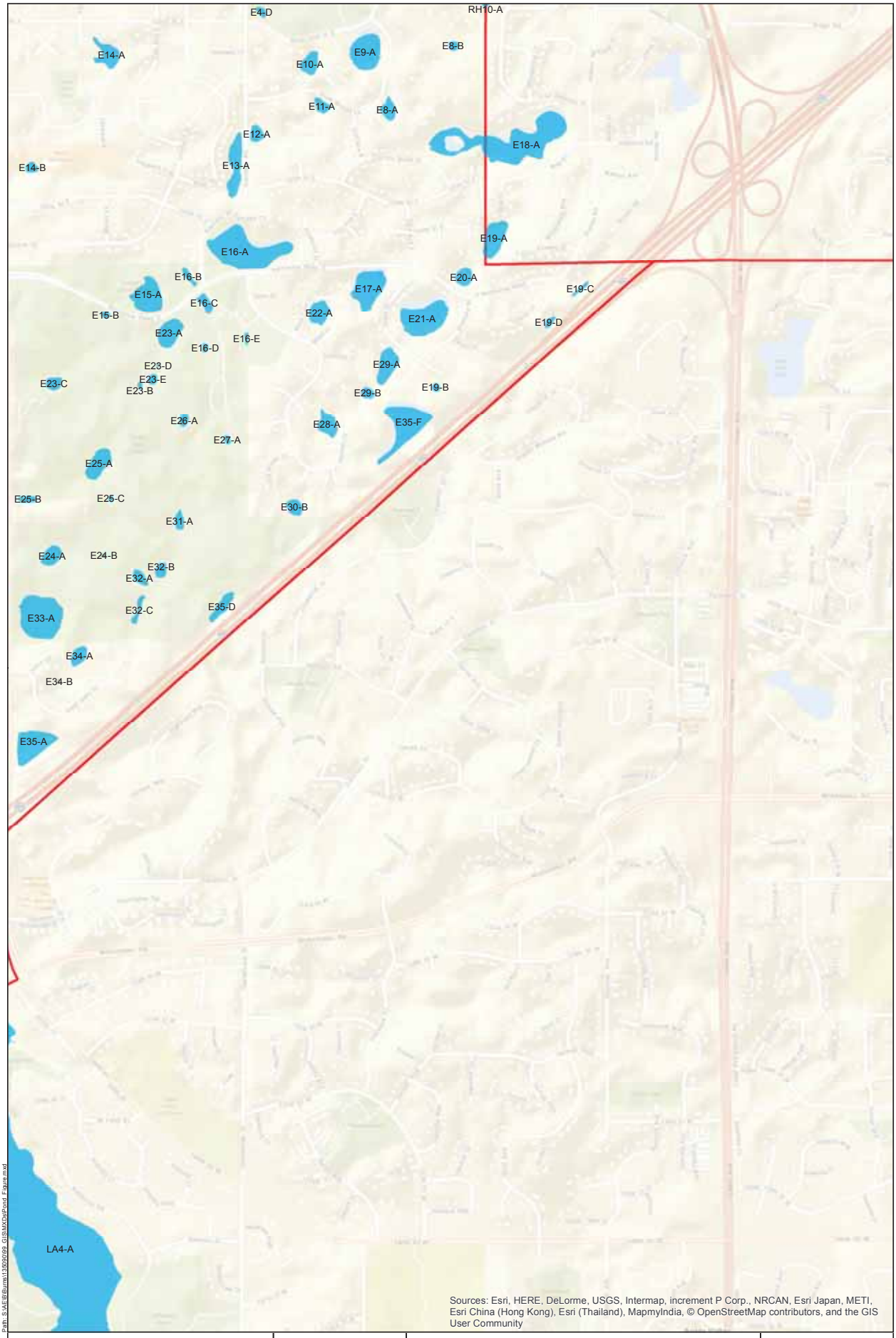

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Figure
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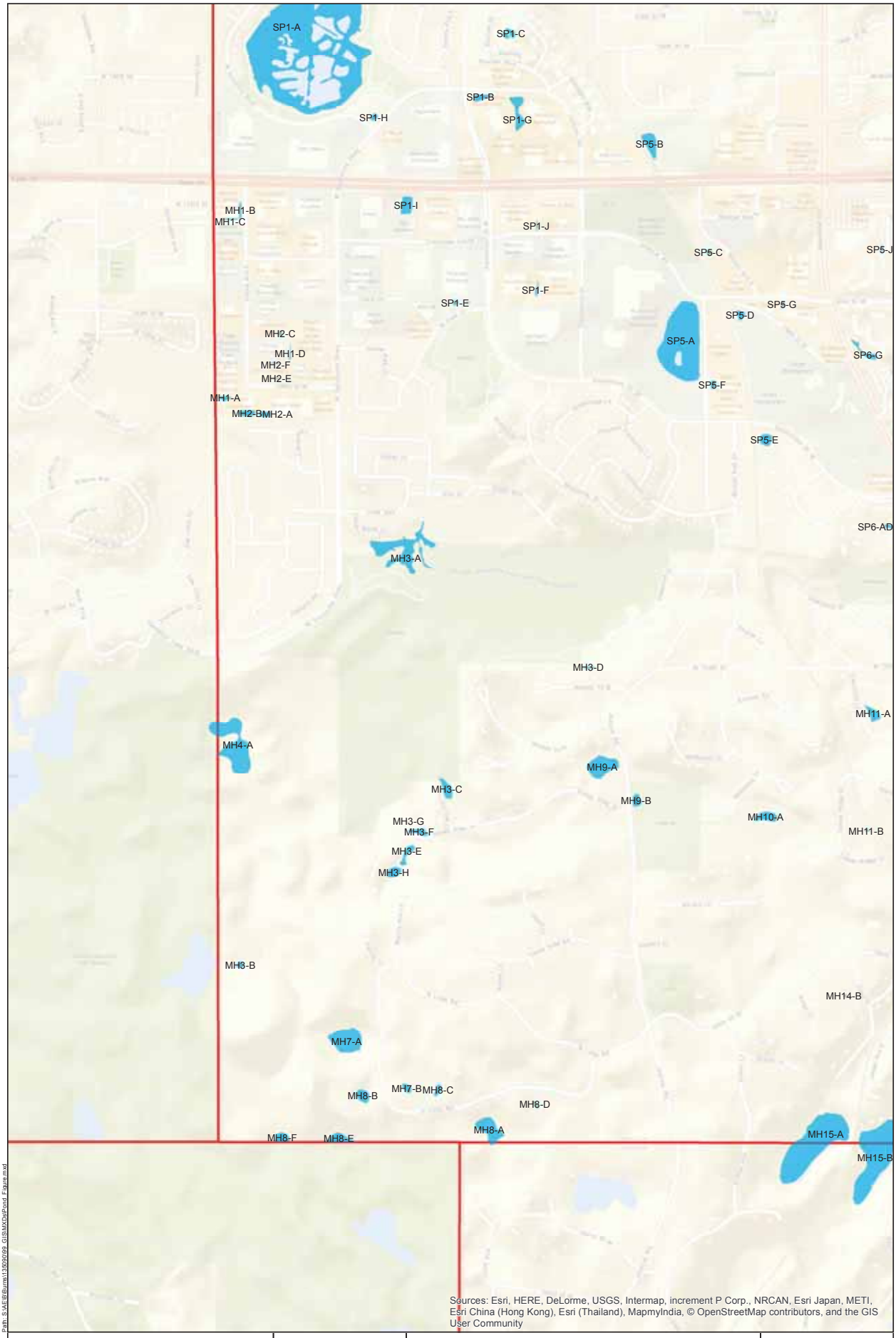

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Pond Inventory Map

City of Burnsville, Minnesota

Figure
D - 2.10

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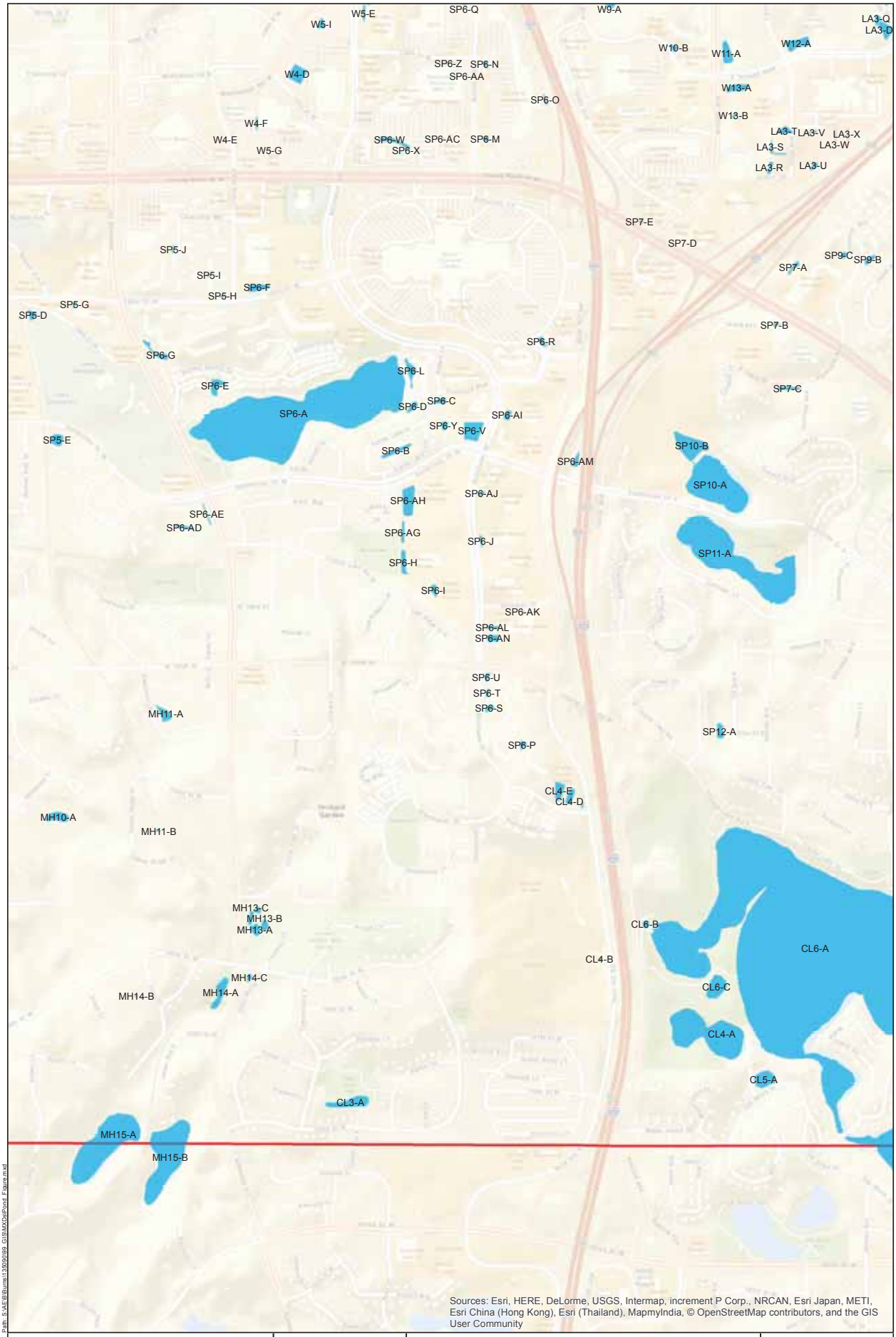

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City of Burnsville, Minnesota

Figure
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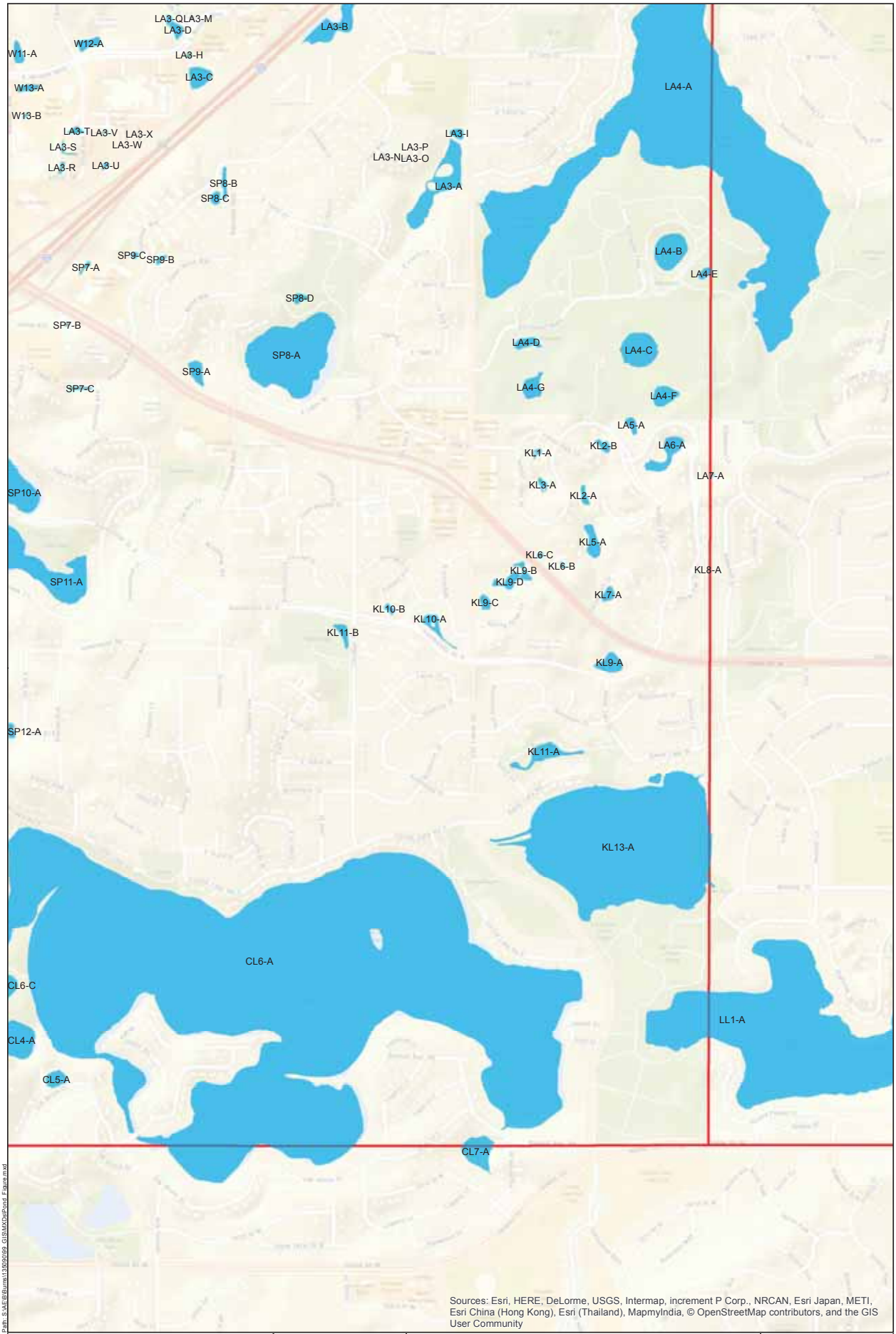

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Figure
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Appendix E

Water Resource Related Agreements

Appendix E – Water Resource Related Agreements

The City of Burnsville has entered into a number of water resource related agreements that govern in part how the City of Burnsville must manage its water resources. These agreements include joint powers agreements between the City and Watershed Management Organizations having jurisdiction within its boundaries, agreements between the City and adjoining communities, or agreements it may have with other governmental units or private parties. A description of the water resources related agreements which the City has entered into are described below.

1. Joint Powers Agreement with the Black Dog Watershed Management Organization.
2. Joint Powers Agreement with Credit River Watershed Management Organization.
3. Joint Powers Agreement with the Vermillion River Watershed Management Organization.
4. Joint Powers Agreement with the City of Savage, dated May 21, 1990 – City Project 90LD-3 – relates to billing and construction of Chowen Avenue storm sewer.
5. Joint Powers Agreement with the City of Savage, dated June 6, City Project Nos. 83LD-1A, B & C – relates to the Sunset Pond area.
6. Joint Powers Agreement with the City of Lakeville, dated March 17, 1980 – relates to Crystal Lake Overflow System
7. Joint Powers Agreement with the City of Lakeville, dated September 6, 1983 – relates to storm controls in an area adjacent to a common border between the cities of Lakeville and Burnsville in the vicinity of 35W North and 160th Street.
8. Joint Powers Agreement with the City of Apple Valley, dated March 15, 1982 – relates to City Project No. 81LD-7, and relates to Pond D, called out by Mn/DOT which is located in Burnsville in the SE Quarter of the NW Quarter of Section 16, Township 115, Range 20W.
9. Joint Powers agreement with the City of Apple Valley, dated December 18, 1978 – relates to Alimagnet Lake Lift Station to control lake level from stormwater runoff.
10. Joint Powers Agreement with the City of Eagan, dated March 15, 1992 – relates to land in Eagan in the SW ¼ of Section 31, Township 27, North Range 23, draining into the City of Burnsville.
11. Joint Powers Agreement with the City of Eagan, dated July 15, 1974 – relates to sanitary sewer, water lines and storm sewer improvements in River Hills 9th Addition, SW Quarter of the NW Quarter of Section 30, Township 27, North Range 23 West.
12. Joint Powers Agreement with the City of Savage, dated January 30, 1991 – relates to City Project 83LD-1A.
13. Joint Powers Agreement with the City of Savage, dated May 3, 1982 – relates to billing fees for properties in savage that are connected to the Burnsville Water System.
14. Joint Powers Agreement with the City of Lakeville, dated January 3, 1992 – relates to three issues;
    a. Quarterly Potable Water Usage

b. Maple Island Sanitary Sewer Lift Station Charges
c. Payment for the Crystal Lake Outlet Construction.

15. Joint Powers Agreement with the City of Apple Valley, dated November 2, 1981 and amended March 7, 1983 – relates to Cobblestone Manor sewer Service Agreement.

16. Joint Powers Agreement with the City of Eagan, dated March 15, 1982 – relates to Subject 81LD-7 and Pond "E" Agreement further relates to Eagan reimbursing the City of Burnsville for appropriate trunk area storm sewer assessments when area is platted or building permits are issued.

17. Joint Powers Agreement with the City of Eagan, dated July 15, 1974. Agreement outlines Burnsville and Eagan responsibilities toward providing storm sewer, sanitary sewer and water service to properties in the River Hills 9th Addition.

18. Rose Bluff Development Agreement for Potable Water, Sanitary Sewer and Storm Water, 2016.

19. Maintenance Agreement with Dakota County dated October 22, 2013. Agreement outlines the maintenance responsibilities and cost sharing percentages for storm sewer system repair and maintenance activities in Dakota County road right of ways.

Stormwater Best Management Practice (BMP) Maintenance Agreement

The BMP Maintenance Agreement is taken from the City NPDES MS4 Policy Document as of February 2017. The agreement can be modified, with input from the City Engineer, to apply to a wide range of storm water BMPs.

(Reserved for Recording Data)

STORMWATER BEST MANAGEMENT PRACTICE (BMP) MANAGEMENT AGREEMENT

This AGREEMENT made this __ day of _____, 20__, by and between the **CITY OF BURNSVILLE**, a Minnesota municipal corporation (hereinafter referred to as the "City") and _____, a _____, (hereinafter referred to as the "Developer").

WHEREAS, the Developer is the fee owner of certain real property situated in the City of Burnsville, County of Dakota, State of Minnesota legally described on the attached Exhibit "A" (hereinafter referred to as the "Subject Property") which the Developer has obtained the approval of the City for the development thereof; and

WHEREAS, the City has required that the Developer make provision for the construction, maintenance and repair of one or more Stormwater Best Management Practices (BMPs) located within the boundaries of the Subject Property as shown on Exhibit "B" attached hereto, as the same is described and depicted in those certain construction plans drawn by _____, ("Plans"). BMPs are physical devices or structures (e.g., wet ponds, rain gardens, infiltration basins, filtration basins, porous pavement) within the site that are necessary to convey and/or treat stormwater.

WHEREAS, the City and Developer desire to set forth their understanding with respect to the construction, repair and maintenance of the BMPs and the responsibility relating to the costs of the repair and maintenance of the BMP.

NOW THEREFORE, in consideration of the foregoing facts and circumstances, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto hereby agree as follows:

1. Construction and Maintenance of BMP. The Developer agrees to construct the BMPs according to the Plans and repair and maintain the BMP at its sole cost and expense. Maintenance of the BMP shall mean (i) monthly inspections and, if necessary, removal of all litter and debris, and replacement of mulch, vegetation, and eroded areas to ensure establishment of healthy functioning plant life therein; and (ii) an annual inspection, and

certification, by a qualified individual or company acceptable to the City that the BMP is functioning in accordance with the approved plans and have maintained the proper operation of the BMP according to the City Standards. If, as a result of an inspection by a qualified individual or company acceptable to the City or City staff, it is determined that the BMP (1) has not been maintained; or (2) is not functioning as originally designed and intended; or (3) is in need of repair, the Developer agrees to restore the BMP so that it functions as it was designed and intended. The Developer further agrees that they will not use the BMP for snow storage and will inform its snow removal contractors of this provision of the Agreement.

Subject to Section 4 below, Developer shall be solely responsible for the repair and maintenance of the Stormwater Pond.

2. Developer's Default. In the event of default by the Developer as to any of the work to be performed by it hereunder, following at least thirty (30) days prior written notice and Developer's failure to cure such default within such time-frame, except in an emergency as determined by the City, the City may, at its option, perform the work and the Developer shall promptly, following receipt of an invoice and reasonable substantiation of such costs, reimburse the City for any reasonable out-of-pocket expense incurred by the City. This Agreement is a license for the City to act when so authorized under this Agreement, and it shall not be necessary for the City to seek a Court order for permission to enter the Subject Property. When the City does any such work, the City may, in addition to its other remedies, assess the reasonable out-of-pocket cost in whole or in part.

3. Future City Policy. Notwithstanding anything contained in this Agreement to the contrary, in the event the City shall in the future establish a policy for repair and maintenance by the City of stormwater ponds owned by private parties located elsewhere in the City under which policy the costs of such repair and maintenance are to be paid either out of general City revenues or by collection of utility or service fees or charges, then any owner of any portion of the Subject Property shall be entitled to petition the City for the inclusion of the Stormwater Pond under such repair and maintenance program. The recording of a certified copy of the Resolution of the City Council of the City which sets forth the consent and authorization described in the foregoing sentence shall serve to terminate this Agreement, without further action on the part of any party hereto.

4. Terms and Conditions. This Agreement shall run with the land and shall be binding upon Developer's successors and assigns with respect to the Subject Property. The terms and conditions of this Agreement shall be binding upon, and shall insure to the benefit of, the parties hereto and their respective successors and assigns.

IN WITNESS WHEREOF, the parties hereto have caused this document to be executed as of the day and year first above written.

CITY OF BURNSVILLE

BY:_____
Elizabeth B. Kautz, Mayor

(SEAL)

AND _____
Heather A. Johnston, City Manager

STATE OF MINNESOTA)
(ss.
COUNTY OF DAKOTA)

The foregoing instrument was acknowledged before me this _th day of _____, 20____, by Elizabeth B. Kautz and by Heather Johnston, the Mayor and City Manager of the City of Burnsville, a Minnesota municipal corporation, on behalf of the corporation and pursuant to the authority granted by its City Council.

_____
NOTARY PUBLIC

Appendix F

Local Permitting Process

Appendix F – Development Review Procedures

The City's process for water resource related permitting is a significant aspect of the overall City development review and permitting program. The key steps in the permitting process are outlined in the City's NPDES MS4 Policy Number 5.155.

The City's Standard Operating Procedure for Development Review and Review Checklist from the Policy as of February 2017 are included in the following pages.

	City of Burnsville	**SOP - Site Plan Review Procedures**

MCM 5 - SITE PLAN REVIEW PROCEDURES

Upon receipt of a proposed site plan submittal package to the City of Burnsville the following procedures shall be followed:

1) Proposed site plan submittal information shall be directed to the City Engineer.

2) The City Engineer shall take the following actions:
   a. Forward the information to the appropriate entities for review and approval. This may include, but not limited to one or all of the following reviewers:
      i. City Engineering Consultant
      ii. Review by the City's Engineering Specialist
      iii. Other City Departments as needed (Natural Resources, Planning, etc.)
   b. Oversee the review process and compile comments.
   c. Notify owner of approval, disapproval, or required resubmittal of site plan information based on the comments.
   d. Ensure appropriate City permits are obtained or applied for prior to final approval.
   e. If applicable, notify the applicant of the need to apply for and obtain coverage under the MPCA NPDES Construction Stormwater Permit.

3) The reviewing entities shall complete the following actions:
   a. Review submitted information against the City's Site Plan Review Checklist which reflects concurrence with current ordinances, policies and design standards.
   b. Provide written comments and recommendations of approval, disapproval and/or required resubmittal of site plan information. City Engineer or designee shall ensure delivery to plan submitter.
   c. Utilize site plan review checklist/form and a comment letter describing compliance or non-compliance. The City's Engineering Consultants may use the form and/or provide a review memorandum addressed to the City Engineer that addresses the items noted in the form.
   d. Repeat process until the plan is approved and permits can be approved.

	City of Burnsville	**FORM – SITE PLAN REVIEW CHECKLIST**

Project / Site Information

Project Name / Owner:	
Project Location:	
Disturbed Acres: Existing Impervious: Proposed Impervious: Net Increase / (Decrease):	
City Project Number:	

Review Tracking

Initial Submittal Date:	Reviewed By / Date:

Review Comments / Findings:	Notified Owner:

Re-Submittal Date:	Reviewed By / Date:

Review Comments / Findings:	Notified Owner:

Construction Site – Erosion/Sediment Control (All projects)

Site plans and project documentation must incorporate erosion and sediment controls and waste controls.

Incorporated			Comments:
Yes	No	NA	
☐	☐	☐	Do the plans include provisions in accordance with Appendix C – Part 9: ≠ Perimeter controls, construction entrance/exit, inlet protection ≠ Sediment Tracking Cleanup, Waste Controls ≠ Temporary Sediment Basins – Water Quality Treatment (if required) ≠ Dewatering ≠ Final stabilization ≠ Maintenance of BMPs and Site Inspections/Rainfall record keeping

SWPPP Submittal (Required for projects disturbing 1 acre or more)

Incorporated			Comments:
Yes	No	NA	
☐	☐	☐	Has a Stormwater Pollution Prevention Plan (SWPPP) been prepared/Included?
☐	☐	☐	Has the City notified the owner of the NPDES Permit Requirements?

Post-Construction Stormwater Management Requirements

Refer to Water Resources Management Plan – Appendix C and/or other documents noted.
General Provisions – From WRMP Appendix C

- ≠ Water quality treatment, volume control, water quantity and rate control requirements apply to any project which results in one-half acre or more of disturbed area or 5,000 square feet or more of new impervious area.
- ≠ Additional requirements applicable to projects in Shoreland Areas are defined in City Code Section 10-8-10.
- ≠ Any project within a floodplain area requires a permit from the City and/or FEMA.
- ≠ Additional requirements applicable to the City's Wellhead Protection Overlay District

Incorporated			
Yes	No	NA	
☐	☐	☐	Do the plans address the water quality treatment in accordance with the provisions in Appendix C – Part 2?
☐	☐	☐	Do the volume control / infiltration/filtration practices meet the provisions of Appendix C – Part 3?
☐	☐	☐	Does the project meet the Water Quantity/Flood Control requirements of Appendix C – Part 4?
☐	☐	☐	Does the project meet the rate control provisions in Appendix C – Part 5?
☐	☐	☐	Do the plans address the Special waters and Wetland provisions in Appendix C – Part 6?
☐	☐	☐	Do the plans and supporting documentation include Design Computations consistent with Appendix C – Part 7?
☐	☐	☐	Do the plans address the Additional Pond and Infiltration System Design Criteria in Appendix C – Part 8?
☐	☐	☐	Do the plans include the Storm Water Plan Submittals in Appendix C – Part 10?
☐	☐	☐	Do the plans include provisions of the City's Wellhead Protection Plans (including but not limited to) Appendix C – Parts 3a and 3b?

Additional Review Comments / Findings:	

	City of Burnsville	**SOP - Site Plan Mitigation Procedures**

MCM 5 - SITE PLAN MITIGATION PROCEDURES

The MS4 Permit requires the City to establish mitigation provisions for circumstances where the City or other owners and operators of a construction activity cannot cost effectively meet the conditions for post- construction stormwater management (volume control requirements or TSS and/or TP requirements) established in the City's WRMP on the site of the original construction activity. If during the development review process, the City determines that this is the case, the City may require the owner to identify locations where mitigation projects can be completed.

Mitigation project areas will be evaluated and selected in the following order of preference:

1) Locations that yield benefits to the same receiving water that receives runoff from the original construction activity.
2) Locations within the same Department of Natural Resource (DNR) catchment area as the original construction activity.
3) Locations in the next adjacent DNR catchment area up-stream.
4) Locations anywhere within the City of Burnsville.

Mitigation projects must involve the creation of new structural stormwater BMPs or the retrofit of existing structural stormwater BMPs, or the use of a properly designed regional structural stormwater BMP. Routine maintenance of structural stormwater BMPs already required by the NPDES permit cannot be used to meet mitigation requirements. Mitigation projects shall be completed within 24 months after the start of the original construction activity.

The City will determine, and document, who is responsible for long-term maintenance on all mitigation projects. The City will not accept payment from the owner and/or operator of a construction activity for mitigation purposes in lieu of the owner or operator of that construction activity meeting the City Standards for post-construction stormwater management.

City Of Burnsville

Appendix K – MnDOT and Dakota County Access Management Guidelines

MnDOT Access Management Guidelines

Category	Area or Facility Type	Typical Functional Class	Public Street Spacing		Signal Spacing
			Primary Full-Movement Intersection	Secondary Intersection	
1	High-Priority Interregional Corridors & Interstate System (IRCs)				
1F	Interstate Freeway	Principal Arterials	Interchange Access Only		⊘
1AF	Non-Interstate Freeway		Interchange Access Only (see Section 3.2.7 for interim spacing)		See Section 3.2.5 for Signalization on Interregional Corridors
1A	Rural		1 mile	1/2 mile	
1B	Urban/ Urbanizing		1/2 mile	1/4 mile	
1C	Urban Core		300-660 feet dependent upon block length		
2	Medium-Priority Interregional Corridors				
2AF	Non-Interstate Freeway	Principal Arterials	Interchange Access Only (see Section 3.2.7 for interim spacing)		See Section 3.2.5 for Signalization on Interregional Corridors
2A	Rural		1 mile	1/2 mile	
2B	Urban/ Urbanizing		1/2 mile	1/4 mile	
2C	Urban Core		300-660 feet, dependent upon block length		1/4 mile
3	Regional Corridors				
3AF	Non-Interstate Freeway	Principal and Minor Arterials	Interchange Access Only (see Section 3.2.7 for interim spacing)		Interim
3A	Rural		1 mile	1/2 mile	See Section 3.2.5
3B	Urban/ Urbanizing		1/2 mile	1/4 mile	1/2 mile
3C	Urban Core		300-660 feet, dependent upon block length		1/4 mile

Category	Signal Spacing Guidance
Interregional Corridors & Interstate Highways	
The Interregional Corridor system identifies important statewide mobility corridors. On these highways, performance targets have been developed based on overall corridor speed. A traffic signal on one of these corridors represents a delay penalty or a reduction in the corridor speed; therefore, a new traffic signal on an Interregional Corridor should generally be avoided, if possible. When a district is considering a new signal on an Interregional Corridor, the Office of Investment Management is available to assist in calculating the impact of the signal on the overall corridor performance.	
1F	All access to the interstate system is via interchanges. Signal spacing is not applicable.
1AF **2AF**	**Full Access-Controlled Highways:** All access to the highway system is via interchanges. Signal spacing is not applicable. **Transitioning Highways:** On IRC highways transitioning to a full freeway design, new traffic signals should not be considered unless no other economically feasible alternative is available. The new traffic signal should be considered interim, and a plan for its future removal should be developed. Wherever possible, the new traffic signal should be located where a future interchange is planned.
1A **2A**	On rural IRC highways, a new traffic signal may be considered if warranted and if it does not lower the performance of the corridor below the target speed. However, if the signal is warranted and needed for safety, and a cost-effective alternative is not feasible, an interim signal may be considered, even though it would lower the performance of the corridor below the target speed.
1B **2B**	On urban/urbanizing IRC highways, a new traffic signal may be considered if warranted, but it should be both uniformly-spaced and interconnected with other signals along the corridor to minimize delay and to promote platoon flow. • **Category 1B: The recommended signal spacing is one-half mile. The new traffic signal should be considered interim and a plan for its future removal should be developed.** • **Category 2B: The recommended signal spacing is one-half mile.**

Note:
The information provided in this Mn/DOT Access Management Manual does not supersede the Mn/DOT Traffic Engineering Manual or the Mn MUTCD.

Mn/DOT Traffic Engineering Manual:
"Traffic signals should not be installed unless one or more of the signal warrants in the Mn MUTCD are met, but the meeting of a warrant or warrants does not alone justify the installation of a signal."

Category	Signal Spacing Guidance
Non-IRC Highways	
3AF 4AF	**Full Access-Controlled Highways:** All access to the highway system is via interchanges. Signal spacing is not applicable. **Transitioning Highways:** On highways transitioning to a full freeway design, new traffic signals should not be considered unless no other economically feasible alternative is available. The new traffic signal should be considered interim, and a plan for its future removal should be developed. Wherever possible, the new traffic signal should be located where a future interchange is planned.
3A 4A 5A 6A	**Rural:** Because traffic signals located in rural areas are generally isolated, they do not directly impact the spacing of at-grade public street connections. In these areas, traffic progression is not an issue and traffic signals are generally installed to address safety concerns. In rare cases, two or more traffic signals may be closely spaced (spacing of one-half mile or less) along an otherwise rural and unsignalized highway. These signals should be interconnected and timing should be coordinated to minimize the impact on the mobility of the through-traffic.
1C 2C 3B & 3C 4B & 4C 5B & 5C 6B & 6C	**Urban/Urbanizing and Urban Core:** The public street connection spacing policy is based on providing two-way coordinated traffic progression (or platoon flow) through a series of traffic signals. The policy balances mobility and accessibility and relies on the ability to provide uniform and interconnected traffic signal spacing. • **Categories 3B & 4B: The recommended signal spacing is one-half mile;** • **Categories 5B & 6B: The recommended signal spacing is one-quarter mile;** • **Category 1C: The recommended signal spacing is one-quarter mile. The new traffic signal should be considered an interim solution, and a plan for its future removal should be developed;** • **Categories 2C, 3C, 4C, & 5C: The recommended signal spacing is one-quarter mile;** • **Category 6C: The recommended signal spacing is one-eighth mile.**
7	By adopted plan

Note:
The information provided in this Mn/DOT Access Management Manual does not supersede the Mn/DOT Traffic Engineering Manual or the Mn MUTCD.

Mn/DOT Traffic Engineering Manual:
"Traffic signals should not be installed unless one or more of the signal warrants in the Mn MUTCD are met, but the meeting of a warrant or warrants does not alone justify the installation of a signal."

Dakota County Access Guidelines

Road Type (A)	Posted or Design Speed	Projected 2030 Average Daily Traffic	Full Movement Intersection	Partial Movement Intersection (B)
Principal Arterial	All	All	½ mile	¼ mile (C)
Divided Highway	All	>35,000	½ mile	¼ mile (C)
	All	<35,000	¼ mile	1/8 mile
Undivided Highway	(≤ 40 mph)	All	1/8 mile	N/A
	(≥ 45 mph)	>1,500	¼ mile	N/A
	(≥ 45 mph)	<1,500	Allowed per (D)	N/A

(A) Road type refers to the anticipated future roadway cross-section and functional classification.

(B) Partial Movement intersections do not allow left turns from the minor street to the major street or movements straight across the major street. Movements that are allowed will be based on engineering study.

(C) Right-in/right-out access may be permitted at approximately 1/8 mile for public or private (See Note #3) streets if the County determines the access improves the overall safety and/or efficiency of the transportation system.

(D) Private street or driveway access requests will be considered based on engineering judgment and the following factors: location, distance from other driveways and intersections, alignment with other access points, easement/access rights that allow widespread usage and system connectivity, the potential to combine accesses, visibility, adjacent land use, and other operational/safety issues.

N/A – Not Applicable to undivided roadway segments.

Access Spacing Notes:

1. There are minimum access spacing guidelines. The County may require accesses be spaced at distances greater than the minimums considering conditions specific to any County highway segment.
2. County roadways with full movement access spacing of ½ mile are shown in Figure 31 of the Dakota County 2030 Transportation Plan. Considerations include regional transitways, adopted studies, principal arterials, system continuity and projected ADT > 35,000.
3. Access to County roadways is typically provided through public street connections. Private access will be considered along the County roadway system based on engineering assessment of the function and use of the private access point in consideration of the spacing criteria.
4. Specific corridor access plans or project designs developed through a public process and adopted by the County Board shall supersede these guidelines.
5. Medians may be added or median openings may be removed or modified at any time by the County to address safety and/or operational issues identified through engineering review.
6. Where there is opportunity for access on more than one public roadway, access shall be provided from the lower- function roadway, unless deemed impractical by the County. To support the objectives of system efficiency and connectivity, access to the higher-function County roadway may be allowed in addition to the lower-function roadway, provided there is adequate distance to accommodate access based on these access guidelines.

City Of Burnsville

Appendix L – Burnsville Local Water Supply Plan DRAFT

2017

Local Water Supply Plan Template
Third Generation for 2016-2018

Revised April 10, 2017

Formerly called Water Emergency & Water Conservation Plan

DEPARTMENT OF NATURAL RESOURCES

Cover photo by Molly Shodeen

For more information on this Water Supply Plan Template, please contact the DNR Division of Ecological and Water Resources at (651) 259-5034 or (651) 259-5100.

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This information is available in an alternative format upon request.

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Table of contents

INTRODUCTION TO WATER SUPPLY PLANS (WSP) 6

Who needs to complete a Water Supply Plan 6

Groundwater Management Areas (GWMA) 6

Benefits of completing a WSP 6

WSP Approval Process 7

PART 1. WATER SUPPLY SYSTEM DESCRIPTION AND EVALUATION 9

A. Analysis of Water Demand 9

B. Treatment and Storage Capacity 11

Treatment and storage capacity versus demand 13

C. Water Sources 13

Limits on Emergency Interconnections 14

D. Future Demand Projections – Key Metropolitan Council Benchmark 15

Water Use Trends 15

Projection Method 16

E. Resource Sustainability 16

Monitoring – Key DNR Benchmark 17

Water Level Data 19

Potential Water Supply Issues & Natural Resource Impacts – Key DNR & Metropolitan Council Benchmark 21

Wellhead Protection (WHP) and Source Water Protection (SWP) Plans 27

F. Capital Improvement Plan (CIP) 29

Adequacy of Water Supply System 29

Proposed Future Water Sources 30

Water Source Alternatives - Key Metropolitan Council Benchmark 31

PART 2. EMERGENCY PREPAREDNESS PROCEDURES 31

A. Emergency Response Plan 31

B. Operational Contingency Plan 32

C. Emergency Response Procedures 32

Emergency Telephone List 32
Current Water Sources and Service Area 32
Procedure for Augmenting Water Supplies 33
Allocation and Demand Reduction Procedures 34
Notification Procedures 36
Enforcement 37
PART 3. WATER CONSERVATION PLAN 38
Progress since 2006 38
A. Triggers for Allocation and Demand Reduction Actions 39
B. Conservation Objectives and Strategies – Key benchmark for DNR 40
Objective 1: Reduce Unaccounted (Non-Revenue) Water loss to Less than 10% 40
Objective 2: Achieve Less than 75 Residential Gallons per Capita Demand (GPCD) 42
Objective 3: Achieve at least 1.5% annual reduction in non-residential per capita water use 44
Objective 4: Achieve a Decreasing Trend in Total Per Capita Demand 45
Objective 5: Reduce Ratio of Maximum day to the Average Day Demand to Less Than 2.6 45
Objective 6: Implement Demand Reduction Measures 46
Objective 7: Additional strategies to Reduce Water Use and Support Wellhead Protection Planning 48
Objective 8: Tracking Success: How will you track or measure success through the next ten years? 48
C. Regulation 49
D. Retrofitting Programs 50
Retrofitting Programs 50
E. Education and Information Programs 51
Proposed Education Programs 51
PART 4. ITEMS FOR METROPOLITAN AREA COMMUNITIES 54
A. Water Demand Projections through 2040 54
B. Potential Water Supply Issues 54

C. Proposed Alternative Approaches to Meet Extended Water Demand Projections.....54
D. Value-Added Water Supply Planning Efforts (Optional).....55
Source Water Protection Strategies.....55
Technical assistance.....55
GLOSSARY.....56
Acronyms and Initialisms.....58
APPENDICES TO BE SUBMITTED BY THE WATER SUPPLIER.....58
Appendix 1: Well records and maintenance summaries.....58
Appendix 2: Water level monitoring plan.....58
Appendix 3: Water level graphs for each water supply well.....58
Appendix 4: Capital Improvement Plan.....58
Appendix 5: Emergency Telephone List.....58
Appendix 6: Cooperative Agreements for Emergency Services.....58
Appendix 7: Municipal Critical Water Deficiency Ordinance.....58
Appendix 8: Graph of Ten Years of Annual Per Capita Water Demand for Each Customer Category.....58
Appendix 9: Water Rate Structure.....58
Appendix 10: Ordinances or Regulations Related to Water Use.....58
Appendix 11: Implementation Checklist.....58
Appendix 12: Sources of Information for Table 10.....58

INTRODUCTION TO WATER SUPPLY PLANS (WSP)

Who needs to complete a Water Supply Plan

Public water suppliers serving more than 1,000 people, large private water suppliers in designated Groundwater Management Areas, and all water suppliers in the Twin Cities metropolitan area are required to prepare and submit a water supply plan.

The goal of the WSP is to help water suppliers: 1) implement long term water sustainability and conservation measures; and 2) develop critical emergency preparedness measures. Your community needs to know what measures will be implemented in case of a water crisis. A lot of emergencies can be avoided or mitigated if long term sustainability measures are implemented.

Groundwater Management Areas (GWMA)

The DNR has designated three areas of the state as Groundwater Management Areas (GWMAs) to focus groundwater management efforts in specific geographies where there is an added risk of overuse or water quality degradation. A plan directing the DNRs actions within each GWMA has been prepared. Although there are no specific additional requirements with respect to the water supply planning for communities within designated GWMAs, communities should be aware of the issues and actions planned if they are within the boundary of one of the GWMAs. The three GWMAs are the North and East Metro GWMA (Twin Cities Metro), the Bonanza Valley GWMA and the Straight River GWMA (near Park Rapids). Additional information and maps are included in the DNR Groundwater Management Areas webpage.

Benefits of completing a WSP

Completing a WSP using this template, fulfills a water supplier's statutory obligations under M.S. M.S.103G.291 to complete a water supply plan. For water suppliers in the metropolitan area, the WSP will help local governmental units to fulfill their requirements under M.S. 473.859 to complete a local comprehensive plan. Additional benefits of completing WSP template:

- The standardized format allows for quicker and easier review and approval
- Help water suppliers prepare for droughts and water emergencies.
- Create eligibility for funding requests to the Minnesota Department of Health (MDH) for the Drinking Water Revolving Fund.
- Allow water suppliers to submit requests for new wells or expanded capacity of existing wells.
- Simplify the development of county comprehensive water plans and watershed plans.
- Fulfill the contingency plan provisions required in the MDH wellhead protection and surface water protection plans.
- Fulfill the demand reduction requirements of Minnesota Statutes, section 103G.291 subd 3 and 4.

- Upon implementation, contribute to maintaining aquifer levels, reducing potential well interference and water use conflicts, and reducing the need to drill new wells or expand system capacity.
- Enable DNR to compile and analyze water use and conservation data to help guide decisions.
- Conserve Minnesota's water resources

If your community needs assistance completing the Water Supply Plan, assistance is available from your area hydrologist or groundwater specialist, the MN Rural Waters Association circuit rider program, or in the metropolitan area from Metropolitan Council staff. Many private consultants are also available.

WSP Approval Process

10 Basic Steps for completing a 10-Year Water Supply Plan

1. Download the DNR/Metropolitan Council Water Supply Plan Template from the DNR Water Supply Plan webpage.
2. Save the document with a file name with this naming convention: WSP_cityname_permitnumber_date.doc.
3. The template is a form that should be completed electronically.
4. Compile the required water use data (Part 1) and emergency procedures information (Part 2)
5. The Water Conservation section (Part 3) may need discussion with the water department, council, or planning commission, if your community does not already have an active water conservation program.
6. Communities in the seven-county Twin Cities metropolitan area should complete all the information discussed in Part 4. The Metropolitan Council has additional guidance information on their Water Supply webpage. All out-state water suppliers ***do not*** need to complete the content addressed in Part 4.
7. Use the Plan instructions and Checklist document from the DNR Water Supply Plan webpage to insure all data is complete and attachments are included. This will allow for a quicker approval process.
8. Plans should be submitted electronically using the MPARS website – no paper documents are required.
9. DNR hydrologist will review plans (in cooperation with Metropolitan Council in Metro area) and approve the plan or make recommendations.
10. Once approved, communities should complete a Certification of Adoption form, and send a copy to the DNR.

Complete Table 1 with information about the public water supply system covered by this WSP.

Table 1. General information regarding this WSP

Requested Information	Description
DNR Water Appropriation Permit Number(s)	**1974-5014 and 2007-0101**
Ownership	☒ Public or ☐ Private
Metropolitan Council Area	☒ Yes or ☐ No (Dakota)
Street Address	**100 Civic Center Parkway**
City, State, Zip	**Burnsville, MN 55337**
Contact Person Name	Linda Mullen
Title	Utilities Superintendent
Phone Number	952-895-4552
MDH Supplier Classification	Municipal

PART 1. WATER SUPPLY SYSTEM DESCRIPTION AND EVALUATION

The first step in any water supply analysis is to assess the current status of demand and availability. Information summarized in Part 1 can be used to develop Emergency Preparedness Procedures (Part 2) and the Water Conservation Plan (Part 3). This data is also needed to track progress for water efficiency measures.

A. Analysis of Water Demand

Complete Table 2 showing the past 10 years of water demand data.

- Some of this information may be in your Wellhead Protection Plan.
- If you do not have this information, do your best, call your engineer for assistance or if necessary leave blank.

If your customer categories are different than the ones listed in Table 2, please describe the differences below:

We do not break water use down into the Non-Essential Services categories. Any non-essential water is included in the overall water use category (residential, commercial etc)

Table 2. Historic water demand (see definitions in the glossary after Part 4 of this template)

Year	Pop. Served(1)	Total Connections	Residential Water Delivered (MG)	C/I/I Water Delivered (MG)	Water used for Non-essential	Wholesale Deliveries (MG)(2)	Total Water Delivered (MG)	Total Water Pumped (MG)	Water Supplier Services	Percent Unmetered/ Unaccounted (3)	Average Daily Demand (MGD)	Max. Daily Demand (MGD)	Date of Max. Demand	Residential Per Capita Demand (GPCD)(4)	Total per capita Demand (GPCD)(4)
2005	59,956	16,577	1,834.82	660.75	N/A	16.39	2,577.06	2,631.91	65.10	2.1%	7.21	19.20	7/16/06	83.84	119.52
2006	59,966	16,187	2,046.75	771.34	N/A	14.65	2,848.23	2,915.95	15.49	2.3%	7.99	18.60	7/9/06	93.51	132.55
2007	59,976	16,240	2,138.98	754.02	N/A	12.38	2,960.69	2,915.95	55.31	-1.5%(5)	7.99	21.42	7/30/07	97.71	132.64
2008	59,986	16,277	1,979.42	692.87	N/A	10.52	2,785.81	2,780.67	103.00	-0.2%*(5)	7.62	16.78	7/6/17	90.41	126.52
2009	59,996	16,300	1,673.31	576.02	N/A	14.40	2,372.40	2,545.28	108.67	6.8%	6.97	14.90	6/9/09	76.41	115.57
2010	60,006	16,572	1,445.20	512.89	N/A	412.74	2,536.58	3,074.25	165.75	17.5%	8.42	12.71	7/29/10	65.98	121.52
2011	60,326	16,593	1,551.33	479.87	N/A	583.99	2,894.42	3,263.22	279.23	11.3%	8.94	11.93	9/12/11	70.45	121.68
2012	60,646	16,613	1,665.36	561.99	N/A	635.18	3,070.66	3,588.00	208.13	14.4%	9.83	21.50	7/12/12	75.23	133.40
2013	60,966	16,628	1,496.25	538.08	N/A	663.00	2,829.56	3,363.52	132.23	15.9%	9.22	19.60	8/26/13	67.24	121.36
2014	61,447	16,665	1,419.12	494.44	N/A	647.71	2,772.22	3,287.83	210.95	15.7%	9.01	14.05	8/6/14	63.27	117.71
2015	61,608	16,718	1,347.45	455.00	N/A	632.58	2,805.46	3,675.44	370.43	23.7%(6)	10.07	16.26	8/15/15	59.92	135.32
Avg. 2010-2015	60,833	16,632	1,487.45	507.05	N/A	595.87	2,818.15	3,375.38	227.79	16.4%	9.25	16.00	N/A	67.02	125.16

MG – Million Gallons **MGD –** Million Gallons per Day **GPCD** – Gallons per Capita per Day

See Glossary for definitions. A list of Acronyms and Initialisms can be found after the Glossary.

(1) Excludes residents of other cities served by wholesale deliveries from Burnsville.
(2) Wholesale Deliveries is water provided to Lakeville, Eagan and Savage via JPA agreements. It also includes water provided to Savage as part of the joint Water Use Agreement.
(3) City unmetered water analysis estimates that up to 8% may be attributed to the age of the metering system. In 2016 the City initiated a full meter replacement program that will include installation of Advanced Metering Infrastructure system that will provide full two-way real time water use data. This $8M project is expected to be completed by the end of 2018.
(4) For purposes of calculating Burnsville's Residential per Capita and Total per Capita Demand Wholesale deliveries to the Cities of Savage, Lakeville and Apply Valley have been excluded. Their inclusion misrepresents the per capita demand since their populations are not included in the population served.
(5) Transition from manual read to SCADA system.
(6) Includes significant extended water system leak event in remote area of 100psi + high pressure zone that went undetected as pressures did not drop below 80 psi during leak.

Complete Table 3 by listing the top 10 water users by volume, from largest to smallest. For each user, include information about the category of use (residential, commercial, industrial, institutional, or wholesale), the amount of water used in gallons per year, the percent of total water delivered, and the status of water conservation measures.

Table 3. Large volume users

Customer	Use Category (Residential, Industrial, Commercial, Institutional, Wholesale)	Amount Used (Gallons per Year)	Percent of Total Annual Water Delivered	Implementing Water Conservation Measures? (Yes/No/Unknown)
1 SUMMIT PARK APTS	RESIDENTIAL	35,562,000	1.60	UNKNOWN
2.FAIRVIEW RIDGES HOSPITAL	INSTITUTIONAL	29,903,000	1.21	
3. BURNSVILLE PARKWAY ESTATES MANUFACTURED HOUSING	RESIDENTIAL	26,013,000	1.17	UNKNOWN
4. BUCK HILL, INC	COMMERCIAL	25,407,000	1.14	UNKNOWN
5. RAMBUSH ESTATES MANUFACTURED HOUSING	RESIDENTIAL	24,538,000	1.10	UNKNOWN
6. RRE NICOLLET RIDGE CONDOS	RESIDENTIAL	19,660,000	0.90	UNKNOWN
7. WRPV I WOODS OF BURNSVILLE APTS	RESIDENTIAL	20,220,000	0.91	UNKNOWN
8. RIDGEVIEW CONDOMINIUMS	RESIDENTIAL	18,502,000	.83	UNKNOWN
9. BDC MANAGEMENT	COMMERCIAL	18,056,000	0.81	UNKNOWN
10. SUNNY ACRES MOBILE HOMES	RESIDENTIAL	17,571,000	0.79	UNKNOWN

1. Treatment and Storage Capacity

Complete Table 4 with a description of where water is treated, the year treatment facilities were constructed, water treatment capacity, the treatment methods (i.e. chemical addition, reverse osmosis, coagulation, sedimentation, etc.) and treatment types used (i.e. fluoridation, softening, chlorination, Fe/MN removal, coagulation, etc.). Also describe the annual amount and method of disposal of treatment residuals. Add rows to the table as needed.

Table 4. Water treatment capacity and treatment processes

Treatment Site ID (Plant Name or Well ID)	Year Constructed	Treatment Capacity (GPD)	Treatment Method	Treatment Type	Annual Volume of Residuals	Disposal Process for Residuals	Do You Reclaim Filter Backwash Water?

Treatment Site ID (Plant Name or Well ID)	Year Constructed	Treatment Capacity (GPD)	Treatment Method	Treatment Type	Annual Volume of Residuals	Disposal Process for Residuals	Do You Reclaim Filter Backwash Water?
Ground* Water Treatment Plant	1975	18,000,000	Chemical addition, filtration	Chlorine, Fluoride, Phosphate, Sodium Permanganate	2,708,000	Sanitary Sewer	Yes
Surface Water Treatment Plant	2009	6,000,000	Chemical addition, flocculation, filtration	Chlorine, Fluoride, Phosphate, Polymer, Ferric Chloride, Sodium, Powdered Activated Carbon, Permanganate	2,073,000	Sanitary Sewer	Yes
Total	NA	24,000,000	NA	NA	4,781,000	NA	

Complete Table 5 with information about storage structures. Describe the type (i.e. elevated, ground, etc.), the storage capacity of each type of structure, the year each structure was constructed, and the primary material for each structure. Add rows to the table as needed.

*Reconstruction of filters, controls and generator system starting in fall of 2017.

Table 5. Storage capacity, as of the end of the last calendar year

Structure Name	Type of Storage Structure	Year Constructed	Primary Material	Storage Capacity (Gallons)
Buck Hill	Elevated storage	1981	Steel	1.7 MG
Colonial Hills	Elevated storage	1962	Steel	1.1 MG
Heather Hills	Elevated storage	1971	Steel	7.0 MG
Nicollet Reservoir	Ground storage	1971	Concrete	1.8 MG
Water Treatment Plant	Ground storage	1976	Concrete	7.0 MG
Total	NA	NA	NA	18.6 MG

Treatment and storage capacity versus demand

It is recommended that total storage equal or exceed the average daily demand.

Discuss the difference between current storage and treatment capacity versus the water supplier's projected average water demand over the next 10 years (see Table 7 for projected water demand):

We do not anticipate increasing our storage and treatment capacity over the next 10 years.

2. Water Sources

Complete Table 6 by listing all types of water sources that supply water to the system, including groundwater, surface water, interconnections with other water suppliers, or others. Provide the name of each source (aquifer name, river or lake name, name of interconnecting water supplier) and the Minnesota unique well number or intake ID, as appropriate. Report the year the source was installed or established and the current capacity. Provide information about the depth of all wells. Describe the status of the source (active, inactive, emergency only, retail/wholesale interconnection) and if the source facilities have a dedicated emergency power source. Add rows to the table as needed for each installation.

Include copies of well records and maintenance summary for each well that has occurred since your last approved plan in **Appendix 1.**

Table 6. Water sources and status

Resource Type (Groundwater, Surface water, Interconnection)	Resource Name	MN Unique Well # or Intake ID	Year Installed	Capacity (Gallons per Minute)	Well Depth (Feet)	Status of Normal and Emergency Operations (active, inactive, emergency only, retail/wholesale interconnection))	Does this Source have a Dedicated Emergency Power Source? (Yes or No)
Jordan	Well 1	206177	1964	800	347	Active	No
Jordan	Well 2	206176	1966	1200	306	Active	No
Jordan	Well 3	206170	1968	1200	338	Active	Yes
Jordan	Well 4	206178	1969	1200	314	Active	Yes
Jordan	Well 5	206179	1970	1200	335	Active	Yes

Resource Type (Groundwater, Surface water, Interconnection)	Resource Name	MN Unique Well # or Intake ID	Year Installed	Capacity (Gallons per Minute)	Well Depth (Feet)	Status of Normal and Emergency Operations (active, inactive, emergency only, retail/wholesale interconnection))	Does this Source have a Dedicated Emergency Power Source? (Yes or No)
Jordan	Well 6	206171	1975	1200	265	Active	Yes
Jordan	Well 7	206174	1971	1200	356	Active	Yes
Prairie Du Chien-Jordan	Well 8	206172	1971	1200	357	Active	Yes
Tunnel City-Wonewoc	Well 9	127261	1975	1500	957	Active	No
Jordan	Well 10	127259	1975	1200	386	Active	No
Mt. Simon	Well 11	150359	1981	1500	984	Active	No
Jordan	Well 12	439856	1988	1000	465	Active	No
Jordan	Well 13	112235	1978	1200	407	Active	No
Mt. Simon	Well 14	505676	1990	900	854	Active	Yes
Jordan	Well 15	505677	1990	1200	503	Active	Yes
Jordan	Well 16	420992	1993	1200	565	Active	No
Jordan	Well 17	686255	2005	1100	513	Active	No
Surface Water	Kraemer Quarry	N/A	2009	3820	N/A	Active	No
Interconnect	Apple Valley	N/A		Depends on tower levels	N/A	Emergency Operations	No
Interconnect	Lakeville 1	N/A		Depends on tower levels	N/A	Emergency Operations	No
Interconnect	Lakeville 2	N/A		Depends on tower levels	N/A	Emergency Operations	No
Interconnect	Savage	N/A		Depends on tower levels	N/A	Emergency	No

Limits on Emergency Interconnections

Discuss any limitations on the use of the water sources (e.g. not to be operated simultaneously, limitations due to blending, aquifer recovery issues etc.) and the use of interconnections, including capacity limits or timing constraints (i.e. only 200 gallons per minute are available from the City of Prior Lake, and it is estimated to take 6 hours to establish the emergency connection). If there are no limitations, list none.

Water source use limitations would be minimal because we have four emergency interconnections with neighboring cities. The interconnection with Apple Valley is the least desirable because of the elevation needed to make it a useful source.

Burnsville provides the City of Savage with a potable water supply which varies from 1.1 MGD to 2.1 MGD depending on the time of year. We are able to shut that connection source down in an emergency. The average amount of time it would take to establish an emergency connection would be three hours during the workday and up to five hours in an after-hours situation.

3. Future Demand Projections – *Key Metropolitan Council Benchmark*

Water Use Trends

Use the data in Table 2 to describe trends in 1) population served; 2) total per capita water demand; 3) average daily demand; 4) maximum daily demand. Then explain the causes for upward or downward trends. For example, over the ten years has the average daily demand trended up or down? Why is this occurring?

The City of Burnsville is fully developed so our water use trend should remain stable. The dramatic increase in water pumped after 2009 is from our JPA with the City of Savage to provide them with potable drinking water (89% of their total water use in 2016). The big driver in water use is residential and commercial irrigation. Burnsville has an increasing block rate structure along with water conservation measures which include odd/even and a midday watering ban. These restrictions are in place each year from April 1 thru September 30.

Use the water use trend information discussed above to complete Table 7 with projected annual demand for the next ten years. Communities in the seven-county Twin Cities metropolitan area must also include projections for 2030 and 2040 as part of their local comprehensive planning.

Projected demand should be consistent with trends evident in the historical data in Table 2, as discussed above. Projected demand should also reflect state demographer population projections and/or other planning projections.

Table 7. Projected annual water demand

Year	Projected Total Population	Projected Population Served(1)	Projected Total Per Capita Water Demand (GPCD)(1)	Projected Average Daily Demand (MGD)(3)	Projected Maximum Daily Demand (MGD)(3)(4)
2016(2)	62,331	62,000	105.94	8.68	12.94
2017	62,623	62,323	113.19	9.00	19.8
2018	62,915	62,615	115.89	9.20	20.2
2019	63,207	62,907	117.50	9.33	20.5
2020	63,500	63,200	117.32	9.36	20.6
2021	63,750	63,450	117.16	9.38	20.6
2022	64,000	63,700	117.00	9.40	20.6
2023	64,250	63,950	116.84	9.41	20.7
2024	64,500	64,100	116.75	9.43	20.7
2025	64,750	64,450	116.53	9.45	20.8
2030	66,000	65,700	117.16	9.64	21.2
2040	68,500	68,200	117.01	9.92	21.8

(1) Excludes populations served in Lakeville, Eagan and Savage via wholesale water provided by Burnsville and approximately 150 properties in SW Burnsville served by private wells.

(2) Actual data from 2016 water use report

(3) Includes wholesale water provided to Lakeville, Eagan and Savage.

(4) Maximum Day Peaking Factor 2.2

GPCD – Gallons per Capita per Day **MGD** – Million Gallons per Day

Projection Method

Describe the method used to project water demand, including assumptions for population and business growth and how water conservation and efficiency programs affect projected water demand:

Population Served

Utilizing current Met Council population data for 2016 and 2017 and projected data for 2020, 2030 and 2040 the population served was projected (Burnsville only) for the analysis period. This excludes populations served in Lakeville, Eagan and Savage and populations served by private wells in Burnsville. Future wholesale water supplied for these communities is fixed. Inclusion of their populations skews actual Burnsville uses and projections.

Projected Total Per Capita Water Demand (Burnsville Only)

Total annual water pumped for Burnsville only was project by estimating future annual uses for Residential, Commercial/Industrial, Water Supplier Services and Unmetered/Unaccounted water for all years. This was based on projected future population served. The City is fully developed so the only anticipated increases are related to a small increase in population served of only about 6,000 residents over the projection period. To calculate that increase based on residential growth, the City selected a fixed residential per capita use post 2018. For 2016 and 2017 the amounts were calculated using actual (2016) use and year to date (2017) information. For 2018 we will see a transition as our meter replacement is completed and the City's unaccounted water decreases while the metered residential and commercial/industrial water increases as it is accounted for.

Based on an estimated amount of unaccounted water shifting to residential and residential per capita average for the past 7 years a Residential Per Capita Demand of 70 GPCD was used for future projections from 2019-2040. The City's unaccounted for water use was assumed to drop to 10% after the water meter project is complete. Pilot meter projects indicated a recapture of 5-8% of this water once the system was updated. This would reduce the average unmetered/unaccounted water amount to about 10%.

Based on the future total water pumped (calculated above) for each year, the total per capita water demand for Burnsville was calculated utilizing on the City's population served. The City does not plan to provide additional water to Eagan, Lakeville or Savage above the amount currently provided annually through 2040. The current quarry configuration and aesthetic water quality constraints limit the amount of water Burnsville can provide Savage long term to the current amount.

Projected Average Daily Demand

This was calculated utilizing total water pumped projections generated above as part of the Projected Total Per Capita Water Demand plus the Wholesale delivery amounts to Lakeville, Eagan and Savage estimated for each year. The wholesale amounts are fixed and not expected to change over the analysis period.

Projected Maximum Daily Demand

This was calculated by multiplying a maximum day peaking factor by the Projected Average Daily Demand. The highest peaking factor in the last 7 years was 2.2 which was used utilized for calculate the Maximum Daily Demand. The average peaking factor from 2010-2016 was 1.76, indicating project maximum daily demand will be generally overestimated as only 3 times in the past 10 years did the maximum daily demand exceed 19 MGD.

4. Resource Sustainability

Monitoring – *Key DNR Benchmark*

Complete Table 8 by inserting information about source water quality and quantity monitoring efforts. The list should include all production wells, observation wells, and source water intakes or reservoirs. Groundwater level data for DNR's statewide network of observation wells are available online through the DNR's Cooperative Groundwater Monitoring (CGM) webpage.

Table 8. Information about source water quality and quantity monitoring

MN Unique Well # or Surface Water ID	Type of monitoring point	Monitoring program	Frequency of monitoring	Monitoring Method
206177	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☐ routine water utility sampling ☐ other	☒ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☒ SCADA ☐ grab sampling ☒ steel tape ☐ stream gauge
206176	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☐ routine water utility sampling ☐ other	☐ continuous ☐ hourly ☒ daily ☒ monthly ☐ quarterly ☐ annually	☒ SCADA ☐ grab sampling ☒ steel tape ☐ stream gauge
206170	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☐ routine water utility sampling ☐ other	☒ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☒ SCADA ☐ grab sampling ☒ steel tape ☐ stream gauge
206178	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☐ routine water utility sampling ☐ other	☒ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☒ SCADA ☐ grab sampling ☒ steel tape ☐ stream gauge
206179	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☐ routine water utility sampling ☐ other	☒ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☒ SCADA ☐ grab sampling ☒ steel tape ☐ stream gauge
206171	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☐ routine water utility sampling ☐ other	☒ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☒ SCADA ☐ grab sampling ☒ steel tape ☐ stream gauge

MN Unique Well # or Surface Water ID	Type of monitoring point	Monitoring program	Frequency of monitoring	Monitoring Method
206174	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☐ routine water utility sampling ☐ other	☒ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☒ SCADA ☐ grab sampling ☒ steel tape ☐ stream gauge
206172	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☐ routine water utility sampling ☐ other	☒ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☒ SCADA ☐ grab sampling ☒ steel tape ☐ stream gauge
127261	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☐ routine water utility sampling ☐ other	☒ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☒ SCADA ☐ grab sampling ☒ steel tape ☐ stream gauge
127259	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☐ routine water utility sampling ☐ other	☒ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☒ SCADA ☐ grab sampling ☒ steel tape ☐ stream gauge
150359	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☐ routine water utility sampling ☐ other	☒ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☒ SCADA ☐ grab sampling ☒ steel tape ☐ stream gauge
439856	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☐ routine water utility sampling ☐ other	☒ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☒ SCADA ☐ grab sampling ☒ steel tape ☐ stream gauge
112235	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☐ routine water utility sampling ☐ other	☒ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☒ SCADA ☐ grab sampling ☒ steel tape ☐ stream gauge

MN Unique Well # or Surface Water ID	Type of monitoring point	Monitoring program	Frequency of monitoring	Monitoring Method
505676	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☐ routine water utility sampling ☐ other	☒ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☒ SCADA ☐ grab sampling ☒ steel tape ☐ stream gauge
505677	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☐ routine water utility sampling ☐ other	☒ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☒ SCADA ☐ grab sampling ☒ steel tape ☐ stream gauge
420992	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☐ routine water utility sampling ☐ other	☒ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☒ SCADA ☐ grab sampling ☒ steel tape ☐ stream gauge
686255	☒ production well ☐ observation well ☐ source water intake ☐ source water reservoir	☒ routine MDH sampling ☐ routine water utility sampling ☐ other	☒ continuous ☐ hourly ☐ daily ☒ monthly ☐ quarterly ☐ annually	☒ SCADA ☐ grab sampling ☒ steel tape ☐ stream gauge
2007-0101	☐ production well ☐ observation well ☐ source water intake ☒ source water reservoir	☒ routine MDH sampling ☒ routine water utility sampling ☒ other	☒ continuous ☐ hourly ☒ daily ☒ monthly ☒ quarterly ☐ annually	☒ SCADA ☒ grab sampling ☐ steel tape ☒ stream gauge

Water Level Data

A water level monitoring plan that includes monitoring locations and a schedule for water level readings must be submitted as **Appendix 2**. If one does not already exist, it needs to be prepared and submitted with the WSP. Ideally, all production and observation wells are monitored at least monthly.

Complete Table 9 to summarize water level data for each well being monitored. Provide the name of the aquifer and a brief description of how much water levels vary over the season (the difference between the highest and lowest water levels measured during the year) and the long-term trends for each well. If water levels are not measured and recorded on a routine basis, then provide the static water level when each well was constructed and the most recent water level measured during the same season the well was constructed. Also include all water level data taken during any well and pump maintenance. Add rows to the table as needed.

Groundwater hydrographs illustrate the historical record of aquifer water levels measured within a well and can indicate water level trends over time. For each well in your system, provide a hydrograph for

the life of the well, or for as many years as water levels have been measured. Include the hydrographs in **Appendix 3**. An example of a hydrograph can be found on the DNR's Groundwater Hydrograph webpage. Hydrographs for DNR Observation wells can be found in the CGM discussed above.

Table 9. Water level data

Unique Well Number or Well ID	Aquifer Name	Seasonal Variation (Feet)	Long-term Trend in water level data	Water level measured during well/pumping maintenance
206177	Jordan	105 Ft	☐ Falling ☒ Stable ☐ Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____
206176	Jordan	116 Ft	☐ Falling ☐ Stable ☒ Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____
206170	Jordan	25 Ft	☐ Falling ☒ Stable ☐ Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____
206178	Jordan	104 Ft	☐ Falling ☐ Stable ☒ Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____
206179	Jordan	117 Ft	☐ Falling ☒ Stable ☐ Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____
206171	Jordan	88 Ft	☐ Falling ☒ Stable ☐ Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____
206174	Jordan	102 Ft	☐ Falling ☒ Stable ☐ Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____
206172	Prairie du Chien	75 Ft	☐ Falling ☒ Stable ☐ Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____
127261	Tunnel City-Wonewoc	124 Ft	☐ Falling ☒ Stable ☐ Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____
127259	Jordan	79 Ft	☐ Falling ☒ Stable ☐ Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____
150359	Mt. Simon/Hinkley	196 Ft	☐ Falling ☐ Stable ☒ Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____
439856	Jordan	72 Ft	☐ Falling ☒ Stable ☐ Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____
112235	Jordan	26 Ft	☐ Falling ☒ Stable ☐ Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____

Unique Well Number or Well ID	Aquifer Name	Seasonal Variation (Feet)	Long-term Trend in water level data	Water level measured during well/pumping maintenance
505676	Mt. Simon/Hinkley	129 Ft	☐ Falling ☒ Stable ☐ Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____
505677	Jordan	73 Ft	☐ Falling ☒ Stable ☐ Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____
420992	Jordan	45 Ft	☐ Falling ☐ Stable ☒ Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____
686255	Jordan	57 Ft	☐ Falling ☐ Stable ☒ Rising	MM/DD/YY:____ MM/DD/YY:____ MM/DD/YY:____

Potential Water Supply Issues & Natural Resource Impacts – *Key DNR & Metropolitan Council Benchmark*

Complete Table 10 by listing the types of natural resources that are or could potentially be impacted by permitted water withdrawals in the future. You do not need to identify every single water resource in your entire community. The goal is to help you triage the most important water resources and/or the water resources that may be impacted by your water supply system – perhaps during a drought or when the population has grown significantly in ten years. This is emerging science, so do the best you can with available data. For identified resources, provide the name of specific resources that may be impacted. Identify what the greatest risks to the resource are and how the risks are being assessed. Identify any resource protection thresholds – formal or informal – that have been established to identify when actions should be taken to mitigate impacts. Provide information about the potential mitigation actions that may be taken, if a resource protection threshold is crossed. Add additional rows to the table as needed. See the glossary at the end of the template for definitions.

Some of this baseline data should have been in your earlier water supply plans or county comprehensive water plans. When filling out this table, think of what are the water supply risks, identify the resources, determine the threshold and then determine what your community will do to mitigate the impacts.

Your DNR area hydrologist is available to assist with this table.

For communities in the seven-county Twin Cities metropolitan area, the Master Water Supply Plan *Appendix 1 (Water Supply Profiles)*, provides information about potential water supply issues and natural resource impacts for your community.

Steps for completing Table 10

1. ***Identify the potential for natural resource impacts/issues within the community***
   First, review available information to identify resources that may be impacted by the operation of your water supply system (such as pumping).

Potential Sources of Information:

- County Geologic Atlas
- Local studies
- Metropolitan Council System Statement (for metro communities)
- Metropolitan Council Master Water Supply Plan (for metro communities)

ACTION: Check the resource type(s) that may be impacted in the column "Resource Type"

2. ***Identify where your water supply system is most likely to impact those resources (and vice versa).***

Potential Sources of Information:

- Drinking Water Supply Management Areas
- Geologic Atlas - Sensitivity
- If no WHPA or other information exists, consider rivers, lakes, wetlands and significant within 1.5 miles of wells; and calcareous fens and trout streams within 5 miles of wells

ACTION: Focus the rest of your work in these areas.

3. ***Within focus areas, identify specific features of value to the community***

You know your community best. What resources are important to pay attention to? It may be useful to check in with your community's planning and zoning staff and others.

Potential Sources of Information:

- Park plans
- Local studies
- Natural resource inventories
- Tourist attractions/recreational areas/valued community resource

ACTION: Identify specific features that the community prioritizes in the "Resource Name" column (for example: North Lake, Long River, Brook Trout Stream, or Green Fen). If, based on a review of available information, no features are likely to be at risk, note "None".

4. ***Identify what impact(s) the resource is at risk for***

Potential Sources of Information:

- Wellhead Protection Plan
- Water Appropriation Permit
- County Geologic Atlas
- MDH or PCA reports of the area
- Metropolitan Council System Statement (for metro communities)
- Metropolitan Council Master Water Supply Plan (for metro communities)

ACTION: Check the risk type in the column "Risk". If, based on a review of available information, no risk is identified, note "None anticipated".

5. ***Describe how the risk was assessed***

Potential Sources of Information:

- Local studies

- Monitoring data (community, WMO, DNR, etc.)
- Aquifer testing
- County Geologic Atlas or other hydrogeologic studies
- Regional or state studies, such as DNR's report 'Definitions and Thresholds for Negative Impacts to Surface Waters'
- Well boring logs

ACTION: Identify the method(s) used to identify the risk to the resource in the "Risk Assessed Through" column

6. *Describe protection threshold/goals*

What is the goal, if any, for protecting these resources? For example, is there a lower limit on acceptable flow in a river or stream? Water quality outside of an accepted range? A lower limit on acceptable aquifer level decline at one or more monitoring wells? Withdrawals that exceed some percent of the total amount available from a source? Or a lower limit on acceptable changes to a protected habitat?

Potential Sources of Information:

- County Comprehensive Water Plans
- Watershed Plans or One Watershed/One Plan
- Groundwater or Aquifer Plans
- Metropolitan Master Plans
- DNR Thresholds study
- Community parks, open space, and natural resource plans

ACTION: Describe resource protection goals in the "Describe Resource Protection Threshold" column or reference an existing plan/document/webpage

7. *If a goal/threshold should trigger action, describe the plan that will be implemented.*

Identify specific action, mitigation measures or management plan that the water supplier will implement, or refer to a partner's plan that includes actions to be taken.

Potential Sources of Information:

- County Comprehensive Water Plans
- Watershed Plans or One Watershed/One Plan
- Groundwater or Aquifer Plans
- Metropolitan Master Plans
- Studies such as DNR Thresholds study

ACTION: Describe the mitigation measure or management plan in the "Mitigation Measure or Management Plan" column.

8. *Describe work to evaluate these risks going forward.*

For example, what is the plan to regularly check in to stay current on plans or new data?

Identify specific action that the water supplier will take to identify the creation of or change to goals/thresholds, or refer to a partner's plan that includes actions to be taken.

Potential Sources of Information:

- County Comprehensive Water Plans
- Watershed Plans or One Watershed/One Plan
- Groundwater or Aquifer Plans
- Metropolitan Master Plans
- Studies such as DNR Thresholds study

ACTION: Describe what will be done to evaluate risks going forward, including any changes to goals or protection thresholds in the "Describe how Changes to Goals are monitored" column.

Table 10. Natural resource impacts (*List specific resources in Appendix 12)

Resource Type	Resource Name	Risk(1)	Risk Assessed Through *	Describe Resource Protection Threshold or Goal *	Mitigation Measures or Management Plan	Describe How Thresholds or Goals are Monitored
☒ River or stream	Minnesota River	☒ None anticipated ☐ Flow/water level decline ☐ Degrading water quality trends ☐ Impacts on endangered, threatened, or special concern species habitat ☐ Other: _____	☐ Geologic atlas or other mapping ☐ Modeling ☒ Modeling ☐ Monitoring ☐ Aquifer testing ☐WRAPS or other watershed report ☐Proximity (<1.5 miles) ☒ Other: Met Council	☒ Not applicable ☐ Additional data is needed to establish ☐ See report: _____ ☐ No data available ☐ Other: _____	☒Not applicable ☐ Change groundwater pumping ☐ Increase conservation ☐ Other: _____	☐Not applicable ☐ Newly collected data will be analyzed ☒ Regular check-in with these partners: __X_Met Council & MNDNR_____ ☐ Other: _____
☒ Calcareous fen	Black Dog	☒ None anticipated ☐ Flow/water level decline ☐ Degrading water quality trends ☐ Impacts on endangered, threatened, or special concern species habitat ☒ Other: _Because of the surface water source we use the quality of the fen is improving_____	☐ Geologic atlas or other mapping ☐ Modeling ☒ Modeling ☒ Monitoring ☒ Aquifer testing ☐WRAPS or other watershed Report ☐Proximity (<5 miles) ☐ Other: _____ ☐ Other: ___	☐ Not applicable ☐ Additional data is needed to establish ☒ See report: _Met Council Calcareous Fen: Generalized Monitoring Strategy_____ ☐ Other: _____	☐Not applicable ☐ Change groundwater pumping ☐ Increase conservation ☒ Other: _Review MNDNR & Met Council Recommendations_____	☐Not applicable ☐ Newly collected data will be analyzed ☒ Regular check-in with these partners: _ Met Council & MNDNR _____ ☐ Other: _____

Resource Type	Resource Name	Risk(1)	Risk Assessed Through *	Describe Resource Protection Threshold or Goal *	Mitigation Measures or Management Plan	Describe How Thresholds or Goals are Monitored
☒ Lake	Black Dog Lake PW #19008300	☒ None anticipated ☐ Flow/water level decline ☐ Degrading water quality trends ☐ Impacts on endangered, threatened, or special concern species habitat ☐ Other: _____	☐ Geologic atlas or other mapping ☐ Modeling ☐ Modeling ☐ Monitoring ☐ Aquifer testing ☐WRAPS or other watershed report ☐Proximity (<1.5 miles) ☒ Other: Lake levels are influenced by Mn River_____ ____ ☐ Other: ___	☒ Not applicable ☐ Additional data is needed to establish ☐ See report: _____ ☐ Other: _____	☒Not applicable ☐ Change groundwater pumping ☐ Increase conservation ☐ Other: _____	☒Not applicable ☐ Newly collected data will be analyzed ☐ Regular check-in with these partners: _____ ☐ Other: _____
☒ Wetland	Includes Public Waters #19011000 #19010900	☒ None anticipated ☐ Flow/water level decline ☐ Degrading water quality trends ☐ Impacts on endangered, threatened, or special concern species habitat ☐ Other: _____	☐ Geologic atlas or other mapping ☐ Modeling ☒ Modeling ☐ Monitoring ☐ Aquifer testing ☐WRAPS or other watershed report ☐Proximity (<1.5 miles) ☐ Other: _____	☒ Not applicable ☐ Additional data is needed to establish ☐ See report: _____ ☐ Other: _____	☒Not applicable ☐ Change groundwater pumping ☐ Increase conservation ☐ Other: _____	☒Not applicable ☐ Newly collected data will be analyzed ☐ Regular check-in with these partners: _____ _ ☐ Other: _____

Resource Type	Resource Name	Risk(1)	Risk Assessed Through *	Describe Resource Protection Threshold or Goal *	Mitigation Measures or Management Plan	Describe How Thresholds or Goals are Monitored
☒ Trout stream	Trout Stream #4 and #7	☒ None anticipated ☐ Flow/water level decline ☐ Degrading water quality trends ☐ Impacts on endangered, threatened, or special concern species habitat ☐ Other: _____	☐ Geologic atlas or other mapping ☒ Modeling ☐ Monitoring ☐ Aquifer testing ☐WRAPS or other watershed report ☐Proximity (< 5 miles) ☐ Other: _____	☒ Not applicable ☐ Additional data is needed to establish ☐ See report: _____ ☐ Other: _____	☒Not applicable ☐ Change groundwater pumping ☐ Increase conservation ☐ Other: _____	☒Not applicable ☐ Newly collected data will be analyzed ☐ Regular check-in with these partners: _____ ☐ Other: _____
☒ Aquifer	Jordan, Mt. Simon-Hinkley, Prairie du Chien-Jordan, Tunnel City-Mt. Simon	☒ None anticipated ☐ Flow/water level decline ☐ Degrading water quality trends ☐ Impacts on endangered, threatened, or special concern species habitat ☐ Other: _____	☐ Geologic atlas or other mapping ☐ Modeling ☐ Monitoring ☐ Aquifer testing ☐Proximity (obwell < 5 miles) ☒ Other: __MDH, MDNR, and Met Council Reports_____	☐ Not applicable ☒ Additional data is needed to establish ☐ See report: _____ ☐ Other: _____	☐Not applicable ☐ Change groundwater pumping ☒ Increase conservation ☐ Other: _____	☐Not applicable ☐ Newly collected data will be analyzed ☒ Regular check-in with these partners: MNDR & MDH_____ ☐ Other: _____

(1) Burnsville is fully developed and growth will have a very minimal impact on water demand. It is expected that current annual fluctuations due to weather will continue to be the largest impact on annual water pumped. Current monitoring and future Met Council (post Kramer Quarry) show that ground water levels in Burnsville are stable and will actually increase in the future due to the cessation of the quarry.

Wellhead Protection (WHP) and Source Water Protection (SWP) Plans

Complete Table 11 to provide status information about WHP and SWP plans.

The emergency procedures in this plan are intended to comply with the contingency plan provisions required in the Minnesota Department of Health's (MDH) Wellhead Protection (WHP) Plan and Surface Water Protection (SWP) Plan.

Table 11. Status of Wellhead Protection and Source Water Protection Plans

Plan Type	Status	Date Adopted	Date for Update
WHP	☐ In Process ☒ Completed ☐ Not Applicable	June 2013	2023
Drinking Water Protection Overlay District	☐ In Process ☒ Completed ☐ Not Applicable	June 2015	Ongoing

WHP – Wellhead Protection Plan **SWP** – Source Water Protection Plan

5. The City adopted a Drinking Water Protection Overlay District and amended ordinances for enforcement in in June of 2015. This district includes the City's WHPA and surface water protection area. Capital Improvement Plan (CIP)

Please note that any wells that received approval under a ten-year permit, but that were not built, are now expired and must submit a water appropriations permit.

Adequacy of Water Supply System

Complete Table 12 with information about the adequacy of wells and/or intakes, storage facilities, treatment facilities, and distribution systems to sustain current and projected demands. List planned capital improvements for any system components, in chronological order. Communities in the seven-county Twin Cities metropolitan area should also include information about plans through 2040.

The assessment can be the general status by category; it is not necessary to identify every single well, storage facility, treatment facility, lift station, and mile of pipe.

Please attach your latest Capital Improvement Plan as **Appendix 4**.

Table 12. Adequacy of Water Supply System

System Component	Planned action	Anticipated Construction Year	Notes
Wells/Intakes	☐ No action planned - adequate ☒ Repair/replacement ☐ Expansion/addition	Yearly-A maximum of 10 years between rehabs	Well Rehab Projects
Water Storage Facilities	☐ No action planned - adequate ☒ Repair/replacement ☐ Expansion/addition	2021, 2022, 2023, and 2034, 2035, 2036	Repair and painting projects

System Component	Planned action	Anticipated Construction Year	Notes
Water Treatment Facilities	☐ No action planned - adequate ☒ Repair/replacement ☐ Expansion/addition	2017/2018	This winter we will begin a rehab project of the groundwater treatment plant. Anticipated completion date is April 2018
Distribution Systems (Pipes, valves, etc.)	☐ No action planned - adequate ☒ Repair/replacement ☐ Expansion/addition	Watermain, Valves and Hydrants – Yearly Water Meters and AMI System- Every 20 years	Yearly replacement of approximately three miles of watermain, valves, and hydrants. Currently replacing all customer meters and AMI system. Expected to be complete by end of 2018.
Pressure Zones	☐ No action planned - adequate ☒ Repair/replacement ☐ Expansion/addition	Every other year replacement project	A plan to replace/rehab our PRV stations is in place and is completed every other year
Other:	☒ No action planned - adequate ☐ Repair/replacement ☐ Expansion/addition		

Proposed Future Water Sources

Complete Table 13 to identify new water source installation planned over the next ten years. Add rows to the table as needed.

Table 13. Proposed future installations/sources

Source	Installation Location (approximate)	Resource Name	Proposed Pumping Capacity (gpm)	Planned Installation Year	Planned Partnerships
Groundwater	None				
Surface Water	None				
Interconnection to another supplier	None				

Water Source Alternatives - *Key Metropolitan Council Benchmark*

Do you anticipate the need for alternative water sources in the next 10 years? Yes ☐ No ☒

For metro communities, will you need alternative water sources by the year 2040? Yes ☐ No ☒

If you answered yes for either question, then complete table 14. If no, insert NA.

Complete Table 14 by checking the box next to alternative approaches that your community is considering, including approximate locations (if known), the estimated amount of future demand that could be met through the approach, the estimated timeframe to implement the approach, potential partnerships, and the major benefits and challenges of the approach. Add rows to the table as needed.

For communities in the seven-county Twin Cities metropolitan area, these alternatives should include approaches the community is considering to meet projected 2040 water demand.

Table 14. Alternative water sources

Alternative Source Considered	Source and/or Installation Location (approximate)	Estimated Amount of Future Demand (%)	Timeframe to Implement (YYYY)	Potential Partners	Benefits	Challenges
☐ Groundwater	NA					
☐ Surface Water	N/A					
☐ Reclaimed stormwater	N/A					
☐ Reclaimed wastewater	N/A					
☐ Interconnection to another supplier	N/A					

PART 2. EMERGENCY PREPAREDNESS PROCEDURES

The emergency preparedness procedures outlined in this plan are intended to comply with the contingency plan provisions required by MDH in the WHP and SWP. Water emergencies can occur as a result of vandalism, sabotage, accidental contamination, mechanical problems, power failings, drought, flooding, and other natural disasters. The purpose of emergency planning is to develop emergency response procedures and to identify actions needed to improve emergency preparedness. In the case of a municipality, these procedures should be in support of, and part of, an all-hazard emergency operations plan. Municipalities that already have written procedures dealing with water emergencies should review the following information and update existing procedures to address these water supply protection measures.

A. Emergency Response Plan

Section 1433(b) of the Safe Drinking Water Act, (Public Law 107-188, Title IV- Drinking Water Security and Safety) requires community water suppliers serving over 3,300 people to prepare an Emergency Response Plan. MDH recommends that Emergency Response Plans are updated annually.

Do you have an Emergency Response Plan? Yes ☒ No ☐

Have you updated the Emergency Response Plan in the last year? Yes ☒ No ☐

When did you last update your Emergency Response Plan? ___City Wide Plan - May 2017_____

Complete Table 15 by inserting the noted information regarding your completed Emergency Response Plan.

Table 15. Emergency Response Plan contact information

Emergency Response Plan Role	Contact Person	Contact Phone Number	Contact Email
Emergency Response Lead	LINDA MULLEN	952-292-5577	LINDA.MULLEN@BURNSVILLEMN.GOV
Alternate Emergency Response Lead	STEVE ALBRECHT	952-406-2687	STEVE.ALBRECHT@BURNSVILLEMN.GOV

B. Operational Contingency Plan

All utilities should have a written operational contingency plan that describes measures to be taken for water supply mainline breaks and other common system failures as well as routine maintenance.

Do you have a written operational contingency plan? Yes ☐ No ☒

At a minimum, a water supplier should prepare and maintain an emergency contact list of contractors and suppliers.

C. Emergency Response Procedures

Water suppliers must meet the requirements of MN Rules 4720.5280. Accordingly, the Minnesota Department of Natural Resources (DNR) requires public water suppliers serving more than 1,000 people to submit Emergency and Conservation Plans. Water emergency and conservation plans that have been approved by the DNR, under provisions of Minnesota Statute 186 and Minnesota Rules, part 6115.0770, will be considered equivalent to an approved WHP contingency plan.

Emergency Telephone List

Prepare and attach a list of emergency contacts, including the MN Duty Officer (1-800-422-0798), as **Appendix 5**. An Emergency Contact List template is available at the MnDNR Water Supply Plans webpage.

The list should include key utility and community personnel, contacts in adjacent water suppliers, and appropriate local, state and federal emergency contacts. Please be sure to verify and update the contacts on the emergency telephone list and date it. Thereafter, update on a regular basis (once a year is recommended). In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the Emergency Manager for that community. Responsibilities and services for each contact should be defined.

Current Water Sources and Service Area

Quick access to concise and detailed information on water sources, water treatment, and the distribution system may be needed in an emergency. System operation and maintenance records should

be maintained in secured central and back-up locations so that the records are accessible for emergency purposes. A detailed map of the system showing the treatment plants, water sources, storage facilities, supply lines, interconnections, and other information that would be useful in an emergency should also be readily available. It is critical that public water supplier representatives and emergency response personnel communicate about the response procedures and be able to easily obtain this kind of information both in electronic and hard copy formats (in case of a power outage).

Do records and maps exist? Yes ☒ No ☐

Can staff access records and maps from a central secured location in the event of an emergency?

Yes ☒ No ☐

Does the appropriate staff know where the materials are located?

Yes ☒ No ☐

Procedure for Augmenting Water Supplies

Complete Tables 16 – 17 by listing all available sources of water that can be used to augment or replace existing sources in an emergency. Add rows to the tables as needed.

In the case of a municipality, this information should be contained in a notification and warning standard operating procedure maintained by the warning point for that community. Municipalities are encouraged to execute cooperative agreements for potential emergency water services and copies should be included in **Appendix 6**. Outstate Communities may consider using nearby high capacity wells (industry, golf course) as emergency water sources.

WSP should include information on any physical or chemical problems that may limit interconnections to other sources of water. Approvals from the MDH are required for interconnections or the reuse of water.

Table 16. Interconnections with other water supply systems to supply water in an emergency

Other Water Supply System Owner	Capacity (GPM & MGD)	Note Any Limitations On Use	List of services, equipment, supplies available to respond
City of Apple Valley	DEPENDS ON TANK ELEVATIONS OF BOTH CITIES	ELEVATION	MNWARN CITY DAKOTA COUNTY EMERGENCY SERVICES JPA
City of Lakeville A	DEPENDS ON TANK ELEVATIONS OF BOTH CITIES	N/A	MNWARN CITY DAKOTA COUNTY JPA
City of Lakeville B	DEPENDS ON TANK ELEVATIONS OF BOTH CITIES	N/A	MNWARN CITY DAKOTA COUNTY EMERGENCY SERVICES JPA

Other Water Supply System Owner	Capacity (GPM & MGD)	Note Any Limitations On Use	List of services, equipment, supplies available to respond
City of Savage	DEPENDS ON TANK ELEVATIONS OF BOTH CITIES	PIPE DIAMETER	MNWARN CITY DAKOTA COUNTY EMERGENCY SERVICES JPA

GPM – Gallons per minute MGD – million gallons per day

Table 17. Utilizing surface water as an alternative source

Surface Water Source Name	Capacity (GPM)	Capacity (MGD)	Treatment Needs	Note Any Limitations On Use
Quarry Surface Water Treatment Plant	3,500 GPM	4 – 6 MGD	OXIDATION, FLOCCULATION, FILTRATION, T & O, DISENFECTION	NONE

If not covered above, describe additional emergency measures for providing water (obtaining bottled water, or steps to obtain National Guard services, etc.)

We are confident our interconnections with neighboring cities will provide the water we need in an emergency. If needed we will activate a MnWARN event.

Allocation and Demand Reduction Procedures

Complete Table 18 by adding information about how decisions will be made to allocate water and reduce demand during an emergency. Provide information for each customer category, including its priority ranking, average day demand, and demand reduction potential for each customer category. Modify the customer categories as needed, and add additional lines if necessary.

Water use categories should be prioritized in a way that is consistent with Minnesota Statutes 103G.261 (#1 is highest priority) as follows:

1. Water use for human needs such as cooking, cleaning, drinking, washing and waste disposal; use for on-farm livestock watering; and use for power production that meets contingency requirements.
2. Water use involving consumption of less than 10,000 gallons per day (usually from private wells or surface water intakes)
3. Water use for agricultural irrigation and processing of agricultural products involving consumption of more than 10,000 gallons per day (usually from private high-capacity wells or surface water intakes)
4. Water use for power production above the use provided for in the contingency plan.
5. All other water use involving consumption of more than 10,000 gallons per day.
6. Nonessential uses – car washes, golf courses, etc.

Water used for human needs at hospitals, nursing homes and similar types of facilities should be designated as a high priority to be maintained in an emergency. Lower priority uses will need to address water used for human needs at other types of facilities such as hotels, office buildings, and manufacturing plants. The volume of water and other types of water uses at these facilities must be carefully considered. After reviewing the data, common sense should dictate local allocation priorities to protect domestic requirements over certain types of economic needs. Water use for lawn sprinkling, vehicle washing, golf courses, and recreation are legislatively considered non-essential.

Table 18. Water use priorities

Customer Category	Allocation Priority	Average Daily Demand (GDP)	Short-Term Emergency Demand Reduction Potential (GPD)
Residential	1	3,740,597	406,389
Institutional	1	259,425	14,056
Commercial	2	848,901	290,479
Industrial	3	138,260	WINTER USAGE GREATER THAN SUMMER USAGE
Irrigation	6	TOTALED WITH COMMERCIAL	TOTALED WITH COMMERCIAL
Wholesale	1	2,726,438	1,300,000
Non-Essential	6	TOTALED WITH COMMERCIAL	TOTALED WITH COMMERCIAL
TOTAL	NA	7,713,621	1,720,445

GPD – Gallons per Day

Tip: Calculating Emergency Demand Reduction Potential

The emergency demand reduction potential for all uses will typically equal the difference between maximum use (summer demand) and base use (winter demand). In extreme emergency situations, lower priority water uses must be restricted or eliminated to protect priority domestic water requirements. Emergency demand reduction potential should be based on average day demands for customer categories within each priority class. Use the tables in Part 3 on water conservation to help you determine strategies.

Complete Table 19 by selecting the triggers and actions during water supply disruption conditions.

Table 19. Emergency demand reduction conditions, triggers and actions (Select all that may apply and describe)

Emergency Triggers	Short-term Actions	Long-term Actions
☒ Contamination ☒ Loss of production ☒ Infrastructure failure ☒ Executive order by Governor ☐ Other: _____	☒ Supply augmentation through emergency interconnections ☒ Adopt (if not already) and enforce a critical water deficiency ordinance to penalize lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. ☐ Water allocation through____ ☐ Meet with large water users to discuss their contingency plan.	☐ Supply augmentation through ____ ☒ Adopt (if not already) and enforce a critical water deficiency ordinance to penalize lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. ☐ Water allocation through____ ☒ Meet with large water users to discuss their contingency plan.

Notification Procedures

Complete Table 20 by selecting trigger for informing customers regarding conservation requests, water use restrictions, and suspensions; notification frequencies; and partners that may assist in the notification process. Add rows to the table as needed.

Table 20. Plan to inform customers regarding conservation requests, water use restrictions, and suspensions

Notification Trigger(s)	Methods (select all that apply)	Update Frequency	Partners
☒ Short-term demand reduction declared (< 1 year)	☒ Website ☐ Email list serve ☒ Social media (e.g. Twitter, Facebook) ☐ Direct customer mailing, ☒ Press release (TV, radio, newspaper), ☐ Meeting with large water users (> 10% of total city use) ☐ Other: _____	☒ Daily ☒ Weekly ☐ Monthly ☐ Annually	
☒ Long-term Ongoing demand reduction declared	☒ Website ☐ Email list serve ☒ Social media (e.g. Twitter, Facebook) ☒ Direct customer mailing, ☒ Press release (TV, radio, newspaper), ☒ Meeting with large water users (> 10% of total city use) ☐ Other: _____	☐ Daily ☐ Weekly ☒ Monthly ☐ Annually	
☒ Governor's critical water deficiency declared	☒ Website ☐ Email list serve ☒ Social media (e.g. Twitter, Facebook)	☒ Daily ☐ Weekly ☐ Monthly ☐ Annually	

Notification Trigger(s)	Methods (select all that apply)	Update Frequency	Partners
	☐ Direct customer mailing, ☒ Press release (TV, radio, newspaper), ☒ Meeting with large water users (> 10% of total city use) ☐ Other: _____		

Enforcement

Prior to a water emergency, municipal water suppliers must adopt regulations that restrict water use and outline the enforcement response plan. The enforcement response plan must outline how conditions will be monitored to know when enforcement actions are triggered, what enforcement tools will be used, who will be responsible for enforcement, and what timelines for corrective actions will be expected.

Affected operations, communications, and enforcement staff must then be trained to rapidly implement those provisions during emergency conditions.

Important Note:

Disregard of critical water deficiency orders, even though total appropriation remains less than permitted, is adequate grounds for immediate modification of a public water supply authority's water use permit (2013 MN Statutes 103G.291)

Does the city have a critical water deficiency restriction/official control in place that includes provisions to restrict water use and enforce the restrictions? (This restriction may be an ordinance, rule, regulation, policy under a council directive, or other official control) Yes ☒ No ☐

If yes, attach the official control document to this WSP as **Appendix 7**.

If no, the municipality must adopt such an official control within 6 months of submitting this WSP and submit it to the DNR as an amendment to this WSP.

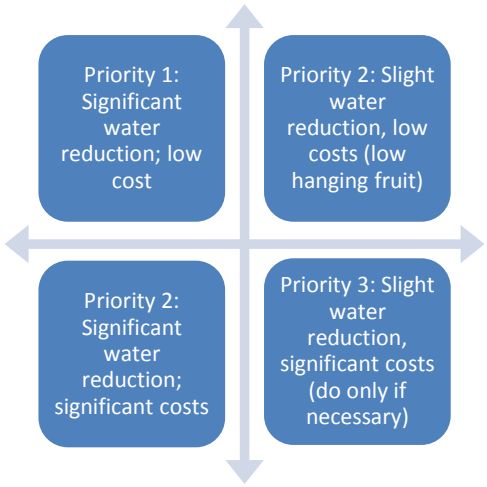
Irrespective of whether a critical water deficiency control is in place, does the public water supply utility, city manager, mayor, or emergency manager have standing authority to implement water restrictions? Yes ☒ No ☐

If yes, cite the regulatory authority reference: City Code 7-2-17: Water Use Restrictions; Penalties.

If no, who has authority to implement water use restrictions in an emergency?

PART 3. WATER CONSERVATION PLAN

Minnesotans have historically benefited from the state's abundant water supplies, reducing the need for conservation. There are however, limits to the available supplies of water and increasing threats to the quality of our drinking water. Causes of water supply limitation may include: population increases, economic trends, uneven statewide availability of groundwater, climatic changes, and degraded water quality. Examples of threats to drinking water quality include: the presence of contaminant plumes from past land use activities, exceedances of water quality standards from natural and human sources, contaminants of emerging concern, and increasing pollutant trends from nonpoint sources.



There are many incentives for conserving water; conservation:

- reduces the potential for pumping-induced transfer of contaminants into the deeper aquifers, which can add treatment costs
- reduces the need for capital projects to expand system capacity
- reduces the likelihood of water use conflicts, like well interference, aquatic habitat loss, and declining lake levels
- conserves energy, because less energy is needed to extract, treat and distribute water (and less energy production also conserves water since water is used to produce energy)
- maintains water supplies that can then be available during times of drought

It is therefore imperative that water suppliers implement water conservation plans. The first step in water conservation is identifying opportunities for behavioral or engineering changes that could be made to reduce water use by conducting a thorough analysis of:

- Water use by customer
- Extraction, treatment, distribution and irrigation system efficiencies
- Industrial processing system efficiencies
- Regulatory and barriers to conservation
- Cultural barriers to conservation
- Water reuse opportunities

Once accurate data is compiled, water suppliers can set achievable goals for reducing water use. A successful water conservation plan follows a logical sequence of events. The plan should address both conservation on the supply side (leak detection and repairs, metering), as well as on the demand side (reductions in usage). Implementation should be conducted in phases, starting with the most obvious and lowest-cost options. In some cases, one of the early steps will be reviewing regulatory constraints to water conservation, such as lawn irrigation requirements. Outside funding and grants may be available for implementation of projects. Engage water system operators and maintenance staff and customers in brainstorming opportunities to reduce water use. Ask the question: "How can I help save water?"

Progress since 2006

Is this your community's first Water Supply Plan? Yes ☐ No ☒

If yes, describe conservation practices that you are already implementing, such as: pricing, system improvements, education, regulation, appliance retrofitting, enforcement, etc.

N/A

If no, complete Table 21 to summarize conservation actions taken since the adoption of the 2006 water supply plan.

Table 21. Implementation of previous ten-year Conservation Plan

2006 Plan Commitments	Action Taken?
Change water rates structure to provide conservation pricing	☒ Yes ☐ No
Water supply system improvements (e.g. leak repairs, valve replacements, etc.)	☒ Yes ☐ No
Educational efforts	☒ Yes ☐ No
New water conservation ordinances	☐ Yes ☒ No
Rebate or retrofitting Program (e.g. for toilet, faucets, appliances, showerheads, dish washers, washing machines, irrigation systems, rain barrels, water softeners, etc. **A rebate program will be implemented in 2018.**	☐ Yes ☒ No
Enforcement **The City's new AMI system will allow for better enforcement of watering restrictions. Issues can be identified based on data and property owners contacted with concise dates and times of violations.**	☒ Yes ☐ No
Describe other **The City's new AMI system will also have the ability to identify watermain breaks and issues remotely in real time.**	☒ Yes ☐ No

What are the results you have seen from the actions in Table 21 and how were results measured?

Water supply improvements and the odd/even and midday ban have shown the best results for water conservation.

A. Triggers for Allocation and Demand Reduction Actions

Complete table 22 by checking each trigger below, as appropriate, and the actions to be taken at various levels or stages of severity. Add in additional rows to the table as needed.

Table 22. Short and long-term demand reduction conditions, triggers and actions

Objective	Triggers	Actions
Protect surface water flows	☐ Low stream flow conditions ☐ Reports of declining wetland and lake levels ☐ Other: _____	☐ Increase promotion of conservation measures ☐ Other: _____
Short-term demand reduction (less than 1 year	☒ Extremely high seasonal water demand (more than double winter demand) ☒ Loss of treatment capacity ☒ Lack of water in storage ☒ State drought plan ☒ Well interference ☐ Other: _____	☒ Adopt (if not already) and enforce the critical water deficiency ordinance to restrict or prohibit lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. ☒ Supply augmentation through interconnects with other cities. ☐ Water allocation through____ ☐ Meet with large water users to discuss user's contingency plan.
Long-term demand reduction (>1 year)	☒ Per capita demand increasing ☐ Total demand increase (higher population or more industry). Water level in well(s) below elevation of _____ ☐ Other: _____	☒ Develop a critical water deficiency ordinance that is or can be quickly adopted to penalize lawn watering, vehicle washing, golf course and park irrigation & other nonessential uses. ☐ Enact a water waste ordinance that targets overwatering (causing water to flow off the landscape into streets, parking lots, or similar), watering impervious surfaces (streets, driveways or other hardscape areas), and negligence of known leaks, breaks, or malfunctions. ☒ Meet with large water users to discuss user's contingency plan. ☒ Enhanced monitoring and reporting: audits, meters, billing, etc.
Governor's "Critical Water Deficiency Order" declared	☒ Water levels are approaching critically low levels and the Governor has requested water demand reduction measures	☐ Describe

B. Conservation Objectives and Strategies – *Key benchmark for DNR*

This section establishes water conservation objectives and strategies for eight major areas of water use.

Objective 1: Reduce Unaccounted (Non-Revenue) Water loss to Less than 10%

The Minnesota Rural Water Association, the Metropolitan Council and the Department of Natural Resources recommend that all water uses be metered. Metering can help identify high use locations and times, along with leaks within buildings that have multiple meters.

It is difficult to quantify specific unmetered water use such as that associated with firefighting and system flushing or system leaks. Typically, water suppliers subtract metered water use from total water pumped to calculate unaccounted or non-revenue water loss.

Is your five-year average (2005-2014) unaccounted Water Use in Table 2 higher than 10%?

Yes ☒ No ☐

What is your leak detection monitoring schedule? (e.g. Monitor 1/3rd of the city lines per year)

The City completes a yearly leak detection survey of one fourth of city lines per year.

Water Audits - are designed to help quantify and track water losses associated with water distribution systems and identify areas for improved efficiency and cost recovery. The American Water Works Association (AWWA) has a recommended water audit methodology which is presented in AWWA's M36 Manual of Water Supply Practices: Water Audits and Loss Control Programs. AWWA also provides a free spreadsheet-based water audit tool that water suppliers can use to conduct their own water audits. This free water audit tool can be found on AWWA's Water Loss Control webpage. Another resource for water audit and water loss control information is Minnesota Rural Water Association.

What is the date of your most recent water audit? _2017

Frequency of water audits: ☒ **yearly** ☐ **other (specify frequency) _____**

Leak detection and survey: ☒ **every year** ☐ **every other year** ☐ **periodic as needed**
Year last leak detection survey completed: 2017

If Table 2 shows annual water losses over 10% or an increasing trend over time, describe what actions will be taken to reach the <10% loss objective and within what timeframe

- **The City is currently replacing all meters with a smart meter/AMI system which will be completed by summer 2018. Pre-project meter inspections indicate that due to the age of the City's meter system, 5-8% of the unaccounted/unmetered water may be recaptured by replacement of the system. This is an $8M capital investment.**
- **A fulltime water meter and water loss technician has been added to maintain the meter system and reduce lost water.**
- **In 2018 the City will begin a retrofitting program offering rebates for replacing inefficient fixtures and appliances.**
- **In 2018 an intern has been budgeted to work with our fulltime water meter technician to utilize the new meter system to identify water loss issues.**

Metering -AWWA recommends that every water supplier install meters to account for all water taken into its system, along with all water distributed from its system at each customer's point of service. An effective metering program relies upon periodic performance testing, repair, maintenance or replacement of all meters. Drinking Water Revolving Loan Funds are available for purchase of new meters when new plants are built. AWWA also recommends that water suppliers conduct regular water audits to account for unmetered unbilled consumption, metered unbilled consumption and source

water and customer metering inaccuracies. Some cities install separate meters for interior and exterior water use, but some research suggests that this may not result in water conservation.

Complete Table 23 by adding the requested information regarding the number, types, testing and maintenance of customer meters.

Table 23. Information about customer meters

Customer Category	Number of Customers	Number of Metered Connections	Number of Automated Meter Readers	Meter testing intervals (years)*	Average **age/meter replacement schedule (years
Residential		15,730	15,730	*as needed	_<1_ / _15-20__
Irrigation meters		N/A	N/A	*as needed	_<1_ / _15-20__
Institutional		157	157	*as needed	_<1_ / _15-20__
Commercial		1,066	1,066	*as needed	_<1_ / _15-20__
Industrial		28	28	*as needed	_<1_ / _15-20__
Public facilities		N/A	N/A	*as needed	_<1_ / _15-20__
Other		N/A	N/A	*as needed	_<1_ / _15-20__
TOTALS		16,981	16,981	NA	NA

*The Cities new AMI system provides full 2 way real time reading of all meters in the city. The AMI software provides the City to identify meters as they begin to underreport or aren't working. These meters can either be tested, repaired or replaced.

** City is currently replacing all water meters in the City (expected to be completed by mid 2018). In the future larger meters will be replaced or repaired as needed based on performance as measured by the AMI system.

For unmetered systems, describe any plans to install meters or replace current meters with advanced technology meters. Provide an estimate of the cost to implement the plan and the projected water savings from implementing the plan.

N/A

Table 24. Water source meters

	Number of Meters	Meter testing schedule (years)	Number of Automated Meter Readers	Average age/meter replacement schedule (years
Water source (wells/intakes)	19	As the well is rehabilitated	2	__10_ / _20__
Treatment plant	2	Yearly	1	__8_ / _20__

Objective 2: Achieve Less than 75 Residential Gallons per Capita Demand (GPCD)

The 2002 average residential per capita demand in the Twin Cities Metropolitan area was 75 gallons per capita per day.

Is your average 2010-2015 residential per capita water demand in Table 2 more than 75? Yes ☐ No ☒

What was your 2010 – 2015 five-year average residential per capita water demand? 67.2 g/person/day

Describe the water use trend over that timeframe:

The residential per capita water demand has decreased slightly between 2010 and 2015. With installation of new water meters we expect the residential gpcd to increase as a portion of the unmetered water is metered as residential water. We estimate long term it will be about 70 gpcd.

Complete Table 25 by checking which strategies you will use to continue reducing residential per capita demand and project a likely timeframe for completing each checked strategy (Select all that apply and add rows for additional strategies):

Table 25. Strategies and timeframe to reduce residential per capita demand

Strategy to reduce residential per capita demand	Timeframe for completing work
☐ Revise city ordinances/codes to encourage or require water efficient landscaping.	
☐ Revise city ordinance/codes to permit water reuse options, especially for non-potable purposes like irrigation, groundwater recharge, and industrial use. Check with plumbing authority to see if internal buildings reuse is permitted	
☐ Revise ordinances to limit irrigation. Describe the restricted irrigation plan:	
☐ Revise outdoor irrigation installations codes to require high efficiency systems (e.g. those with soil moisture sensors or programmable watering areas) in new installations or system replacements.	
☐ Make water system infrastructure improvements	
☐ Offer free or reduced cost water use audits) for residential customers.	
☐ Implement a notification system to inform customers when water availability conditions change.	
☒ Provide rebates or incentives for installing water efficient appliances and/or fixtures indoors (e.g., low flow toilets, high efficiency dish washers and washing machines, showerhead and faucet aerators, water softeners, etc.)	Begin in 2018 and continuing yearly.
☒ Provide rebates or incentives to reduce outdoor water use (e.g., turf replacement/reduction, rain gardens, rain barrels, smart irrigation, outdoor water use meters, etc.)	Water resource enhancement grants are currently offered yearly
☐ Identify supplemental Water Resources	
☒ Conduct audience-appropriate water conservation education and outreach.	Ongoing
☐ Describe other plans	

Objective 3: Achieve at least 1.5% annual reduction in non-residential per capita water use

(For each of the next ten years, or a 15% total reduction over ten years.) This includes commercial, institutional, industrial and agricultural water users.

Complete Table 26 by checking which strategies you will used to continue reducing non-residential customer use demand and project a likely timeframe for completing each checked strategy (add rows for additional strategies).

Where possible, substitute recycled water used in one process for reuse in another. (For example, spent rinse water can often be reused in a cooling tower.) Keep in mind the true cost of water is the amount on the water bill PLUS the expenses to heat, cool, treat, pump, and dispose of/discharge the water. Don't just calculate the initial investment. Many conservation retrofits that appear to be prohibitively expensive are actually very cost-effective when amortized over the life of the equipment. Often reducing water use also saves electrical and other utility costs. Note: as of 2015, water reuse, and is not allowed by the state plumbing code, M.R. 4715 (a variance is needed). However, several state agencies are addressing this issue.

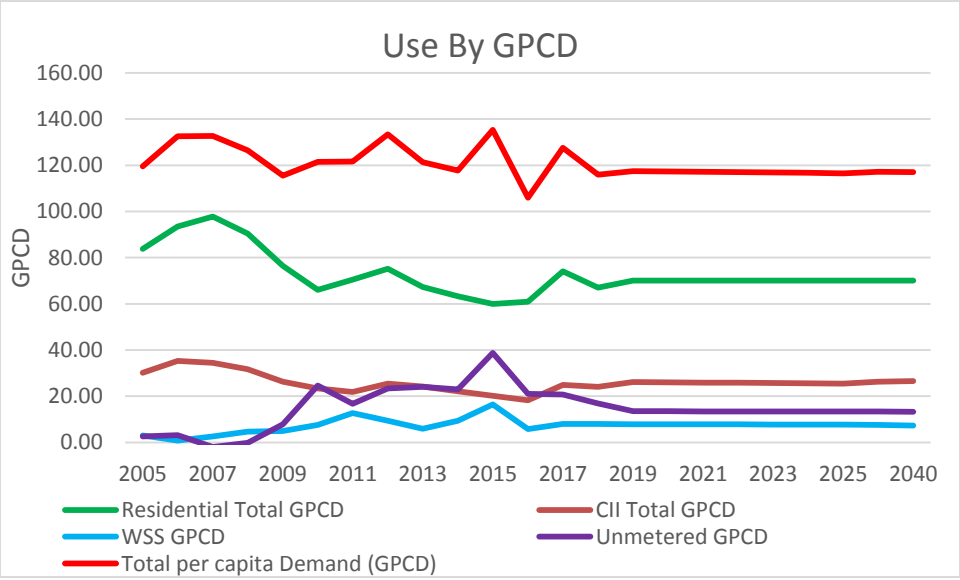
Table 26. Strategies and timeframe to reduce institutional, commercial industrial, and agricultural and non-revenue use demand

Strategy to reduce total business, industry, agricultural demand	Timeframe for completing work
☐ Conduct a facility water use audit for both indoor and outdoor use, including system components	
☐ Install enhanced meters capable of automated readings to detect spikes in consumption	
☐ Compare facility water use to related industry benchmarks, if available (e.g., meat processing, dairy, fruit and vegetable, beverage, textiles, paper/pulp, metals, technology, petroleum refining etc.)	
☐ Install water conservation fixtures and appliances or change processes to conserve water	
☒ Repair leaking system components (e.g., pipes, valves)	Ongoing as we find them through the yearly leak detection survey, watermain replacement project, and as leaks are visible.
☐ Investigate the reuse of reclaimed water (e.g., stormwater, wastewater effluent, process wastewater, etc.)	
☐ Reduce outdoor water use (e.g., turf replacement/reduction, rain gardens, rain barrels, smart irrigation, outdoor water use meters, etc.)	
☒ Train employees how to conserve water	2018
☐ Implement a notification system to inform non-residential customers when water availability conditions change.	
☐ Nonpotable rainwater catchment systems intended to supply uses such as water closets, urinals, trap primers for floor drains and floor sinks, industrial processes, water features, vehicle washing facilities, cooling tower makeup, and similar uses shall be approved by the commissioner. Plumbing code 4714.1702, Published October 31, 2016	
☐ Describe other plans:	

Objective 4: Achieve a Decreasing Trend in Total Per Capita Demand

Include as **Appendix 8** one graph showing total per capita water demand for each customer category (i.e., residential, institutional, commercial, industrial) from 2005-2014 and add the calculated/estimated linear trend for the next 10 years.

Describe the trend for each customer category; explain the reason(s) for the trends, and where trends are increasing.



Residential: Burnsville is fully developed and will have limited growth so long term GPCD will be stable and will fluctuate based on weather conditions and related irrigation.

Commercial/Industrial/Institutional: Burnsville is fully developed with no grown expected in this category. Long term GPCD will be stable and will only fluctuated based on weather conditions and related irrigation.

Water Supplier Services: This category includes city operations and irrigation of city facilities. No new facilities are planned, so long term GPCD will be stable and will fluctuate based on weather conditions and related irrigation.

Unmetered: Data prior to 2009 was not audited and the City did not have full a SCADA system in place. The high unmetered water use since 2010 is believed to be related primarily to the age of the City's meter system. The City is currently replace all water meters and installing a two way real time AMI system. The City expects un-metered water to drop to 10% once the system is fully operational (mid 2018) and being utilized proactively. This assumption is reflected in the graph and estimated uses.

Total GPCD: Due to limited City growth this is expected to be stable long term and will only fluctuated based on weather conditions and related irrigation.

Objective 5: Reduce Ratio of Maximum day (peak day) to the Average Day Demand to Less Than 2.6

Is the ratio of average 2005-2014 maximum day demand to average 2005-2014 average day demand reported in Table 2 more than 2.6? Yes ☐ No ☒

Calculate a ten-year average (2005 – 2014) of the ratio of maximum day demand to average day demand: 2.0 (1.73 for period 2010-2015)

The position of the DNR has been that a peak day/average day ratio that is above 2.6 for in summer indicates that the water being used for irrigation by the residents in a community is too large and that efforts should be made to reduce the peak day use by the community.

It should be noted that by reducing the peak day use, communities can also reduce the amount of infrastructure that is required to meet the peak day use. This infrastructure includes new wells, new water towers which can be costly items.

Objective 6: Implement Demand Reduction Measures

Water Conservation Program

Municipal water suppliers serving over 1,000 people are required to adopt demand reduction measures that include a conservation rate structure, or a uniform rate structure with a conservation program that achieves demand reduction. These measures must achieve demand reduction in ways that reduce water demand, water losses, peak water demands, and nonessential water uses. These measures must be approved before a community may request well construction approval from the Department of Health or before requesting an increase in water appropriations permit volume (Minnesota Statutes, section 103G.291, subd. 3 and 4). Rates should be adjusted on a regular basis to ensure that revenue of the system is adequate under reduced demand scenarios. If a municipal water supplier intends to use a Uniform Rate Structure, a community-wide Water Conservation Program that will achieve demand reduction must be provided.

Current Water Rates

Include a copy of the actual rate structure in **Appendix 9** or list current water rates including base/service fees and volume charges below.

Volume included in base rate or service charge: 15,000 gallons or ____ cubic feet ___ other

Frequency of billing: ☒ Monthly ☐ Bimonthly ☐ Quarterly ☐ Other: _____

Water Rate Evaluation Frequency: ☒ every year ☐ every ___ years ☐ no schedule

Date of last rate change: __2017_____

Table 27. Rate structures for each customer category (Select all that apply and add additional rows as needed)

Customer Category	Conservation Billing Strategies in Use *	Conservation Neutral Billing Strategies in Use **	Non-Conserving Billing Strategies in Use ***
Residential	☒ Monthly billing ☒ Increasing block rates (volume tiered rates)	☐ Uniform ☒ Odd/even day watering	☐ Service charge based on water volume ☐ Declining block

Customer Category	Conservation Billing Strategies in Use *	Conservation Neutral Billing Strategies in Use **	Non-Conserving Billing Strategies in Use ***
	☐ Seasonal rates ☐ Time of use rates ☒ Water bills reported in gallons ☐ Individualized goal rates ☐ Excess use rates ☐ Drought surcharge ☐ Use water bill to provide comparisons ☐ Service charge not based on water volume ☐ Other (describe)		☐ Flat ☐ Other (describe)
Commercial/ Industrial/ Institutional	☒ Monthly billing ☒ Increasing block rates (volume tiered rates) ☐ Seasonal rates ☐ Time of use rates ☒ Water bills reported in gallons ☐ Individualized goal rates ☐ Excess use rates ☐ Drought surcharge ☐ Use water bill to provide comparisons ☐ Service charge not based on water volume ☐ Other (describe)	☐ Uniform	☐ Service charge based on water volume ☐ Declining block ☐ Flat ☐ Other (describe)
☐ Other			

*** Rate Structures components that may promote water conservation:**

- **Monthly billing:** is encouraged to help people see their water usage so they can consider changing behavior.
- **Increasing block rates (also known as a tiered residential rate structure):** Typically, these have at least three tiers: should have at least three tiers.
    - The first tier is for the winter average water use.
    - The second tier is the year-round average use, which is lower than typical summer use. This rate should be set to cover the full cost of service.
    - The third tier should be above the average annual use and should be priced high enough to encourage conservation, as should any higher tiers. For this to be effective, the difference in block rates should be significant.
- **Seasonal rate:** higher rates in summer to reduce peak demands
- **Time of Use rates:** lower rates for off peak water use
- **Bill water use in gallons:** this allows customers to compare their use to average rates
- **Individualized goal rates:** typically used for industry, business or other large water users to promote water conservation if they keep within agreed upon goals. **Excess Use rates**: if water use goes above an agreed upon amount this higher rate is charged
- **Drought surcharge:** an extra fee is charged for guaranteed water use during drought
- **Use water bill to provide comparisons**: simple graphics comparing individual use over time or compare individual use to others.

- **Service charge or base fee that does not include a water volume** – a base charge or fee to cover universal city expenses that are not customer dependent and/or to provide minimal water at a lower rate (e.g., an amount less than the average residential per capita demand for the water supplier for the last 5 years)
- **Emergency rates** -A community may have a separate conservation rate that only goes into effect when the community or governor declares a drought emergency. These higher rates can help to protect the city budgets during times of significantly less water usage.

****Conservation Neutral****

- **Uniform rate**: rate per unit used is the same regardless of the volume used
- **Odd/even day watering** –This approach reduces peak demand on a daily basis for system operation, but it does not reduce overall water use.

***** Non-Conserving *****

- **Service charge or base fee with water volume:** an amount of water larger than the average residential per capita demand for the water supplier for the last 5 years
- **Declining block rate:** the rate per unit used decreases as water use increases.
- **Flat rate:** one fee regardless of how much water is used (usually unmetered).

Provide justification for any conservation neutral or non-conserving rate structures. If intending to adopt a conservation rate structure, include the timeframe to do so:

N/A

Objective 7: Additional strategies to Reduce Water Use and Support Wellhead Protection Planning

Development and redevelopment projects can provide additional water conservation opportunities, such as the actions listed below. If a Uniform Rate Structure is in place, the water supplier must provide a Water Conservation Program that includes at <u>least two</u> of the actions listed below. Check those actions that you intent to implement within the next 10 years.

Table 28. Additional strategies to Reduce Water Use & Support Wellhead Protection

☒	Participate in the GreenStep Cities Program, including implementation of at least one of the 20 "Best Practices" for water
☐	Prepare a master plan for smart growth (compact urban growth that avoids sprawl)
☐	Prepare a comprehensive open space plan (areas for parks, green spaces, natural areas)
☐	Adopt a water use restriction ordinance (lawn irrigation, car washing, pools, etc.)
☒	Adopt an outdoor lawn irrigation ordinance
☐	Adopt a private well ordinance (private wells in a city must comply with water restrictions)
☒	Implement a stormwater management program
☐	Adopt non-zoning wetlands ordinance (can further protect wetlands beyond state/federal laws-for vernal pools, buffer areas, restrictions on filling or alterations)
☐	Adopt a water offset program (primarily for new development or expansion)
☐	Implement a water conservation outreach program
☒	Hire a water conservation coordinator (part-time)
☒	Implement a rebate program for water efficient appliances, fixtures, or outdoor water management
☐	Other

Objective 8: Tracking Success: How will you track or measure success through the next ten years?

1) Maintain a gpcd of less than 75
2) Reduce unmetered water use to 10% or less

Tip: The process to monitor demand reduction and/or a rate structure includes:

a) The DNR Hydrologist will call or visit the community the first 1-3 years after the water supply plan is completed.
b) They will discuss what activities the community is doing to conserve water and if they feel their actions are successful. The Water Supply Plan, Part 3 tables and responses will guide the discussion. For example, they will discuss efforts to reduce unaccounted for water loss if that is a problem, or go through Tables 33, 34 and 35 to discuss new initiatives.
c) The city representative and the hydrologist will discuss total per capita water use, residential per capita water use, and business/industry use. They will note trends.
d) They will also discuss options for improvement and/or collect case studies of success stories to share with other communities. One option may be to change the rate structure, but there are many other paths to successful water conservation.
e) If appropriate, they will cooperatively develop a simple work plan for the next few years, targeting a couple areas where the city might focus efforts.

C. Regulation

Complete Table 29 by selecting which regulations are used to reduce demand and improve water efficiencies. Add additional rows as needed.

Copies of adopted regulations or proposed restrictions or should be included in **Appendix 10** (a list with hyperlinks is acceptable).

Table 29. Regulations for short-term reductions in demand and long-term improvements in water efficiencies

Regulations Utilized	When is it applied (in effect)?
☒ Rainfall sensors required on landscape irrigation systems	☒ Ongoing ☐ Seasonal ☐ Only during declared Emergencies
☒ Water efficient plumbing fixtures required	☐ New development ☐ Replacement ☒ Rebate Programs
☒ Critical/Emergency Water Deficiency ordinance	☒ Only during declared Emergencies
☒ Watering restriction requirements (time of day, allowable days, etc.)	☒ Odd/even ☐ 2 days/week ☐ Only during declared Emergencies
☐ Water waste prohibited (for example, having a fine for irrigators spraying on the street)	☐ Ongoing ☐ Seasonal ☐ Only during declared Emergencies
☐ Limitations on turf areas (requiring lots to have 10% - 25% of the space in natural areas)	☐ New development ☐ Shoreland/zoning ☐ Other
☐ Soil preparation requirement s (after construction, requiring topsoil to be applied to promote good root growth)	☐ New Development ☐ Construction Projects

Regulations Utilized	When is it applied (in effect)?
	☐ Other
☐ Tree ratios (requiring a certain number of trees per square foot of lawn)	☐ New development ☐ Shoreland/zoning ☐ Other
☐ Permit to fill swimming pool and/or requiring pools to be covered (to prevent evaporation)	☐ Ongoing ☐ Seasonal ☐ Only during declared Emergencies
☒ Ordinances that permit stormwater irrigation, reuse of water, or other alternative water use (Note: be sure to check current plumbing codes for updates)	☐ Describe **City Council currently discussing.**

D. Retrofitting Programs

Education and incentive programs aimed at replacing inefficient plumbing fixtures and appliances can help reduce per capita water use, as well as energy costs. It is recommended that municipal water suppliers develop a long-term plan to retrofit public buildings with water efficient plumbing fixtures and appliances. Some water suppliers have developed partnerships with organizations having similar conservation goals, such as electric or gas suppliers, to develop cooperative rebate and retrofit programs.

A study by the AWWA Research Foundation (Residential End Uses of Water, 1999) found that the average indoor water use for a non-conserving home is 69.3 gallons per capita per day (gpcd). The average indoor water use in a conserving home is 45.2 gpcd and most of the decrease in water use is related to water efficient plumbing fixtures and appliances that can reduce water, sewer and energy costs. In Minnesota, certain electric and gas providers are required (Minnesota Statute 216B.241) to fund programs that will conserve energy resources and some utilities have distributed water efficient showerheads to customers to help reduce energy demands required to supply hot water.

Retrofitting Programs

Complete Table 30 by checking which water uses are targeted, the outreach methods used, the measures used to identify success, and any participating partners.

Table 30. Retrofitting programs (Select all that apply)

Water Use Targets	Outreach Methods	Partners
☒ Low flush toilets, ☒ Toilet leak tablets, ☐ Low flow showerheads, ☐ Faucet aerators;	☒ Education about ☐ Free distribution of ☐ Rebate for ☐ Other	☐ Gas company ☐ Electric company ☐ Watershed organization
☒ Water conserving washing machines, ☒ Dish washers, ☒ Water softeners;	☒ Education about ☐ Free distribution of ☐ Rebate for ☐ Other	☐ Gas company ☐ Electric company ☐ Watershed organization

Water Use Targets	Outreach Methods	Partners
☒ Rain gardens, ☐ Rain barrels, ☒ Native/drought tolerant landscaping, etc.	☒ Education about ☐ Free distribution of ☒ Rebate for ☐ Other	☐ Gas company ☐ Electric company ☒ Watershed organization

Briefly discuss measures of success from the above table (e.g. number of items distributed, dollar value of rebates, gallons of water conserved, etc.):

E. Education and Information Programs

Customer education should take place in three different circumstances. First, customers should be provided information on how to conserve water and improve water use efficiencies. Second, information should be provided at appropriate times to address peak demands. Third, emergency notices and educational materials about how to reduce water use should be available for quick distribution during an emergency.

Proposed Education Programs

Complete Table 31 by selecting which methods are used to provide water conservation and information, including the frequency of program components. Select all that apply and add additional lines as needed.

Table 31. Current and Proposed Education Programs

Education Methods	General summary of topics	#/Year	Frequency
Billing inserts or tips printed on the actual bill	Water Restrictions	1	☐ Ongoing ☒ Seasonal ☐ Only during declared emergencies
Consumer Confidence Reports		1	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Press releases to traditional local news outlets (e.g., newspapers, radio and TV)	Water Restrictions, Consumer Confidence Report	2	☐ Ongoing ☒ Seasonal ☐ Only during declared emergencies
Social media distribution (e.g., emails, Facebook, Twitter)	Water Restrictions	1	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Paid advertisements (e.g., billboards, print media, TV, radio, web sites, etc.)			☐ Ongoing ☐ Seasonal ☒ Only during declared emergencies

Education Methods	General summary of topics	#/Year	Frequency
Presentations to community groups			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Staff training	NPDES training, water and wastewater operator certification	1	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Facility tours	School groups, daycares, interested citizens	As requested	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Displays and exhibits	Water Plant Exhibit = Water Cycle & Water production/distribution process	N/A	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Marketing rebate programs (e.g., indoor fixtures & appliances and outdoor practices)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Community news letters	Consumer Confidence Report, Water Restrictions, Water Conservation	1	☐ Ongoing ☒ Seasonal ☐ Only during declared emergencies
Direct mailings (water audit/retrofit kits, showerheads, brochures)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Information kiosk at utility and public buildings	Brochures, Consumer Confidence Report	N/A	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Public service announcements	Water restrictions	1	☐ Ongoing ☒ Seasonal ☐ Only during declared emergencies
Cable TV Programs			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Demonstration projects (landscaping or plumbing)	Water Resource Enhancement Workshops	2	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
K-12 education programs (Project Wet, Drinking Water Institute, presentations)	Tours as requested	5	☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies

Education Methods	General summary of topics	#/Year	Frequency
Community events (children's water festivals, environmental fairs)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Community education classes			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Water week promotions			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Website (include address: www.burnsville.org	Water conservation tips, Consumer Confidence Report		☒ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Targeted efforts (large volume users, users with large increases)			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Notices of ordinances			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Emergency conservation notices			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies
Other:			☐ Ongoing ☐ Seasonal ☐ Only during declared emergencies

Briefly discuss what future education and information activities your community is considering in the future:

PART 4. ITEMS FOR METROPOLITAN AREA COMMUNITIES

Minnesota Statute 473.859 requires WSPs to be completed for all local units of government in the seven-county Metropolitan Area as part of the local comprehensive planning process.

Much of the information in Parts 1-3 addresses water demand for the next 10 years. However, additional information is needed to address water demand through 2040, which will make the WSP consistent with the Metropolitan Land Use Planning Act, upon which the local comprehensive plans are based.

This Part 4 provides guidance to complete the WSP in a way that addresses plans for water supply through 2040.

A. Water Demand Projections through 2040

Complete Table 7 in Part 1D by filling in information about long-term water demand projections through 2040. Total Community Population projections should be consistent with the community's system statement, which can be found on the Metropolitan Council's website and which was sent to the community in September 2015.

Projected Average Day, Maximum Day, and Annual Water Demands may either be calculated using the method outlined in *Appendix 2* of the *2015 Master Water Supply Plan* or by a method developed by the individual water supplier.

B. Potential Water Supply Issues

Complete Table 10 in Part 1E by providing information about the potential water supply issues in your community, including those that might occur due to 2040 projected water use.

The Master Water Supply Plan provides information about potential issues for your community in *Appendix 1 (Water Supply Profiles).* This resource may be useful in completing Table 10.

You may document results of local work done to evaluate impact of planned uses by attaching a feasibility assessment or providing a citation and link to where the plan is available electronically.

C. Proposed Alternative Approaches to Meet Extended Water Demand Projections

Complete Table 12 in Part 1F with information about potential water supply infrastructure impacts (such as replacements, expansions or additions to wells/intakes, water storage and treatment capacity, distribution systems, and emergency interconnections) of extended plans for development and redevelopment, in 10-year increments through 2040. It may be useful to refer to information in the community's local Land Use Plan, if available.

Complete Table 14 in Part 1F by checking each approach your community is considering to meet future demand. For each approach your community is considering, provide information about the amount of future water demand to be met using that approach, the timeframe to implement the approach, potential partners, and current understanding of the key benefits and challenges of the approach.

As challenges are being discussed, consider the need for: evaluation of geologic conditions (mapping, aquifer tests, modeling), identification of areas where domestic wells could be impacted, measurement and analysis of water levels & pumping rates, triggers & associated actions to protect water levels, etc.

D. Value-Added Water Supply Planning Efforts (Optional)

The following information is not required to be completed as part of the local water supply plan, but completing this can help strengthen source water protection throughout the region and help Metropolitan Council and partners in the region to better support local efforts.

Source Water Protection Strategies

Does a Drinking Water Supply Management Area for a neighboring public water supplier overlap your community? Yes ☒ No ☐

If you answered no, skip this section. If you answered yes, please complete Table 32 with information about new water demand or land use planning-related local controls that are being considered to provide additional protection in this area.

Table 32. Local controls and schedule to protect Drinking Water Supply Management Areas

Local Control	Schedule to Implement	Potential Partners
☒ None at this time		
☐ Comprehensive planning that guides development in vulnerable drinking water supply management areas		
☐ Zoning overlay		
☐ Other:		

Technical assistance

From your community's perspective, what are the most important topics for the Metropolitan Council to address, guided by the region's Metropolitan Area Water Supply Advisory Committee and Technical Advisory Committee, as part of its ongoing water supply planning role?

☐ Coordination of state, regional and local water supply planning roles
☒ Regional water use goals
☐ Water use reporting standards
☒ Regional and sub-regional partnership opportunities
☐ Identifying and prioritizing data gaps and input for regional and sub-regional analyses
☐ Others: _____

GLOSSARY

Agricultural/Irrigation Water Use - Water used for crop and non-crop irrigation, livestock watering, chemigation, golf course irrigation, landscape and athletic field irrigation.

Average Daily Demand - The total water pumped during the year divided by 365 days.

Calcareous Fen - Calcareous fens are rare and distinctive wetlands dependent on a constant supply of cold groundwater. Because they are dependent on groundwater and are one of the rarest natural communities in the United States, they are a protected resource in MN. Approximately 200 have been located in Minnesota. They may not be filled, drained or otherwise degraded.

Commercial/Institutional Water Use - Water used by motels, hotels, restaurants, office buildings, commercial facilities and institutions (both civilian and military). Consider maintaining separate institutional water use records for emergency planning and allocation purposes. Water used by multi-family dwellings, apartment buildings, senior housing complexes, and mobile home parks should be reported as Residential Water Use.

Commercial/Institutional/Industrial (C/I/I) Water Sold - The sum of water delivered for commercial/institutional or industrial purposes.

Conservation Rate Structure - A rate structure that encourages conservation and may include increasing block rates, seasonal rates, time of use rates, individualized goal rates, or excess use rates. If a conservation rate is applied to multifamily dwellings, the rate structure must consider each residential unit as an individual user. A community may have a separate conservation rate that only goes into effect when the community or governor declares a drought emergency. These higher rates can help to protect the city budgets during times of significantly less water usage.

Date of Maximum Daily Demand - The date of the maximum (highest) water demand. Typically this is a day in July or August.

Declining Rate Structure - Under a declining block rate structure, a consumer pays less per additional unit of water as usage increases. This rate structure does not promote water conservation.

Distribution System - Water distribution systems consist of an interconnected series of pipes, valves, storage facilities (water tanks, water towers, reservoirs), water purification facilities, pumping stations, flushing hydrants, and components that convey drinking water and meeting fire protection needs for cities, homes, schools, hospitals, businesses, industries and other facilities.

Flat Rate Structure - Flat fee rates do not vary by customer characteristics or water usage. This rate structure does not promote water conservation.

Industrial Water Use - Water used for thermonuclear power (electric utility generation) and other industrial use such as steel, chemical and allied products, paper and allied products, mining, and petroleum refining.

Low Flow Fixtures/Appliances - Plumbing fixtures and appliances that significantly reduce the amount of water released per use are labeled “low flow”. These fixtures and appliances use just enough water to be effective, saving excess, clean drinking water that usually goes down the drain.

Maximum Daily Demand - The maximum (highest) amount of water used in one day.

Metered Residential Connections - The number of residential connections to the water system that have meters. For multifamily dwellings, report each residential unit as an individual user.

Percent Unmetered/Unaccounted For - Unaccounted for water use is the volume of water withdrawn from all sources minus the volume of water delivered. This value represents water “lost” by miscalculated water use due to inaccurate meters, water lost through leaks, or water that is used but unmetered or otherwise undocumented. Water used for public services such as hydrant flushing, ice skating rinks, and public swimming pools should be reported under the category “Water Supplier Services”.

Population Served - The number of people who are served by the community's public water supply system. This includes the number of people in the community who are connected to the public water supply system, as well as people in neighboring communities who use water supplied by the community's public water supply system. It should not include residents in the community who have private wells or get their water from neighboring water supply.

Residential Connections - The total number of residential connections to the water system. For multifamily dwellings, report each residential unit as an individual user.

Residential Per Capita Demand - The total residential water delivered during the year divided by the population served divided by 365 days.

Residential Water Use - Water used for normal household purposes such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens. Should include all water delivered to single family private residences, multi-family dwellings, apartment buildings, senior housing complexes, mobile home parks, etc.

Smart Meter - Smart meters can be used by municipalities or by individual homeowners. Smart metering generally indicates the presence of one or more of the following:

- Smart irrigation water meters are controllers that look at factors such as weather, soil, slope, etc. and adjust watering time up or down based on data. Smart controllers in a typical summer will reduce water use by 30%-50%. Just changing the spray nozzle to new efficient models can reduce water use by 40%.
- Smart Meters on customer premises that measure consumption during specific time periods and communicate it to the utility, often on a daily basis.
- A communication channel that permits the utility, at a minimum, to obtain meter reads on demand, to ascertain whether water has recently been flowing through the meter and onto the premises, and to issue commands to the meter to perform specific tasks such as disconnecting or restricting water flow.

Total Connections - The number of connections to the public water supply system.

Total Per Capita Demand - The total amount of water withdrawn from all water supply sources during the year divided by the population served divided by 365 days.

Total Water Pumped - The cumulative amount of water withdrawn from all water supply sources during the year.

Total Water Delivered - The sum of residential, commercial, industrial, institutional, water supplier services, wholesale and other water delivered.

Ultimate (Full Build-Out) - Time period representing the community's estimated total amount and location of potential development, or when the community is fully built out at the final planned density.

Unaccounted (Non-revenue) Loss - See definitions for "percent unmetered/unaccounted for loss".

Uniform Rate Structure - A uniform rate structure charges the same price-per-unit for water usage beyond the fixed customer charge, which covers some fixed costs. The rate sends a price signal to the customer because the water bill will vary by usage. Uniform rates by class charge the same price-per-unit for all customers within a customer class (e.g. residential or non-residential). This price structure is generally considered less effective in encouraging water conservation.

Water Supplier Services - Water used for public services such as hydrant flushing, ice skating rinks, public swimming pools, city park irrigation, back-flushing at water treatment facilities, and/or other uses.

Water Used for Nonessential Purposes - Water used for lawn irrigation, golf course and park irrigation, car washes, ornamental fountains, and other non-essential uses.

Wholesale Deliveries - The amount of water delivered in bulk to other public water suppliers.

Acronyms and Initialisms

AWWA – American Water Works Association
C/I/I – Commercial/Institutional/Industrial
CIP – Capital Improvement Plan
GIS – Geographic Information System
GPCD – Gallons per capita per day
GWMA – Groundwater Management Area – North and East Metro, Straight River, Bonanza,
MDH – Minnesota Department of Health
MGD – Million gallons per day
MG – Million gallons
MGL – Maximum Contaminant Level
MnTAP – Minnesota Technical Assistance Program (University of Minnesota)
MPARS – MN/DNR Permitting and Reporting System (new electronic permitting system)
MRWA – Minnesota Rural Waters Association
SWP – Source Water Protection
WHP – Wellhead Protection

APPENDICES TO BE SUBMITTED BY THE WATER SUPPLIER

Appendix 1: Well records and maintenance summaries
Go to Part 1C for information on what to include in appendix

Appendix 2: Water level monitoring plan
Go to Part 1E for information on what to include in appendix

Appendix 3: Water level graphs for each water supply well
Go to Part 1E for information on what to include in appendix

Appendix 4: Capital Improvement Plan
Go to Part 1E for information on what to include in appendix

Appendix 5: Emergency Telephone List
Go to Part 2C for information on what to include in appendix

Appendix 6: Cooperative Agreements for Emergency Services
Go to Part 2C for information on what to include in appendix

Appendix 7: Municipal Critical Water Deficiency Ordinance
Go to Part 2C for information on what to include in appendix

Appendix 8: Graph of Ten Years of Annual Per Capita Water Demand for Each Customer Category
Go to Objective 4 in Part 3B for information on what to include in appendix

Appendix 9: Water Rate Structure
Go to Objective 6 in Part 3B for information on what to include in appendix

Appendix 10: Ordinances or Regulations Related to Water Use
Go to Objective 7 in Part 3B for information on what to include in appendix

Appendix 11: Implementation Checklist
Provide a table that summarizes all the actions that the public water supplier is doing, or proposes to do, with estimated implementation dates.

Appendix 12: Sources of Information for Table 10
Provide links or references to the information used to complete Table 10. If the file size is reasonable, provide source information as attachments to the plan.

City Of Burnsville

Appendix M – 2013 Sanitary Sewer Lift Station Condition Assessment

May 2013

Condition Assessment Report

May 31, 2013

Sanitary Sewer Lift Stations Condition Assessment

Prepared for:

City of Burnsville

City of Burnsville
100 Civic Center Parkway
Burnsville, MN 55337

WSB Project No. 1880-220

701 Xenia Avenue South, Suite 300 Minneapolis, MN 55416 763.541.4800

WSB & Associates, Inc.

CONDITION ASSESSMENT REPORT

SANITARY SEWER LIFT STATIONS
CONDITION ASSESSMENT

FOR THE
CITY OF BURNSVILLE, MINNESOTA

May 31, 2013

Prepared By:

WSB & Associates, Inc.
701 Xenia Avenue South, Suite 300
Minneapolis, MN 55416
(763) 541-4800
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WSB & Associates, Inc.
engineering · planning · environmental · construction

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May 31, 2013

Mr. Jeff Radick
City of Burnsville
100 Civic Center Parkway
Burnsville, MN 55337

Re: Condition Assessment Report
Sanitary Sewer Lift Stations
City of Burnsville, MN
WSB Project No. 1880-130

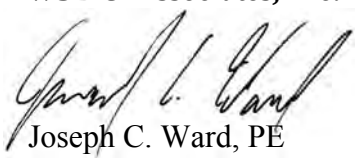
Dear Mr. Radick:

Transmitted herewith is the Condition Assessment Report for the City's sanitary sewer lift stations. The report summarizes the existing condition of the City's existing fourteen sanitary sewer lift stations, provides recommendations and costs for improvements, and prioritizes the improvements for incorporation into the City's Capital Improvements Plan.

We would be happy to discuss this report with you at your convenience. Please contact me at 763-541-4800 if you have any questions regarding this report.

Sincerely,

WSB & Associates, Inc.

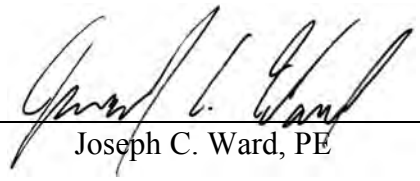


Joseph C. Ward, PE
Project Engineer

Enclosure

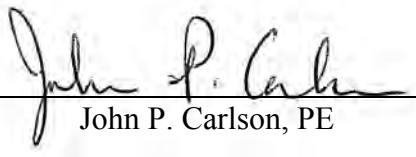
CERTIFICATION

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.



Joseph C. Ward, PE

Date: May 31, 2013 Lic. No. 45855



John P. Carlson, PE

Date: May 31, 2013 Lic. No. 24001

TABLE OF CONTENTS

TITLE SHEET
LETTER OF TRANSMITTAL
CERTIFICATION SHEET
TABLE OF CONTENTS

1. INTRODUCTION 1

2. BLUE BILL BAY (1190 BLUEBILL BAY) 3

2.1 Location Description 3
2.2 Existing Condition Assessment 3
2.3 Recommended Improvements 5
2.4 Estimated Costs 6

3. BUCK HILL (15400 BUCK HILL ROAD) 9

3.1 Location Description 9
3.2 Existing Condition Assessment 9
3.3 Recommended Improvements 11
3.4 Estimated Costs 12

4. CRYSTAL LAKE (1508 EAST CRYSTAL LAKE ROAD) 15

4.1 Location Description 15
4.2 Existing Condition Assessment 15
4.3 Recommended Improvements 17
4.4 Estimated Costs 18

5. ECHO VALLEY (1901 VICTORIA LANE) 21

5.1 Location Description 21
5.2 Existing Condition Assessment 21
5.3 Recommended Improvements 23
5.4 Estimated Costs 24

6. KELLER LAKE (1621 KELLER LAKE DRIVE) 27

6.1 Location Description 27
6.2 Existing Condition Assessment 27
6.3 Recommended Improvements 29
6.4 Estimated Costs 30

7. MAPLE ISLAND 1 (BIG) (299 MAPLE ISLAND ROAD) 33

7.1 Location Description 33
7.2 Existing Condition Assessment 33
7.3 Recommended Improvements 35
7.4 Estimated Costs 36

TABLE OF CONTENTS (continued)

8. MAPLE ISLAND 2 (SMALL) (299 MAPLE ISLAND ROAD) 39

8.1 Location Description 39
8.2 Existing Condition Assessment 39
8.3 Recommended Improvements 41
8.4 Estimated Costs 42

9. MCANDREWS (13811 NICOLLET BOULEVARD) 45

9.1 Location Description 45
9.2 Existing Condition Assessment 45
9.3 Recommended Improvements 48
9.4 Estimated Costs 50

10. MEADOW ACRES (16 NORTH MEADOW CIRCLE) 53

10.1 Location Description 53
10.2 Existing Condition Assessment 53
10.3 Recommended Improvements 55
10.4 Estimated Costs 56

11. SAVAGE (3700 WEST HIGHWAY 13) 59

11.1 Location Description 59
11.2 Existing Condition Assessment 59
11.3 Recommended Improvements 61
11.4 Estimated Costs 62

12. SODOMKA (12195 COUNTY ROAD 11) 65

12.1 Location Description 65
12.2 Existing Condition Assessment 65
12.3 Recommended Improvements 67
12.4 Estimated Costs 68

13. VALLEY VIEW (9885 OAK SHORE DRIVE) 71

13.1 Location Description 71
13.2 Existing Condition Assessment 71
13.3 Recommended Improvements 73
13.4 Estimated Costs 74

14. WASHBURN (12421 WASHBURN AVENUE) 77

14.1 Location Description 77
14.2 Existing Condition Assessment 77
14.3 Recommended Improvements 79
14.4 Estimated Costs 80

TABLE OF CONTENTS (continued)

15. WOODS TRAIL (2920 WOODS TRAIL SOUTH) 83

15.1 Location Description 83
15.2 Existing Condition Assessment 83
15.3 Recommended Improvements 85
15.4 Estimated Costs 86

16. CAPITAL IMPROVEMENTS PLAN 89

17. OPERATIONS AND MAINTENANCE ACTIVITIES 89

17.1 Wet Well Safety Grates/Netting 89
17.2 Miscellaneous Lift Station Controls Improvements 89

Appendix A
Detailed Breakdown of Opinion of Probable Costs

Appendix B
City of Burnsville Sanitary Sewer Lift Station and Storm Sewer
Lift Station Standardization Policy – August 2010

1. INTRODUCTION

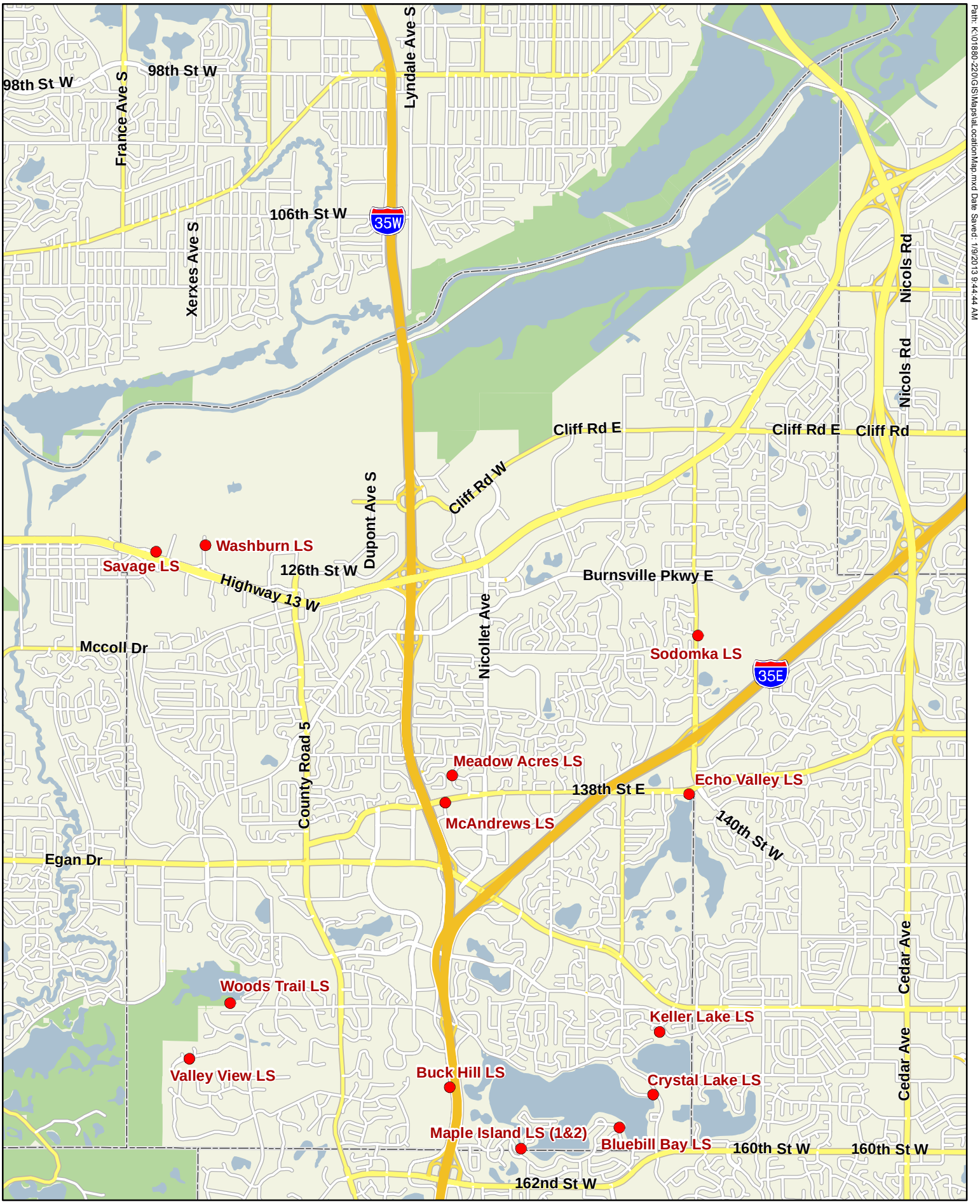
On September 5 and 27, 2012, site inspections of the Burnsville Sanitary Sewer Lift Stations (lift stations) was conducted by WSB & Associates, Inc. (WSB) and HDR Engineering, Inc. (HDR) to evaluate the condition of existing sites, structures, pumping equipment, mechanical heating and ventilation systems (HVAC), and electrical/instrumentation systems. In general the lift stations are in good operational condition. However, many of the pumps, structures, and electrical equipment in the lift stations are over 25 years old and in need of updating.

On October 10, October 29, and November 8, 2012, lift station pump down tests were completed by WSB to determine the current pumping rates of existing lift station pumps. Most of the pumps within the lift stations are currently pumping as designed, however there were a few exceptions.

The purpose of this report is to summarize the condition of the City's fourteen lift stations, including the existing site, structures, pumps and piping, and electrical systems, and provide recommendations and costs for improvements. The scope of this report includes an evaluation of the following lift stations:

- Blue Bill Bay
- Buck Hill
- Crystal Lake
- Echo
- Keller Lake
- Maple Island 1 (Big)
- Maple Island 2 (Small)
- McAndrews
- Meadow Acres
- Savage
- Sodomka
- Valley View
- Washburn
- Woods Trail

An aerial map showing the locations of the City's storm sewer lift stations are shown in **Figure 1-1** on the following page.



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Sanitary Sewer Lift Station
Condition Assessment
City of Burnsville, MN
WSB Project No. 1880-220

Figure 1-1
Sanitary Sewer Lift Stations
Location Map

1 inch = 4,500 feet

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2. BLUE BILL BAY (1190 BLUEBILL BAY)

2.1 Location Description

The City's Blue Bill Bay Lift Station was constructed in 1973 and is located on the south side of the cul-de-sac at on the east end of Blue Bill Bay Road, approximately 250 feet north of the intersection with 156th Street. **Figure 2-1** on **Page 7** is an aerial map showing the site location of the lift station.

2.2 Existing Condition Assessment

A. **Figures 2-2 through 2-6** on **Page 8** are photographs showing the existing condition of the Blue Bill Bay Lift Station.

B. Service Area and Wastewater Flow: The lift station service area consists of approximately 26 single family residential units as shown in Figure 2-1. Based on existing development in the service area, the estimated influent flow rate is approximately 5 gpm average flow and 20 gpm peak flow.

C. Site conditions: The lift station is located approximately 30 feet south of the cul-de-sac. The concrete slab for the control panel is separate from the lift station area and there are no bollards protecting the lift station and control panel. There is no pavement between the cul-de-sac and the lift station however the turf appears to be in good condition. The curb along the cul-de-sac has been damaged due to plows hitting the curb when removing snow from the lift station area in the winter. The lift station is within 10 feet of private property to the south.

D. Wet well: 6'Ø precast concrete structure approximately 22 feet deep. City staff indicated the wet well has capacity adequate to allow ample emergency response time. The wet well is not vented and the hatch does not include a safety grate. City staff indicated there are minimal grease problems in the wet well. The existing wet well appears to be in good condition.

E. Wet Well Access Hatch: Single leaf 48"x 30" aluminum hatch without safety grate. The access hatch is appears to be in fair condition, the hinges have been corroded.

F. Valve vault: 6'Ø precast concrete structure approximately 10 feet deep and has a manhole casting for access. The valve vault has a concrete bottom with a sump pit to collect drainage to be pumped out prior to staff access. The valve vault had some water in the structure at the time of inspection. The existing valve vault appears to be in good condition.

G. Pumps: The station has two Flygt non-clog submersible 2.5 horsepower (hp) pumps that were installed when the original lift station was constructed in 1973. Pump down tests indicated the pumping rate of pump 1 was approximately 195 gpm and pump 2 was 175 gpm. Pump curves indicate the design capacity is 225

gpm at 16 feet Total Dynamic Head (TDH). City maintenance records indicate pump 1 has oil in the motor stator and recommends new wear rings and new sleeves for the impellers. City staff indicated there are minimal problems with pump clogging at this location.

H. Lift Station Piping: Sewage enters the lift station from the north through a 9"Ø Polyvinyl Chloride (PVC) pipe. Lift station pumps discharge through parallel 4"Ø ductile iron pipes (DIP), 4"Ø gate and swing flex check valves in the valve vault, and tie into a single 4"Ø DIP forcemain downstream of the valve vault. Valves were replaced in 2005 with new gate valves and swing flex check valves. The piping has external corrosion, but thickness is unknown.

I. Accessories: Dual stainless steel pump guide rails, lifting chains, cable holders, and hardware appear to be in good condition.

J. Force Main: The 4"Ø DIP forcemain is approximately 60 feet in length and discharges to a 9"Ø PVC gravity sewer that flows south along 156th Street. The force main was constructed in 1973 and estimated velocity in the force main is approximately 5 feet per second (fps).

K. Electrical Service:

1. Rating: 240V, 3-Phase, 4-Wire
2. Utility: Dakota Electric Association, Meter # 35 842 898
3. Main: 200 Amp Main Breaker
4. Backup Power:
   a. 200 Amp Gen Breaker
   b. Crouse-Hinds AR2041-S22 Receptacle

L. Pump Electrical Data:

	Size (HP)	**Rating**	**Starter**
Pump #1	2.5	230V, 3 Phase	FVNR* Furnas 14DS-32A
Pump #2	2.5	230V, 3 Phase	FVNR Furnas 14DS-32A

*FVNR = Full Voltage, Non-Reversing (Across-the-Line)

M. Controls: The station level is currently monitored by a submersible level transducer which is used as the primary control. Backup control is provided by float switches for high level and low level.

N. Control Panel: The stainless steel, door-in-door control panel was manufactured by US Filter in 2000. The main controller is a model LC 150 (submersible transducer) and the backup controller is a model CB1T (floats). All control panel components appeared to be in good condition.

O. SCADA: The stainless steel control panel was manufactured by Wunderlich-Malec in 2008. The PLC is an Allen-Bradley Micrologix 1100. The panel communicates the station status to the SCADA master via fiber optic cable. The media converter is a Cisco Catalyst 2955. All control panel components appeared to be in excellent condition.

2.3 Recommended Improvements

Recommended improvements are consistent with the City's lift station standardization policy.

A. Site Improvements: Construct a bituminous access driveway to the station including bollards and a concrete slab around both the lift station and control panel. Remove and replace the curb where it has been damaged.

B. Wet Well /Access Hatch: Replace the wet well cover slab including a wet well vent pipe and new H20 rated aluminum access hatch with safety grate and stainless steel hardware. The cover slab should be elevated above surrounding pavement for positive drainage. The interior of the wet well should be cleaned and coated for corrosion protection.

C. Valve Vault: Replace the valve vault cover slab including a new H20 rated aluminum access hatch with safety grate. The cover slab should be elevated above surrounding pavement for positive drainage. Verify the existing base slab is in good condition prior to construction improvements.

D. Pumps: Replace the Flygt pumps with ABS non-clog submersible pumps and modify accessories as necessary. Pump capacity may be able to be reduced, which would be evaluated in greater detail at the time of design.

E. Lift Station Piping: Replace lift station mechanical piping in the wet well and valve vault. The valves may be able to be salvaged depending upon their condition at the time of piping replacement. Paint/coat all new and existing piping in the wet well. Install a 2"Ø PVC drain line between the valve vault and wet well with a rubber backwater check valve.

F. Force Main: Replace the existing 4"Ø DIP force main with a 4"Ø PVC force main from the discharge manhole on 156th Street to the point where the parallel 4"Ø DIP force mains tie into a single 4"Ø DIP forcemain downstream of the valve vault.

G. The overall condition of the electrical equipment is good to excellent. The control panel is not compliant with the City's lift station standard, but can be expected to remain serviceable for approximately 10-15 years. There is no yard light at the site.

1. Install yard light.
2. Install a new control panel in compliance with the City's lift station standardization policy in 10-15 years.

2.4 Estimated Costs

Table 2-1 below summarizes the estimated costs for recommended improvements to the Blue Bill Bay Lift Station and the proposed year for the improvements. A more detailed breakdown of the costs is included in **Appendix A**.

Table 2-1
Summary of Estimated Costs and Proposed Year for Improvements for Blue Bill Bay Lift Station

Description of Improvements	Total Estimated Opinion of Probable Cost (Including 2.5% Annual Inflation)	Proposed Year for Improvements
Site and Surface Improvements	$33,000	2020
Pumping, Mechanical, and Structure Improvements	$83,000	2020
Force Main Improvements	$23,000	2020
Yard Light Installation	$7,000	2020
Control Panel Replacement	$148,000	2023-2028

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Sanitary Sewer Lift Station
Condition Assessment
City of Burnsville, MN
WSB Project No. 1880-220

Figure 2-1
Bluebill Bay Lift Station
Site Location Map

1 inch = 250 feet

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Fig. 2-2: Blue Bill Bay Site

Fig 2-3: Blue Bill Bay Control and SCADA Panel

Fig. 2-4: Blue Bill Bay Control Panel

Fig. 2-5: Blue Bill Bay Wet Well

Fig. 2-6: Blue Bill Bay Valve Vault

3. BUCK HILL (15400 BUCK HILL ROAD)

3.1 Location Description

The City's Buck Hill Lift Station is located at the entrance road to the Buck Hill ski area along Buck Hill Road approximately 1,300 feet south of Greenhaven Drive. Based on City maintenance records and draft plans the construction date was 1993. **Figure 3-1** on **Page 13** is an aerial map showing the site location of the lift station.

3.2 Existing Condition Assessment

A. **Figures 3-2 through 3-6** on **Page 14** are photographs showing the existing condition of the Buck Hill Lift Station.

B. Service Area and Wastewater Flow: The lift station service area consists of the Buck Hill recreational area including ski chalet, offices, and restaurants as shown in Figure 3-1. Wastewater generated by the ski area is seasonal and highly variable. Based on Metropolitan Council Environmental Services (MCES) Sewer Access Charge (SAC) criteria for the building uses and sizes the winter it is the estimated influent flow rate is 20 gpm average flow and 80 gpm peak flow.

C. Site conditions: The lift station access driveway (bituminous) is adjacent to the access road at the Buck Hill recreational area and appears to be in good condition. The concrete slab for the control panel is connected to the lift station but is not oriented perpendicular to the control panel. There are no bollards protecting control panel on the access road, but there is a guard rail protecting the station on the access road side.

D. Wet well: 6'Ø precast concrete structure approximately 20 feet deep. City staff indicated the wet well has adequate capacity to allow ample emergency response time. The wet well is not vented and the hatch does not include a safety grate. City staff indicated there are some grease problems in the wet well due to the restaurants in the service area. The existing wet well appears to be in good condition.

E. Wet Well Access Hatch: Single leaf 48"x 30" aluminum hatch without safety grate. The access hatch appears to be in fair condition, some hardware has been corroded.

F. Valve vault: 6'Ø precast concrete structure approximately 10 feet deep and has a manhole casting for access. The valve vault has a concrete base slab and a drain to the wet well. The existing valve vault appears to be in good condition.

G. Pumps: The station has two KSB non-clog submersible 15 hp pumps that were installed when the original lift station was constructed in 1995. Pump down tests indicated the pumping rate of pump 1 was approximately 275 gpm and pump 2 was 255 gpm. Pump curves indicate the design capacity is 200 gpm at 80 feet TDH. Maintenance records indicate there is blow by on both pumps and the impeller on pump 2 is showing cavitation. City staff indicated there are minimal problems with pump clogging at this location.

H. Lift Station Piping: Sewage enters the lift station from the north through an 8"Ø PVC pipe. Lift station pumps discharge through parallel 6"Ø DIPs, through 6"Ø gate and outside lever and weight (OS&L) check valves in the valve vault, and tie into a single 6"Ø DIP forcemain downstream of the valve vault. The piping has external corrosion, but thickness is unknown. Valve corrosion is consistent with piping; City staff indicated valves are functioning adequately.

I. Accessories: The pumps have a cable guide rail system that appears to be significantly corroded. Lifting chains, cable holders, and hardware appear to be in fair condition.

J. Force Main: The 6"Ø DIP forcemain is approximately 1,600 feet in length and discharges to an 8"Ø PVC gravity sewer north of Greenhaven Drive and flows north along Buck Hill Road. The force main was constructed in 1993 and estimated velocity in the force main is 3.0 fps.

K. Electrical Service:

1. Rating: 240V, 1-Phase, 3-Wire
2. Utility: Dakota Electric Association, Meter # 05193605
3. Main: 200 Amp Main Breaker
4. Backup Power: Backup Power:
   a. 200 Amp Gen Breaker
   b. Crouse-Hinds AR2041-S22 Receptacle

L. Pump Electrical Data:

	Size (HP)	**Rating**	**Starter**	**Notes**
Pump #1	15	230V, 3 Phase	FVNR Siemens 3TF46	3-Phase by Ronk 15HP Add-A-Phase Unit
Pump #2	15	230V, 3 Phase	FVNR Siemens 3UA58-20-2F	3-Phase by Ronk 15HP Add-A-Phase Unit

M. Controls: The station level is currently monitored by a submersible level transducer which is used as the primary control. Backup control is provided by float switches for high level and low level.

N. Control Panel: The NEMA 3R, painted steel, door-in-door control panel was manufactured by Consolidated Electric in 1995. The main controller is a model LC 150 (submersible transducer) and the backup controller is a model CB1T (floats). All control panel components appeared to be in good condition.

O. SCADA: The stainless steel control panel was manufactured by Wunderlich-Malec in 2009. The PLC is an Allen-Bradley Micrologix 1100. The panel communicates the station status to the SCADA master via fiber optic cable. The media converter is a Cisco Catalyst 2955. All control panel components appeared to be in excellent condition.

3.3 Recommended Improvements

Recommended improvements are consistent with the City's lift station standardization policy.

A. General: Some components of the existing lift station are not in compliance with the City's lift station standardization policy, however existing structures, pumps, and piping can be expected to remain serviceable for 10-15 years.

B. Site Improvements: Add an additional bituminous pavement lift to the access driveway, add bollards to protect the control panel, reorient the control panel (at time of replacement) so that it is perpendicular to the wet well, and construct a concrete slab around both the lift station and control panel.

C. Wet Well: Replace the wet well cover slab including a wet well vent pipe and new H20 rated aluminum access hatch with safety grate and stainless steel hardware. The top slab of the lift station wet well should be elevated for positive drainage away from the station. Also, the interior of the wet well should be cleaned and coated for corrosion protection.

D. Pumps: Replace the 15 hp KSB pumps with ABS non-clog submersible pumps and replace accessories as necessary including cable guide rail system. Pump capacity may be able to be reduced, which would be evaluated in greater detail at the time of design.

E. Lift Station Piping: Replace lift station mechanical piping in the wet well and valve vault. Paint/coat all new and existing piping in the wet well.

F. Force Main: Replace the existing 6"Ø DIP force main with a 6"Ø PVC force main from the discharge manhole near Greenhaven Drive to the point where the parallel 6"Ø DIP force mains tie into a single 6"Ø DIP force main downstream of the valve vault. The force main is located under Buck Hill Drive, so directional boring of the force main could be used to reduce surface replacement costs. Cured-In-Place-Pipe (CIPP) lining may be an alternative for replacement of the 6"Ø DIP force main and should be evaluated at the time of project design.

G. Overall condition of the electrical equipment is good, but is nearing 20 years of service. The control panel is not compliant with the City's lift station standard, but can be expected to remain serviceable for approximately 5-10 years. Three phase service is available near the site and in order to eliminate the need for phase conversion and to reduce maintenance costs, it is recommended that the existing utility transformer be replaced with a 75KVA 3-phase 480V transformer. (The minimum size 3-phase transformer provided by Dakota Electric is 75 KVA).

1. Install a new control panel in compliance with the City's lift station standardization policy in 5-10 years.
2. Upgrade to 3-phase utility service in 5-10 years.

3.4 Estimated Costs

Table 3-1 below summarizes the estimated costs for recommended improvements to the Buck Hill Lift Station and the proposed year for the improvements. A more detailed breakdown of the costs is included in **Appendix A**.

Table 3-1
Summary of Estimated Costs and Proposed Year for Improvements for Buck Hill Lift Station

Description of Improvements	Total Estimated Opinion of Probable Cost (Including 2.5% Annual Inflation)	Proposed Year for Improvements
Site and Surface Improvements	$22,000	2023-2028
Pumping, Mechanical, and Structure Improvements	$185,000	2023-2028
Force Main Improvements	$235,000	2023-2028
Control Panel Replacement	$155,000	2023-2028
Convert to 3-Phase Service	$46,000	2023-2028

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Sanitary Sewer Lift Station
Condition Assessment
City of Burnsville, MN
WSB Project No. 1880-220

Figure 3-1
Buck Hill Lift Station
Site Location Map

1 inch = 300 feet

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Fig. 3-2: Buck Hill Main Control Panel (Front)

Fig 3-3: Buck Hill Main Control Panel (Rear) and SCADA Panel

Fig. 3-4: Buck Hill Site

Fig. 3-5: Buck Hill Wet Well

Fig. 3-6: Buck Hill Valve Vault

4. CRYSTAL LAKE (1508 EAST CRYSTAL LAKE ROAD)

4.1 Location Description

The City's Crystal Lake Lift Station is located on the north side of Crystal Lake Drive, approximately 150 feet west the intersection with Lac Lavon Drive. It was constructed in 1973. **Figure 4-1** on **Page 19** is an aerial map showing the location of the lift station.

4.2 Existing Condition Assessment

A. **Figures 4-2 through 4-6** on **Page 20** are photographs showing the existing condition of the Crystal Lake Lift Station.

B. Service Area and Wastewater Flow: The lift station service area consists of approximately 41 single family residential units as shown in Figure 4-1. Based on existing development in the service area, the estimated influent flow rate is 8 gpm average flow and 32 gpm peak flow.

C. Site conditions: The lift station access driveway (bituminous) is south of Crystal Lake Road. The concrete slab for the control panel is separate from the lift station area and there are no bollards protecting the lift station and control panel. The lift station access hatch has settled or sunk below the elevation of the top slab. Water settles on the lift station since it is at a low elevation.

D. Wet Well: 6'Ø precast concrete structure approximately 19 feet deep. City staff indicated the wet well has adequate capacity to allow ample emergency response time. The wet well is not vented and the hatch does not include a safety grate. City staff indicated there are minimal grease problems in the wet well. The existing wet well appears to be in good condition.

E. Wet Well Access Hatch: Single leaf 48"x 30" aluminum hatch without safety grate. The access hatch appears to be in fair condition, the hinges have been corroded.

F. Valve Vault: 6'Ø precast concrete structure approximately 10 feet deep and has a manhole casting for access. The valve vault has a concrete bottom with a sump pit to collect drainage to be pumped out prior to staff access. The valve vault had some water in the structure at the time of inspection. The existing valve vault appears to be in good condition.

G. Pumps: The station has two Flygt non-clog submersible 2.5 hp pumps that were installed when the original lift station was constructed in 1973. Pump down tests indicated the pumping rate of pump 1 was approximately 205 gpm and pump 2 was 225 gpm. Pump curves indicate the design capacity is 225 gpm at 16 feet TDH. City maintenance records indicate new wear rings and new sleeves for the impellers are recommended for pump 1 and there is some wear on the impeller for pump 2. City staff indicated there are minimal problems with pump clogging at this location.

H. Lift Station Piping: Sewage enters the lift station from the north through an 8"Ø DIP. Lift station pumps discharge through parallel 4"Ø DIPs, through gate and swing flex check valves in the valve vault, and tie into a single 4"Ø DIP forcemain downstream of the valve vault. The piping has external corrosion, but thickness is unknown. Valve corrosion is consistent with piping; City staff indicated valves are functioning adequately.

I. Accessories: Dual stainless steel pump guide rails, lifting chains, cable holders, and hardware appear to be in good condition.

J. Force Main: The 4"Ø DIP forcemain is approximately 60 feet and discharges to a 27"Ø reinforced concrete pipe (RCP) MCES interceptor that flows west along Crystal Lake Road. The force main was constructed in 1973 and estimated velocity is approximately 5.5 fps.

K. Electrical Service:

1. Rating: 240V, 3-Phase, 4-Wire
2. Utility: Dakota Electric Association, Meter # 28 315 092
3. Main: 200 Amp Main Breaker
4. Backup Power:
   a. 200 Amp Gen Breaker
   b. Crouse-Hinds AR2041-S22 Receptacle

L. Pump Electrical Data:

	Size (HP)	**Rating**	**Starter**
Pump #1	2.5	230V, 3 Phase	FVNR Furnas 14DS-32A
Pump #2	2.5	230V, 3 Phase	FVNR Furnas 14DS-32A

M. Controls: The station level is currently monitored by a submersible level transducer which is used as the primary control. Backup control is provided by float switches for high level and low level.

N. Control Panel: The stainless steel, door-in-door control panel was manufactured by US Filter in 2000. The main controller is a model LC 150 (submersible transducer) and the backup controller is a model CB1T (floats). All control panel components appeared to be in good condition.

O. SCADA: The stainless steel control panel was manufactured by Wunderlich-Malec in 2008. The PLC is an Allen-Bradley Micrologix 1100. The panel communicates the station status to the SCADA master via fiber optic cable. The media converter is a Cisco Catalyst 2955. All control panel components appeared to be in excellent condition.

4.3 Recommended Improvements

Recommended improvements are consistent with the City's lift station standardization policy.

A. Site Improvements: Add an additional bituminous pavement lift to the access driveway, add bollards to protect the control panel, reorient the control panel (at time of replacement), so that it is perpendicular to the wet well, and construct a slab around both the lift station and control panel.

B. Wet Well /Access Hatch: Replace the wet well cover slab including a wet well vent pipe and new H20 rated aluminum access hatch with safety grate and stainless steel hardware. The cover slab should be elevated above surrounding pavement for positive drainage. The interior of the wet well should be cleaned and coated for corrosion protection.

C. Valve Vault: Replace the valve vault cover slab including a new H20 rated aluminum access hatch with safety grate. The cover slab should be elevated above surrounding pavement for positive drainage. Verify the existing base slab is in good condition prior to constructing improvements.

D. Pumps: Replace the Flygt pumps with ABS non-clog submersible pumps and modify accessories as necessary. Pump capacity may be able to be reduced, which would be evaluated in greater detail at the time of design.

E. Lift Station Piping: Replace lift station mechanical piping in the wet well and valve vault. Paint/coat all new and existing piping in the wet well. Install a 2"Ø PVC drain line between the valve vault and wet well with a rubber backwater check valve.

F. Force main: Replace the existing 4"Ø DIP force main with a 4"Ø PVC force main from the discharge manhole on Crystal Lake Road to the point where the parallel 4"Ø DIP force mains tie into a single 4"Ø DIP force main downstream of the valve vault.

G. Overall condition of the electrical equipment is good to excellent. The control panel is not compliant with the City's lift station standard, but can be expected to remain serviceable for approximately 10-15 years. There is no yard light at the site.

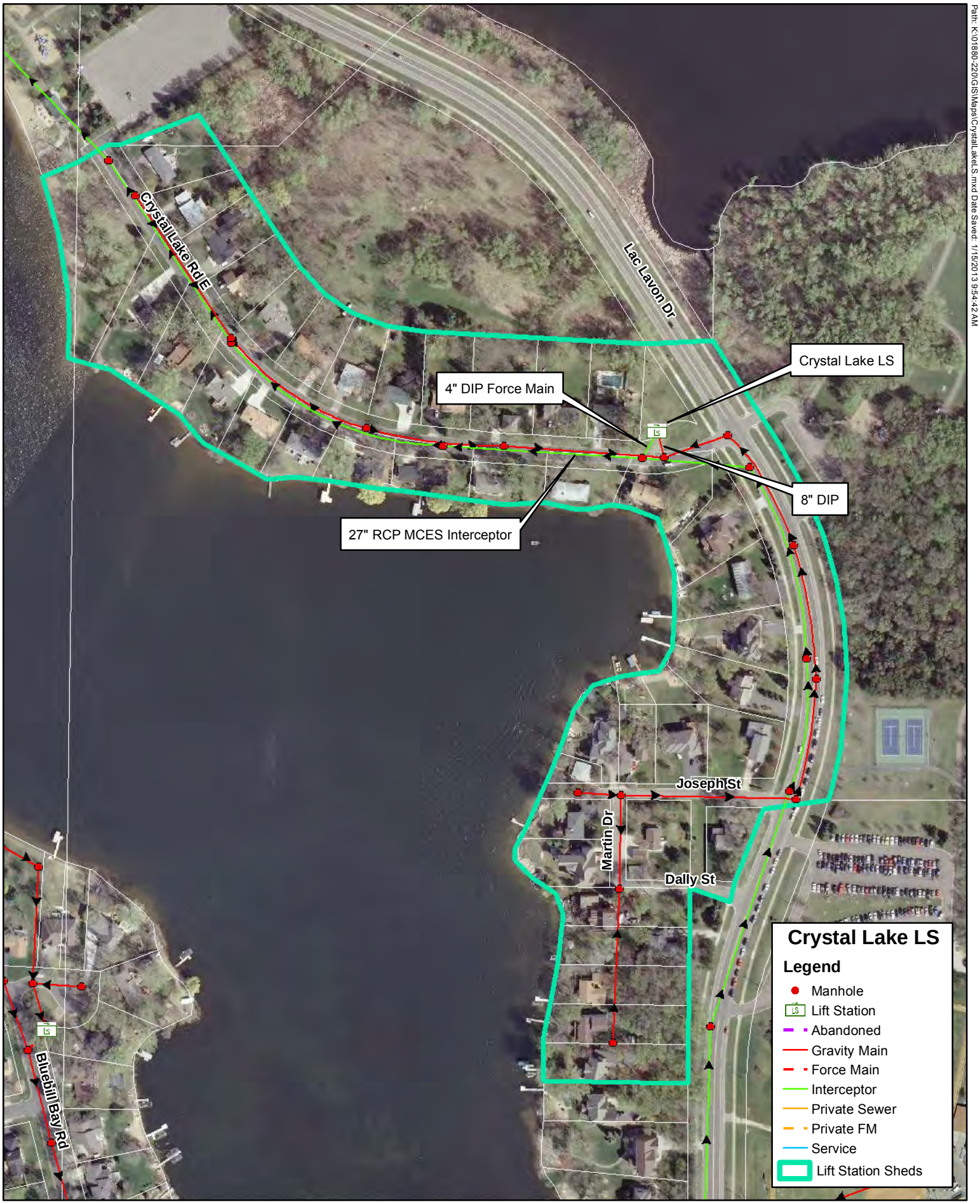
1. Install yard light.
2. Install a new control panel in compliance with the City's lift station standardization policy in 10-15 years.

4.4 Estimated Costs

Table 4-1 below summarizes the estimated costs for recommended improvements to the Crystal Lake Lift Station and the proposed year for the improvements. A more detailed breakdown of the costs is included in **Appendix A**.

Table 4-1
Summary of Estimated Costs and Proposed Year for Improvements for Crystal Lake Lift Station

Description of Improvements	Total Estimated Opinion of Probable Cost (Including 2.5% Annual Inflation)	Proposed Year for Improvements
Site and Surface Improvements	$26,000	2021
Pumping, Mechanical, and Structure Improvements	$82,000	2021
Force Main Improvements	$18,000	2021
Control Panel Replacement	$148,000	2023-2028
Yard Light Installation	$7,000	2021



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Sanitary Sewer Lift Station
Condition Assessment
City of Burnsville, MN
WSB Project No. 1880-220

Figure 4-1
Crystal Lake Lift Station
Site Location Map

1 inch = 250 feet

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WSB & Associates, Inc.

Fig. 4-2: Crystal Lake Site and Control Panels

Fig 4-3: Crystal Lake Control Panels (Rear)

Fig. 4-4: Crystal Lake Wet Well

Fig. 4-5: Crystal Lake Valve Vault

Fig. 4-6: Crystal Lake Site Main Control Panel

5. ECHO VALLEY (1901 VICTORIA LANE)

5.1 Location Description

The City's Echo Valley Lift Station is located on a cul-de-sac at the west end of Victoria Lane approximately 600 feet east of the intersection with Frontier Lane. It was rehabilitated and converted to a submersible pump lift station style in 2011. **Figure 5-1** on **Page 25** is an aerial map showing the location of the lift station.

5.2 Existing Condition Assessment

A. **Figures 5-2 through 5-6** on **Page 26** are photographs showing the existing condition of the Echo Valley Lift Station.

B. Service Area and Wastewater Flow: The lift station service area consists of 307 single family residential units and 15 non-residential parcels in Burnsville. Also, wastewater is collected from an estimated 147 equivalent residential units in Apple Valley. Current flow meter readings indicate an average wastewater flow of 15 gpm from Apple Valley. Based on existing development in the Burnsville service area the estimated influent flow rate is approximately 71 gpm average flow and 335 gpm peak flow.

C. Site conditions: The lift station access driveway (bituminous) is south of Victoria Lane. The concrete slab for the control panel is connected to the lift station and oriented perpendicular to the control panel. There are bollards protecting the lift station control panel.

D. Wet well: 10'Ø precast concrete structure approximately 31 feet deep. City staff indicated that wet well capacity requires an emergency response time of 30 minutes. There are some grease problems in the wet well which is cleaned out 2 times per year. The existing wet well appears to be in good condition.

E. Pump access hatch: Single leaf 48"x66" aluminum hatch with safety grate and appears to be in good condition.

F. Valve vault: 6'Ø precast concrete structure approximately 9 feet deep with a 3'x3' access hatch with safety grate for access. The valve vault has a concrete base with a 2" PVC drain line to the wet well. The valve vault appears to be in good condition.

G. Pumps: The station has two ABS non-clog submersible 14 hp pumps that were installed when the lift station was reconstructed in 2011. Pump down tests indicated the pumping rate of pump 1 was approximately 640 gpm and pump 2 was 615 gpm. Pump curves indicate the design capacity is 606 gpm at 48 feet TDH. City staff indicated there are no regular problems with pumps clogging at the station.

H. Lift Station Piping: Sewage enters the lift station from the north through a 8"Ø pipe of unknown material. Upstream of the influent line a flume measures the wastewater flow from Apple Valley. Lift station pumps discharge through parallel 6"Ø DIPs, through 6"Ø gate and swing flex check valves in the valve vault, and tie into a single 10"Ø cast iron pipe (CIP) forcemain downstream of the valve vault. There is a connection in the valve vault available for a temporary bypass connection. The piping and valves appear to be in good condition.

I. Accessories: Dual stainless steel pump guide rails, lifting chains, cable holders, and hardware appear to be in good condition.

J. Force Main: The 10"Ø CIP forcemain is approximately 1,350 feet in length and discharges to a 21"Ø RCP sanitary sewer that flows north along Echo Park Lane. The force main was constructed in 1991 and estimated velocity in the force main is approximately 2.5 fps.

K. Electrical Service:

1. Rating: 480V, 3-Phase, 4-Wire
2. Utility: Dakota Electric Association, Meter # 05213751
3. Main: 100 Amp Main Breaker
4. Backup Power:
   a. 100 Amp Gen Breaker
   b. ASCO 7000 ATS
   c. Cummins Model GGHE-8289903 75KVA Generator

M. Pump Electrical Data:

	Size (HP)	**Rating**	**Starter**	**Notes**
Pump #1	14.1	480V, 3 Phase	FVNR Square D NEMA Size 2 8536SDO1H10S	
Pump #2	14.1	480V, 3 Phase	FVNR Square D NEMA Size 2 8536SDO1H10S	

N. Controls: The station level is currently monitored by a submersible level transducer which is used as the primary control. Backup control is provided by float switches for high level and low level.

O. Control Panel: The stainless steel, door-in-door control panel was manufactured by Wunderlich-Malec in 2011. The main controller is an Allen-Bradley Micrologix 1100 (submersible transducer) and the backup controller are relays (floats). All control panel components appeared to be in excellent condition.

P. SCADA: The SCADA system is integrated with the control panel. The panel communicates the station status to the SCADA master and allows control of pump operation levels via fiber optic cable. The media converter is a Cisco Catalyst 2955. All control panel components appeared to be in excellent condition.

5.3 Recommended Improvements

Recommended improvements are consistent with the City's lift station standardization policy.

A. Site Improvements: The lift station has been constructed in accordance with the City's lift station standardization policy, so no improvements are recommended at this time. However, an additional bituminous pavement lift and bollard painting may be necessary as the lift station ages.

B. Lift Station Improvements: The lift station has been constructed in accordance with the City's lift station standardization policy, so no improvements are recommended at this time. However, the typical design life of lift station materials is approximately 20-30 years, so the following maintenance should be expected at that time.

1. Replace pumps
2. Replace valves
3. Clean and coat the wet well interior and piping

C. Force Main: Replace the existing 10"Ø CIP force main with a 6"Ø PVC force main from the discharge manhole on Echo Park Lane to the point where the parallel 6"Ø DIP force mains tie into a single 10"Ø CIP force main downstream of the valve vault. Directional boring of the force main could be used to reduce surface replacement costs. CIPP lining may be an alternative for replacement of the 10"Ø CIP force main and should be evaluated at the time of project design.

D. The electrical equipment and controls are in excellent condition and can be expected to remain in service for 20+ years.

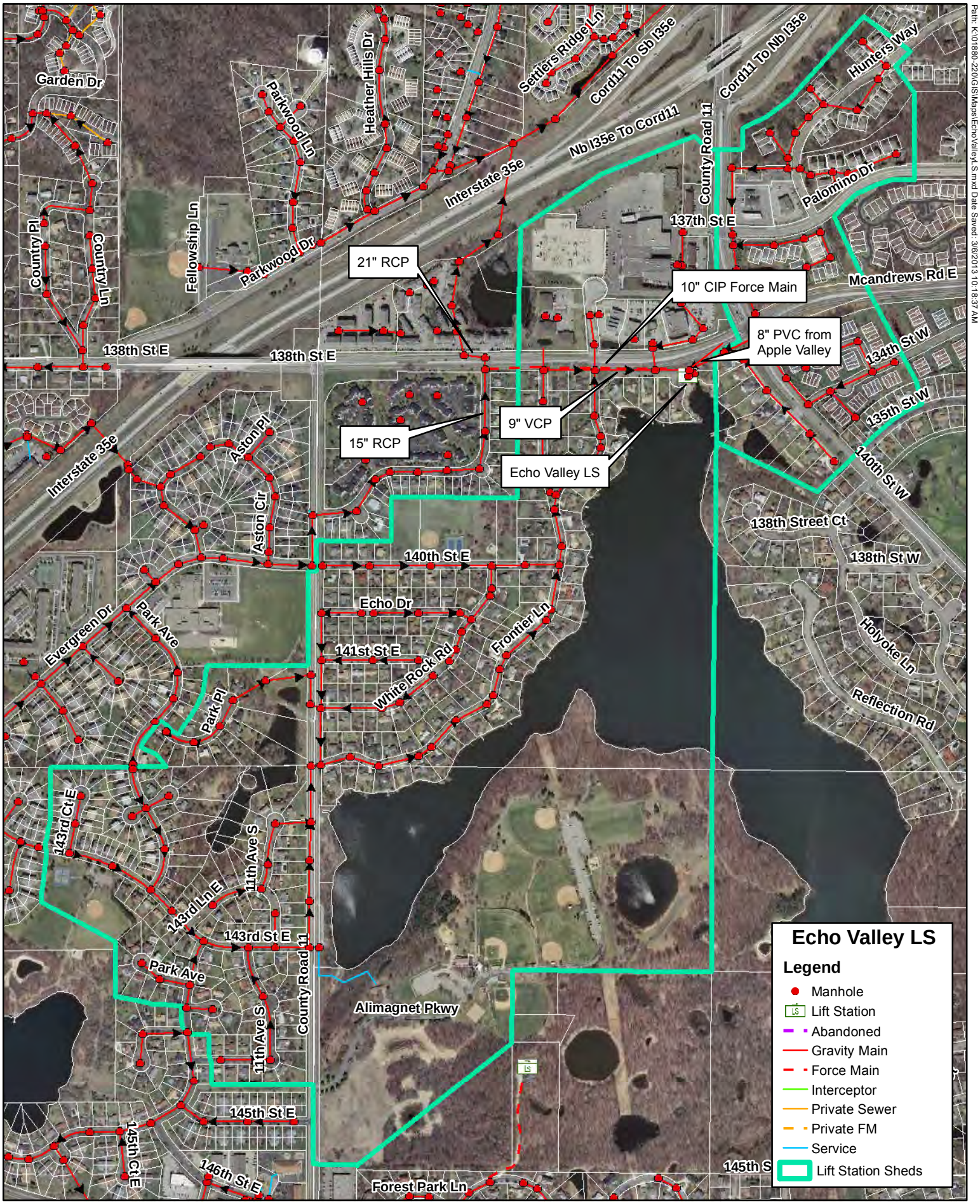
1. Replace the existing control panel in 20-30 years.
2. Replace generator in 20-30 years.

5.4 Estimated Costs

Table 5-1 below summarizes the estimated costs for recommended improvements to the Echo Valley Lift Station and the proposed year for the improvements. A more detailed breakdown of the costs is included in **Appendix A**.

Table 5-1
Summary of Estimated Costs and Proposed Year for Improvements for Echo Valley Lift Station

Description of Improvements	Total Estimated Opinion of Probable Cost (Including 2.5% Annual Inflation)	Proposed Year for Improvements
Site and Surface Improvements	$13,000	2034-2043
Pumping, Mechanical, and Structure Improvements	$227,000	2034-2043
Force Main Improvements	$363,000	2034-2043
Control Panel Replacement	$224,000	2034-2043
Generator Replacement	$149,000	2034-2043



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Sanitary Sewer Lift Station
Condition Assessment
City of Burnsville, MN
WSB Project No. 1880-220

Figure 5-1
Echo Valley Lift Station
Site Location Map

1 inch = 800 feet

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Fig. 5-2: Echo Valley Site

Fig 5-3: Echo Valley Wet Well

Fig. 5-4: Echo Valley Valve Vault

Fig. 5-5: Echo Valley Control Panel

Fig. 5-6: Echo Valley Generator

6. KELLER LAKE (1621 KELLER LAKE DRIVE)

6.1 Location Description

The City's Keller Lake Lift Station is located approximately 200 feet west of Keller Lake Drive and approximately 200 feet south of the intersection with Rushmore Drive. It was reconstructed as submersible pump lift station in 2010. **Figure 6-1** on **Page 31** is an aerial map showing the location of the lift station.

6.2 Existing Condition Assessment

A. **Figures 6-2 through 6-5** on **Page 32** are photographs showing the existing condition of the Keller Lake Lift Station.

B. Service Area and Wastewater Flow: The lift station service area consists of approximately 52 single family residential units. Based on existing development in the service area, the estimated influent flow rate is 11 gpm average flow and 44 gpm peak flow.

C. Site conditions: The lift station access driveway (bituminous) is a City trail for accessing Keller Lake Park from Keller Lake Drive. The concrete slab for the control panel is connected to the lift station and oriented perpendicular to the control panel. There are bollards protecting the lift station wet well and control panel.

D. Wet well: 6'Ø precast concrete structure approximately 24 feet deep. City staff indicated the wet well capacity allows an emergency response time of an hour or more. City staff indicated there are minimal grease problems. The existing wet well appears to be in good condition.

E. Pump access hatch: Single leaf 30"x48" aluminum hatch with safety grate and appears to be in good condition.

F. Valve vault: 6'Ø precast concrete structure approximately 9 feet deep with a 3'x3' access hatch for access. There is no safety grate with the access hatch. The valve vault has a concrete base with a 2" PVC drain line to the wet well. The valve vault appears to be in good condition.

G. Pumps: The station has two ABS non-clog submersible 2.7 hp pumps that were installed when the station was reconstructed in 2010. Pump down tests indicated the pumping rate of pump 1 was approximately 115 gpm and pump 2 was 135 gpm. Pump curves indicate the design capacity is 128 gpm at 18 feet TDH. City staff indicated there are no regular problems with pumps clogging at the station.

H. Lift Station Piping: Sewage enters the lift station from the east through an 8"Ø PVC pipe. Lift station pumps discharge through parallel 4"Ø DIPs, through 4"Ø gate and swing flex check valves in the valve vault, and tie into a single 4"Ø DIP forcemain downstream of the valve vault. Also there is a connection in the valve vault available for a temporary bypass connection. The piping and valves appear to be in good condition.

I. Accessories: Dual stainless steel pump guide rails, lifting chains, cable holders, and hardware appear to be in good condition.

J. Force Main: The 4"Ø DIP forcemain is approximately 70 feet in length and discharges to a 12"Ø RCP gravity sewer that flows west through the park. The force main was constructed in 1985, and estimated velocity in the force main is approximately 3 fps.

K. Electrical Service:

1. Rating: 240V, 3-Phase, 4-Wire
2. Utility: Dakota Electric Association, Meter # 03 023 247
3. Main: 200 Amp Main Breaker
4. Backup Power:
   a. 200 Amp Gen Breaker
   b. Crouse-Hinds AR2041-S22 Receptacle

L. Pump Electrical Data:

	Size (HP)	**Rating**	**Starter**
Pump #1	2.7	240V, 3 Phase	FVNR Square D NEMA Size 1 8536SCO3H10S
Pump #2	2.7	240V, 3 Phase	FVNR Square D NEMA Size 1 8536SCO3H10S

M. Controls: The station level is currently monitored by a submersible level transducer which is used as the primary control. Backup control is provided by float switches for high level and low level.

N. Control Panel: The stainless steel, door-in-door control panel was manufactured by Wunderlich-Malec in 2010. The main controller is an Allen-Bradley Micrologix 1100 (submersible transducer) and the backup controller are relays (floats). All control panel components appeared to be in excellent condition.

O. SCADA: The SCADA system is integrated with the control panel. The panel communicates the station status to the SCADA master and allows control of pump operation levels via fiber optic cable. The media converter is a Cisco Catalyst 2955. All control panel components appeared to be in excellent condition.

6.3 Recommended Improvements

Recommended improvements are consistent with the City's lift station standardization policy.

A. Site Improvements: The lift station has been constructed in accordance with the City's lift station standardization policy, so no improvements are recommended at this time. An additional bituminous pavement lift and bollard painting may be necessary as the lift station ages; however, it is assumed that it would be paved as part of park improvement projects.

B. Lift Station Improvements: The lift station has been constructed in accordance with the City's lift station standardization policy, so no improvements are recommended at this time. However, the typical design life of lift station materials is approximately 20-30 years, so the following maintenance should be expected at that time.

1. Replace pumps
2. Replace valves
3. Clean and coat the wet well interior and piping

C. Force Main: Replace the existing 4"Ø DIP force main with a 4"Ø PVC force main from the discharge manhole southwest of the lift station to the point where the parallel 4"Ø DIP force mains tie into a single 4"Ø DIP force main downstream of the valve vault.

D. The electrical equipment and controls are in excellent condition and can be expected to remain in service for 20+ years.

1. Replace the existing control panel in 20-30 years.

6.4 Estimated Costs

Table 6-1 below summarizes the estimated costs for recommended improvements to the Keller Lake Lift Station and the proposed year for the improvements. A more detailed breakdown of the costs is included in **Appendix A**.

Table 6-1
Summary of Estimated Costs and Proposed Year for Improvements for Keller Lake Lift Station

Description of Improvements	Total Estimated Opinion of Probable Cost (Including 2.5% Annual Inflation)	Proposed Year for Improvements
Site and Surface Improvements	$1,000	2033-2043
Pumping, Mechanical, and Structure Improvements	$105,000	2033-2043
Force Main Improvements	$54,000	2023-2028
Control Panel Replacement	$214,000	2033-2043

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Sanitary Sewer Lift Station
Condition Assessment
City of Burnsville, MN
WSB Project No. 1880-220

Figure 6-1
Keller Lake Lift Station
Site Location Map

1 inch = 200 feet

N

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Fig. 6-2: Keller Lake Site

Fig 6-3: Keller Lake Wet Well

Fig. 6-4: Keller Lake Valve Vault

Fig. 6-5: Keller Lake Control Panel

7. MAPLE ISLAND 1 (BIG) (299 MAPLE ISLAND ROAD)

7.1 Location Description

The City's Maple Island 1 (Big) Lift Station is located on the same site with Maple Island 2 (Small) lift station. It is on the south side of Maple Island Road approximately 200 feet northeast of the intersection with Oak Shore Drive North. It was rehabilitated and converted to a submersible pump lift station style in 2009. **Figure 7-1** on **Page 37** is an aerial map showing the location of the lift station.

7.2 Existing Condition Assessment

A. **Figures 7-2 through 7-7** on **Page 38** are photographs showing the existing condition of the Maple Island Big Lift Station.

B. Service Area and Wastewater Flow: The lift station service area consists of 574 equivalent residential units in Burnsville, and 1,123 equivalent residential units in Lakeville. Based on existing development in the service area, the estimated influent flow rate is 320 gpm average flow and 1,130 gpm peak flow.

C. Site conditions: The lift station access driveway (concrete) is southeast of Maple Island Road. The concrete slab for the control panel is connected to the lift station but is approximately 15 feet from the wet well, which is acceptable for this lift station since the site includes two lift stations. There are bollards protecting the control panel.

D. Wet well: 10'Ø precast concrete structure approximately 24 feet deep. City staff indicated that wet well capacity requires an emergency response time of 15 to 30 minutes. There are some grease problems in the wet well however the grease does not cling to the sides of the wet well and can be removed by vacuum. There is a flow diverter on the influent invert to direct wastewater around the sides of the wet well and reduce pump cavitation. The existing wet well appears to be in good condition.

E. Pump access hatch: Double leaf 6'x4' aluminum hatch with safety grate and appears to be in good condition.

F. Valve vault: 8'Ø precast concrete structure approximately 10 feet deep with a 3'x3' access hatch with safety grate for access. The valve vault has a concrete base with a 2" PVC drain line to the wet well. The valve vault appears to be in good condition.

G. Pumps: The station has two ABS non-clog submersible 33.5 hp pumps that were installed when the lift station was reconstructed in 2009. Pump down tests indicated the pumping rate of pump 1 was approximately 1,210 gpm and pump 2 was 1,190 gpm. Pump curves indicate the design capacity is 1,300 gpm at 55 feet TDH. Based on discussions with City staff pump 1 had a bad bearing and was replaced. City staff indicated the lift stations clog with rags a couple of times per month and the City is in the process of purchasing new pumps more capable of handling rags.

H. Lift Station Piping: Sewage enters the lift station from the north through a 12"Ø RCP. Lift station pumps discharge through parallel 8"Ø DIPs, through 8"Ø gate and swing flex check valves in the valve vault, and tie into a single 10"Ø DIP forcemain downstream of the valve vault. Also there is a connection in the valve vault available for a temporary bypass connection. The piping and valves appear to be in good condition.

I. Accessories: Dual stainless steel pump guide rails, lifting chains, cable holders, and hardware appear to be in good condition.

J. Force Main: The 10"Ø DIP forcemain is approximately 1,200 feet in length and discharges to a 12"Ø RCP sanitary sewer that flows east along Oak Shore Drive. The force main was constructed in 1974 and velocity in the force main is estimated to be approximately 5 fps. The forcemain was televised in 2009; City staff indicated it appeared to be in good condition.

K. Electrical Service:

1. Rating: 480V, 3-Phase, 4-Wire
2. Utility: Dakota Electric Association, Meter # 05255490
3. Main: 200 Amp Main Breaker
4. Backup Power:
   a. 150 Amp Gen Breaker
   b. ASCO 7000 ATS
   c. Cummins Model GGLA-1233075 125KVA Generator (Shared with Station B)

L. Pump Electrical Data:

	Size (HP)	**Rating**	**Starter**
Pump #1	33.5	480V, 3 Phase	FVNR Square D NEMA Size 3 8536SEO1H10S
Pump #2	33.5	480V, 3 Phase	FVNR Square D NEMA Size 3 8536SEO1H10S

M. Controls: The station level is currently monitored by a submersible level transducer which is used as the primary control. Backup control is provided by float switches for high level and low level.

N. Control Panel: The stainless steel, door-in-door control panel was manufactured by Wunderlich-Malec in 2009. The main controller is an Allen-Bradley Micrologix 1100 (submersible transducer) and the backup controllers are relays (floats) controlled through the PLC. All control panel components appeared to be in excellent condition.

O. SCADA: The SCADA system is integrated with the control panel. The panel communicates the station status to the SCADA master and allows control of pump operation levels via fiber optic cable. The media converter is a Cisco Catalyst 2955. All control panel components appeared to be in excellent condition.

7.3 Recommended Improvements

Recommended improvements are consistent with the City's lift station standardization policy, but may deviate since there are two lift stations at this location.

A. Site Improvements: The lift station has been constructed in accordance with the City's lift station standardization policy, so no improvements are recommended at this time. Bollard painting may be necessary as the lift station ages.

B. Pumps: The City should continue to pursue new ABS pumps more capable of handling rags to reduce trips to the lift station.

C. Lift Station Improvements: The lift station has been constructed in accordance with the City's lift station standardization policy, so no improvements are recommended at this time. However, the typical design life of lift station materials is approximately 20-30 years, so the following maintenance should be expected at that time.

1. Replace pumps
2. Replace valves
3. Clean and coat the wet well and piping

D. Force Main: Replace the existing 10"Ø DIP force main with a 10"Ø PVC force main from the discharge manhole southeast of the lift station along Oak Shore Drive to the point where the parallel 8"Ø DIP force mains tie into a single 10"Ø DIP force main downstream of the valve vault. Directional boring of the force main could be used to reduce surface replacement costs. CIPP lining may be an alternative for replacement of the 10"Ø DIP force main and should be evaluated at the time of project design.

E. The electrical equipment and controls are in excellent condition and can be expected to remain in service for 20+ years.

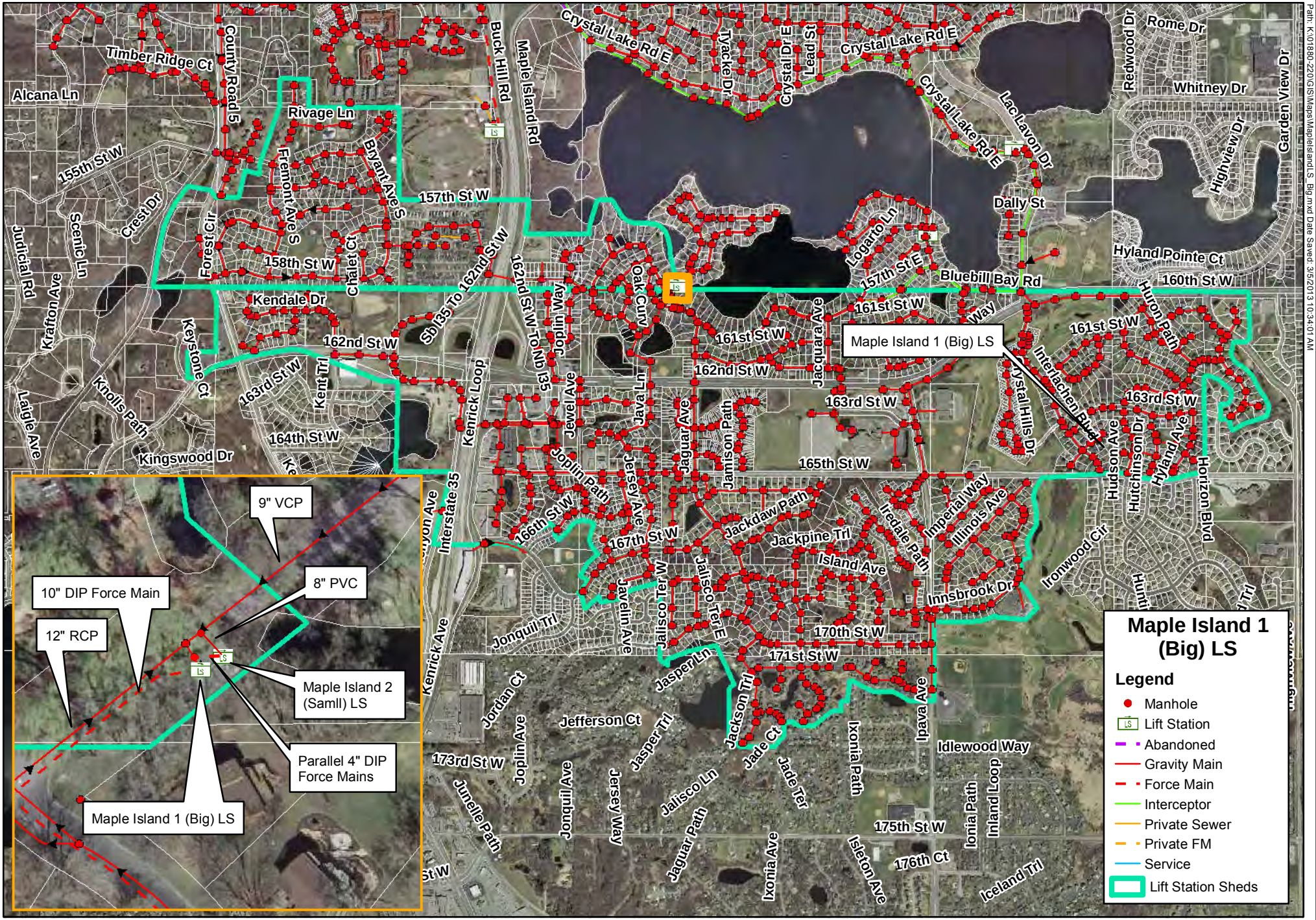
1. Replace the existing control panel in 20-30 years.
2. Replace generator in 20-30 years.
3. Rewire the control panel so floats operate independently of PLC (Operations and Maintenance activity).

7.4 Estimated Costs

Table 7-1 below summarizes the estimated costs for recommended improvements to the Maple Island Big Lift Station and the proposed year for the improvements. A more detailed breakdown of the costs is included in **Appendix A**.

Table 7-1
Summary of Estimated Costs and Proposed Year for Improvements for Maple Island Big Lift Station

Description of Improvements	Total Estimated Opinion of Probable Cost (Including 2.5% Annual Inflation)	Proposed Year for Improvements
Site and Surface Improvements	$1,000	2034-2043
Pumping, Mechanical, and Structure Improvements	$302,000	2034-2043
Force Main Improvements	$275,000	2029-2033
Control Panel Replacement	$229,000	2034-2043
Generator Replacement	$268,000	2034-2043



Sanitary Sewer Lift Station
Condition Assessment
City of Burnsville, MN
WSB Project No. 1880-220

Figure 7-1
Maple Island 1 (Big) Lift Station
Site Location Map

1 inch = 1,800 feet

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Fig. 7-2: Maple Island Big Site

Fig 7-3: Maple Island Big Wet Well

Fig. 7-4: Maple Island Big Valve Vault

Fig. 7-5: Maple Island Big Control Panel

Fig. 7-6: Maple Island Big and Small Generator

Fig. 7-7: Maple Island Big Control Panel

8. MAPLE ISLAND 2 (SMALL) (299 MAPLE ISLAND ROAD)

8.1 Location Description

The City's Maple Island 2 (Small) Lift Station is located on the sane site with Maple Island Big lift station. It is on the south side of Maple Island Road approximately 200 feet northeast of the intersection with Oak Shore Drive North. It was constructed in 1988, and the site and controls were rehabilitated as part of the 2009 Maple Island Big improvements project. **Figure 8-1** on **Page 43** is an aerial map showing the location of the lift station.

8.2 Existing Condition Assessment

A. **Figures 8-2 through 8-7** on **Page 44** are photographs showing the existing condition of the Maple Island Small Lift Station.

B. General: Upstream sanitary sewers are at an elevation where the lift station is unnecessary. However, in the past there were sewer backup issues on Maple Island resulting from the Maple Island Big Lift Station. The Maple Island Small Lift Station serves as a point to protect homes on Maple Island from sewer backups.

C. Service Area and Wastewater Flow: The lift station service area consists of approximately 67 single family residential units. Based on existing development in the service area, the estimated influent flow rate is 13 gpm average flow and 52 gpm peak flow.

D. Site conditions: The lift station access driveway (concrete) is southeast of Maple Island Road. The concrete slab for the control panel is connected to the lift station but is not oriented perpendicular to the control panel, which is acceptable for this lift station since the site includes two lift stations. There are bollards protecting the control panel.

E. Wet well: 6'Ø precast concrete structure approximately 20 feet deep. City staff indicated the wet well has adequate capacity to allow ample emergency response time. The wet well is not vented and the hatch does not include a safety grate. City staff indicated there are minimal grease problems in the wet well. Groundwater appears to have seeped in at the lowest precast section of the wet well, however the wet well appears to be in good condition.

F. Pump access hatch: Single leaf 48"x 30" aluminum hatch without safety grate. The access hatch appears to be in fair condition, the hinges have been corroded.

G. Valve vault: 4'Ø precast concrete structure approximately 6 feet deep and has a manhole casting for access. Flanges for the valves are within 6" of the valve vault walls. The existing valve vault appears to be in good condition.

H. Pumps: The station has two Flygt non-clog submersible 3hp pumps that were installed when the original lift station was constructed in 1988. Pump down tests indicated the pumping rate of pump 1 was approximately 415 gpm and pump 2 was 400 gpm. Pump curves indicate the design capacity is 100 gpm at 24 feet TDH. City maintenance records indicated a new handle is needed for pump 1. City staff indicated there are minimal problems with pump clogging at this location.

I. Lift Station Piping: Sewage enters the lift station from the north through an 8"Ø PVC pipe. Lift station pumps discharge through parallel 4"Ø DIP pipes, through gate and OS&L check valves in the valve vault, and discharge to a 12" Ø RCP sewer immediately upstream of the Maple Island Big lift station. Velocity in the discharge piping is estimated to be approximately 10 fps. The piping has external corrosion, but thickness is unknown. Valve corrosion is consistent with piping, City staff indicated valves are functioning adequately.

J. Accessories: Dual stainless steel pump guide rails, lifting chains, cable holders, and hardware appear to be in good condition.

K. Electrical Service:

1. Rating: 480V, 3-Phase, 4-Wire.
2. Utility: Dakota Electric Association, Meter # 10147429
3. Main: 100 Amp Main Breaker
4. Backup Power:
   a. 100 Amp Gen Breaker
   b. ASCO 7000 ATS
   c. Cummins Model GGLA-1233075 125KVA Generator (Shared w/Station A)

L. Pump Electrical Data:

	Size (HP)	Rating	Starter	Notes
Pump #1	3	480V, 3 Phase	FVNR Square D NEMA Size 1 8536SCO3H10S	
Pump #2	3	480V, 3 Phase	FVNR Square D NEMA Size 1 8536SCO3H10S	

M. Controls: The station level is currently monitored by a submersible level transducer which is used as the primary control. Backup control is provided by float switches for high level and low level.

N. Control Panel: The stainless steel, door-in-door control panel was manufactured by Wunderlich-Malec in 2009. The main controller is an Allen-Bradley Micrologix 1100 (submersible transducer) and the backup controller are relays (floats). All control panel components appeared to be in excellent condition.

O. SCADA: The SCADA system is integrated with the Maple Island 1 (Big) lift station control panel. All control panel components appeared to be in excellent condition.

8.3 Recommended Improvements

Recommended improvements are consistent with the City's lift station standardization policy, but deviate some since there are two lift stations at this location.

A. General: Some components of the existing lift station are not in compliance with the City's lift station standardization policy, however existing structures, pumps, and piping can be expected to remain serviceable for 5-10 years.

B. Wastewater Flow: It is understood this lift station is necessary to prevent sewer backups at Maple Island. However, removal of the lift station should be considered in the future to reduce maintenance costs. It could be possible to prevent sewer backups on Maple Island by installing a backwater rubber check valve in the sewer upstream of the existing lift station.

C. Site Improvements: The lift station site has been constructed in accordance with the City's lift station standardization policy, so no improvements are recommended at this time. Bollard painting may be necessary as the lift station ages.

D. Wet Well / Access Hatch: Replace the wet well cover slab including a wet well vent pipe and new H20 rated aluminum access hatch with safety grate and stainless steel hardware. Also, the interior of the wet well should be cleaned and coated for corrosion protection.

E. Valve Vault: Replace the existing valve vault with a 6'Ø precast concrete structure including a cover slab with a H20 rated aluminum access hatch. It may not be possible to remove and replace the valves within the existing structure due to their proximity to the structure sidewalls.

F. Pumps: Replace the Flygt pumps with ABS non-clog submersible pumps and modify accessories as necessary. Pump capacity may be able to be reduced which would be evaluated in greater detail at the time of design.

G. Lift Station Piping: Replace lift station piping, including discharge piping at the discharge manhole. Replace the 4"Ø valves including changing the OS&L valve to a swing flex check valve. Add a 2"Ø PVC drain line between the valve vault and wet well with a rubber backwater check valve in the wet well to reduce the volume of water collected in the valve vault.

H. The electrical equipment and controls are in excellent condition and can be expected to remain in service for 20+ years.

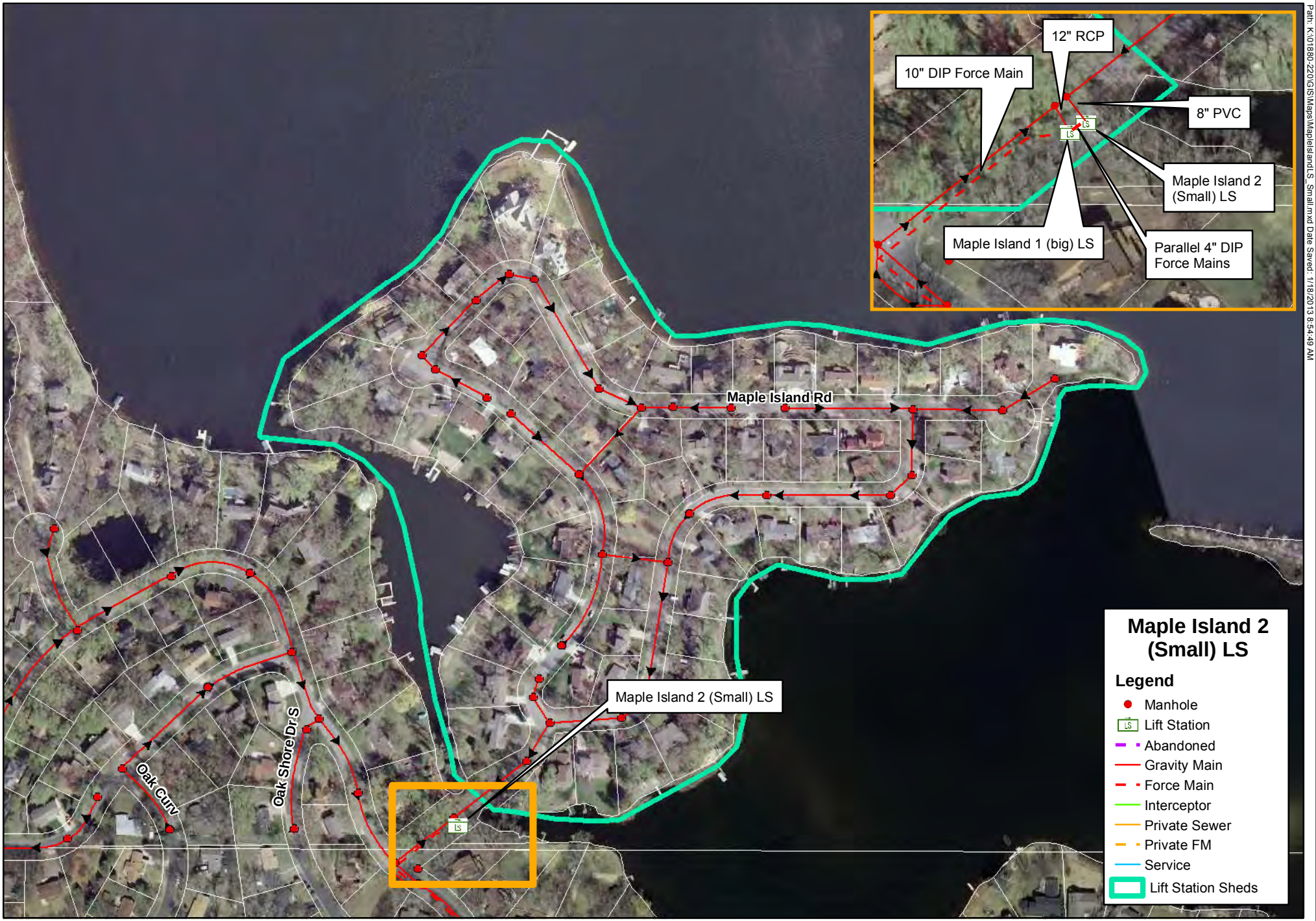
1. Replace the existing control panel in 20-30 years.

8.4 Estimated Costs

Table 8-1 below summarizes the estimated costs for recommended improvements to the Maple Island 2 (Small) Lift Station and the proposed year for the improvements. A more detailed breakdown of the costs is included in **Appendix A**.

Table 8-1
Summary of Estimated Costs and Proposed Year
for Improvements for Maple Island 2 (Small) Lift Station

Description of Improvements	Total Estimated Opinion of Probable Cost (Including 2.5% Annual Inflation)	Proposed Year for Improvements
Site and Surface Improvements	$22,000	2023-2028
Pumping, Mechanical, and Structure Improvements	$158,000	2023-2028
Control Panel Replacement	$214,000	2034-2043



Sanitary Sewer Lift Station
Condition Assessment
City of Burnsville, MN
WSB Project No. 1880-220

Figure 8-1
Maple Island 2 (Small) Lift Station
Site Location Map

1 inch = 300 feet

N

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Fig. 8-2: Maple Island Small Site and Control Panel

Fig 8-3: Maple Island Small Wet Well

Fig. 8-4: Maple Island Small Valve Vault

Fig. 8-5: Maple Island Small Control Panel

Fig. 8-6: Maple Island Big and Small Generator

Fig. 8-7: Maple Island Small Pump Discharge

9. MCANDREWS (13811 NICOLLET BOULEVARD)

9.1 Location Description

The City's McAndrews Lift Station is located on the south side of McAndrews Road, approximately 30 feet south of the intersection with Nicollet Boulevard. It was constructed in 1986. **Figure 9-1** on **Page 51** is an aerial map showing the location of the lift station.

9.2 Existing Condition Assessment

A. **Figures 9-2 through 9-7** on **Page 52** are photographs showing the existing condition of the McAndrews Lift Station.

B. Service Area and Wastewater Flow: The lift station service area consists of a wide variety of land uses including hospital/medical facilities, assisted living facilities, apartment buildings, commercial properties, and single family residential units. Based on existing development in the service area, the estimated influent flow rate is approximately 125 gpm average flow and 495 gpm peak flow.

C. Site conditions: The lift station access driveway (concrete apron and gravel) is east of Nicollet Boulevard. There is an access road for the site, but it requires City staff to back out of the site onto a busy road. There are no bollards protecting the control panel.

D. Wet Well/Dry Well: The station is a wet well/dry well configuration. The wet well is 10'x11' and the dry well 9'-9" Ø, and both are approximately 33 feet deep. City staff indicated the wet well has capacity to allow a 30 minute emergency response time, but if more time is necessary, some flow can be diverted to the Meadow Acres lift station by placing sand bags in an upstream manhole. The wet well is not vented. City staff indicated it is very difficult to clean the wet well, due to its configuration it is not possible to reach the corners with the vacuum. The condition of the wet well is unknown since it was not entirely visible. The dry well appears to be in good condition.

E. Wet Well/Dry Well Access: The wet well has a 24"x 24" aluminum hatch with safety net that enters 48" typical manhole section which is approximately 20' deep to the wet well. The dry well has a Smith and Loveless 36" Ø painted steel hatch that extends approximately 20' deep to the dry well. Both the wet well and dry well accesses appear to be in good condition.

F. Pumps: The station has three Smith & Loveless dry pit pumps that were installed when the original lift station was constructed in 1986. Based on maintenance records, pumps 1 and 2 appear to be 15 hp and pump 3 to be 20 hp. Pump down tests indicated the pumping rate of pump 1 was approximately 610 gpm, pump 2 was 555 gpm, and pump 3 was 580 gpm. The wet well was not visible during testing so pumped volumes in the wet well were estimated. Pump curves indicate the design capacity is 500 gpm at 60 feet TDH. City staff indicated there are problems with rocks and grit in the pumps, and rags in the past. Based on the station configuration, it is very difficult to remove the pumps from the dry well.

G. Lift Station Piping: Sewage enters the lift station from the west through a 12"Ø DIP pipe. Lift station pumps draw wastewater from the wet well through 8"Ø DIP suction lines and discharge through 8"Ø DIP pipes that tie into a single 12"Ø DIP forcemain in the dry well. The suction lines and discharge lines have 8"Ø gate valves and the discharge lines have 8"Ø OS&L check valves. The piping and valves appear to be in good condition.

H. Force Main: The 12"Ø DIP forcemain runs approximately 500 feet west along McAndrews before turning north along Interstate 35W's (35W) east right-of-way line inside of the sound barrier. At that point the force main converts to 12"Ø PVC and travels north along 35W's east right-of-way line approximately 5,500 feet where it discharges to a 12"Ø PVC sanitary sewer that continues north along the 35W east right-of-way line. In some locations the permanent easement over the force main is 7 feet wide. The force main route has significant relief and is difficult to access in some locations, especially for maintenance and construction equipment. The DIP section of the forcemain was constructed in 1986. The force main from McAndrews road to approximately 400 feet north along the 35W sound barrier is PVC and was constructed in 2011, but the remainder of the PVC section was constructed in 1986. When only a single pump is running, velocity in the force main is approximately 1.5 fps.

I. Force Main Air Release Structures: There are 5 structures with air release valves located along the force main. These structures include a 4'Ø diameter manhole, 5'Ø diameter bolted top access cover, with a 27"Ø standard manhole cover immediately below the 5'Ø top cover. The top covers include lifting hooks designed to be removed by equipment. The force main is routed through the manhole, with a pipe saddle attached to the pipe, and the air release valve mounted above the saddle with shutoff valves between. City staff inspected the structures and indicated the structures and PVC force main appear to be in good condition, however three of the five air release valves and shut off valves/piping are in poor condition. Air release valves have been purchased and are planned to be installed in the near future.

J. Force Main Clean Out Structures: There are 5 structures with clean outs located along the force main route. These structures include a 4'Ø diameter manhole, 5'Ø diameter bolted top access cover, with a 27"Ø standard manhole cover immediately below the 5'Ø top cover. The top covers include lifting hooks designed to be removed by equipment. The force main is routed through the manhole with an upturned tee and blind flange cover. City staff inspected the structures and indicated the structures and piping appear to be in good condition.

K. Electrical Service:

1. Rating: 480V, 3-Phase, 4-Wire
2. Utility: Dakota Electric Association, Meter # 27 435 751
3. Main: 100 Amp Main Breaker
4. Backup Power:
   a. 100 Amp Generator Breaker
   b. Crouse-Hinds AR2041-S22 Receptacle

L. Pump Electrical Data:

	Size (HP)	**Rating**	**Starter**
Pump #1	15	480V, 3 Phase	FVNR Allen Bradley 509-CO2
Pump #2	15	480V, 3 Phase	FVNR Allen Bradley 509-CO2
Pump #3	20	480V, 3 Phase	FVNR Allen Bradley 509-CO2

M. Controls: The station level is currently monitored by a submersible level transducer which is used as the primary control. Backup control is provided by float switches for high level and low level.

N. Control Panel: The steel, door-in-door control panel was manufactured by Edison Controls in 1985 and upgraded by Wunderlich-Maclec in 2008. The main controller is an Allen-Bradley Micrologix 1100 (submersible transducer) and the backup controller are relays (floats). All control panel components appeared to be in good condition.

O. SCADA: The SCADA system is integrated with the control panel. The panel communicates the station status to the SCADA master and allows control of pump operation levels via fiber optic cable. The media converter is a Cisco Catalyst 2955. All control panel components appeared to be in good condition.

9.3 Recommended Improvements

Recommended improvements are consistent with the City's lift station standardization policy.

A. Site Improvements: Construct a bituminous access driveway including bollards and a concrete slab around both the lift station and control panel. The driveway should allow City staff to pull through from Nicollet Avenue to McAndrews Road, or a pull off lane on Nicollet Avenue. This will require further evaluation and coordination with Dakota County.

B. Wet Well: Construct a new 10'Ø wet well adjacent to the existing wet well including vent pipe, H20 rated aluminum access hatch, and safety grate. Due to the size of the site, the lift station would need to be constructed by caisson construction methods. An alternative would be to extend the existing 10'x11' wet well upward to the surface. Wet well capacity, layout, and location will be determined at the time of final design and include further structural evaluation of the existing wet well. A bypass pumping plan will also need to be coordinated. The existing wet well could act as a manhole for wastewater to flow through to the new wet well. The existing wet well would require a modified flow channel and interior fill. The cover slab should be elevated above surrounding pavement for positive drainage. The interior of the new wet well should be coated with a hydrogen sulfide resistant coating.

C. Valve Vault: Construct an 8'Ø valve vault including H20 rated aluminum access hatch and safety grate. The cover slab should be elevated above surrounding pavement for positive drainage.

D. Pumps: The existing lift station has three 15 hp pumps. Now that the service area is fully developed and wastewater flow is relatively consistent in the service area, the number of pumps should be reduced to two. Based on a pumping design rate of 750 gpm (to maintain 2 fps in the force main), it is anticipated two ABS 20 hp non-clog submersible pumps would be necessary.

E. Lift Station Piping: Lift station piping would consist of 8"Ø discharge lines tying into the existing 12"Ø force main downstream of a new valve vault. 8"Ø gate valves and swing flex check valves should be included in the valve vault. A connection for future temporary bypass pumping should be designed in the new valve vault. Coat all new piping with a hydrogen sulfide resistant coating.

F. Force Main: Replace the approximate 500' section of 12"Ø DIP force main with 12"Ø PVC force main between the existing PVC force main and the point where the parallel 8"Ø DIP force mains tie into the single12"Ø DIP force main downstream of the valve vault. Directional boring of the force main could be used to reduce surface replacement costs. CIPP lining may be an alternative for replacement of the 12"Ø DIP force main and should be evaluated at the time of project design.

G. Force Main Operations: The force main has several locations which are difficult to access. Develop an emergency operations plan that includes a listing of contractors who have equipment capable of accessing the force main area and providing bypass pumping between cleanouts in the event of a main break.

H. Force Main Air Release/Clean Out Structures: Replace the structure cover slabs with cover slabs that include typical manhole castings. The replacement cover slabs over the air release structures should include venting.

I. Overall condition of the electrical equipment is fair. The control panel is integrated with the storm station located at the same site and was updated in 2008 by Wunderlich-Malec. A remote panel is located in the dry well. This panel contains the motor starters and remote HOA control functionality. It is recommended this remote panel be removed from the dry well and incorporated into a new stainless steel main control panel.

J. The 2010 Sanitary Sewer Generator Study recommends that the McAndrews Lift Station be provided with backup power. Based on existing pump sizes, it is estimated that a 125 KVA natural gas generator and 100A Automatic Transfer Switch be provided. Costs are based on RSMeans electrical cost data. Installation of the generator and transfer switch should be coordinated with the control panel replacement to minimize costs and downtime associated with the project.

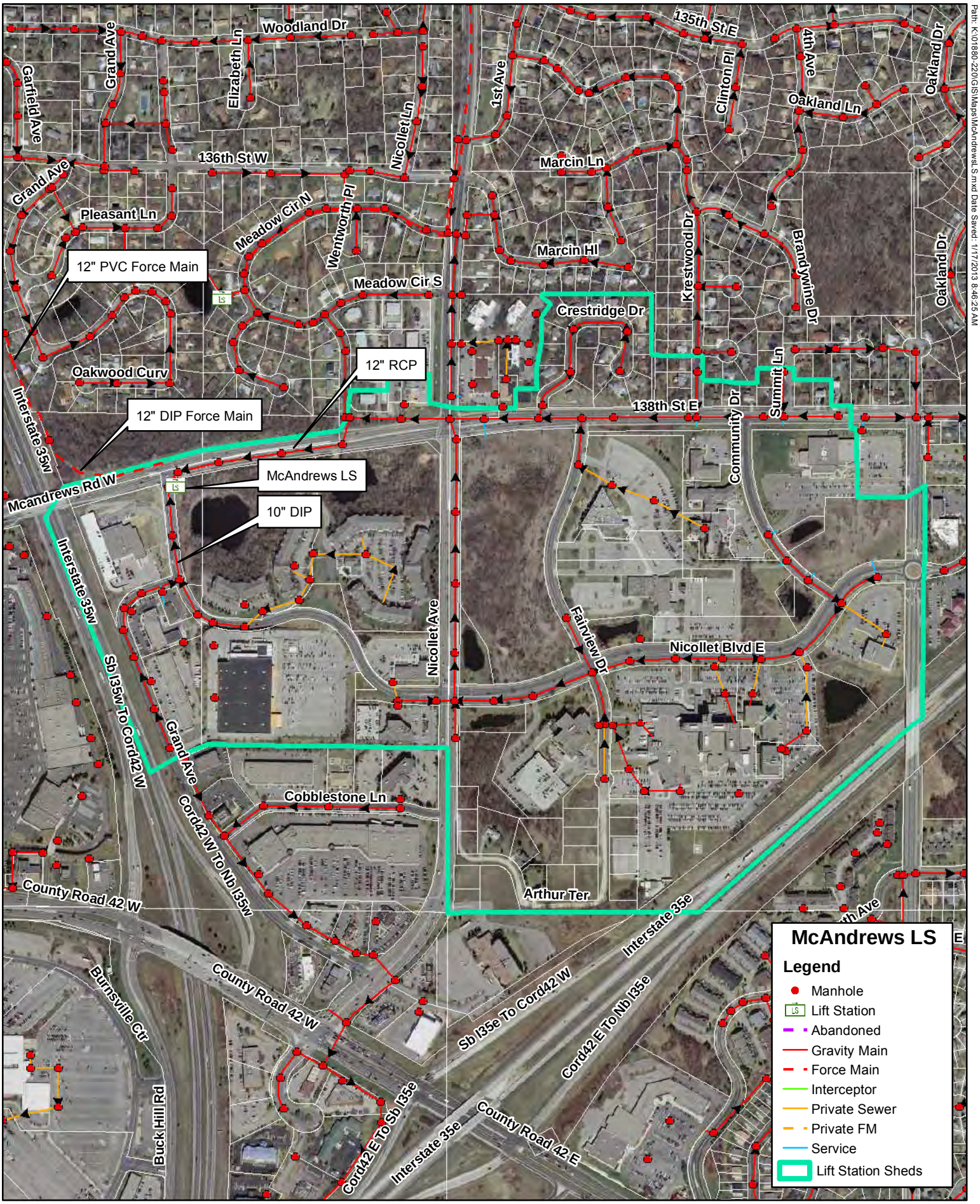
1. Integrate remote panel into new control panel in 0-5 years.
2. Install generator in 0-5 years.

9.4 Estimated Costs

Table 9-1 below summarizes the estimated costs for recommended improvements to the McAndrews Lift Station and the proposed year for the improvements. A more detailed breakdown of the costs is included in **Appendix A**.

Table 9-1
Summary of Estimated Costs and Proposed Year for Improvements for McAndrews Lift Station

Description of Improvements	Total Estimated Opinion of Probable Cost (Including 2.5% Annual Inflation)	Proposed Year for Improvements
Site and Surface Improvements	$34,000	2018
Pumping, Mechanical, and Structure Improvements	$424,000	2018
Force Main Structure Improvements	$42,000	2018
Force Main Improvements (Ex. Structures)	$120,000	2023-2028
Control Panel Integration	$115,000	2018
Generator Improvements	$145,000	2018



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Sanitary Sewer Lift Station
Condition Assessment
City of Burnsville, MN
WSB Project No. 1880-220

Figure 9-1
McAndrews Lift Station
Site Location Map

1 inch = 650 feet

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Fig. 9-2: McAndrews Dry Well Access

Fig 9-3: McAndrews Wet Well Access

Fig. 9-4: McAndrews Pump and Piping

Fig. 9-5: McAndrews Header Piping

Fig. 9-6: McAndrews Main Control Panel (Above Grade)

Fig. 9-7: McAndrews Remote Control Panel (Drywell)

10. MEADOW ACRES (16 NORTH MEADOW CIRCLE)

10.1 Location Description

The City's Meadow Acres Lift Station was constructed in 1989 and is located on the west side of Meadow Circle, approximately 300 feet north of the intersection with Meadow Acres Place. **Figure 10-1** on **Page 57** is an aerial map showing the site location of the lift station.

10.2 Existing Condition Assessment

A. **Figures 10-2 through 10-6** on **Page 58** are photographs showing the existing condition of the Meadow Acres Lift Station.

B. Service Area and Wastewater Flow: The lift station service area consists of approximately 92 single family residential units, apartment/condo buildings, commercial properties, an elementary school, and a junior high school. Based on existing development in the service area, the estimated influent flow rate is 180 gpm average flow and 660 gpm peak flow.

C. Site conditions: The lift station access driveway (bituminous) is west of Meadow Circle. The control panel is located on the lift station cover slab, very close to the pump access hatch. It is difficult to view the SCADA panel when the wet well access hatch is open. There are no bollards protecting the control panel on the access road.

D. Wet well: 8'Ø precast concrete structure approximately 23 feet deep. City staff indicated the wet well has capacity to allow a 20 minute emergency response time. The wet well is not vented. City staff indicated there are grease problems in the wet well. Under normal operations, wastewater is allowed to back up into the upstream manhole. The existing wet well appears to be in good condition.

E. Pump access hatch: Single leaf 48"x 36" aluminum hatch without safety grate. The access hatch appears to be in fair condition, it has sunk in the middle.

F. Valve vault: 4'Ø precast concrete structure approximately 9 feet deep and has a manhole casting for access. The valve vault has a concrete base slab. The valve vault had water in the structure at the time of inspection. The existing valve vault appears to be in good condition.

G. Pumps: The station has two ABS non-clog submersible 25 hp pumps that were installed in 2012. Pump down tests indicated the pumping rate of pump 1 was approximately 375 gpm and pump 2 was 340 gpm. Pump curves were available and appear to indicate the design capacity is 787 gpm at 64 feet TDH. City staff indicated there are minimal problems with pump clogging at this location.

H. Lift Station Piping: Sewage enters the lift station from the north through a 9"Ø vitrified clay pipe (VCP). Lift station pumps discharge through parallel 6"Ø DIP pipes, through swing flex check valves in the valve vault and buried gate valves downstream of the valve vault, and tie into a single 8"Ø DIP force main downstream of the valve vault. The piping has external corrosion, but thickness is unknown. Valve corrosion is consistent with piping, City staff indicated valves are functioning adequately.

I. Accessories: Dual stainless steel pump guide rails, lifting chains, cable holders, and hardware appear to be in good condition.

J. Force Main: The 8"Ø CIP force main is approximately 2,800 feet in length and discharges to a 12"Ø VCP gravity sewer that flows north along Nicollet Avenue. The force main was originally constructed in 1963, however, approximately 1,100 feet of the force main along Meadow Circle North was replaced with DIP in 1995. The velocity in the force main is estimated to be approximately 2.5 fps.

K. Electrical Service:

1. Rating: 480V, 3-Phase, 4-Wire
2. Utility: Dakota Electric Association, Meter # 01 623 371
3. Main: 200 Amp Main Breaker
4. Backup Power: Backup Power:
   a. 200 Amp Generator Breaker
   b. Crouse-Hinds AR2041-S22 Receptacle

L. Pump Electrical Data:

	Size (HP)	**Rating**	**Starter**
Pump #1	20	480V, 3 Phase	FVNR Siemens 3TF46
Pump #2	20	480V, 3 Phase	FVNR Siemens 3TF46

M. Controls: The station level is currently monitored by a submersible level transducer which is used as the primary control. Backup control is provided by float switches for high level and low level.

N. Control Panel: The steel, door-in-door control panel was manufactured by Automatic Pump Control System in 1989. The main controller is the SCADA PLC (submersible transducer) and the backup controller are relays (floats). All control panel components appeared to be in good condition.

O. SCADA: The stainless steel control panel was manufactured by Wunderlich-Malec in 2009. The PLC is an Allen-Bradley Micrologix 1100. The panel communicates the station status to the SCADA master and allows control of pump operation levels via fiber optic cable. The media converter is a Cisco Catalyst 2955. All control panel components appeared to be in excellent condition.

10.3 Recommended Improvements

Recommended improvements are consistent with the City's lift station standardization policy.

A. Site Improvements: Remove and replace bituminous driveway pavement lift to the access driveway, add bollards to protect the control panel, and construct a concrete slab around both the lift station and control panel. Redirect the existing 9"Ø PVC sewer from the east to the new wet well location, and extend the 9"Ø PVC sewer from the north to the new wet well location. The bituminous driveway pavement is in good condition, however, due to construction and relocation of the lift station the majority of pavement would need to be removed.

B. Wet Well: Construct a new 10'Ø wet well east of the existing wet well including vent pipe, H20 rated aluminum access hatch, and safety grate. Due to the size of the site, the lift station would need to be constructed by caisson construction methods. The cover slab should be elevated above surrounding pavement for positive drainage. Coat the wet well with a hydrogen sulfide resistant coating.

C. Valve Vault: Construct an 8'Ø valve vault, including H20 rated aluminum access hatch and safety grate, to house both check and gate valves. The cover slab should be elevated above surrounding pavement for positive drainage.

D. Pumps: Based on lift station pump down tests, the existing pumps are pumping at a rate of approximately 350 gpm, but the design rate is 787 gpm. Due to the discrepancy between pump design and pump down test results, the actual pumping rate should be verified by flow meters. Pumps would be relocated to the new wet well, however may need to be increased in size depending upon the flow meter testing results.

E. Lift Station Piping: New lift station piping would consist of parallel 8"Ø DIP force mains tying into the existing 8"Ø force main downstream of a new valve vault. 8"Ø gate valves and swing flex check valves should be included in the valve vault, along with a connection available for a temporary bypass pumping. Coat all new piping with a hydrogen sulfide resistant coating. Install a 2"Ø PVC drain line between the valve vault and wet well with a rubber backwater check valve.

F. Force Main: Replace the approximately 1,700 feet of the existing 8"Ø DIP force main with an 8"Ø PVC force main between the discharge manhole and the 8"Ø DIP force main that was constructed in 1995 along Meadow Circle North. Directional boring of the force main could be used to reduce surface replacement costs. CIPP lining may be an alternative for replacement of the 8"Ø DIP force main and should be evaluated at the time of project design.

G. Overall condition of the electrical equipment is fair. The control panel is not compliant with the City's lift station standard, but can be expected to remain serviceable for approximately 2-5 years. The current SCADA panel is located with the door opening over the wet well hatch, creating a fall hazard if working in the panel while the hatch is open. There is no yard light at the site.

1. Install yard light.
2. Install a new control panel in compliance with the City's lift station standardization policy in 2-5 years.

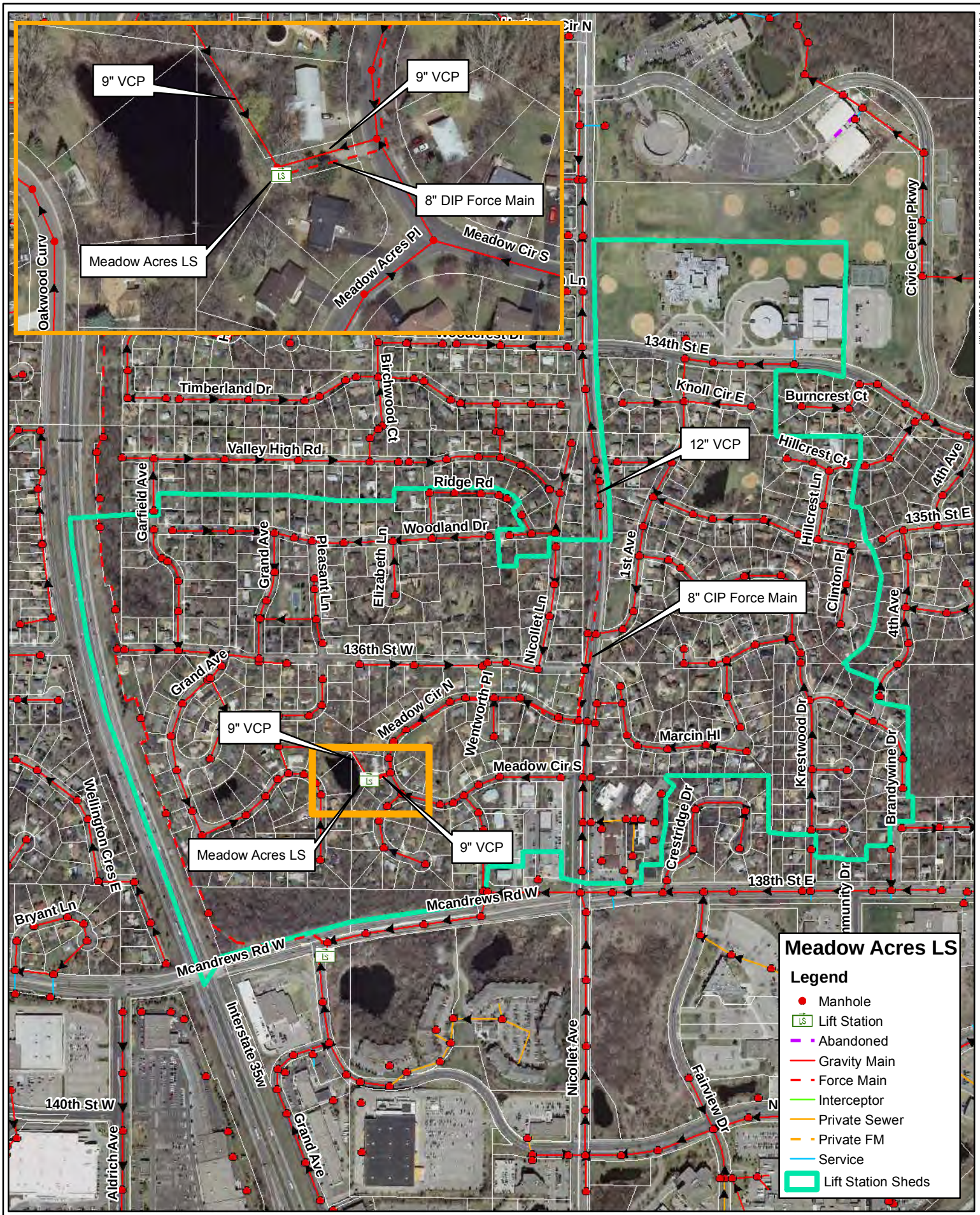
H. The 2010 Sanitary Sewer Generator Study recommends that the Meadow Acres Lift Station be provided with backup power. Based on existing pump sizes, it is estimated that a 100 KVA natural gas generator and 100A Automatic Transfer Switch be provided. Costs are based on the RSMeans electrical cost data. Installation of the generator and transfer switch should be coordinated with the control panel replacement to minimize costs and downtime associated with the project.

10.4 Estimated Costs

Table 10-1 below summarizes the estimated costs for recommended improvements to the Meadow Acres Lift Station and the proposed year for the improvements. A more detailed breakdown of the costs is included in **Appendix A**.

Table 10-1
Summary of Estimated Costs and Proposed Year for Improvements for Meadow Acres Lift Station

Description of Improvements	Total Estimated Opinion of Probable Cost (Including 2.5% Annual Inflation)	Proposed Year for Improvements
Site and Surface Improvements	$54,000	2014
Pumping, Mechanical, and Structure Improvements	$301,000	2014
Force Main Improvements	$280,000	2016
Yard Light Installation	$6,000	2014
Replace Control Panel	$105,000	2014
Generator Improvements	$76,000	2014



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Sanitary Sewer Lift Station
Condition Assessment
City of Burnsville, MN
WSB Project No. 1880-220

Figure 10-1
Meadow Acres Lift Station
Site Location Map

1 inch = 700 feet

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Fig. 10-2: Meadow Acres Site

Fig 10-3: Meadow Acres Pump Access Hatch

Fig. 10-4: Meadow Acres Wet Well

Fig. 10-5: Meadow Acres Valve Vault

Fig. 10-6: Meadow Acres Control Panel

11. SAVAGE (3700 WEST HIGHWAY 13)

11.1 Location Description

The City's Savage Lift Station is located approximately 80 feet north of the Highway 13 service road approximately 300 feet east of the intersection with Chowen Drive. It was originally constructed as a wet well/dry well configuration in 1966 but was reconstructed as submersible pump lift station in 1990. **Figure 11-1** on **Page 63** is an aerial map showing the location of the lift station.

11.2 Existing Condition Assessment

A. **Figures 11-2 through 11-5** on **Page 64** are photographs showing the existing condition of the Savage Lift Station.

B. Service Area and Wastewater Flow: The lift station service area consists of approximately 115 acres of commercial property and approximately 300 apartment units. The Washburn lift station (see Section 14) pumps into the service area at approximately 150 gpm. Based on existing development in the service area, the estimated influent flow rate is 120 gpm average flow and 610 gpm peak flow.

C. Site conditions: The lift station access driveway (bituminous) is north of the Highway 13 frontage road and shares a driveway with Rock Hard Landscapes. The concrete slab for the control panel is connected to the lift station area, but there are no bollards protecting the lift station and control panel.

D. Wet well: 14.5'x13'(exterior dimensions) concrete structure approximately 25 feet deep was originally a dry well, but converted to a wet well as part of the 1990 rehabilitation project. City staff indicated the wet well has capacity for an hour emergency response time, but there can be delay in the radio signal from the site. The wet well is vented. There are some grease problems in the wet well which is cleaned out 2 times per year. The existing wet well appears to be in good condition.

E. Pump access hatch: Three separate leaf 24"x 36" aluminum hatches without safety grates. The access hatches appear to be in good condition.

F. Valve vault: 6'x12' (interior dimensions) precast concrete structure approximately 12 feet deep and has a 27" Ø manhole casting for access. The valve vault was constructed as part of the 1990 rehabilitation project. The valve vault has a drain to the wet well. The existing valve vault appears to be in good condition, but it was not possible to view the entire vault from the surface.

G. Pumps: The station has two KSB non-clog submersible 15 hp pumps (pumps 1 and 3) and one ABS non-clog submersible 12 hp pump (pump 2). Pumps 1 and 3 were installed when the lift station was reconstructed in 1990, and pump 2 was installed in 2011. Pump down tests indicated the pumping rate of pump 1 was approximately 705 gpm, pump 2 was 685 gpm, and pump 3 was 745 gpm. Pump curves indicate the design capacity is 600 gpm at 47 feet TDH for pumps 1 and 3, and 600 gpm at 48 feet TDH for pump 2. City staff indicated there are some problems with rocks and grit in pump 3.

H. Lift Station Piping: Sewage enters the lift station from the north through a 10"Ø CIP. Lift station pumps discharge through parallel 6"Ø DIPs, 6"Ø gate and swing flex check valves in the valve vault, and tie into a single 8"Ø DIP force main downstream of the valve vault. There is a bypass pumping connection available in the valve vault. The piping has external corrosion, but thickness is unknown. Valve corrosion is consistent with piping, City staff indicated valves are functioning adequately.

I. Accessories: Dual stainless steel pump guide rails, lifting chains, cable holders, and hardware appear to be in good condition.

J. Force Main: The 8"Ø force main is approximately 1,400 feet in length and ties into MCES parallel force mains that are 14"Ø and 18"Ø. Approximately 200 feet of the force main, between the lift station and Highway 13 service road, is CIP that was constructed in 1966. The remaining 1,200 feet of the force main is DIP that was constructed in 1990. Velocity in the force main is estimated to be approximately 4.5 fps.

K. Electrical Service:

1. Rating: 240V, 3-Phase, 4-Wire
2. Utility: Xcel Energy, Meter # 02 087 920
3. Main: 200 Amp Main Breaker
4. Backup Power: Backup Power:
   a. 200 Amp Generator Breaker
   b. Crouse-Hinds AR2041-S22 Receptacle

L. Pump Electrical Data:

	Size (HP)	Rating	Starter	Notes
Pump #1	15	230V, 3 Phase	FVNR Siemens 3TF46	
Pump #2	12.1	230V, 3 Phase	FVNR Siemens 3TF46	
Pump #3	15	230V, 3 Phase	FVNR Siemens 3TF46	

M. Controls: The station level is currently monitored by a submersible level transducer which is used as the primary control. Backup control is provided by float switches for high level and low level.

N. Control Panel: The stainless steel, door-in-door control panel was manufactured by Pumpak in 1990. The main controller is the SCADA PLC (submersible transducer) in the SCADA panel and the backup controller are relays connected to the SCADA PLC (floats). All control panel components appeared to be in good condition.

O. SCADA: The stainless steel control panel was manufactured by Wunderlich-Malec in 2008. The PLC is an Allen-Bradley Micrologix 1100. The panel communicates the station status to the SCADA master and allows control of pump operation levels via radio. The media converter is a MDS 9710. All control panel components appeared to be in excellent condition.

11.3 Recommended Improvements

Recommended improvements are generally consistent with the City's lift station standardization policy, but deviate some due to the site configuration.

A. General: Some components of the existing lift station are not in compliance with the City's lift station standardization policy, however existing structures, pumps, and piping can be expected to remain serviceable for 5-10 years.

B. Site Improvements: Add an additional bituminous pavement lift to the access driveway and bollards to protect the control panel. Remove and replace bituminous pavement over the valve vault.

C. Wet Well: The interior of the wet well should be cleaned and coated for corrosion protection.

D. Valve Vault: Replace the valve vault cover slab including a new H20 rated aluminum access hatch with safety grate. The cover slab should be elevated above surrounding pavement for positive drainage.

E. Pumps: Replace pumps 1 and 3 with ABS non-clog submersible pumps and modify accessories as necessary. Should the force main from the Washburn lift station be redirected to the MCES interceptor, capacity of pumps 1 and 3 may be able to be reduced (see Section 14) which would be evaluated at the time of final design.

F. Lift Station Piping: Replace lift station mechanical piping in the wet well and valve vault. Paint/coat all new and existing piping in the wet well.

G. Force Main: Replace the existing 8"Ø DIP force main with a 8"Ø PVC force main from the parallel MCES force mains to each (3) of the 6"Ø DIP discharge pipes outside of the valve vault. Directional boring of the force main could be used to reduce surface replacement costs. CIPP lining may be an alternative for replacement of the 8"Ø DIP force main and should be evaluated at the time of project design.

H. Overall condition of the electrical equipment is good to excellent. The control panel is not compliant with the City's lift station standard, but can be expected to remain serviceable for approximately 5-10 years. Currently, the station communicates via radio. An upgrade to cellular, (or fiber if available), communication is recommended to provide a faster and more reliable communication link. Documentation of existing panel configuration is inaccurate and updated as-built drawings are recommended.

1. Install a new control panel in compliance with the City's lift station standardization policy in 5-10 years.
2. Update existing control diagrams (Operations and Maintenance activity).
3. Replace existing radio with cellular or fiber optic communications (Operations and Maintenance activity).

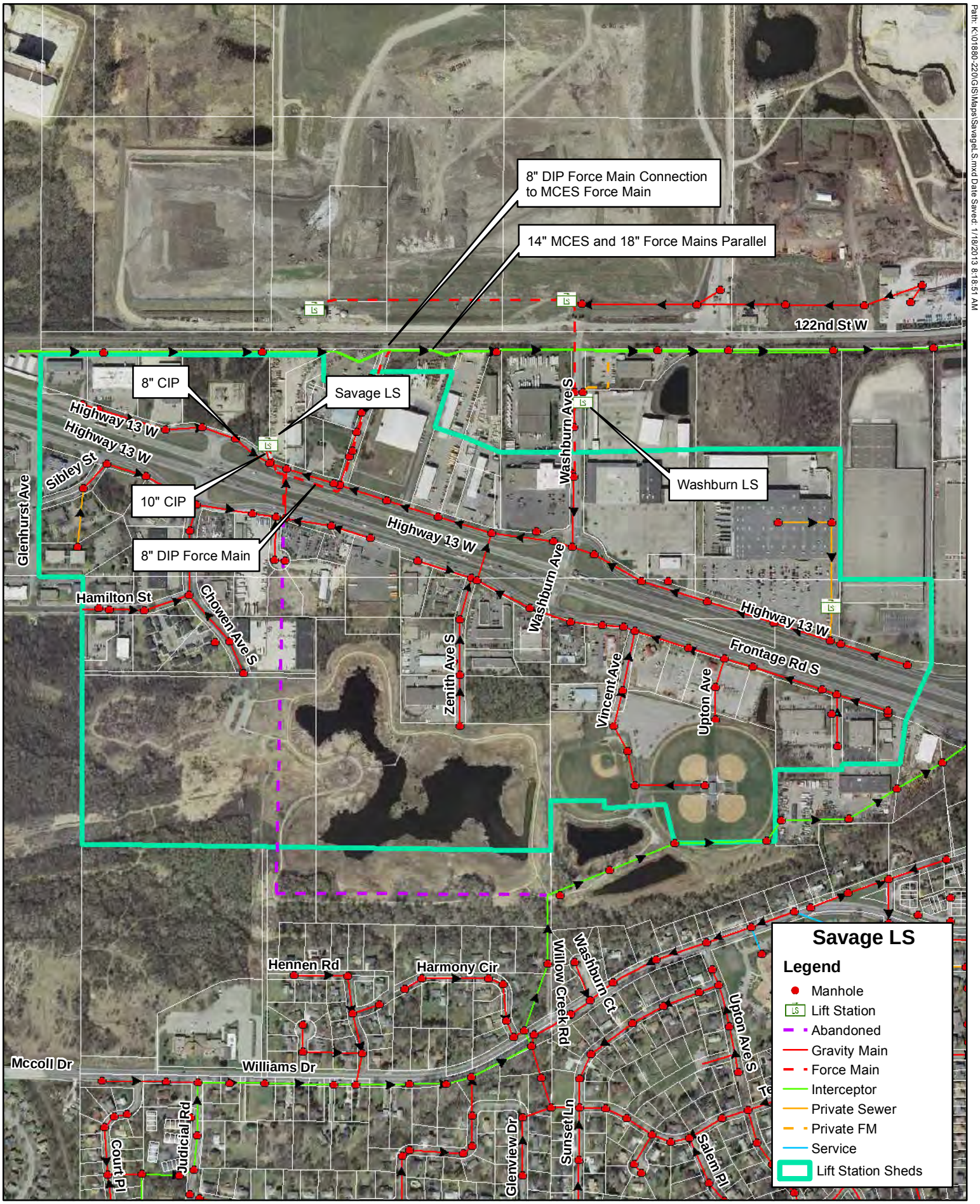
E. The 2010 Sanitary Sewer Generator Study recommends that the Savage Lift Station be provided with backup power. Based on existing pump sizes, it is estimated that a 100 KVA natural gas generator and 100A Automatic Transfer Switch be provided. Costs are based on the RSMeans electrical cost data. Installation of the generator and transfer switch should be coordinated with the control panel replacement to minimize costs and downtime associated with the project.

11.4 Estimated Costs

Table 11-1 below summarizes the estimated costs for recommended improvements to the Savage Lift Station and the proposed year for the improvements. A more detailed breakdown of the costs is included in **Appendix A**.

Table 11-1
Summary of Estimated Costs and Proposed Year for Improvements for Savage Lift Station

Description of Improvements	Total Estimated Opinion of Probable Cost (Including 2.5% Annual Inflation)	Proposed Year for Improvements
Site and Surface Improvements	$19,000	2022
Pumping, Mechanical, and Structure Improvements	$197,000	2022
Force Main Improvements	$221,000	2022
Replace Control Panel	$127,000	2022
Generator Improvements	$92,000	2022



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Sanitary Sewer Lift Station
Condition Assessment
City of Burnsville, MN
WSB Project No. 1880-220

Figure 11-1
Savage Lift Station
Site Location Map

1 inch = 700 feet

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Fig. 11-2: Savage Site

Fig 11-3: Savage Wet Well

Fig. 11-4: Savage Valve Vault

Fig. 11-5: Savage Main Control Panel

12. SODOMKA (12195 COUNTY ROAD 11)

12.1 Location Description

The City's Sodomka Lift Station was constructed in 1997 and is located on the east side of County Road 11 (CR 11), approximately 100 feet south of the intersection with County View Drive. **Figure 12-1** on **Page 69** is an aerial map showing the site location of the lift station.

12.2 Existing Condition Assessment

A. **Figures 12-2 through 12-4** on **Page 70** are photographs showing the existing condition of the Sodomka Lift Station.

B. Service Area and Wastewater Flow: The lift station service area consists of 4 homes as shown in Figure 12-1. Based on existing development in the service area, the estimated influent flow rate is approximately 1 gpm average flow and peak flow would be highly variable depending upon the various plumbing fixtures in operation in the homes.

C. Site conditions: The lift station access driveway (gravel) is north of the Hughes property driveway which is east of CR 11. The concrete slab for the control panel is connected to the lift station area, but there are no bollards protecting the lift station and control panel.

D. Wet well: 5'Ø precast concrete structure approximately 28 feet deep. City staff indicated the wet well has adequate capacity to allow several hours for emergency response time. The wet well is vented. The existing wet well appears to be in good condition.

E. Pump access hatch: Single leaf 48"x 30" aluminum hatch without safety grate. The access hatch appears to be in good condition.

F. Pumps: The station has two Flygt grinder submersible 1.6 hp pumps that were installed when the original lift station was constructed in 1997. Pump down tests indicated the pumping rate of pump 1 was approximately 20 gpm and pump 2 was 15 gpm. Pump curves indicate the design capacity is 30 gpm at 30 feet TDH.

G. Lift Station Piping: Sewage enters the lift station from the south through an 8"Ø PVC pipe. Lift station pumps discharge through parallel 2"Ø galvanized steel pipes, 2"Ø ball valves, and tie into a single 2"Ø polyethylene (PE) force main force main downstream of the lift station. The piping appears to be in good condition.

H. Accessories: Dual stainless steel pump guide rails, lifting chains, cable holders, and hardware appear to be in good condition.

I. Force Main: The 2”Ø PE force main is approximately 300 feet in length and discharges to a 9”Ø VCP sewer that flows west along County View Drive. The force main was constructed in 1997 and velocity in the force main is estimated to be approximately 2 to 3 fps.

J. Electrical Service:

1. Rating: 230V, 1-Phase, 3-Wire
2. Utility: Dakota Electric, Meter # 86 985 803
3. Main: 60 Amp Main Breaker
4. Backup Power: Backup Power:
   a. 60 Amp Generator Breaker
   b. Crouse-Hinds AR2041-S22 Receptacle

K. Pump Electrical Data:

	Size (HP)	**Rating**	**Starter**
Pump #1	1.6	230V, 1 Phase	FVNR Square D LC1D1810
Pump #2	1.6	230V, 1 Phase	FVNR Square D LC1D1810

L. Controls: The station level is currently monitored by a submersible level transducer which is used as the primary control. Backup control is provided by float switches for high level and low level.

M. Control Panel: The stainless steel, door-in-door control panel was manufactured by USEMCO in 1997. The main controller is a US Filter model LC 150 (submersible transducer) and the backup controller is a US Filter model CB1T (floats). All control panel components appeared to be in good condition.

N. SCADA: The stainless steel control panel was manufactured by Wunderlich-Malec in 2009. The PLC is an Allen-Bradley Micrologix 1100. The panel communicates the station status to the SCADA master via fiber optic cable. The media converter is a Cisco Catalyst 2955. All control panel components appeared to be in excellent condition.

12.3 Recommended Improvements

Recommended improvements are consistent with the City's lift station standardization policy.

A. General: Some components of the existing lift station are not in compliance with the City's lift station standardization policy, however existing structures, pumps, and piping can be expected to remain serviceable for 15-20 years.

B. Site Improvements: Construct a bituminous access driveway to the station including bollards and a concrete slab around both the lift station and control panel.

C. Wet Well: The interior of the wet well should be cleaned and coated for corrosion protection.

D. Valve Vault: Construct a 5'Ø valve vault including H20 rated aluminum access hatch and safety grate.

E. Pumps: Replace the Flygt submersible grinder pumps with ABS submersible grinder pumps and modify accessories as necessary.

F. Lift Station Piping: Replace galvanized steel discharge piping with DIP, PVC, or stainless steel piping. Add a 2"Ø check valve to the pump discharge lines in the valve vault. Add a 2"Ø PVC drain line between the valve vault and wet well with a rubber check valve in the wet well to reduce the volume of water collected in the valve vault.

F. Overall condition of the electrical equipment is good. The control panel is not compliant with the City's lift station standard, but can be expected to remain serviceable for approximately 5-10 years.

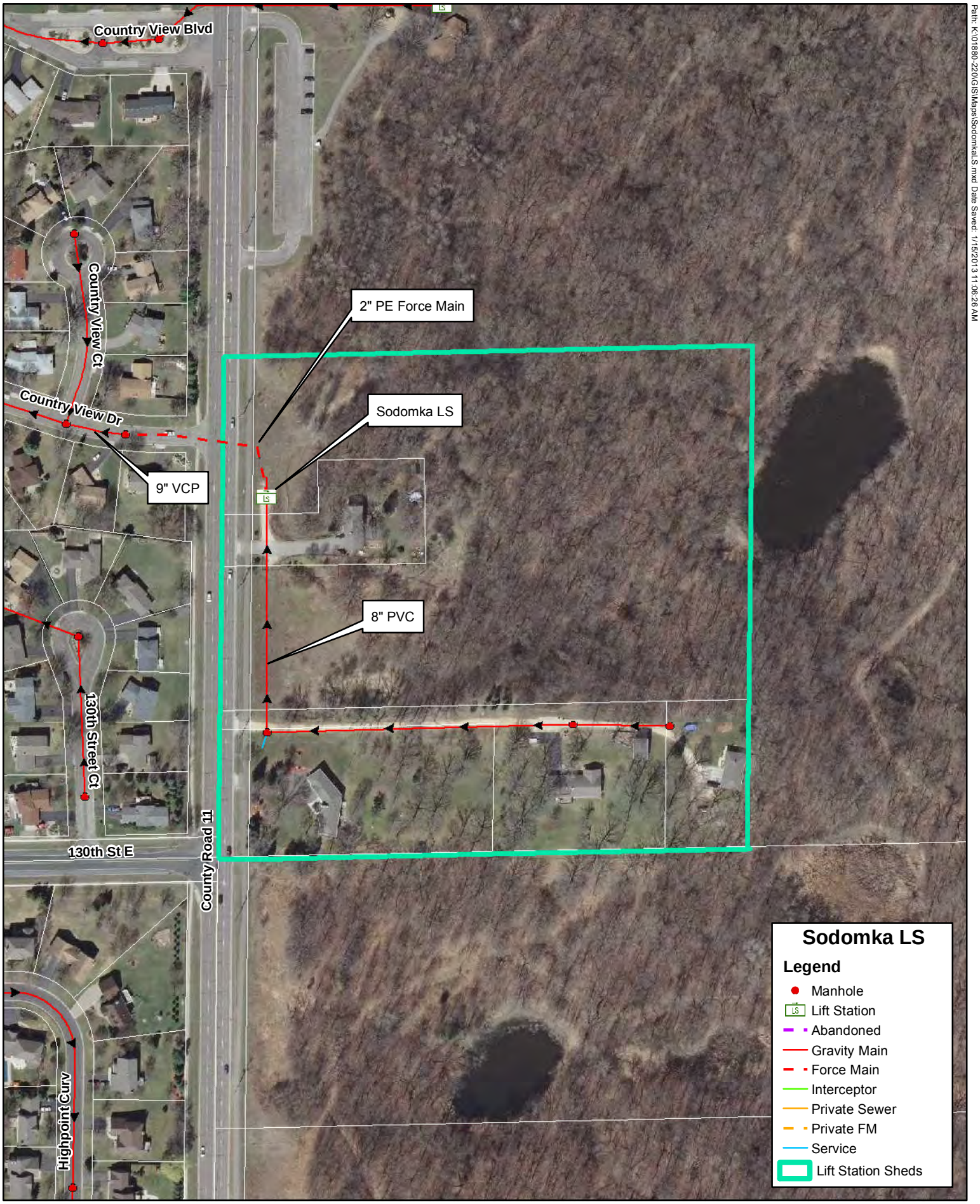
1. Install a new control panel in compliance with the City's lift station standardization policy in 5-10 years.

12.4 Estimated Costs

Table 12-1 below summarizes the estimated costs for recommended improvements to the Sodomka Lift Station and the proposed year for the improvements. A more detailed breakdown of the costs is included in **Appendix A**.

Table 12-1
Summary of Estimated Costs and Proposed Year for Improvements for Sodomka Lift Station

Description of Improvements	Total Estimated Opinion of Probable Cost (Including 2.5% Annual Inflation)	Proposed Year for Improvements
Site and Surface Improvements	$39,000	2029-2033
Pumping, Mechanical, and Structure Improvements	$111,000	2029-2033
Control Panel Replacement	$148,000	2023-2028



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Sanitary Sewer Lift Station
Condition Assessment
City of Burnsville, MN
WSB Project No. 1880-220

Figure 12-1
Sodomka Lift Station
Site Location Map

1 inch = 200 feet

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Fig. 12-2: Sodomka Site

Fig 12-3: Sodomka Wet Well

Fig. 12-4: Sodomka Main Control Panel

13. VALLEY VIEW (9885 OAK SHORE DRIVE)

13.1 Location Description

The City's Valley View Lift Station was constructed in 2007 and is located on the south side of Valley View Drive, approximately 2,400 feet west of Judicial Drive. **Figure 13-1** on **Page 75** is an aerial map showing the site location of the lift station.

13.2 Existing Condition Assessment

A. **Figures 13-2 through 13-5** on **Page 76** are photographs showing the existing condition of the Valley View Lift Station.

B. Service Area and Wastewater Flow: The lift station service area consists of 29 single family residential lots and currently there are 10 units constructed. Lift station design information indicates the service area is planned to include 350 homes. Based on future planned development in the service area, the estimated influent flow rate would be 73 gpm average flow and 291 gpm peak flow.

C. Site conditions: The lift station access driveway (bituminous) is south of Valley View Drive. The concrete slab for the control panel is connected to the lift station. There are no bollards protecting the control panel.

D. Wet well: 6'Ø precast concrete structure approximately 28 feet deep. City staff indicated the wet well has capacity for an emergency response time of several hours. City staff indicated there are no grease problems in the wet well. The existing wet well appears to be in good condition.

E. Pump access hatch: Single leaf 30"x48" aluminum hatch with safety grate and appears to be in good condition.

F. Valve vault: 6'Ø precast concrete structure approximately 9 feet deep with a 30"x48"' access hatch with safety grate for access. The valve vault has a concrete base with a 4" drain line to the wet well with a gate valve. The valve vault appears to be in good condition.

G. Pumps: The station has two KSB non-clog submersible 10 hp pumps that were installed when the lift station was constructed in 2007. Pump down tests indicated the pumping rate of pump 1 was approximately 245 gpm and pump 2 was 245 gpm. Pump curves indicated the design pumping capacity is 210 gpm at 71' TDH. City staff indicated there are no regular problems with pumps clogging at the station.

H. Lift Station Piping: Sewage enters the lift station from the north through a 8"Ø PVC pipe. Lift station pumps discharge through parallel 4"Ø DIPs, through 4"Ø gate and swing flex check valves in the valve vault, and tie into a single 6"Ø high density polyethylene (HDPE) force main downstream of the valve vault. There is a connection in the valve vault available for a temporary bypass connection. The piping and valves appear to be in good condition.

I. Accessories: Dual stainless steel pump guide rails, lifting chains, cable holders, and hardware appear to be in good condition.

J. Force Main: The 6"Ø HDPE force main is approximately 2,400 feet in length discharges to an 8"Ø PVC gravity sewer that flows north along Judicial Road. The inside diameter of HDPE force main can range significantly, it is estimated the velocity in the force main is approximately 2.5 to 5 fps. The force main was constructed in 2007.

K. Electrical Service:

1. Rating: 240V, 1-Phase, 3-Wire
2. Utility: Dakota Electric Association, Meter # 56 047 740
3. Main: 200 Amp Main Breaker
4. Backup Power:
   a. 200 Amp Gen Breaker
   b. Crouse-Hinds AR2041-S22 Receptacle

L. Pump Electrical Data:

	Size (HP)	Rating	Starter	Notes
Pump #1	10	240V, 3 Phase	VFD* Mitsubishi F700	VFD provides phase conversion and control
Pump #2	10	240V, 3 Phase	VFD Mitsubishi F700	VFD provides phase conversion and control

M. Controls: The station level is currently monitored by a submersible level transducer which is used as the primary control. Backup control is provided by float switches for high level and low level.

N. Control Panel: The stainless steel, door-in-door control panel was manufactured by Siemens in 2007. The main controller is an Allen-Bradley Micrologix 1100 (submersible transducer) and the backup controller are relays (floats). All control panel components appeared to be in excellent condition.

O. SCADA: The SCADA system is integrated with the control panel. The panel communicates the station status to the SCADA master and allows control of pump operation levels via cellular link. The media converter is a Cisco 810 Series. All control panel components appeared to be in good condition.

13.3 Recommended Improvements

Recommended improvements are consistent with the City's lift station standardization policy.

A. Site Improvements: The lift station has been constructed in accordance with the City's lift station standardization policy, except there are no bollards are the control panel, but no improvements are recommended at this time. An additional bituminous pavement lift may be necessary as the lift station ages, and bollards around the control panel could be added at that time.

B. Lift Station Improvements: The lift station has been constructed in accordance with the City's lift station standardization policy, except that the pumps are KSB pumps, but no improvements are recommended at this time. The typical design life of lift station materials is approximately 20-30 years, so the following maintenance should be expected at that time.

1. Replace pumps (Replace KSB pumps with ABS pumps and reevaluate pump capacity based on development within service area).
2. Replace valves.
3. Clean and coat the wet well interior and piping.

C. Overall condition of the electrical equipment is good to excellent. The control panel is not compliant with the City's lift station standard, but can be expected to remain serviceable for approximately 10-15 years. Electrical drawings do not show the current panel configuration (installation of the cellular SCADA equipment).

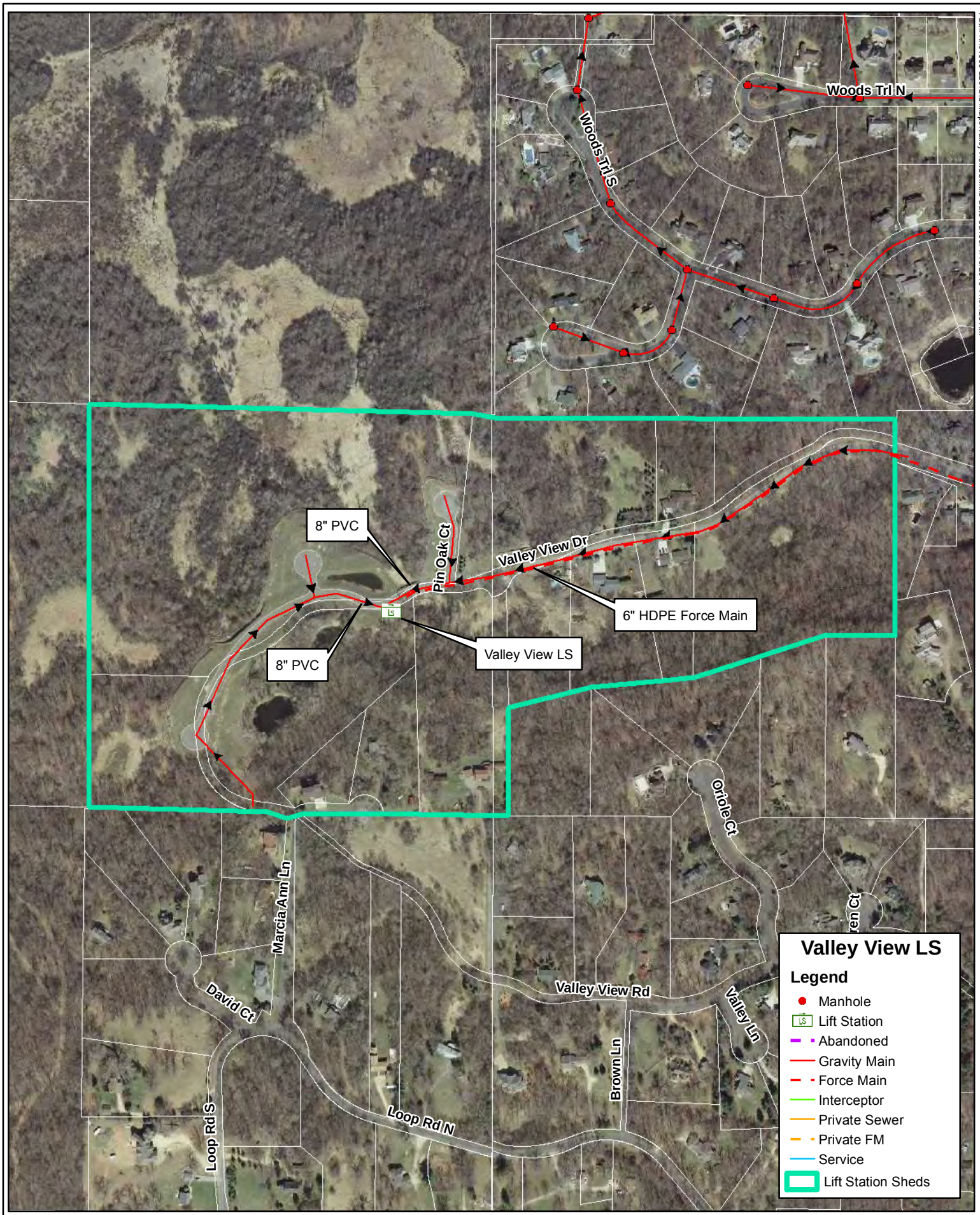
1. Update existing electrical drawings (Operations and Maintenance activity).
2. Install a new control panel in compliance with the City's lift station standardization policy in 10-15 years.

13.4 Estimated Costs

Table 13-1 below summarizes the estimated costs for recommended improvements to the Valley View Lift Station and the proposed year for the improvements. A more detailed breakdown of the costs is included in **Appendix A**.

Table 13-1
Summary of Estimated Costs and Proposed Year for Improvements for Valley View Lift Station

Description of Improvements	Total Estimated Opinion of Probable Cost (Including 2.5% Annual Inflation)	Proposed Year for Improvements
Site and Surface Improvements	$17,000	2034-2043
Pumping, Mechanical, and Structure Improvements	$141,000	2034-2043
Replace Control Panel	$148,000	2023-2028



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Sanitary Sewer Lift Station
Condition Assessment
City of Burnsville, MN
WSB Project No. 1880-220

Figure 13-1
Valley View Lift Station
Site Location Map

1 inch = 400 feet

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Fig. 13-2: Valley View Site

Fig 13-3: Valley View Wet Well

Fig. 13-4: Valley View Valve Vault

Fig. 13-5: Valley View Control Panel

14. WASHBURN (12421 WASHBURN AVENUE)

14.1 Location Description

The City's Washburn Lift Station was constructed in 1989 and is located on the east side of Washburn Avenue, approximately 1,000 feet north of the intersection with Highway 13. **Figure 14-1** on **Page 81** is an aerial map showing the site location of the lift station.

14.2 Existing Condition Assessment

A. **Figures 14-2 through 14-5** on **Page 82** are photographs showing the existing condition of the Washburn Lift Station.

B. Service Area and Wastewater Flow: The lift station service area consists of two commercial properties and a landfill. The flow rate is highly dependent on the lift stations at the landfill and how they operated, which is currently unknown. In the past, wastewater pumped from the landfill has exceeded the capacity of the lift station. An inflow rate of approximately 40 gpm was observed during pump down tests, which is estimated to be the peak flow rate. The landfill leachate is highly corrosive.

C. Site conditions: The lift station is located approximately10 feet east of the east curb of Washburn Avenue. The concrete slab for the control panel is separate from the lift station area and there are no bollards protecting the lift station and control panel. City staff indicated Washburn Avenue has periods of significant traffic.

D. Wet Well: 6'Ø precast concrete structure approximately 25 feet deep. City staff indicated emergency response time is highly variable due to the landfill's variable pumping rate. The wet well is vented. City staff indicated the wet well is cleaned 2 times per year and the landfill leachate deposits a black, gritty, jelly like material in the base of the wet well. The existing wet well appears to be in good condition.

E. Wet Well Access Hatch: Single leaf 48"x 30" aluminum hatch without safety grate. The access hatch appears to be in fair condition, the hinges have corroded away.

F. Valve Vault: 6'Ø precast concrete structure approximately 10 feet deep and has a manhole casting for access. The valve vault appears to have a concrete base slab. The existing valve vault appears to be in good condition.

G. Pumps: The station has two KSB non-clog submersible 5 hp pumps that were installed in 2006. Pump down tests indicated the pumping rate of pump 1 was approximately 180 gpm and pump 2 was 180 gpm. Pump curves were available for the lift station pumps and indicated a design capacity of 150 gpm. City staff indicated there are no problems with pump clogging at this location, but the landfill leachate corrodes the pumps.

H. Lift Station Piping: Sewage enters the lift station from the north through a 8"Ø PVC pipe. Lift station pumps discharge through parallel 4"Ø DIPs, 4"Ø gate and ball check valves in the valve vault, and tie into a single 4"Ø DIP force main downstream of the valve vault. The piping has external corrosion, but thickness is unknown. Valve corrosion is consistent with piping, City staff indicated valves are functioning adequately.

I. Accessories: Dual stainless steel pump guide rails, lifting chains, cable holders, and hardware appear to be in good condition.

J. Force Main: The 4"Ø DIP force main is 485' in length and discharges to an 8"Ø gravity sewer of unknown material that flows south along Washburn Avenue. The force main was constructed in 1989 and velocity in the force main is approximately 4.5 fps.

K. Electrical Service:

1. Rating: 208V, 3-Phase, 4-Wire
2. Utility: Xcel Energy, Meter # 02 846 997
3. Main: 100 Amp Main Breaker
4. Backup Power:
   a. 100 Amp Generator Breaker
   b. Crouse-Hinds AR2041-S22 Receptacle

L. Pump Electrical Data:

	Size (HP)	**Rating**	**Starter**
Pump #1	5	230V, 3 Phase	FVNR Allen Bradley 100-A18ND3
Pump #2	5	230V, 3 Phase	FVNR Allen Bradley 100-A18ND3

M. Controls: The station level is currently monitored by a submersible level transducer which is used as the primary control. Backup control is provided by float switches for high level and low level.

N. Control Panel: The steel, door-in-door control panel was manufactured by Automatic Pump Control Systems in 1989. The main controller is the SCADA PLC (submersible transducer) and the backup controller are relays to the PLC (floats). All control panel components appeared to be in good condition.

O. SCADA: The stainless steel control panel was manufactured by Wunderlich-Malec in 2008. The PLC is an Allen-Bradley Micrologix 1100. The panel communicates the station status to the SCADA master and allows control of pump operation levels via radio. The media converter a MDS 9710. All control panel components appeared to be in excellent condition.

14.3 Recommended Improvements

Recommended improvements are consistent with the City's lift station standardization policy.

A. Wastewater Flow: The Washburn Lift Station collects landfill leachate wastewater and pumps to the Savage lift station. An MCES interceptor is near the Washburn lift station, so the landfill force main could be connected directly to the MCES force main so leachate would not flow to the Washburn Lift Station. Also, the Washburn force main could be connected to the interceptor so wastewater would not have to be re-pumped by the Savage Lift Station. MCES is currently investigating these possibilities and it is recommended to continue to pursue these opportunities. Waste Management may be required to change their existing force main route to connect to the MCES interceptor. The City may want to consider funding participation to encourage this change due to the impact of the leachate on the City's lift station and sewer system.

B. Site Improvements: Construct an access driveway south of the lift station in the boulevard including bollards and a concrete slab around both the lift station and control panel.

C. Wet Well: Replace the wet well cover slab including a wet well vent pipe and new H20 rated aluminum access hatch with safety grate and stainless steel hardware. Rotate the wet well vent pipe to the north side of the structure to allow access to the wet well once the driveway is constructed. Also, the interior of the wet well should be cleaned and coated for corrosion protection.

D. Valve Vault: Replace the valve vault cover slab including a new H20 rated aluminum access hatch with safety grate. The cover slab should be elevated above surrounding pavement for positive drainage. Verify the existing base slab is in good condition prior to constructing improvements.

E. Pumps: Replace the KSB pumps with ABS non-clog submersible pumps and modify accessories as necessary.

F. Lift Station Piping: Replace lift station mechanical piping in both the wet well and valve vault. Add a 2"Ø PVC drain line between the valve vault and wet well with a rubber check valve in the wet well to reduce the volume of water collected in the valve vault.

G. Force Main: Replace the existing 4"Ø DIP force main with a 4"Ø PVC force main from the discharge manhole on the west side of Washburn Avenue to the point where the parallel 4"Ø DIP force mains tie into a single 4"Ø DIP force main downstream of the valve vault. Directional boring of the force main could be used to reduce surface replacement costs. CIPP lining may be an alternative for replacement of the 4"Ø DIP force main and will be evaluated at the time of project design.

H. Overall condition of the electrical equipment is fair. The control panel is not compliant with the City's lift station standard, but can be expected to remain serviceable for approximately 5-10 years. Currently, the station communicates via radio. An upgrade to cellular, (or fiber if available), communication is recommended to provide a faster and more reliable communication link. Documentation of existing panel configuration is inaccurate and updated as-built drawings are recommended.

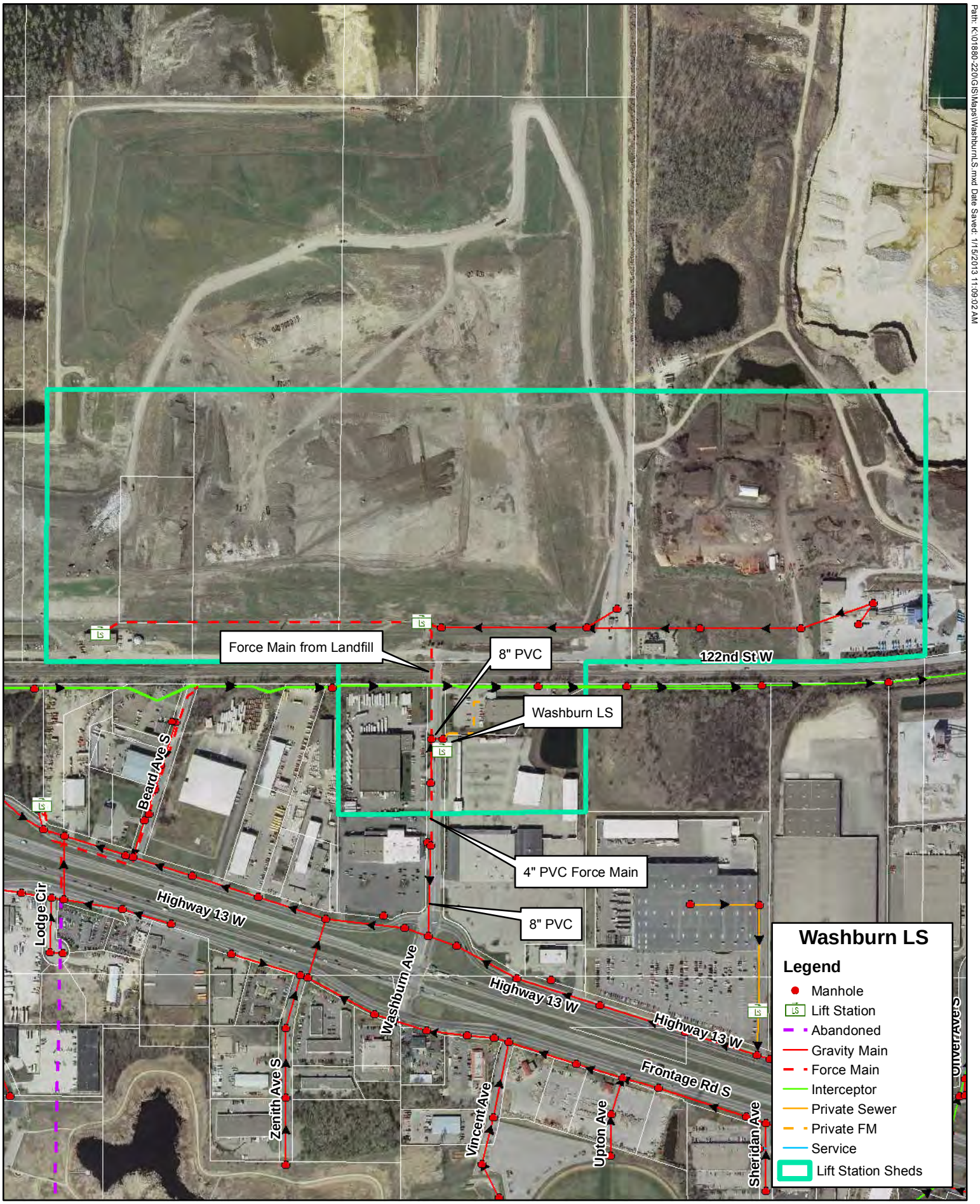
1. Install a new control panel in compliance with the City's lift station standardization policy in 5-10 years.
2. Update existing control diagrams (Operations and Maintenance activity).
3. Replace existing radio with cellular or fiber optic communications (Operations and Maintenance activity).

14.4 Estimated Costs

Table 14-1 below summarizes the estimated costs for recommended improvements to the Washburn Lift Station and the proposed year for the improvements. A more detailed breakdown of the costs is included in **Appendix A**.

Table 14-1
Summary of Estimated Costs and Proposed Year for Improvements for Washburn Lift Station

Description of Improvements	Total Estimated Opinion of Probable Cost (Including 2.5% Annual Inflation)	Proposed Year for Improvements
Site and Surface Improvements	$37,000	2019
Pumping, Mechanical, and Structure Improvements	$94,000	2019
Force Main Improvements	$110,000	2019
Replace Control Panel	$118,000	2019



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Sanitary Sewer Lift Station
Condition Assessment
City of Burnsville, MN
WSB Project No. 1880-220

Figure 14-1
Washburn Lift Station
Site Location Map

1 inch = 550 feet

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Fig. 14-2: Washburn Site

Fig 14-3: Washburn Wet Well

Fig. 14-4: Washburn Valve Vault

Fig. 14-5: Washburn Control Panel

15. WOODS TRAIL (2920 WOODS TRAIL SOUTH)

15.1 Location Description

The City's Woods Trail Lift Station was constructed in 2004 and is located on gravel trail approximately 1,100 feet from the north end of Woods Trail. **Figure 15-1** on **Page 87** is an aerial map showing the site location of the lift station.

15.2 Existing Condition Assessment

A. **Figures 15-2 through 15-5** on **Page 88** are photographs showing the existing condition of the Woods Trail Lift Station.

B. General: Downstream of the lift station there is an inverted siphon. Prior to construction of the lift station, the inverted siphon was prone to plugging and odor problems due to low flow. The perceived purpose of the lift station was to increase wastewater flow through the inverted siphon.

C. Service Area and Wastewater Flow: The lift station service area consists of 42 single family residential units. Based on existing development in the service area, the estimated influent flow rate is approximately 8 gpm average flow and 32 gpm peak flow.

D. Site conditions: The lift station has a long gravel access driveway off of Woods Trail. The concrete slab for the control panel is connected to the lift station. There are no bollards protecting the control panel.

E. Wet well: The wet well and valve vault are combined into a single steel package lift station. The wet well is 5'Ø is approximately 20 feet deep. City staff indicated the wet well has adequate capacity for an emergency response time of several hours. The steel lift station structure has a cathodic protection system that is functioning and checked regularly. The existing wet well appears to be in good condition.

F. Pump access hatch: Single leaf 36"x54" aluminum hatch without safety grate and appears to be in good condition.

G. Valve vault: The wet well and valve vault are combined into a single steel package lift station. The portion of the lift station where the valve vault is located is 8'Ø; however, the valve vault only occupies half of the area. The section of the package lift station that includes the valve vault is approximately 9' deep. The valve vault has a steel base with a drain line to the wet well. The valve vault has a 36"x54" access hatch without safety grate. The valve vault appears to be in good condition.

H. Pumps: The station has two KSB non-clog submersible 3.4 hp pumps that were installed when the lift station was constructed in 2004. Pump down tests indicated the pumping rate of pump 1 was approximately 70 gpm and pump 2 was 60 gpm. Pump curves indicated the design capacity is 100 gpm at 13' TDH. City staff indicated there are no regular problems with pumps clogging at the station.

I. Lift Station Piping: Sewage enters the lift station from the north through an 8"Ø PVC pipe. Lift station pumps discharge through parallel 4"Ø DIPs, through 4"Ø gate and OS&L check valves in the valve vault, and tie into a single 4"Ø DIP force main in the valve vault that transitions to a 4"Ø PVC force main downstream of the valve vault. Also there is a connection in the valve vault available for a temporary bypass connection. Velocity in the discharge piping is approximately 4 fps. The piping and valves appear to be in good condition.

J. Appurtenances: Dual stainless steel pump guide rails, cable holders, and hardware appear to be in good condition. The pump chains are rusty and appear to be in fair condition.

K. Force Main: The 4"Ø PVC forcemain is approximately 100 feet in length and discharges to an inverted siphon inlet structure. The force main was constructed in 2004 and velocity in the force main is approximately 4 fps.

L. Electrical Service:

1. Rating: 240V, 1-Phase, 3-Wire
2. Utility: Dakota Electric Association, Meter # 04995289
3. Main: 100 Amp Main Breaker
4. Backup Power:
   a. 100 Amp Gen Breaker
   b. Crouse-Hinds AR2041-S22 Receptacle

M. Pump Electrical Data:

	Size (HP)	**Rating**	**Starter**	**Notes**
Pump #1	3.4	230V, 3 Phase	VFD Cutler-Hammer MVX9000	VFD provides phase conversion and control
Pump #2	3.4	230V, 3 Phase	VFD Cutler-Hammer MVX9000	VFD provides phase conversion and control

N. Controls: The station level is currently monitored by a submersible level transducer which is used as the primary control. Backup control is provided by float switches for high level and low level.

O. Control Panel: The stainless steel, door-in-door control panel was manufactured by US Filter in 2004. The main controller is the SCADA PLC (submersible transducer) and the backup controller are relays to the PLC (floats). All control panel components appeared to be in good condition.

P. SCADA: The stainless steel control panel was manufactured by Wunderlich-Malec in 2009. The PLC is an Allen-Bradley Micrologix 1100. The panel communicates the station status to the SCADA master and allows control of pump operation levels via radio. The media converter a MDS 9710. All control panel components appeared to be in excellent condition.

15.3 Recommended Improvements

Recommended improvements are consistent with the City's lift station standardization policy.

A. General: Reconstruct the lift station as a wet well/valve vault configuration in accordance with the City's lift station standardization policy. However existing structures, pumps, and piping can be expected to remain serviceable for 20-30 years.

B. Site Improvements: Construct a concrete slab around the new wet well and control panel, and add bollards on the access driveway to protect the control panel.

C. Wet well: Replace the steel wet well with a 6'Ø precast concrete structure including H20 rated aluminum access hatch with safety grate and stainless steel hardware, and vent pipe. The cover slab should be elevated above surrounding pavement for positive drainage.

D. Valve Vault: Replace the steel valve vault with a separate 6'Ø precast concrete structure downstream of the wet well. The cover slab should be elevated above the surrounding pavement for positive drainage and include a H20 rated aluminum access hatch with safety grate and stainless steel hardware.

E. Pumps: Replace the KSB non-clog submersible pumps with ABS non-clog submersible pumps and modify appurtenances as necessary.

F. Lift Station Piping: Replace lift station piping with 4"Ø DIP to fit the wet well/valve vault configuration including 4"Ø gate and swing flex check valves and a temporary bypass pumping connection. Install a 2"Ø PVC drain line between the valve vault and wet well with rubber backwater check valve.

G. Appurtenances: Replace pump lifting chains in the existing lift station with stainless steel chains.

H. Overall condition of the electrical equipment is good to excellent. The control panel is not compliant with the City's lift station standard, but can be expected to remain serviceable for approximately 10-15 years. There is no yard light at the site, and the existing radio communications are unreliable.

1. Install yard light.
2. Update communications media from radio to cellular (Operations and Maintenance activity).
3. Install a new control panel in compliance with the City's lift station standardization policy in 10-15 years.

15.4 Estimated Costs

Table 15-1 below summarizes the estimated costs for recommended improvements to the Woods Trail Lift Station and the proposed year for the improvements. A more detailed breakdown of the costs is included in **Appendix A**.

Table 15-1
Summary of Estimated Costs and Proposed Year for Improvements for Woods Trail Lift Station

Description of Improvements	Total Estimated Opinion of Probable Cost (Including 2.5% Annual Inflation)	Proposed Year for Improvements
Site Piping and Surface Improvements	$40,000	2034-2043
Pumping, Mechanical, and Structure Improvements	$336,000	2034-2043
Control Panel Replacement	$148,000	2023-2028
Yard Light Installation	$6,000	2016

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Sanitary Sewer Lift Station
Condition Assessment
City of Burnsville, MN
WSB Project No. 1880-220

Figure 15-1
Woods Trail Lift Station
Site Location Map

1 inch = 300 feet

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Fig. 15-2: Woods Trail Site

Fig 15-3: Woods Trail Wet Well

Fig. 15-4: Woods Trail Valve Vault

Fig. 15-5: Woods Trail Control Panel

16. CAPITAL IMPROVEMENTS PLAN

The cost of recommended improvements including construction costs and indirect costs have been estimated and used in developing a Capital Improvement Program. The opinion of probable costs are based on projected 2012 construction costs and include a 10% contingency factor and 25% indirect costs. The indirect costs would include engineering, city administrative costs, and financing costs associated with the projects. The proposed schedule of improvements for the next 20 years and their estimated opinion of probable cost are presented in **Table 16-1 on the following page**.

17. OPERATIONS AND MAINTENANCE ACTIVITIES

17.1 Wet Well Safety Grates/Netting

Many lift station structures do not include safety grates or nets for fall protection. It is recommended to add safety nets in the near future at the structures listed below. Estimated costs for safety nets are not included in the CIP.

- Blue Bill Bay – Wet Well
- Buck Hill – Wet Well
- Crystal Lake – Wet Well
- Keller Lake – Valve Vault
- Maple Island 2 (Small) – Wet Well
- Meadow Acres – Wet Well
- Savage – Wet Well
- Sodomka – Wet Well
- Washburn – Wet Well
- Woods Trail – Wet Well and Valve Vault

17.2 Miscellaneous Lift Station Controls Improvements

Minor controls improvements were recommended for several lift stations that can be completed on available basis. These are improvements are noted in each lift station evaluation section. Estimated opinions of probable costs are not included in the CIP, but a detailed breakdown has been included in Appendix A.

- Savage – Update existing control panel diagrams
- Savage – Replace radio communication with cellular or fiber optic
- Valley View – Update existing control panel diagrams
- Maple Island 1 (Big) – Rewire control panel so floats operate independently of PLC
- Washburn – Update existing control panel diagrams
- Washburn – Replace radio communication with cellular or fiber optic
- Woods Trail – Replace radio communication with cellular or fiber optic

Table 16-1
Capital Improvements Plan
Sanitary Sewer Lift Stations

Year	Improvement	Engineer's Opinion of Probable Cost (Inflation 2.5% annual)
2014	Meadow Acres - Site, Lift Station, Yard Lighting, Control Panel, and Generator Improvements	$542,000
2016	Woods Trail - Yard Light Installation	$6,000
2016	Meadow Acres - Force Main Improvements	$280,000
		$828,000
2018	McAndrews - Site, Lift Station, Force Main Structures, Control Panel, and Generator Improvements	$760,000
2019	Washburn - Site, Lift Station, Force Main, and Control Panel Improvements	$359,000
2020	Blue Bill Bay - Site, Lift Station, Force Main, and Yard Light Improvements	$146,000
2021	Crystal Lake - Site, Lift Station, Force Main, and Yard Light Improvements	$133,000
2022	Savage - Site, Lift Station, Force Main, Control Panel, and Generator Improvements	$656,000
		$2,054,000
2023-2028	Buck Hill - Site, Lift Station, Force Main, Control Panel, and 3-Phase Service Improvements	$643,000
	Blue Bill Bay - Control Panel Replacement	$148,000
	Crystal Lake - Control Panel Replacement	$148,000
	McAndrews - Force Main (Ex. Structures) Improvements	$120,000
	Maple Island 2 (Small) - Site and Lift Station Improvements	$180,000
	Keller Lake - Force Main Improvements	$54,000
	Sodomka - Control Panel Replacement	$148,000
	Valley View - Control Panel Replacement	$148,000
	Woods Trail - Control Panel Replacement	$148,000
		$1,737,000
2029-2033	Sodomka - Site and Lift Station Improvements	$150,000
	Maple Island 1 (Big) - Force Main Improvements	$275,000
		$425,000
2033-2043	Maple Island 1 (Big) - Site, Lift Station, Control Panel, and Generator Replacement	$800,000
	Echo Valley - Site, Lift Station, Force Main, Control Panel Replacement, and Generator Replacement	$976,000
	Keller Lake - Site, Lift Station, and Generator Replacement	$320,000
	Maple Island 2 (Small) - Control Panel Replacement	$214,000
	Valley View - Site and Lift Station Improvements	$158,000
	Woods Trail - Site and Lift Station Improvements	$376,000
		$2,844,000
	Total	**$7,888,000**

APPENDIX A

Detailed Breakdown of Opinion of Probable Costs

Blue Bill Bay Lift Station Improvements ***Cost Opinion***

Site and Surface Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$500.00	$500.00
2	Clear & Grub	LS	1.00	$500.00	$500.00
3	Remove Curb and Gutter	LF	30.00	$6.00	$180.00
4	Remove Cover Slab (Wet Well and Valve Vault)	EA	2.00	$500.00	$1,000.00
5	Common Excavation	CY	40.00	$25.00	$1,000.00
6	Aggregate Base Class 5	TN	40.00	$40.00	$1,600.00
7	Bituminous Driveway Pavement	TN	20.00	$150.00	$3,000.00
8	Concrete Slab around Wet Well and Control Panel	SF	160.00	$10.00	$1,600.00
9	Curb and Gutter	LF	30.00	$50.00	$1,500.00
10	Bollards	EA	3.00	$500.00	$1,500.00
11	84" Diameter Cover Slab with Access Hatches and Safety Grates (Vent in Wet Well)	EA	2.00	$3,000.00	$6,000.00
12	Silt Fence Type Heavy Duty	LF	100.00	$5.00	$500.00
13	Site Restoration	LS	1.00	$1,000.00	$1,000.00
				Subtotal	***$19,900.00***
				+10% Contingency	***$2,000.00***
				Subtotal	***$21,900.00***
				+25% Indirect Costs	***$5,500.00***
				Total Site and Surface Improvements	***$28,000.00***
				Total Site and Surface Improvements (2020, 2.5% Annual Inflation)	***$33,000.00***

Pumping, Mechanical, and Structure Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$2,400.00	$2,400.00
2	Bypass Pumping	LS	1.00	$4,000.00	$4,000.00
3	Remove Wet Well and Valve Vault Piping	LS	1.00	$2,000.00	$2,000.00
4	Remove Pumps	LS	1.00	$1,500.00	$1,500.00
5	Core Drill Structure Sidewall	EA	2.00	$500.00	$1,000.00
6	Wet Well Hydrogen Sulfide Resistant Coating	LS	1.00	$5,000.00	$5,000.00
7	2" PVC Drain	LS	1.00	$500.00	$500.00
8	4" DIP Wet Well Piping (incl. Coating)	LS	1.00	$10,000.00	$10,000.00
9	2" Rubber Backwater Check Valve	EA	1.00	$1,000.00	$1,000.00
10	4" Gate Valve (Flanged)	EA	2.00	$2,500.00	$5,000.00
11	4" Swing Flex Check Valve (Flanged)	EA	2.00	$3,000.00	$6,000.00
12	2.5 HP ABS Non-Clog Submersible Pump	EA	2.00	$5,000.00	$10,000.00
13	Stainless Steel Guide Rails, Cable Holders, and Hardware	LS	1.00	$2,000.00	$2,000.00
				Subtotal	***$50,400.00***
				+10% Contingency	***$5,100.00***
				Subtotal	***$55,500.00***
				+25% Indirect Costs	***$13,900.00***
				Total Pumping, Mechanical, and Structure Improvements	***$70,000.00***
				Total Pumping, Mechanical, and Structure Improvements (2020, 2.5% Annual Inflation)	***$83,000.00***

Blue Bill Bay Lift Station Improvements ***Cost Opinion***

Force Main Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$600.00	$600.00
2	Clear & Grub	LS	1.00	$250.00	$250.00
3	Bypass Pumping	LS	1.00	$4,000.00	$4,000.00
4	Remove Bituminous Pavement	SY	35.00	$5.00	$175.00
5	Remove Curb and Gutter	LF	20.00	$6.00	$120.00
6	Remove 4" Force Main	LF	50.00	$10.00	$500.00
7	Curb and Gutter	LF	20.00	$50.00	$1,000.00
8	Aggregate Base Class 5	TN	25.00	$40.00	$1,000.00
9	Bituminous Driveway Pavement	TN	8.00	$150.00	$1,200.00
10	4" PVC Force Main	LF	50.00	$40.00	$2,000.00
11	Connect to Existing Manhole	EA	1.00	$500.00	$500.00
12	Connect to Existing Force Main	EA	1.00	$1,000.00	$1,000.00
13	Site Restoration	LS	1.00	$1,000.00	$1,000.00
				Subtotal	***$13,400.00***
				+10% Contingency	***$1,400.00***
				Subtotal	***$14,800.00***
				+25% Indirect Costs	***$3,700.00***
				Total Force Main Improvements	***$19,000.00***
				Total Force Main Improvements (2020, 2.5% Annual Inflation)	***$23,000.00***

Control Panel Replacement

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization	LS	1.00	$2,300.00	$2,300.00
2	New Control Panel	EA	1.00	$69,230.00	$69,230.00
3	Control Panel Install	HR	24.00	$96.60	$2,318.40
				Subtotal	***$73,900.00***
				+10% Contingency	***$7,400.00***
				Subtotal	***$81,300.00***
				+25% Indirect Costs	***$20,400.00***
				Total Control Panel Replacement	***$102,000.00***
				Control Panel Replacement (2028, 2.5% Annual Inflation)	***$148,000.00***

Yard Light Installation

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	New Yard Light	LS	1.00	$770.50	$770.50
2	Pole	LS	1.00	$1,322.50	$1,322.50
3	Base	LS	1.00	$908.50	$908.50
4	Miscellaneous Wire and Conduit	LS	1.00	$862.50	$862.50
				Subtotal	***$3,900.00***
				+10% Contingency	***$400.00***
				Subtotal	***$4,300.00***
				+25% Indirect Costs	***$1,100.00***
				Total Yard Light Installation	***$6,000.00***
				Yard Light Installation (2020, 2.5% Annual Inflation)	***$7,000.00***

Buck Hill Lift Station Improvements ***Cost Opinion***

Site and Surface Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$500.00	$500.00
2	Remove Cover Slab (Wet Well)	EA	2.00	$500.00	$1,000.00
3	Remove Control Panel Concrete Slab	LS	1.00	$500.00	$500.00
4	Bituminous Driveway Pavement	TN	8.00	$150.00	$1,200.00
5	Concrete Slab around Wet Well and Control Panel	SF	160.00	$10.00	$1,600.00
6	Bollards	EA	3.00	$500.00	$1,500.00
7	84" Diameter Cover Slab with Access Hatch, Safety Grate, and Vent	EA	1.00	$3,000.00	$3,000.00
8	Silt Fence Type Heavy Duty	LF	100.00	$5.00	$500.00
9	Site Restoration	LS	1.00	$1,000.00	$1,000.00
				Subtotal	***$10,800.00***
				+10% Contingency	***$1,100.00***
				Subtotal	***$11,900.00***
				+25% Indirect Costs	***$3,000.00***
				Total Site and Surface Improvements	***$15,000.00***
				Total Site and Surface Improvements (2028, 2.5% Annual Inflation)	***$22,000.00***

Buck Hill Lift Station Improvements ***Cost Opinion***

Pumping, Mechanical, and Structure Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$4,400.00	$4,400.00
2	Bypass Pumping	LS	1.00	$17,500.00	$17,500.00
3	Remove Wet Well and Valve Vault Piping	LS	1.00	$2,500.00	$2,500.00
4	Remove Pumps	LS	1.00	$2,000.00	$2,000.00
5	Wet Well Hydrogen Sulfide Resistant Coating	LS	1.00	$5,000.00	$5,000.00
6	6" DIP Wet Well Piping (incl. Coating)	LS	1.00	$13,000.00	$13,000.00
7	6" Gate Valve (Flanged)	EA	2.00	$3,500.00	$7,000.00
8	6" Swing Flex Check Valve (Flanged)	EA	2.00	$4,000.00	$8,000.00
9	15 HP ABS Non-Clog Submersible Pump	EA	2.00	$15,000.00	$30,000.00
10	Stainless Steel Guide Rails, Cable Holders, and Hardware	LS	1.00	$3,000.00	$3,000.00
				Subtotal	***$92,400.00***
				+10% Contingency	***$9,300.00***
				Subtotal	***$101,700.00***
				+25% Indirect Costs	***$25,500.00***
				Total Pumping, Mechanical, and Structure Improvements	***$128,000.00***
				Total Pumping, Mechanical, and Structure Improvements (2028, 2.5% Annual Inflation)	***$185,000.00***

Buck Hill Lift Station Improvements — ***Cost Opinion***

Force Main Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$7,400.00	$7,400.00
2	Traffic Control	LS	1.00	$5,000.00	$5,000.00
3	Bypass Pumping	LS	1.00	$17,500.00	$17,500.00
4	Remove Bituminous Pavement	SY	180.00	$5.00	$900.00
5	Abandon 6" Force Main	LF	1,600.00	$4.00	$6,400.00
6	Aggregate Base Class 5	TN	120.00	$40.00	$4,800.00
7	Bituminous Pavement	TN	40.00	$150.00	$6,000.00
8	Directional Bore 6" PVC Force Main	LF	1,600.00	$40.00	$64,000.00
9	Connect to Existing Manhole	LS	1.00	$500.00	$500.00
10	Site Restoration	LS	1.00	$5,000.00	$5,000.00
				Subtotal	***$117,500.00***
				+10% Contingency	***$11,800.00***
				Subtotal	***$129,300.00***
				+25% Indirect Costs	***$32,400.00***
				Total Force Main Improvements	***$162,000.00***
				Total Force Main Improvements (2028, 2.5% Annual Inflation)	***$235,000.00***

Control Panel Replacement

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization	LS	1.00	$2,300.00	$2,300.00
2	New Control Panel	EA	1.00	$69,230.00	$69,230.00
3	Control Panel Install	HR	24.00	$96.60	$2,318.40
4	Size 3 Starter	EA	2.00	$1,868.75	$3,737.50
				Subtotal	***$77,600.00***
				+10% Contingency	***$7,800.00***
				Subtotal	***$85,400.00***
				+25% Indirect Costs	***$21,400.00***
				Total Control Panel Replacement	***$107,000.00***
				Control Panel Replacement (2028, 2.5% Annual Inflation)	***$155,000.00***

Convert Service to 3 Phase

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization	LS	1.00	$1,150.00	$1,150.00
2	New 3-Phase Service	LS	1.00	$12,897.25	$12,897.25
3	2" PVC Conduit	LF	100.00	$12.48	$1,247.75
4	3/0 Cable	LF	400.00	$10.01	$4,002.00
5	Concrete Pad	EA	2.00	$1,868.75	$3,737.50
				Subtotal	***$23,100.00***
				+10% Contingency	***$2,400.00***
				Subtotal	***$25,500.00***
				+25% Indirect Costs	***$6,400.00***
				Total Convert Service to 3-Phase	***$32,000.00***
				Convert Service to 3-Phase (2028, 2.5% Annual Inflation)	***$46,000.00***

Site and Surface Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$900.00	$900.00
2	Remove Cover Slab (Wet Well and Valve Vault)	EA	2.00	$500.00	$1,000.00
3	Remove Control Panel Concrete Slab	LS	1.00	$500.00	$500.00
4	Bituminous Driveway Pavement	TN	13.00	$150.00	$1,950.00
5	Concrete Slab around Wet Well and Control Panel	SF	160.00	$10.00	$1,600.00
6	Bollards	EA	3.00	$500.00	$1,500.00
7	84" Diameter Cover Slab with Access Hatches and Safety Grates (Vent in Wet Well)	EA	2.00	$3,000.00	$6,000.00
8	Silt Fence Type Heavy Duty	LF	100.00	$5.00	$500.00
9	Site Restoration	LS	1.00	$1,000.00	$1,000.00
				Subtotal	***$15,000.00***
				+10% Contingency	***$1,500.00***
				Subtotal	***$16,500.00***
				+25% Indirect Costs	***$4,200.00***
				Total Site and Surface Improvements	***$21,000.00***
				Total Site and Surface Improvements (2021, 2.5% Annual Inflation)	***$26,000.00***

Pumping, Mechanical, and Structure Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$2,300.00	$2,300.00
2	Bypass Pumping	LS	1.00	$2,000.00	$2,000.00
3	Remove Wet Well and Valve Vault Piping	LS	1.00	$2,000.00	$2,000.00
4	Remove Pumps	LS	1.00	$1,500.00	$1,500.00
5	Core Drill Structure Sidewall	EA	2.00	$500.00	$1,000.00
6	Wet Well Hydrogen Sulfide Resistant Coating	LS	1.00	$5,000.00	$5,000.00
7	2" PVC Drain	LS	1.00	$500.00	$500.00
8	4" DIP Wet Well Piping (incl. Coating)	LS	1.00	$10,000.00	$10,000.00
9	2" Rubber Backwater Check Valve	EA	1.00	$1,000.00	$1,000.00
10	4" Gate Valve (Flanged)	EA	2.00	$2,500.00	$5,000.00
11	4" Swing Flex Check Valve (Flanged)	EA	2.00	$3,000.00	$6,000.00
12	2.5 HP ABS Non-Clog Submersible Pump	EA	2.00	$5,000.00	$10,000.00
13	Stainless Steel Guide Rails, Cable Holders, and Hardware	LS	1.00	$2,000.00	$2,000.00
				Subtotal	***$48,300.00***
				+10% Contingency	***$4,900.00***
				Subtotal	***$53,200.00***
				+25% Indirect Costs	***$13,300.00***
				Total Pumping, Mechanical, and Structure Improvements	***$67,000.00***
				Total Pumping, Mechanical, and Structure Improvements (2021, 2.5% Annual Inflation)	***$82,000.00***

Crystal Lake Lift Station Improvements *Cost Opinion*

Force Main Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$500.00	$500.00
2	Clear & Grub	LS	1.00	$250.00	$250.00
3	Bypass Pumping	LS	1.00	$2,000.00	$2,000.00
4	Remove Bituminous Pavement	SY	35.00	$5.00	$175.00
5	Remove Curb and Gutter	LF	20.00	$6.00	$120.00
6	Remove 4" Force Main	LF	50.00	$10.00	$500.00
7	Curb and Gutter	LF	20.00	$50.00	$1,000.00
8	Aggregate Base Class 5	TN	25.00	$40.00	$1,000.00
9	Bituminous Driveway Pavement	TN	8.00	$150.00	$1,200.00
10	4" PVC Force Main	LF	50.00	$40.00	$2,000.00
11	Connect to Existing Manhole	LS	1.00	$500.00	$500.00
12	Site Restoration	LS	1.00	$1,000.00	$1,000.00
				Subtotal	***$10,300.00***
				+10% Contingency	***$1,100.00***
				Subtotal	***$11,400.00***
				+25% Indirect Costs	***$2,900.00***
				Total Force Main Improvements	***$15,000.00***
			Total Force Main Improvements (2021, 2.5% Annual Inflation)		***$18,000.00***

Control Panel Replacement

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization	LS	1.00	$2,300.00	$2,300.00
2	New Control Panel	EA	1.00	$69,230.00	$69,230.00
3	Control Panel Install	HR	24.00	$96.60	$2,318.40
				Subtotal	***$73,900.00***
				+10% Contingency	***$7,400.00***
				Subtotal	***$81,300.00***
				+25% Indirect Costs	***$20,400.00***
				Total Control Panel Replacement	***$102,000.00***
			Control Panel Replacement (2028, 2.5% Annual Inflation)		***$148,000.00***

Yard Light Installation

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	New Yard Light	LS	1.00	$770.50	$770.50
2	Pole	LS	1.00	$1,322.50	$1,322.50
3	Base	LS	1.00	$908.50	$908.50
4	Miscellaneous Wire and Conduit	LS	1.00	$862.50	$862.50
				Subtotal	***$3,900.00***
				+10% Contingency	***$400.00***
				Subtotal	***$4,300.00***
				+25% Indirect Costs	***$1,100.00***
				Total Yard Light Installation	***$6,000.00***
			Yard Light Installation (2021, 2.5% Annual Inflation)		***$7,000.00***

City of Burnsville — *Condition Assessment Report*

Sanitary Sewer Lift Station Condition Assessment

WSB Project No. 1880-220

Echo Valley Lift Station Improvements — *Cost Opinion*

Site and Surface Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$200.00	$200.00
2	Bituminous Driveway Pavement	TN	13.00	$150.00	$1,950.00
3	Paint Bollards	EA	3.00	$100.00	$300.00
4	Silt Fence Type Heavy Duty	LF	100.00	$5.00	$500.00
5	Site Restoration	LS	1.00	$1,000.00	$1,000.00
				Subtotal	***$4,000.00***
				+10% Contingency	***$400.00***
				Subtotal	***$4,400.00***
				+25% Indirect Costs	***$1,100.00***
				Total Site and Surface Improvements	***$6,000.00***
				Total Site and Surface Improvements (2043, 2.5% Annual Inflation)	***$13,000.00***

Pumping, Mechanical, and Structure Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$3,800.00	$3,800.00
2	Bypass Pumping	LS	1.00	$15,000.00	$15,000.00
3	Remove Pumps	LS	1.00	$2,000.00	$2,000.00
4	Wet Well Hydrogen Sulfide Resistant Coating	LS	1.00	$9,000.00	$9,000.00
5	Piping Hydrogen Sulfide Resistant Coating	LS	1.00	$3,500.00	$3,500.00
6	6" Gate Valve (Flanged)	EA	2.00	$3,500.00	$7,000.00
7	6" Swing Flex Check Valve (Flanged)	EA	2.00	$4,000.00	$8,000.00
8	14 HP ABS Non-Clog Submersible Pump	EA	2.00	$15,000.00	$30,000.00
				Subtotal	***$78,300.00***
				+10% Contingency	***$7,900.00***
				Subtotal	***$86,200.00***
				+25% Indirect Costs	***$21,600.00***
				Total Pumping, Mechanical, and Structure Improvements	***$108,000.00***
				Total Pumping, Mechanical, and Structure Improvements (2043, 2.5% Annual Inflation)	***$227,000.00***

Force Main Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$7,800.00	$7,800.00
2	Traffic Control	LS	1.00	$5,000.00	$5,000.00
3	Bypass Pumping	LS	1.00	$15,000.00	$15,000.00
4	Remove Bituminous Pavement	SY	135.00	$5.00	$675.00
5	Abandon 10" Force Main	LF	1,350.00	$8.00	$10,800.00
6	Aggregate Base Class 5	TN	90.00	$40.00	$3,600.00
7	Bituminous Pavement	TN	30.00	$150.00	$4,500.00
8	Directional Bore 10" PVC Force Main	LF	1,350.00	$54.00	$72,900.00
9	Connect to Existing Manhole	LS	1.00	$500.00	$500.00
10	Site Restoration	LS	1.00	$5,000.00	$5,000.00
				Subtotal	***$125,800.00***
				+10% Contingency	***$12,600.00***
				Subtotal	***$138,400.00***
				+25% Indirect Costs	***$34,600.00***
				Total Force Main Improvements	***$173,000.00***
			Total Force Main Improvements (2043, 2.5% Annual Inflation)		***$363,000.00***

Control Panel Replacement

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization	LS	1.00	$3,700.00	$3,700.00
2	New Control Panel	EA	1.00	$69,230.00	$69,230.00
3	Control Panel Install	HR	24.00	$96.60	$2,318.40
4	Size 2 Starter	EA	2.00	$1,092.50	$2,185.00
				Subtotal	***$77,500.00***
				+10% Contingency	***$7,800.00***
				Subtotal	***$85,300.00***
				+25% Indirect Costs	***$21,400.00***
				Total Control Panel Replacement	***$107,000.00***
			Control Panel Replacment (2043, 2.5% Annual Inflation)		***$224,000.00***

Generator Replacement

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization	LS	1.00	$1,150.00	$1,150.00
2	New 75KVA Generator & ATS	LS	1.00	$41,515.00	$41,515.00
3	New Generator Pad	LS	1.00	$5,750.00	$5,750.00
4	2" PVC Conduit	LF	100.00	$12.48	$1,247.75
5	#3 AWG Cable	LF	400.00	$4.31	$1,725.00
				Subtotal	***$51,400.00***
				+10% Contingency	***$5,200.00***
				Subtotal	***$56,600.00***
				+25% Indirect Costs	***$14,200.00***
				Total Generator Replacement	***$71,000.00***
				Generator Replacement (2043, 2.5% Annual Inflation)	***$149,000.00***

Keller Lake Lift Station Improvements *Cost Opinion*

Site and Surface Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$100.00	$100.00
2	Paint Bollards	EA	3.00	$100.00	$300.00
				Subtotal	***$400.00***
				+10% Contingency	***$100.00***
				Subtotal	***$500.00***
				+25% Indirect Costs	***$200.00***
				Total Site and Surface Improvements	***$700.00***
				Total Site and Surface Improvements (2043, 2.5% Annual Inflation)	***$1,000.00***

Pumping, Mechanical, and Structure Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$1,700.00	$1,700.00
2	Bypass Pumping	LS	1.00	$5,000.00	$5,000.00
3	Remove Pumps	LS	1.00	$1,500.00	$1,500.00
4	Wet Well Hydrogen Sulfide Resistant Coating	LS	1.00	$5,000.00	$5,000.00
5	Piping Hydrogen Sulfide Resistant Coating	LS	1.00	$2,000.00	$2,000.00
6	4" Gate Valve (Flanged)	EA	2.00	$2,500.00	$5,000.00
7	4" Swing Flex Check Valve (Flanged)	EA	2.00	$3,000.00	$6,000.00
8	2.7 HP ABS Non-Clog Submersible Pump	EA	2.00	$5,000.00	$10,000.00
				Subtotal	***$36,200.00***
				+10% Contingency	***$3,700.00***
				Subtotal	***$39,900.00***
				+25% Indirect Costs	***$10,000.00***
				Total Pumping, Mechanical, and Structure Improvements	***$50,000.00***
				Total Pumping, Mechanical, and Structure Improvements (2043, 2.5% Annual Inflation)	***$105,000.00***

Force Main Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$6,600.00	$6,600.00
2	Bypass Pumping	LS	1.00	$5,000.00	$5,000.00
3	Remove Bituminous Pavemenet	SY	150.00	$5.00	$750.00
4	Remove 4" Force Main	LF	70.00	$10.00	$700.00
5	Aggregate Base Class 5	TN	80.00	$40.00	$3,200.00
6	Bituminous Pavement	TN	35.00	$150.00	$5,250.00
7	4" PVC Force Main	LF	70.00	$40.00	$2,800.00
8	Connect to Existing Manhole	LS	1.00	$500.00	$500.00
9	Site Restoration	LS	1.00	$2,000.00	$2,000.00
				Subtotal	***$26,800.00***
				+10% Contingency	***$2,700.00***
				Subtotal	***$29,500.00***
				+25% Indirect Costs	***$7,400.00***
				Total Force Main Improvements	***$37,000.00***
				Total Force Main Improvements (2028, 2.5% Annual Inflation)	***$54,000.00***

Control Panel Replacment

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization	LS	1.00	$2,300.00	$2,300.00
2	New Control Panel	EA	1.00	$69,230.00	$69,230.00
3	Control Panel Install	HR	24.00	$96.60	$2,318.40
				Subtotal	***$73,900.00***
				+10% Contingency	***$7,400.00***
				Subtotal	***$81,300.00***
				+25% Indirect Costs	***$20,400.00***
				Total Control Panel Replacement	***$102,000.00***
				Control Panel Replacement (2043, 2.5% Annual Inflation)	***$214,000.00***

City of Burnsville — *Condition Assessment Report*

Sanitary Sewer Lift Station Condition Assessment

WSB Project No. 1880-220

Maple Island 1 (Big) Lift Station Improvements — *Cost Opinion*

Site and Surface Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$100.00	$100.00
2	Paint Bollards	EA	3.00	$100.00	$300.00
				Subtotal	***$400.00***
				+10% Contingency	***$100.00***
				Subtotal	***$500.00***
				+25% Indirect Costs	***$200.00***
				Total Site and Surface Improvements	***$700.00***
				Total Site and Surface Improvements (2043, 2.5% Annual Inflation)	***$1,000.00***

Pumping, Mechanical, and Structure Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$5,000.00	$5,000.00
2	Bypass Pumping	LS	1.00	$15,000.00	$15,000.00
3	Remove Pumps	LS	1.00	$3,000.00	$3,000.00
4	Wet Well Hydrogen Sulfide Resistant Coating	LS	1.00	$9,000.00	$9,000.00
5	Piping Hydrogen Sulfide Resistant Coating	LS	1.00	$3,500.00	$3,500.00
6	8" Gate Valve (Flanged)	EA	2.00	$4,500.00	$9,000.00
7	8" Swing Flex Check Valve (Flanged)	EA	2.00	$5,000.00	$10,000.00
8	33 HP ABS Non-Clog Submersible Pump	EA	2.00	$25,000.00	$50,000.00
				Subtotal	***$104,500.00***
				+10% Contingency	***$10,500.00***
				Subtotal	***$115,000.00***
				+25% Indirect Costs	***$28,800.00***
				Total Pumping, Mechanical, and Structure Improvements	***$144,000.00***
				Total Pumping, Mechanical, and Structure Improvements (2043, 2.5% Annual Inflation)	***$302,000.00***

Force Main Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$7,400.00	$7,400.00
2	Traffic Control	LS	1.00	$5,000.00	$5,000.00
3	Bypass Pumping	LS	1.00	$15,000.00	$15,000.00
4	Remove Bituminous Pavement	SY	225.00	$5.00	$1,125.00
5	Abandon 10" Force Main	LF	1,200.00	$8.00	$9,600.00
6	Aggregate Base Class 5	TN	150.00	$40.00	$6,000.00
7	Bituminous Pavement	TN	50.00	$150.00	$7,500.00
8	Directional Bore 10" PVC Force Main	LF	1,200.00	$54.00	$64,800.00
9	Connect to Existing Manhole	LS	1.00	$500.00	$500.00
10	Site Restoration	LS	1.00	$5,000.00	$5,000.00
				Subtotal	***$122,000.00***
				+10% Contingency	***$12,200.00***
				Subtotal	***$134,200.00***
				+25% Indirect Costs	***$33,600.00***
				Total Force Main Improvements	***$168,000.00***
				Total Force Main Improvements (2033, 2.5% Annual Inflation)	***$275,000.00***

Control Panel Replacement

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization	LS	1.00	$3,700.00	$3,700.00
2	New Control Panel	EA	1.00	$69,230.00	$69,230.00
3	Control Panel Install	HR	24.00	$96.60	$2,318.40
4	Size 3 Starter	EA	2.00	$1,868.75	$3,737.50
				Subtotal	***$79,000.00***
				+10% Contingency	***$7,900.00***
				Subtotal	***$86,900.00***
				+25% Indirect Costs	***$21,800.00***
				Total Control Panel Replacement	***$109,000.00***
				Control Panel Replacement (2043, 2.5% Annual Inflation)	***$229,000.00***

Generator Replacement

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization	LS	1.00	$1,150.00	$1,150.00
2	New 125KVA Generator & ATS	LS	1.00	$80,500.00	$80,500.00
3	New Generator Pad	LS	1.00	$5,750.00	$5,750.00
4	2" PVC Conduit	LF	100.00	$12.48	$1,247.75
5	#3/0 AWG Cable	LF	400.00	$10.01	$4,002.00
				Subtotal	***$92,700.00***
				+10% Contingency	***$9,300.00***
				Subtotal	***$102,000.00***
				+25% Indirect Costs	***$25,500.00***
				Total Generator Replacement	***$128,000.00***
				Generator Replacement (2043, 2.5% Annual Inflation)	***$268,000.00***

Control Panel Rewiring for Independent Float Operation

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Rewire Control Panel for Float Operation Independent of PLC	LS	1.00	$3,000.00	$2,500.00
				Subtotal	***$2,500.00***
				+10% Contingency	***$300.00***
				Subtotal	***$2,800.00***
				+25% Indirect Costs	***$700.00***
				Total Control Panel Rewiring (O&M Activity)	***$4,000.00***

City of Burnsville					*Condition Assessment Report*
Sanitary Sewer Lift Station Condition Assessment					
WSB Project No. 1880-220					
Maple Island 2 (Small) Lift Station Improvements					***Cost Opinion***
Site and Surface Improvements					
Item	***Description***	***Unit***	***Quantity***	***Unit Cost***	***Extended Cost***
1	Mobilization (5%)	LS	1.00	$500.00	$500.00
2	Clear & Grub	LS	1.00	$500.00	$500.00
3	Remove Cover Slab (Wet Well and Valve Vault)	EA	2.00	$500.00	$1,000.00
4	Remove Concrete Driveway Pavemenet	SY	45.00	$10.00	$450.00
5	Concrete Driveway Pavement	SF	350.00	$10.00	$3,500.00
6	84" Diameter Cover Slab with Access Hatche, Safety Grate, and Vent	EA	1.00	$3,000.00	$3,000.00
7	Paint Bollards	EA	3.00	$100.00	$300.00
8	Silt Fence Type Heavy Duty	LF	100.00	$5.00	$500.00
9	Site Restoration	LS	1.00	$1,000.00	$1,000.00
				Subtotal	***$10,800.00***
				+10% Contingency	***$1,100.00***
				Subtotal	***$11,900.00***
				+25% Indirect Costs	***$3,000.00***
				Total Site and Surface Improvements	***$15,000.00***
				Total Site and Surface Improvements (2028, 2.5% Annual Inflation)	***$22,000.00***

City of Burnsville — *Condition Assessment Report*

Sanitary Sewer Lift Station Condition Assessment

WSB Project No. 1880-220

Maple Island 2 (Small) Lift Station Improvements — *Cost Opinion*

Pumping, Mechanical, and Structure Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$3,800.00	$3,800.00
2	Bypass Pumping	LS	1.00	$2,500.00	$2,500.00
3	Dewatering	LS	1.00	$5,000.00	$5,000.00
4	Remove Valve Vault	LS	1.00	$3,500.00	$3,500.00
5	Remove Wet Well and Valve Vault Piping	LS	1.00	$2,000.00	$2,000.00
6	Remove Pumps	LS	1.00	$1,500.00	$1,500.00
7	Core Drill Structure Sidewall	EA	2.00	$500.00	$1,000.00
8	Wet Well Hydrogen Sulfide Resistant Coating	LS	1.00	$5,000.00	$5,000.00
9	6' Diameter Valve Vault Structure	LS	1.00	$10,000.00	$10,000.00
10	2" PVC Drain	LS	1.00	$500.00	$500.00
11	4" DIP Wet Well Piping (incl. Coating)	LS	1.00	$10,000.00	$10,000.00
12	4" DIP Valve Vault and Disch. Manhole Piping (incl. Coating)	LS	1.00	$10,000.00	$10,000.00
13	2" Rubber Backwater Check Valve	EA	1.00	$1,000.00	$1,000.00
14	4" Gate Valve (Flanged)	EA	2.00	$2,500.00	$5,000.00
15	4" Swing Flex Check Valve (Flanged)	EA	2.00	$3,000.00	$6,000.00
16	3.0 HP ABS Non-Clog Submersible Pump	EA	2.00	$5,000.00	$10,000.00
17	Stainless Steel Guide Rails, Cable Holders, and Hardware	LS	1.00	$2,000.00	$2,000.00
				Subtotal	***$78,800.00***
				+10% Contingency	***$7,900.00***
				Subtotal	***$86,700.00***
				+25% Indirect Costs	***$21,700.00***
				Total Pumping, Mechanical, and Structure Improvements	***$109,000.00***
				Total Pumping, Mechanical, and Structure Improvements (2028, 2.5% Annual Inflation)	***$158,000.00***

City of Burnsville — *Condition Assessment Report*

Sanitary Sewer Lift Station Condition Assessment

WSB Project No. 1880-220

Maple Island 2 (Small) Lift Station Improvements — *Cost Opinion*

Control Panel Replacement

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization	LS	1.00	$2,300.00	$2,300.00
2	New Control Panel	EA	1.00	$69,230.00	$69,230.00
3	Control Panel Install	HR	24.00	$96.60	$2,318.40
				Subtotal	***$73,900.00***
				+10% Contingency	***$7,400.00***
				Subtotal	***$81,300.00***
				+25% Indirect Costs	***$20,400.00***
				Total Control Panel Replacement	***$102,000.00***
				Control Panel Replacement (2043, 2.5% Annual Inflation)	***$214,000.00***

McAndrews Lift Station Improvements ***Cost Opinion***

Site and Surface Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$1,000.00	$1,000.00
2	Clear & Grub	LS	1.00	$500.00	$500.00
3	Remove Curb and Gutter	LF	40.00	$6.00	$240.00
4	Remove Concrete Driveway Pavement	SY	15.00	$10.00	$150.00
5	Remove Concrete Sidewalk	SY	12.00	$10.00	$120.00
6	Remove Access Manways (Wet Well and Valve Vault)	EA	2.00	$500.00	$1,000.00
7	Common Excavation	CY	75.00	$25.00	$1,875.00
8	Aggregate Base Class 5	TN	75.00	$40.00	$3,000.00
9	Bituminous Driveway Pavement	TN	34.00	$150.00	$5,100.00
10	Concrete Slab around Wet Well and Control Panel	SF	240.00	$10.00	$2,400.00
11	Curb and Gutter	LF	40.00	$50.00	$2,000.00
12	Bollards	EA	3.00	$500.00	$1,500.00
13	Silt Fence Type Heavy Duty	LF	100.00	$5.00	$500.00
14	Site Restoration	LS	1.00	$2,000.00	$2,000.00
				Subtotal	***$21,400.00***
				+10% Contingency	***$2,200.00***
				Subtotal	***$23,600.00***
				+25% Indirect Costs	***$5,900.00***
				Total Site and Surface Improvements	***$30,000.00***
				Total Site and Surface Improvements (2018, 2.5% Annual Inflation)	***$34,000.00***

City of Burnsville — *Condition Assessment Report*

Sanitary Sewer Lift Station Condition Assessment

WSB Project No. 1880-220

McAndrews Lift Station Improvements — *Cost Opinion*

Pumping, Mechanical, and Structure Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$12,500.00	$12,500.00
2	Bypass Pumping	LS	1.00	$13,000.00	$13,000.00
3	Traffic Control	LS	1.00	$10,000.00	$10,000.00
4	Remove Dry Pit Pumps and Piping	LS	1.00	$6,000.00	$6,000.00
5	Abandon Dry Pit	LS	1.00	$3,000.00	$3,000.00
6	Dewatering	LS	1.00	$10,000.00	$10,000.00
7	10' Diameter Wet Well (Caisson Construction)	LS	1.00	$95,000.00	$95,000.00
8	8' Diameter Valve Vault	LS	1.00	$20,000.00	$20,000.00
9	Core Drill Structure Sidewall	EA	1.00	$500.00	$500.00
10	Piping Between Existing Wet Well and New Wet Well	LS	1.00	$3,000.00	$3,000.00
11	Existing Wet Well Modifications	LS	1.00	$7,500.00	$7,500.00
12	Wet Well Hydrogen Sulfide Resistant Coating	LS	1.00	$9,000.00	$9,000.00
13	2" PVC Drain	LS	1.00	$500.00	$500.00
14	8" DIP Wet Well Piping (incl. Coating)	LS	1.00	$25,000.00	$25,000.00
15	2" Rubber Backwater Check Valve	EA	1.00	$1,000.00	$1,000.00
16	8" Gate Valve (Flanged)	EA	2.00	$4,500.00	$9,000.00
17	8" Swing Flex Check Valve (Flanged)	EA	2.00	$5,000.00	$10,000.00
18	20 HP ABS Non-Clog Submersible Pump	EA	2.00	$17,500.00	$35,000.00
19	Stainless Steel Guide Rails, Cable Holders, and Hardware	LS	1.00	$2,500.00	$2,500.00
				Subtotal	***$272,500.00***
				+10% Contingency	***$27,300.00***
				Subtotal	***$299,800.00***
				+25% Indirect Costs	***$75,000.00***
				Total Pumping, Mechanical, and Structure Improvements	***$375,000.00***
				Total Pumping, Mechanical, and Structure Improvements (2018, 2.5% Annual Inflation)	***$424,000.00***

McAndrews Lift Station Improvements *Cost Opinion*

Force Main Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$2,800.00	$2,800.00
2	Clear & Grub	EA	10.00	$250.00	$2,500.00
3	Bypass Pumping	LS	1.00	$13,000.00	$13,000.00
4	Traffic Control	LS	1.00	$10,000.00	$10,000.00
5	Directional Bore 12" PVC Force Main	LF	500.00	$60.00	$30,000.00
6	Site Restoration	LS	1.00	$2,000.00	$2,000.00
				Subtotal	***$60,300.00***
				+10% Contingency	***$6,100.00***
				Subtotal	***$66,400.00***
				+25% Indirect Costs	***$16,600.00***
				Total Force Main Improvements	***$83,000.00***
				Total Force Main Improvements (2028, 2.5% Annual Inflation)	***$120,000.00***

Force Main Structures Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$1,300.00	$1,300.00
2	Remove 60" Diameter Cover Slab	EA	10.00	$500.00	$5,000.00
3	Replace 60" Diameter Cover Slab with Manway	EA	10.00	$2,000.00	$20,000.00
				Subtotal	***$26,300.00***
				+10% Contingency	***$2,700.00***
				Subtotal	***$29,000.00***
				+25% Indirect Costs	***$7,300.00***
				Total Force Main Structures Improvements	***$37,000.00***
				Force Main Structures Improvements (2018, 2.5% Annual Inflation)	***$42,000.00***

Control Panel Integration

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization	LS	1.00	$2,300.00	$2,300.00
2	New Control Panel	EA	1.00	$69,230.00	$69,230.00
3	Control Panel Install	HR	24.00	$96.60	$2,318.40
				Subtotal	***$73,900.00***
				+10% Contingency	***$7,400.00***
				Subtotal	***$81,300.00***
				+25% Indirect Costs	***$20,400.00***
				Total Control Panel Integration	***$102,000.00***
				Control Panel Integration (2018, 2.5% Annual Inflation)	***$115,000.00***

Generator Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization	LS	1.00	$1,150.00	$1,150.00
2	New 125KVA Generator & ATS	LS	1.00	$80,500.00	$80,500.00
3	New Generator Pad	LS	1.00	$5,750.00	$5,750.00
4	2" PVC Conduit	LF	100.00	$12.48	$1,247.75
5	#3/0 AWG Cable	LF	400.00	$10.01	$4,002.00
				Subtotal	***$92,700.00***
				+10% Contingency	***$9,300.00***
				Subtotal	***$102,000.00***
				+25% Indirect Costs	***$25,500.00***
				Total Generator Improvements	***$128,000.00***
				Generator Improvements (2018, 2.5% Annual Inflation)	***$145,000.00***

Site and Surface Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$1,800.00	$1,800.00
2	Clear & Grub	LS	1.00	$500.00	$500.00
3	Remove Curb and Gutter	LF	50.00	$6.00	$300.00
4	Remove Bituminous Pavement	SY	240.00	$5.00	$1,200.00
5	Remove Manhole	LS	1.00	$500.00	$500.00
6	Remove 9" VCP Sanitary Sewer	LF	130.00	$10.00	$1,300.00
7	Common Excavation	CY	85.00	$25.00	$2,125.00
8	Aggregate Base Class 5	TN	85.00	$40.00	$3,400.00
9	Bituminous Driveway and Street Pavement	TN	38.00	$150.00	$5,700.00
10	Concrete Slab around Wet Well and Control Panel	SF	240.00	$10.00	$2,400.00
11	Curb and Gutter	LF	50.00	$50.00	$2,500.00
12	Bollards	EA	3.00	$500.00	$1,500.00
13	48" Diameter Manhole	LF	12.00	$275.00	$3,300.00
14	10" PVC Pipe Sewer	LF	130.00	$60.00	$7,800.00
15	Silt Fence Type Heavy Duty	LF	300.00	$5.00	$1,500.00
16	Site Restoration	LS	1.00	$2,000.00	$2,000.00
				Subtotal	***$37,900.00***
				+10% Contingency	***$3,800.00***
				Subtotal	***$41,700.00***
				+25% Indirect Costs	***$10,500.00***
				Total Site and Surface Improvements	***$53,000.00***
				Total Site and Surface Improvements (2014, 2.5% Annual Inflation)	***$54,000.00***

Pumping, Mechanical, and Structure Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$10,200.00	$10,200.00
2	Bypass Pumping	LS	1.00	$30,000.00	$30,000.00
3	Remove Wet Well and Valve Vault Piping	LS	1.00	$2,500.00	$2,500.00
4	Remove Pumps	LS	1.00	$2,500.00	$2,500.00
5	Abandon Wet Well	LS	1.00	$2,000.00	$2,000.00
6	Remove Valve Vault	LS	1.00	$500.00	$500.00
7	Dewatering	LS	1.00	$10,000.00	$10,000.00
8	10' Diameter Wet Well (Caisson Construction)	LS	1.00	$75,000.00	$75,000.00
9	8' Diameter Valve Vault	LS	1.00	$20,000.00	$20,000.00
10	Core Drill Structure Sidewall	EA	1.00	$500.00	$500.00
11	Piping Between Existing Wet Well and New Wet Well	LS	1.00	$3,000.00	$3,000.00
12	Wet Well Hydrogen Sulfide Resistant Coating	LS	1.00	$9,000.00	$9,000.00
13	2" PVC Drain	LS	1.00	$500.00	$500.00
14	8" DIP Wet Well Piping (incl. Coating)	LS	1.00	$25,000.00	$25,000.00
15	2" Rubber Backwater Check Valve	EA	1.00	$1,000.00	$1,000.00
16	8" Gate Valve (Flanged)	EA	2.00	$4,500.00	$9,000.00
17	8" Swing Flex Check Valve (Flanged)	EA	2.00	$5,000.00	$10,000.00
18	Stainless Steel Guide Rails, Cable Holders, and Hardware	LS	1.00	$2,500.00	$2,500.00
				Subtotal	***$213,200.00***
				+10% Contingency	***$21,400.00***
				Subtotal	***$234,600.00***
				+25% Indirect Costs	***$58,700.00***
				Total Pumping, Mechanical, and Structure Improvements	***$294,000.00***
				Total Pumping, Mechanical, and Structure Improvements (2014, 2.5% Annual Inflation)	***$301,000.00***

Meadow Acres Lift Station Improvements *Cost Opinion*

Force Main Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$11,300.00	$11,300.00
2	Traffic Control	LS	1.00	$20,000.00	$20,000.00
3	Bypass Pumping	LS	1.00	$30,000.00	$30,000.00
4	Remove Bituminous Pavement	SY	225.00	$5.00	$1,125.00
5	Abandon 10" Force Main	LF	1,700.00	$8.00	$13,600.00
6	Aggregate Base Class 5	TN	150.00	$40.00	$6,000.00
7	Bituminous Pavement	TN	50.00	$150.00	$7,500.00
8	Directional Bore 10" PVC Force Main	LF	1,700.00	$54.00	$91,800.00
9	Connect to Existing Manhole	LS	1.00	$500.00	$500.00
10	Connect to Existing Force Main	LS	1.00	$1,500.00	$1,500.00
11	Site Restoration	LS	1.00	$5,000.00	$5,000.00
				Subtotal	***$188,400.00***
				+10% Contingency	***$18,900.00***
				Subtotal	***$207,300.00***
				+25% Indirect Costs	***$51,900.00***
				Total Force Main Improvements	***$260,000.00***
				Total Force Main Improvements (2016, 2.5% Annual Inflation)	***$280,000.00***

Control Panel Replacement

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization	LS	1.00	$2,300.00	$2,300.00
2	New Control Panel	EA	1.00	$69,230.00	$69,230.00
3	Control Panel Install	HR	24.00	$96.60	$2,318.40
				Subtotal	***$73,900.00***
				+10% Contingency	***$7,400.00***
				Subtotal	***$81,300.00***
				+25% Indirect Costs	***$20,400.00***
				Total Control Panel Replacement	***$102,000.00***
				Control Panel Replacement (2014, 2.5% Annual Inflation)	***$105,000.00***

Generator Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization	LS	1.00	$1,150.00	$1,150.00
2	New 100KVA Generator & ATS	LS	1.00	$41,515.00	$41,515.00
3	New Generator Pad	LS	1.00	$5,750.00	$5,750.00
4	2" PVC Conduit	LF	100.00	$12.48	$1,247.75
5	#3/0 AWG Cable	LF	400.00	$10.01	$4,002.00
				Subtotal	***$53,700.00***
				+10% Contingency	***$5,400.00***
				Subtotal	***$59,100.00***
				+25% Indirect Costs	***$14,800.00***
				Total Generator Improvements	***$74,000.00***
				Generator Improvements (2014, 2.5% Annual Inflation)	***$76,000.00***

Yard Light Installation

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	New Yard Light	LS	1.00	$770.50	$770.50
2	Pole	LS	1.00	$1,322.50	$1,322.50
3	Base	LS	1.00	$908.50	$908.50
4	Miscellaneous Wire and Conduit	LS	1.00	$862.50	$862.50
				Subtotal	***$3,900.00***
				+10% Contingency	***$400.00***
				Subtotal	***$4,300.00***
				+25% Indirect Costs	***$1,100.00***
				Total Yard Light Installation	***$6,000.00***
				Yard Light Installation (2014, 2.5% Annual Inflation)	***$6,000.00***

Savage Lift Station Improvements ***Cost Opinion***

Site and Surface Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$500.00	$500.00
2	Remove Cover Slab (Valve Vault)	EA	1.00	$1,000.00	$1,000.00
3	Remove Bituminous Pavement	SY	15.00	$5.00	$75.00
4	Bituminous Driveway Pavement	TN	15.00	$150.00	$2,250.00
5	Bollards	EA	3.00	$500.00	$1,500.00
6	7.5' x 13.'5 Valve Vault Cover Slab with Access Hatch, Safety Grate, and Vent	EA	1.00	$3,000.00	$3,000.00
7	Wet Well Hatch Safety Nets	EA	3.00	$250.00	$750.00
8	Silt Fence Type Heavy Duty	LF	100.00	$5.00	$500.00
9	Site Restoration	LS	1.00	$1,000.00	$1,000.00
				Subtotal	***$10,600.00***
				+10% Contingency	***$1,100.00***
				Subtotal	***$11,700.00***
				+25% Indirect Costs	***$3,000.00***
				Total Site and Surface Improvements	***$15,000.00***
				Total Site and Surface Improvements (2022, 2.5% Annual Inflation)	***$19,000.00***

Savage Lift Station Improvements ***Cost Opinion***

Pumping, Mechanical, and Structure Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$5,500.00	$5,500.00
2	Bypass Pumping	LS	1.00	$21,000.00	$21,000.00
3	Remove Wet Well and Valve Vault Piping	LS	1.00	$3,500.00	$3,500.00
4	Remove Pumps	LS	1.00	$2,000.00	$2,000.00
5	Wet Well Hydrogen Sulfide Resistant Coating	LS	1.00	$12,000.00	$12,000.00
6	6" DIP Wet Well Piping (incl. Coating)	LS	1.00	$15,000.00	$15,000.00
7	6" Gate Valve (Flanged)	EA	3.00	$3,500.00	$10,500.00
8	6" Swing Flex Check Valve (Flanged)	EA	3.00	$4,000.00	$12,000.00
9	15 HP ABS Non-Clog Submersible Pump	EA	2.00	$15,000.00	$30,000.00
10	Stainless Steel Guide Rails, Cable Holders, and Hardware	LS	1.00	$3,000.00	$3,000.00
				Subtotal	***$114,500.00***
				+10% Contingency	***$11,500.00***
				Subtotal	***$126,000.00***
				+25% Indirect Costs	***$31,500.00***
				Total Pumping, Mechanical, and Structure Improvements	***$158,000.00***
				Total Pumping, Mechanical, and Structure Improvements (2022, 2.5% Annual Inflation)	***$197,000.00***

Savage Lift Station Improvements *Cost Opinion*

Force Main Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$7,700.00	$7,700.00
2	Traffic Control	LS	1.00	$5,000.00	$5,000.00
3	Bypass Pumping	LS	1.00	$21,000.00	$21,000.00
4	Remove Bituminous Pavement	SY	180.00	$5.00	$900.00
5	Abandon 6" Force Main	LF	1,400.00	$4.00	$5,600.00
6	Aggregate Base Class 5	TN	120.00	$40.00	$4,800.00
7	Bituminous Pavement	TN	40.00	$150.00	$6,000.00
8	Directional Bore 6" PVC Force Main	LF	1,400.00	$40.00	$56,000.00
9	Connect to Existing MCES Force Main	EA	2.00	$7,500.00	$15,000.00
10	Connect to Existing Lift Station Force Main	EA	3.00	$500.00	$1,500.00
11	Site Restoration	LS	1.00	$5,000.00	$5,000.00
				Subtotal	***$128,500.00***
				+10% Contingency	***$12,900.00***
				Subtotal	***$141,400.00***
				+25% Indirect Costs	***$35,400.00***
				Total Force Main Improvements	***$177,000.00***
				Total Force Main Improvements (2022, 2.5% Annual Inflation)	***$221,000.00***

Communications/As-Builts

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Update Control Panel Drawing As-Builts	LS	1.00	$4,600.00	$4,600.00
2	New Cell Phone Modem	LS	1.00	$5,750.00	$5,750.00
3	Programming and Drawings Update	LS	1.00	$17,250.00	$17,250.00
				Subtotal	***$27,600.00***
				+10% Contingency	***$2,800.00***
				Subtotal	***$30,400.00***
				+25% Indirect Costs	***$7,600.00***
				Total Communications/As-Builts (O&M Activity)	***$38,000.00***

Savage Lift Station Improvements *Cost Opinion*

Control Panel Replacement

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization	LS	1.00	$2,300.00	$2,300.00
2	New Control Panel	EA	1.00	$69,230.00	$69,230.00
3	Control Panel Install	HR	24.00	$96.60	$2,318.40
				Subtotal	***$73,900.00***
				+10% Contingency	***$7,400.00***
				Subtotal	***$81,300.00***
				+25% Indirect Costs	***$20,400.00***
				Total Control Panel Replacement	***$102,000.00***
				Control Panel Replacement (2022, 2.5% Annual Inflation)	***$127,000.00***

Generator Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization	LS	1.00	$1,150.00	$1,150.00
2	New 100KVA Generator & ATS	LS	1.00	$41,515.00	$41,515.00
3	New Generator Pad	LS	1.00	$5,750.00	$5,750.00
4	2" PVC Conduit	LF	100.00	$12.48	$1,247.75
5	#3/0 AWG Cable	LF	400.00	$10.01	$4,002.00
				Subtotal	***$53,700.00***
				+10% Contingency	***$5,400.00***
				Subtotal	***$59,100.00***
				+25% Indirect Costs	***$14,800.00***
				Total Generator Improvements	***$74,000.00***
				Generator Improvements (2022, 2.5% Annual Inflation)	***$92,000.00***

Site and Surface Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$800.00	$800.00
2	Clear & Grub	LS	1.00	$500.00	$500.00
3	Common Excavation	CY	80.00	$25.00	$2,000.00
4	Aggregate Base Class 5	TN	80.00	$40.00	$3,200.00
5	Bituminous Driveway Pavement	TN	40.00	$150.00	$6,000.00
6	Concrete Slab around Wet Well and Control Panel	SF	160.00	$10.00	$1,600.00
7	Bollards	EA	3.00	$500.00	$1,500.00
8	Silt Fence Type Heavy Duty	LF	100.00	$5.00	$500.00
9	Site Restoration	LS	1.00	$1,000.00	$1,000.00
				Subtotal	***$17,100.00***
				+10% Contingency	***$1,800.00***
				Subtotal	***$18,900.00***
				+25% Indirect Costs	***$4,800.00***
				Total Site and Surface Improvements	***$24,000.00***
				Total Site and Surface Improvements (2033, 2.5% Annual Inflation)	***$39,000.00***

Pumping, Mechanical, and Structure Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$2,300.00	$2,300.00
2	Bypass Pumping	LS	1.00	$8,000.00	$8,000.00
3	Remove Wet Well and Valve Vault Piping	LS	1.00	$1,000.00	$1,000.00
4	Remove Pumps	LS	1.00	$500.00	$500.00
5	Dewatering	LS	1.00	$1,000.00	$1,000.00
6	5' Diameter Valve Vault Structure	LS	1.00	$8,500.00	$8,500.00
7	Core Drill Structure Sidewall	EA	2.00	$500.00	$1,000.00
8	Wet Well Hydrogen Sulfide Resistant Coating	LS	1.00	$4,500.00	$4,500.00
9	2" PVC Drain	LS	1.00	$500.00	$500.00
10	2" DIP Wet Well Piping (incl. Coating)	LS	1.00	$8,500.00	$8,500.00
11	2" Rubber Backwater Check Valve	EA	1.00	$1,000.00	$1,000.00
12	2" Gate Valve	EA	2.00	$1,000.00	$2,000.00
13	2" Check Valve	EA	2.00	$1,000.00	$2,000.00
14	1.5 HP ABS Submersible Grinder Pump	EA	2.00	$3,500.00	$7,000.00
15	Stainless Steel Guide Rails, Cable Holders, and Hardware	LS	1.00	$1,000.00	$1,000.00
				Subtotal	***$48,800.00***
				+10% Contingency	***$4,900.00***
				Subtotal	***$53,700.00***
				+25% Indirect Costs	***$13,500.00***
				Total Pumping, Mechanical, and Structure Improvements	***$68,000.00***
				Total Pumping, Mechanical, and Structure Improvements (2033, 2.5% Annual Inflation)	***$111,000.00***

Control Panel Replacement

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization	LS	1.00	$2,300.00	$2,300.00
2	New Control Panel	EA	1.00	$69,230.00	$69,230.00
3	Control Panel Install	HR	24.00	$96.60	$2,318.40
				Subtotal	***$73,900.00***
				+10% Contingency	***$7,400.00***
				Subtotal	***$81,300.00***
				+25% Indirect Costs	***$20,400.00***
				Total Control Panel Replacement	***$102,000.00***
				Control Panel Replacement (2028, 2.5% Annual Inflation)	***$148,000.00***

Site and Surface Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$300.00	$300.00
2	Bituminous Driveway Pavement	TN	19.00	$150.00	$2,850.00
3	Bollards	EA	3.00	$500.00	$1,500.00
4	Silt Fence Type Heavy Duty	LF	100.00	$5.00	$500.00
5	Site Restoration	LS	1.00	$500.00	$500.00
				Subtotal	***$5,700.00***
				+10% Contingency	***$600.00***
				Subtotal	***$6,300.00***
				+25% Indirect Costs	***$1,600.00***
				Total Site and Surface Improvements	***$7,900.00***
				Total Site and Surface Improvements (2043, 2.5% Annual Inflation)	***$17,000.00***

Pumping, Mechanical, and Structure Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$2,300.00	$2,300.00
2	Bypass Pumping	LS	1.00	$4,000.00	$4,000.00
3	Remove Pumps	LS	1.00	$2,000.00	$2,000.00
4	Wet Well Hydrogen Sulfide Resistant Coating	LS	1.00	$5,000.00	$5,000.00
5	Piping Hydrogen Sulfide Resistant Coating	LS	1.00	$2,000.00	$2,000.00
6	4" Gate Valve (Flanged)	EA	2.00	$2,500.00	$5,000.00
7	4" Swing Flex Check Valve (Flanged)	EA	2.00	$3,000.00	$6,000.00
8	10 HP ABS Non-Clog Submersible Pump	EA	2.00	$11,000.00	$22,000.00
				Subtotal	***$48,300.00***
				+10% Contingency	***$4,900.00***
				Subtotal	***$53,200.00***
				+25% Indirect Costs	***$13,300.00***
				Total Pumping, Mechanical, and Structure Improvements	***$67,000.00***
				Total Pumping, Mechanical, and Structure Improvements (2043, 2.5% Annual Inflation)	***$141,000.00***

Control Panel Replacement

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization	LS	1.00	$2,300.00	$2,300.00
2	New Control Panel	EA	1.00	$69,230.00	$69,230.00
3	Control Panel Install	HR	24.00	$96.60	$2,318.40
				Subtotal	***$73,900.00***
				+10% Contingency	***$7,400.00***
				Subtotal	***$81,300.00***
				+25% Indirect Costs	***$20,400.00***
				Total Control Panel Replacement	***$102,000.00***
				Control Panel Replacement (2028, 2.5% Annual Inflation)	***$148,000.00***

Control Panel As-Builts

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Update Control Panel Drawing As-Builts	LS	1.00	$4,600.00	$4,600.00
				Subtotal	***$4,600.00***
				+10% Contingency	***$500.00***
				Subtotal	***$5,100.00***
				+25% Indirect Costs	***$1,300.00***
				Total Control Panel As-Builts (O&M Activity)	***$7,000.00***

Site and Surface Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$1,100.00	$1,100.00
2	Clear & Grub	LS	1.00	$500.00	$500.00
3	Remove Curb and Gutter	LF	45.00	$6.00	$270.00
4	Remove Cover Slab (Wet Well and Valve Vault)	EA	2.00	$500.00	$1,000.00
5	Common Excavation	CY	40.00	$25.00	$1,000.00
6	Aggregate Base Class 5	TN	40.00	$40.00	$1,600.00
7	Bituminous Driveway Pavement	TN	20.00	$150.00	$3,000.00
8	Concrete Slab around Wet Well and Control Panel	SF	375.00	$10.00	$3,750.00
9	Curb and Gutter	LF	30.00	$50.00	$1,500.00
10	Bollards	EA	3.00	$500.00	$1,500.00
11	84" Diameter Cover Slab with Access Hatches and Safety Grates (Vent in Wet Well)	EA	2.00	$3,000.00	$6,000.00
12	Silt Fence Type Heavy Duty	LF	100.00	$5.00	$500.00
13	Site Restoration	LS	1.00	$1,000.00	$1,000.00
				Subtotal	***$22,800.00***
				+10% Contingency	***$2,300.00***
				Subtotal	***$25,100.00***
				+25% Indirect Costs	***$6,300.00***
				Total Site and Surface Improvements	***$32,000.00***
				Total Site and Surface Improvements (2019, 2.5% Annual Inflation)	***$37,000.00***

Pumping, Mechanical, and Structure Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$2,800.00	$2,800.00
2	Bypass Pumping	LS	1.00	$6,000.00	$6,000.00
3	Remove Wet Well and Valve Vault Piping	LS	1.00	$2,000.00	$2,000.00
4	Remove Pumps	LS	1.00	$1,500.00	$1,500.00
5	Core Drill Structure Sidewall	EA	2.00	$500.00	$1,000.00
6	Wet Well Hydrogen Sulfide Resistant Coating	LS	1.00	$5,000.00	$5,000.00
7	2" PVC Drain	LS	1.00	$500.00	$500.00
8	4" DIP Wet Well Piping (incl. Coating)	LS	1.00	$10,000.00	$10,000.00
9	2" Rubber Backwater Check Valve	EA	1.00	$1,000.00	$1,000.00
10	4" Gate Valve (Flanged)	EA	2.00	$2,500.00	$5,000.00
11	4" Swing Flex Check Valve (Flanged)	EA	2.00	$3,000.00	$6,000.00
12	5 HP ABS Non-Clog Submersible Pump	EA	2.00	$8,000.00	$16,000.00
13	Stainless Steel Guide Rails, Cable Holders, and Hardware	LS	1.00	$2,000.00	$2,000.00
				Subtotal	***$58,800.00***
				+10% Contingency	***$5,900.00***
				Subtotal	***$64,700.00***
				+25% Indirect Costs	***$16,200.00***
				Total Pumping, Mechanical, and Structure Improvements	***$81,000.00***
				Total Pumping, Mechanical, and Structure Improvements (2019, 2.5% Annual Inflation)	***$94,000.00***

Force Main Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$3,300.00	$3,300.00
2	Traffic Control	LS	1.00	$5,000.00	$5,000.00
3	Bypass Pumping	LS	1.00	$6,000.00	$6,000.00
4	Remove Bituminous Pavement	SY	140.00	$5.00	$700.00
5	Abandon 4" Force Main	LF	485.00	$3.00	$1,455.00
6	Aggregate Base Class 5	TN	90.00	$40.00	$3,600.00
7	Bituminous Pavement	TN	30.00	$150.00	$4,500.00
8	Directional Bore 4" PVC Force Main	LF	1,200.00	$34.00	$40,800.00
9	Connect to Existing MCES Manhole	EA	1.00	$2,000.00	$2,000.00
10	Connect to Existing Lift Station Force Main	EA	1.00	$500.00	$500.00
11	Site Restoration	LS	1.00	$1,000.00	$1,000.00
				Subtotal	***$68,900.00***
				+10% Contingency	***$6,900.00***
				Subtotal	***$75,800.00***
				+25% Indirect Costs	***$19,000.00***
				Total Force Main Improvements	***$95,000.00***
				Total Force Main Improvements (2019, 2.5% Annual Inflation)	***$110,000.00***

Communications/As-Builts

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Update Control Panel Drawing As-Builts	LS	1.00	$4,600.00	$4,600.00
2	New Cell Phone Modem	LS	1.00	$5,750.00	$5,750.00
3	Programming and Drawings Update	LS	1.00	$17,250.00	$17,250.00
				Subtotal	***$27,600.00***
				+10% Contingency	***$2,800.00***
				Subtotal	***$30,400.00***
				+25% Indirect Costs	***$7,600.00***
				Total Communications/As-Builts (O&M Activity)	***$38,000.00***

Control Panel Replacement

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization	LS	1.00	$2,300.00	$2,300.00
2	New Control Panel	EA	1.00	$69,230.00	$69,230.00
3	Control Panel Install	HR	24.00	$96.60	$2,318.40
				Subtotal	***$73,900.00***
				+10% Contingency	***$7,400.00***
				Subtotal	***$81,300.00***
				+25% Indirect Costs	***$20,400.00***
				Total Control Panel Replacement	***$102,000.00***
				Control Panel Replacement (2019, 2.5% Annual Inflation)	***$118,000.00***

City of Burnsville					*Condition Assessment Report*
Sanitary Sewer Lift Station Condition Assessment					
WSB Project No. 1880-220					
Woods Trail Lift Station Improvements					***Cost Opinion***
Site and Surface Improvements					
Item	***Description***	***Unit***	***Quantity***	***Unit Cost***	***Extended Cost***
1	Mobilization (5%)	LS	1.00	$600.00	$600.00
2	Clear & Grub	LS	1.00	$500.00	$500.00
3	Remove 8" DIP Sanitary Sewer	LF	15.00	$10.00	$150.00
4	Concrete Slab around Wet Well and Control Panel	SF	160.00	$10.00	$1,600.00
5	Bollards	EA	3.00	$500.00	$1,500.00
6	48" Diameter Manhole	LF	18.00	$275.00	$4,950.00
7	8" PVC Pipe Sewer	LF	15.00	$60.00	$900.00
8	Silt Fence Type Heavy Duty	LF	200.00	$5.00	$1,000.00
9	Site Restoration	LS	1.00	$2,000.00	$2,000.00
				Subtotal	***$13,200.00***
				+10% Contingency	***$1,400.00***
				Subtotal	***$14,600.00***
				+25% Indirect Costs	***$3,700.00***
				Total Site and Surface Improvements	***$19,000.00***
				Total Site and Surface Improvements (2043, 2.5% Annual Inflation)	***$40,000.00***

Pumping, Mechanical, and Structure Improvements

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization (5%)	LS	1.00	$5,500.00	$5,500.00
2	Bypass Pumping	LS	1.00	$5,000.00	$5,000.00
3	Remove Wet Well and Valve Vault Piping	LS	1.00	$1,500.00	$1,500.00
4	Remove Pumps	LS	1.00	$1,500.00	$1,500.00
5	Abandon Lift Station	LS	1.00	$2,000.00	$2,000.00
6	Dewatering	LS	1.00	$5,000.00	$5,000.00
7	6' Diameter Wet Well	LS	1.00	$40,000.00	$40,000.00
8	6' Diameter Valve Vault	LS	1.00	$10,000.00	$10,000.00
9	Core Drill Structure Sidewall	EA	2.00	$500.00	$1,000.00
10	Wet Well Hydrogen Sulfide Resistant Coating	LS	1.00	$5,000.00	$5,000.00
11	2" PVC Drain	LS	1.00	$500.00	$500.00
12	4" DIP Wet Well Piping (incl. Coating)	LS	1.00	$15,000.00	$15,000.00
13	2" Rubber Backwater Check Valve	EA	1.00	$1,000.00	$1,000.00
14	4" Gate Valve (Flanged)	EA	2.00	$2,500.00	$5,000.00
15	4" Swing Flex Check Valve (Flanged)	EA	2.00	$3,000.00	$6,000.00
16	3.4 HP ABS Non-Clog Submersible Pump	EA	2.00	$5,000.00	$10,000.00
17	Stainless Steel Guide Rails, Cable Holders, and Hardware	LS	1.00	$2,000.00	$2,000.00
				Subtotal	***$116,000.00***
				+10% Contingency	***$11,600.00***
				Subtotal	***$127,600.00***
				+25% Indirect Costs	***$31,900.00***
				Total Pumping, Mechanical, and Structure Improvements	***$160,000.00***
				Total Pumping, Mechanical, and Structure Improvements (2043, 2.5% Annual Inflation)	***$336,000.00***

Control Panel Replacement

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Mobilization	LS	1.00	$2,300.00	$2,300.00
2	New Control Panel	EA	1.00	$69,230.00	$69,230.00
3	Control Panel Install	HR	24.00	$96.60	$2,318.40
				Subtotal	***$73,900.00***
				+10% Contingency	***$7,400.00***
				Subtotal	***$81,300.00***
				+25% Indirect Costs	***$20,400.00***
				Total Control Panel Replacement	***$102,000.00***
				Control Panel Replacement (2028, 2.5% Annual Inflation)	***$148,000.00***

Communications/As-Builts

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	Update Control Panel Drawing As-Builts	LS	1.00	$4,600.00	$4,600.00
2	New Cell Phone Modem	LS	1.00	$5,750.00	$5,750.00
3	Programming and Drawings Update	LS	1.00	$17,250.00	$17,250.00
				Subtotal	***$27,600.00***
				+10% Contingency	***$2,800.00***
				Subtotal	***$30,400.00***
				+25% Indirect Costs	***$7,600.00***
				Total Communications/As-Builts (O&M Activity)	***$38,000.00***

Yard Light Installation

Item	*Description*	*Unit*	*Quantity*	*Unit Cost*	*Extended Cost*
1	New Yard Light	LS	1.00	$770.50	$770.50
2	Pole	LS	1.00	$1,322.50	$1,322.50
3	Base	LS	1.00	$908.50	$908.50
4	Miscellaneous Wire and Conduit	LS	1.00	$862.50	$862.50
				Subtotal	***$3,900.00***
				+10% Contingency	***$400.00***
				Subtotal	***$4,300.00***
				+25% Indirect Costs	***$1,100.00***
				Total Yard Light Installation	***$6,000.00***
				Yard Light Installation (2016, 2.5% Annual Inflation)	***$6,000.00***

APPENDIX B

City of Burnsville Sanitary Sewer Lift Station and Storm Sewer Lift Station Standardization Policy – August 2010

CITY OF BURNSVILLE

SANITARY SEWER LIFT STATION
AND
STORM SEWER LIFT STATION
STANDARDIZATION POLICY

August 2010

TABLE OF CONTENTS

1.0 GENERAL

2.0 LIFT STATION TYPES

3.0 ELECTRICAL OPTIONS

4.0 CONSTRUCTION AND CONSTRUCTION DOCUMENTATION

5.0 START-UP AND TESTING

6.0 LIFT STATION WARRANTY REQUIREMENTS

7.0 SUBMERSIBLE PUMP LIFT STATIONS

8.0 VERTICAL TURBINE PUMP LIFT STATIONS

APPENDIX A – DRAWINGS

Drawing 1 - Submersible Lift Station Plan

Drawing 2 – Submersible Lift Station Section

Drawing 3 – Vertical Turbine Lift Station Plan and Section

Drawing 4 – Standard Lift Station Details

Drawing 5 – Control Panel Layout Details

Drawing 6 – Lift Station Schematic

Drawing 7 – Lift Station Schematic

1.0 GENERAL

To provide for the standardization of all sanitary lift stations and storm water lift stations, the City of Burnsville, Minnesota, has adopted the following general standards for the rehabilitation of existing sanitary lift stations and the design and construction of future sanitary and storm lift stations within the City of Burnsville.

The standardization of lift stations within the City will simplify operation and maintenance of the stations and will reduce the spare parts inventory that will be necessary to keep on hand. Simplification of lift station operations is most important during emergency events such as storms and power outages.

In order to provide uniformity and standardization, the City of Burnsville will obtain the following items for inclusion in the construction of new, and rehabilitation of existing, lift stations:

- SCADA Integration

2.0 LIFT STATION TYPES

A. General

The City has defined two different types of lift stations to meet the needs of both the sanitary sewer system and the storm water system. One type of lift station is a submersible pump lift station, and the other type of lift station is a vertical turbine lift station. The sanitary sewer system will only use submersible pump lift stations in the future. The storm water system will utilize both submersible lift stations and vertical turbine lift stations depending on the size of the lift station and the flood logistics of the lift station.

Future lift station wet wells and rehabilitation of existing wet wells shall be of concrete construction. Concrete exposed to corrosive environment will be provided with an appropriate coating/sealant to further extend the life of the facility.

Depending on the size and location of the lift station, permanent standby power may or may not be required. The City of Burnsville shall determine which lift stations will be required to have permanent standby power for existing and proposed lift stations within the City of Burnsville, Minnesota.

Unique circumstances may require a deviation from this standardization policy. The City of Burnsville shall decide if deviation from this policy is necessary due to site specific details.

B. Sanitary Sewer Systems

Sanitary lift stations will utilize submersible pump installations. Both future and rehabilitation of existing lift stations will provide for a separate valve manhole. Should space limitations exist for rehabilitation of existing lift stations that do not have a valve manhole, the lift station may be rehabilitated without the addition of a separate valve manhole structure.

Sanitary lift stations with pumps and discharge piping large enough to pass a three (3) inch solid shall be provided with non clog submersible pumps (non-grinder). Lift stations with pumps and discharge piping that cannot pass a three (3) inch solid will be provided with grinder pumps. If at all possible, grinder pumps shall be avoided in planning for future stations, and for the rehabilitation of existing lift stations in the future.

C. Storm Sewer Systems

Storm sewer lift stations with flows less than 4000 gpm, that are not susceptible to flooding, will utilize a submersible pump installation. Those storm water submersible lift station installations that do not require valves on the discharge pipe will not require a separate valve manhole. Those storm water submersible lift station installations that do require valves on the discharge pipe due to duplex pump installations, or for other reasons, will be provided with a separate valve manhole.

Storm sewer lift stations with flows greater than 4000 gpm, or that are susceptible to flooding, will utilize a vertical turbine pump installation.

3.0 ELECTRICAL OPTIONS

The pump station electrical requirements, available utility voltages, and standby power requirements must be identified prior to completing the lift station electrical design.

The City will contact the serving electric utility to determine which service voltages are available. Three-phase power is preferred to avoid the use of variable frequency drives as phase converters, or to avoid other types of phase conversion equipment.

If there are utility charges to provide three-phase service, the City will obtain an estimate of the charges from the serving utility, and prepare a cost comparison between a three-phase installation and a single-phase installation.

Preferred three-phase service voltages:

- 277/480VAC, three-phase, four-wire, grounded-wye

- 120/240VAC, three-phase, four-wire, delta with grounded center tap
- 120/208VAC, three-phase, four-wire, grounded-wye

Single-phase voltage:

- 120/240VAC, single-phase, three-wire, grounded center tap

All lift stations will require a connection for portable standby power. Inform the City of the required capacity at the desired voltage.

Obtain information from the serving electric utility regarding available fault current at each service voltage. The entire lift station electrical system and control panel shall be designed to withstand the available fault current.

The final voltage selection shall be determined by City staff, based on a cost-benefit comparison of available operating voltages.

4.0 CONSTRUCTION AND CONSTRUCTION DOCUMENTATION

A. Submittals

1. Shop Drawings: Shop drawings shall be submitted for approval by the Engineer. Submit the following as a minimum for review:

    - Detailed specifications, dimensions, and weights of pumps, hatches, valves, piping, manholes, and other appurtenances.
    - Size and model number of pump and motor.
    - Factory-certified pump curves for the specific pump to be delivered.
    - Detailed electrical data.
    - Control drawings and data.
    - Typical installation guide.
    - Access hatch drawings.
    - Technical manuals.
    - Parts lists.
    - Operation and maintenance manuals and data.
    - Printed warranty for pumps and appurtenant equipment.
    - Motor performance chart including curves for torque, current, power factor, input/output kilowatts, and efficiency. Include data on starting and no load characteristics.
    - Certified factory performance test curves for each pump provided shall be furnished and approved prior to shipment of the unit to the site. Test curves shall cover the full range of operation from shut

off to maximum capacity including head capacity curve, horsepower curve, wire to water efficiency, shut off head, and recommended operating range. Factory testing of all pump equipment shall be made in accordance with the test code of the Hydraulic Institute Standards. Pumping equipment that fails to meet the specified requirements shall be replaced with pumping equipment that does meet the specified requirements.

B. As-Built Documentation

1. As-builts:

- Submit a complete set of drawings, documentation and manufacturer's operation and maintenance instructions for the project. Construction record drawings shall be updated to show "as-built" conditions.
- Submit complete electrical schematics showing control panel "as-built" conditions.
- Submit complete instrumentation and control "as-built" information including ladder logic.
- All drawings shall be submitted in reproducible hard copy format and in electronic format (either AutoCAD .DWG or Adobe .PDF format).

5.0 START-UP AND TESTING

A factory trained service representative shall be present at the time when the station is to be put into service and turned over to the Owner. The service representative shall instruct the Owner in the proper operation and maintenance of the equipment. The service representative shall provide a minimum of eight (8) hours for field testing and training.

At the time of start up, the Contractor shall conduct the necessary pumping test to determine the proper operation of the system. The Contractor shall furnish all meters, equipment and water required for these tests and the tests shall be so conducted as to check the operation of the pumping system. Necessary measurements of the electrical consumption shall be made to determine whether or not the pump is operating within the conditions recommended by the pump manufacturer. Perform a witnessed operational test of all equipment. Confirm proper operation of all station features and functions. Record phase-to-phase and phase-to-ground voltages during no-load conditions and during all pump operating conditions. Record pump motor phase currents during all pump operating conditions. In the event that the tests show the equipment does not

comply with the specifications of the pump manufacturer, this shall be sufficient cause to reject the pump. All tests therein required shall be supervised by the Engineer.

No "start ups" shall be scheduled for Fridays.

6.0 LIFT STATION WARRANTY

The Contractor shall warrant Contractor-supplied lift station components and Contractor's work for twelve (12) months from final completion and written acceptance by the City of Burnsville.

7.0 SUBMERSIBLE LIFT STATION

A. General

This type of lift station will be provided with one, two, or three pumps at the City's discretion. Drawings 1 and 2 are for submersible lift stations.

The minimum wet well and valve manhole size for non-grinder lift stations will be 72" diameter.

The minimum wet well and valve manhole size for grinder lift stations will be 60" diameter.

Permanent standby power may or may not be required at the lift station site. Standby power requirements will be based upon the service area of the lift station and emergency response times as well as the availability of the City's existing portable standby power. Standby power requirements shall be at the sole discretion of the City for each lift station.

A vent pipe shall be provided for each lift station cast integral with the slab.

A concrete slab shall be provided for the lift station control panel and around the lift station. A driveway shall be provided as the site permits. Control panel shall be protected by bollards. Additional landscaping measures may be necessary, final site improvements shall be at the discretion of the City.

Drawings have been provided in Appendix A to detail the general lift station requirements. Drawings 1 and 2 are for a submersible pump lift station. Drawing 3 is for a vertical turbine pump lift station. Drawing 4 provides standard details for both submersible pump and vertical turbine pump lift stations. Drawings5, 6, and 7 indicate the standard control panel layouts.

B. Wet Well and Valve Manhole

1. Materials of Construction: Main structure shall be a reinforced precast concrete manhole and/or cast-in-place reinforced concrete. All wet well hardware and fasteners shall be stainless steel. All piping and bracing inside the wet well structure shall be stainless steel with the exception of the discharge elbows and the ductile iron discharge piping. Process piping smaller than 3-inches in diameter may be schedule 80 PVC pipe.

   Wet well shall be coated with Sauerisen by Central Scientific Company, Quadex products or approved equal, for additional corrosion protection of the structure. Coating thickness and types shall be per manufacturers recommendation.

2. Buoyancy: Unless site specific information regarding soil types and ground water information can be documented, the wet well, wet well base slab, and wet well cover shall be designed to overcome the buoyant forces on the lift station assuming a ground water elevation at the surface, no soil interaction with the structures, and a minimum safety factor of 1.10 based on the dead loads of the concrete structure, excluding all equipment, hatches, piping, etc.

3. Structure Reinforcement: The concrete structure, including base slab and wet well shall be designed and constructed to overcome the pressure associated with minimum and maximum ground water elevations and a structural safety factor which meets current industry standards. The top slab shall be designed at a minimum for AASHO HS25 loads. It is the City's intent to not construct lift stations or valve manholes within roadways.

4. Hatch: A heavy duty aluminum access hatch shall be cast into the top slab of the lift station and valve manhole. The hatch assembly shall include a recessed padlock locking device, flush steel drop handle which does not protrude above the cover, and an automatic hold open arm with vinyl grip on release handle. Hatches will be equipped with a compression spring assist so that cover will require no more than 30 pounds of force to open using lifting handle. Hatches will have a removable "T" handle operated slam lock system with a threaded slam lock plug. A thick coat of bitumastic coal-tar epoxy shall be applied to the exterior of the hatch frame that will be in contact with the concrete. The hatches shall be sized to allow removal of the pumps and valves.

   The hatch or hatches shall provide a clear opening for easy removal of pump or pumps and all equipment, valves and piping to be located in the wet well or valve manhole. The hatch shall include an OSHA approved integral grating covering the opening. A minimum of 2 inches of

clearance will be provided between the sides of the pumps and the hatch and a minimum of 6 inches clearance will be provided between the front of the pump (side of pump away from guide rails) and the hatch, assuming the pumps are brought straight up through the hatch following the guide rails which are set to meet manufacturer's standards. Hatches shall withstand AASHO H20S loads, at a minimum. It is the City's intent to not construct lift stations or valve manholes within roadways. The City of Burnsville will provide a lock for each hasp on the access hatches upon substantial completion of the lift station. No portion of the hasp or lock shall be above the plane of the flush hatch.

Each hatch shall be provided with removable metal safety grating.

5. Wet Well Size and Dimensions: The wet well dimensions and size shall follow the recommendations of the most recent standards of the Hydraulics Institute. The minimum sizes for grinder and non-grinder lift stations are indicated above.

   Wet well sizing shall maintain pump cycling at or below 10 starts per hour.

   The lower portion of the wet well shall be sloped to reduce solids residence times within the station to reduce the potential for odors.

   The high water alarm elevation shall be at least 6 inches below the invert of the deepest influent pipe.

   The low water alarm shall be above the pump manufacturer's minimum operating water level, and above the top of the submersible pump and motor unit.

   Pump and wet well settings, including high water and low water alarms and pump off and on settings, shall be separated by at least 1 foot in elevation.

   Oversize wet well to accommodate increase in flows should flow increases be likely. Avoid odor production using sloped fillets and adjustable pump on/off elevation settings.

   Single pump installations should be avoided for sanitary sewer lift station installations.

   Wet well dimensions shall promote the use of standard pump sizes wherever possible. Consult the City for a list of standard pump sizes.

6. Valve Manhole Size and Dimensions:

Provide a minimum of 9 inches of clear space between the valve manhole structure and flanged or otherwise bolted fittings for ease of construction and repair.

Provide adequate space for maintenance personnel to enter the valve vault to repair or replace piping, valves, etc. The minimum valve manhole size shall be 60" diameter.

See Drawings 1 and 2 for additional requirements.

C. Discharge Piping for Non-Grinder Lift Stations

1. Sizing: Discharge piping velocities shall be above 2.5 feet per second and below 10 feet per second.

Acceptable discharge piping velocities may be lowered based on life cycle costs calculated by the City.

2. Ductile Iron Piping and Fitting Materials: Unless otherwise stated, ductile iron pipe and fittings shall conform to the requirements of ANSI/AWWA C151/A21.51 for 150 pound working pressure with flange or mechanical joints. Flange joints shall conform to ANSI/AWWA C115/A21.15, drilled in accordance with ANSI B16.1 Class 125. The weight, class, or nominal thickness shall be shown on each pipe. All buried ductile iron pipe within 20 feet of lift station and valve manhole structure shall be a minimum of Class 53.

Mechanical joint fittings shall conform to AWWA C110/ANSI A21.10 rated at 250 psi, or AWWA C153/ANSI A21.53 rated at 350 psi. Rubber gaskets shall conform to AWWA C111.

All ductile iron pipe and fittings shall be lined with cement mortar in accordance with ANSI/AWWA C104/A21.4 unless otherwise noted.

3. Special Fittings:

Flanged coupling adapters shall be Dresser Style 227, Smith Blair 912, or equal.

Flexible water tight sleeves shall be according to Mn/DOT Standard Plate 4007C.

4. Valves

a. Rubber Flapper Check Valves: Check valves shall be designed to be non-clog, fully automatic and specifically suited for wastewater application. Check valves shall have flanged ends drilled and faced as specified in ANSI B16.1, Class 125. Flapper shall be constructed of Buna-N. Valve body shall be constructed of cast iron conforming to ASTM A126, Class B or ductile iron conforming to ASTM A536. Valve seat shall be designed to prevent reversal of flow when inlet pressure decreases below delivery pressure. Valve seating surfaces shall be metal-to-synthetic rubber. Valve seat shall be renewable. Valve shall pass a 3-inch diameter solid. Valve shall be provided with a backflush attachment.

When there is no flow through the line, the gate shall hang lightly against the seat. The maximum permissible leakage shall be 1 fl. oz. per hour per inch of nominal valve size.

Rubber flapper check valves shall be APCO Rubber Flapper Check Valve, Valmatic Swingflex, or approved equal.

b. Gate Valves: Gate valves shall be resilient seated gate valves conforming to AWWA C515. Allowances shall be made for material thickness associated with ductile iron valves.

c. Rubber Check Valves: Rubber backwater valve shall be Red Valve Series 35 check valve or equal.

D. Discharge Piping for Grinder Lift Stations

1. Sizing: Discharge piping velocities shall be above 2.5 feet per second and below 10 feet per second.

Acceptable discharge piping velocities may be lowered based on life cycle costs calculated by the City.

Piping that is 3 inches in diameter or larger shall be ductile iron pipe. Gate valves shall be used for shut off, and rubber flapper check valves shall be used for directional flow control on piping systems that are 3 inches in diameter and greater.

Piping less than 3 inches in diameter may be ductile iron, schedule 80 PVC pipe, or schedule 40 stainless steel pipe.

2. Ductile Iron Piping and Fitting Materials: Unless otherwise stated, ductile iron pipe and fittings shall conform to the requirements of ANSI/AWWA C151/A21.51 for 150 pound working pressure with flange or mechanical joints. Flange joints shall conform to ANSI/AWWA C115/A21.15, drilled

in accordance with ANSI B16.1 Class 125. The weight, class, or nominal thickness shall be shown on each pipe. All buried ductile iron pipe within 20 feet of lift station and valve manhole structure shall be a minimum of Class 53.

Mechanical joint fittings shall conform to AWWA C110/ANSI A21.10 rated at 250 psi, or AWWA C153/ANSI A21.53 rated at 350 psi. Rubber gaskets shall conform to AWWA C111.

All ductile iron pipe and fittings shall be lined with cement mortar in accordance with ANSI/AWWA C104/A21.4 unless otherwise noted.

3. PVC Piping and Fitting Materials: Piping and fittings shall be manufactured from a PVC compound which meets the requirements of Type I, Grade 1 PVC in accordance with ASTM D1784. Pipe, fittings, and valves shall be Schedule 80. Fittings shall conform to the requirements of ASTM D2467 for socket type, and ASTM D2464 for threaded type. All socket type connections shall be joined with PVC solvent cement conforming to ASTM D2564. Pipe, fittings, and valves shall be installed in compliance with manufacturer's recommendations.

4. Stainless Steel Piping and Fitting Materials: Stainless steel piping shall be Schedule 40, threaded. Fittings shall be Class 150, threaded.

5. Valves

   a. Rubber Flapper Check Valves: Check valves shall be designed to be non-clog, fully automatic and specifically suited for wastewater application. Check valves shall have flanged ends drilled and faced as specified in ANSI B16.1, Class 125. Flapper shall be constructed of Buna-N. Valve body shall be constructed of cast iron conforming to ASTM A126, Class B or ductile iron conforming to ASTM A536. Valve seat shall be designed to prevent reversal of flow when inlet pressure decreases below delivery pressure. Valve seating surfaces shall be metal-to-synthetic rubber. Valve seat shall be renewable. Valve shall pass a 3-inch diameter solid. Valve shall be provided with a backflush attachment.

      When there is no flow through the line, the gate shall hang lightly against the seat. The maximum permissible leakage shall be 1 fl. oz. per hour per inch of nominal valve size.

Rubber flapper check valves shall be APCO Rubber Flapper Check Valve, Valmatic Swingflex, or approved equal.

b. Gate Valves: Gate valves shall be resilient seated gate valves conforming to AWWA C515. Allowances shall be made for material thickness associated with ductile iron valves.

c. Swing Check Valves: Directional flow control valves (less than 3-inches in diameter) may be stainless steel Class 200 swing disc type. Valve shall have integral seat and screwed cap with union type fittings.

d. Metal Ball Valves: Shut off valves (less than 3 inches in diameter) may be metal ball valves. The valves shall be three piece construction allowing for maintenance without removing the valve from the pipeline. Valve body and pipe ends shall be brass or stainless steel. Pipe ends shall be NPT screwed and bolted through valve body. Valve ball and stem shall be Type 316 stainless steel. Seats shall be TFE glass reinforced. Seals shall be Buna-N or PTFE.

e. PVC Ball Valves: Shut off valves (less than 3 inches in diameter) may be PVC. PVC ball valves shall be true union type. Valves shall be provided with PTFE ball seats, double Viton or E.T. stem seals, and blow-out proof stem.

E. Pumps and Lift Station Appurtenances

1. Pump Type: Install ABS submersible, non-clog sewage pumps and discharge elbows capable of passing a three-inch diameter solid sphere.

   If properly sized pumps and piping cannot pass a three-inch diameter solid sphere, install ABS submersible grinder pumps and discharge elbows.

2. Non-Grinder Pump Warranty: The pump manufacturer shall warrant the total non-grinder submersible pumping package for twelve (12) months from the date of written acceptance by the City of Burnsville. This total pumping package warranty will be a 100% not pro-rated warranty. The total pumping package includes all pump components, including bearings, power cables, etc. The major wear parts such as mechanical seals, impeller, pump housing, wear rings, and ball bearings, are pro-rated on a linear basis over a full five (5) years following the time period stipulated previously in this paragraph.

3. Grinder Pump Warranty: The pump manufacturer shall warrant the total grinder submersible pumping package for twelve (12) months from the date of written acceptance by the City of Burnsville. This total pumping package warranty will be a 100% not pro-rated warranty. The total

pumping package includes all pump components, including bearings, power cables, etc.

4. Pumps and Motors: Pumps shall be centrifugal, non-clog, solids handling, submersible explosion proof wastewater type pumps capable of handling raw unscreened wastewater. The entire pumping unit shall be explosion proof. The pump casing shall have a centerline discharge equipped with an automatic pipe coupling arrangement for ease of installation and piping alignment. The pumps shall automatically connect to the discharge piping when lowered into position. Sealing of the pump to the discharge piping (discharge elbow) shall incorporate a watertight metal-to-metal contact between machined surfaces. The machined surfaces of the pumps shall be compatible with a Flygt type base elbow. The pumps shall be equipped with stainless steel chains long enough and strong enough to raise the pump for removal and inspection. The pumps shall be easily removable by one operator with a portable hoist for inspection or service, requiring no bolts, nuts, or other fasteners to be removed for this purpose, and no need for personnel to enter the wet well. No portion of the pump shall bear directly on the sump floor. The base elbow which shall be attached to the floor of the wet well shall be designed to accept both ABS and Flygt pumps without additional tooling.

   The pump volute, motor, and seal housing shall be high quality grey cast iron, ASTM A-48, Class 35B. All external mating surfaces shall be machined and Buna N Rubber o-ring sealed. All fasteners exposed to the water shall be 304 stainless steel.

   The pump impellers shall be double shrouded (non-grinder pumps) or single shrouded (grinder pumps) non-clog type. The impeller shall be dynamically balanced. The impeller shall be A 48 Class 35 B Cast Iron.

   A wear ring system shall be installed to provide efficient sealing between the volute and impeller. Replaceable metal wear rings shall have a Brinell Hardness of 200 or more.

   The pump shafts shall be AISI Type 431 stainless steel. Pump shaft and motor shaft shall be the same unit. Couplings will not be allowed.

   The pump bearings shall have a B10 bearing life of a minimum of 50,000 hours.

   The pump shall be provided with an oil chamber for the shaft sealing system. The drain and inspection plug, with positive anti-leak seal, shall be easily accessible from the outside.

The pump shall have an electrode probe mounted in the seal chamber. The probe shall be connected via submersible cable to the motor control center to alarm a seal failure when liquid is sensed, including a light in the control panel to notify the operator of a problem.

The pump shall have two mechanical seals mounted in tandem. Each seal shall be held in contact with its own spring. The upper tandem set of seals shall operate in an oil chamber located just below the stator housing. This set shall contain tungsten-carbide rings (for non-grinder pumps) or carbon-ceramic rings (for grinder pumps). This set of seals shall function as an independent secondary barrier between the pumped liquid and the stator housing. The lower of the tandem set of seals shall function as the primary barrier between the pumped liquid and the stator housing. This set of seals shall contain one stationary and one positively driven rotating, corrosion resistant tungsten-carbide ring (for both non-grinder pumps and grinder pumps).

The motor stator, rotor and bearings shall be mounted in a sealed submersible housing. The stator windings shall have Class H or better insulation. Motors shall be equipped with thermal overload protection capable of resetting automatically after cool-down. The motors shall also be equipped with a seal leak detection and warning system that will be connected to the motor control center to alarm a seal failure when liquid is sensed, including a light in the control panel to notify the operator of a problem.

The pump and motor shall be designed so that they may operate partially or totally submerged in the water. The pump and motor shall be rated for continuous duty.

Motors shall be sized so they are not loaded above full-load rating at any point on the impeller operating curve. Operation in the motor “service factor” range is not acceptable.

Minimum motor efficiency shall be designated by the City.

Motors shall be suitable for City-determined voltages, phases and hertz of operating power at a City-specified maximum rpm.

Protect all pumping equipment metal surfaces in contact with pumpage, other than stainless steel or brass, with a factory-applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish.

The power cable shall be sized according to NEC and ICEA standards and shall be of sufficient length to reach the control panel without any need for

splices. The use of junction boxes will require special consideration and written authorization from the City of Burnsville. The outer jacket of the cable shall be oil resistant chloroprene rubber. The motor and cable shall be capable of continuous submergence underwater without the loss of watertight integrity to a depth of 65 feet.

5. Guide Rails: Lift stations shall be equipped with dual stainless steel guide rails to guide the pump into proper alignment with the discharge elbow. The guide rails shall extend from the discharge elbow to the upper guide holder on the access door.

   Guide rails shall be of full length single piece construction between supports. Field welded guide rails shall not be acceptable.

   Guide rail supports shall be stainless steel.

   The guide rail diameter and guide rail bracing spacing shall be as recommended by the pump manufacturer. Intermediate guide rail braces shall be stainless steel. Intermediate guide rail braces shall not be more than 8 feet apart.

6. Cable Holders: Four (4) stainless steel "J" hooks shall be provided for holding pump and control cables. "J" hooks shall be fastened at hatch opening, confirm mounting locations with City during construction.

7. Pump Lifting Chains: Provide one (1) 316 stainless steel lifting chain for each pump. Lifting chain shall be strong enough and long enough to raise pump for removal and inspection.

8. Anchor Bolts: All bolts, washers, and nuts shall be AISI Type 304 stainless steel. Anchor bolts shall be adhesive anchor bolts.

F. Pump Control

1. Level control shall be accomplished using a submersible pressure/level transducer and programmable logic controller (PLC) for pump control and alternation. In addition, float switches with relay logic shall be provided as a backup system to the submersible transducer and PLC. The float switch backup circuitry shall be independent of the primary level control circuitry for redundancy. Provide two float switches with the following functions:

   - High Level Alarm / Start Pumps
   - Low Level Alarm / Stop Pumps

2. Float switches shall be non-mercury type. Provide intrinsically-safe barrier relays on each float switch circuit.

G. Motor Starters / Variable Frequency Drives

1. Starters shall be NEMA-style, NEMA-rated for the application. Starters shall have replaceable contacts and solid-state type adjustable overloads that provide NEMA Class 10 protection for submersible pump motors.

2. Approved starter manufacturers:

- Allen-Bradley Bulletin 509
- Square D Company Class 8536

3. Where phase conversion equipment is needed to convert single-phase utility power to three-phase power for pump motors, provide variable frequency drives (VFDs) that are rated for single-phase input voltage by the drive manufacturer. When VFDs are used, the control panel shall be oversized to dissipate heat from the VFDs, and the panel shall be located in an area that is not exposed to direct sunlight.

4. Approved VFD manufacturers:

- Allen-Bradley "Power Flex"
- Cutler-Hammer/Westinghouse "SVX9000"

H. Permanent Standby Power - (When required)

1. Engine-generator set shall be either a diesel-powered unit with four-cycle industrial diesel engine, double-wall base fuel tank or a natural gas unit. It shall include weatherproof housing, silencer, battery, battery charger, alternator, control panel, silencer, and related equipment. The City will determine which type of unit to use prior to electrical design.

2. Size the engine-generator set for continuous duty at peak flow conditions. Provide fuel storage for 24 hours, minimum operation at continuous peak station flow. Engine generator shall be sized to allow starting and operating both pumps at a duplex lift station and all three pumps at a triplex lift station.

3. Locate the unit on the project site, and provide adequate sound abatement so that the installation complies with Minnesota Pollution Control Agency (MPCA) noise rules.

4. Provide automatic transfer switch in the pump control panel, so that the unit will automatically start and transfer upon loss of utility power, or upon abnormal supply voltage conditions. Acceptable manufacturers:

   - Automatic Switch Company (ASCO)
   - General Electric / Zenith

5. Provide generator with an "Emergency Stop" push button located inside the lockable housing. Do not provide a shutdown switch on the outside of the housing.

6. Acceptable permanent standby power generator manufacturers:

   - Caterpillar
   - Cummins/Onan

I. Portable Standby Power - (When required)

1. Provide Crouse-Hinds connector to match available connectors on the City's existing portable generator sets. Select connector ampacity to match the station service entrance amperage rating.

2. For stations where an existing connector exists, salvage and install the existing connector on the new pump control panel if the connector is of the required type.

3. Provide main and standby circuit breakers with circuit breaker manufacturer's "walking-beam interlock" to allow only one breaker to be closed at a time. A manual transfer switch located inside the pump control panel may also be used.

J. Control Panel

1. Control panel enclosure shall be NEMA Type 3R, constructed of Type 304 or Type 316 stainless steel of not less than 12 gauge thickness. The enclosure shall be low-profile, two-door design, with stainless steel hinges, stainless steel three-point latch, and stainless steel vault handle with padlock provisions. Control panel enclosure shall be free-standing type with stainless steel supporting legs and skirting secured with stainless steel tamperproof hardware.

2. Size the enclosure to accept all electrical equipment without overcrowding, and in accordance with UL 508 and UL698A requirements. The minimum panel size shall be 60" wide by 48" high with a 12"skirted area below the panel. The overall panel height, including mounting legs, shall not exceed 60 inches.

3. The completed panel shall bear UL labels in accordance with Minnesota Board of Electricity requirements, UL 508 and applicable portions of UL698A and UL913.

4. Provide front-panel components as required by equipment, and as indicated on Drawing 5 located in Appendix A. The attached Drawing 5 shows the general control panel layout requirements.

5. All control devices including, but not limited to, selector switches, pushbutton switches, and indicating lights, shall be of the heavy duty, oil tight type. The contacts shall meet NEMA rating designation A600.

6. Drawing 6 and 7 show a typical two-pump control panel with stationary generator set. These schematics shall be used as a basis for the project design. Modify the schematics as required by specific requirements at each site, including service voltage, number of phases, stationary vs. portable generator set, size and quantity of pumps, pump protective circuitry, and method of SCADA communication. Control panel manufacturers shall be Control System Integrator Association (CSIA) Certified.

K. SCADA Communication

1. Communication with the City's existing supervisory control and data acquisition (SCADA) system shall be accomplished using the control panel PLC. The PLC shall communicate with the existing SCADA network using Ethernet protocol. Where fiber optic service does not exist, The City will determine whether to install a fiber optic service to the site or to use radio communication. If radio communication is selected, the project shall include the installation of a radio, antenna cable in conduit, antenna with pole and foundation, all in accordance with City requirements.

L. Spare Parts

1. A spare parts package shall be provided for each lift station. The spare parts package shall contain the following items:

   a. One set of each, upper and lower seals.

   b. Spare fuses and lamps, consisting of a minimum of 10% spare each type used, or quantity six (6) of each type used, whichever is greater.

8. VERTICAL TURBINE LIFT STATION

A. General

This type of lift station will be provided with one, two, or three pumps at the City's discretion. Drawing 3 depicts a standard vertical turbine lift station.

The structure housing the pump and control panel shall be an above grade structure. The above grade structure shall be of masonry construction. The City of Burnsville will provide site specific aesthetic requirements so that the building blends in with the surrounding structures and environment. These requirements may include surface treatments such as brick or stone, or may require a pitched roof in lieu of the flat roof shown on the drawings.

Permanent standby power may or may not be required at the lift station site. Standby power requirements will be based upon the service area of the lift station and emergency response times as well as the availability of the City's existing portable standby power. Standby power requirements shall be at the sole discretion of the City for each lift station.

The lift station control panel shall be housed in the vertical turbine lift station building. A driveway shall be provided as the site permits. Additional landscaping measures may be necessary, final site improvements shall be at the discretion of the City.

Drawings have been provided in Appendix A to detail the general lift station requirements. Drawings 1 and 2 depict a submersible pump lift station. Drawing 3 is for a vertical turbine pump lift station. Drawing 4 provides standard details for both submersible pump and vertical turbine pump lift stations. Drawings 5, 6, and 7 indicate the standard control panel layouts.

B. Wet Well

1. Materials of Construction: Main structure shall be a reinforced precast concrete manhole and/or cast-in-place reinforced concrete. All wet well hardware and fasteners shall be stainless steel.

2. Buoyancy: Without justification using site specific soils and ground water information, the wet well, and wet well base slab, shall be designed to overcome the buoyant forces on the lift station assuming a ground water elevation at the surface, no liquid in the wet well, no soil interaction with the structures, and a minimum safety factor of 1.10 based on the dead loads of the wet well concrete structure, excluding all equipment, hatches, piping, etc.

3. Structure Reinforcement: The concrete structure, including base slab and wet well shall be designed and constructed to overcome the pressure associated with minimum and maximum ground water elevations and a structural safety factor which meets current industry standards. The top slab shall be designed at a minimum for AASHO HS25 loads, additional capacity will be required if a facility is large enough to experience vehicle loads. The top slab shall also be designed to accommodate masonry building loads above including safety factors in line with appropriate industry standards.

4. Hatch: A heavy duty aluminum access hatch shall be cast into the top slab of the lift station. The hatch assembly shall include a recessed padlock locking device, flush steel drop handle which does not protrude above the cover and an automatic hold open arm with vinyl grip on release handle. Hatches will be equipped with a compression spring assist so that cover will require no more than 30 pounds of force to open using lifting handle. Hatches will have a removable "T" handle operated slam lock system with a threaded slam lock plug. A thick coat of bitumastic coal-tar epoxy shall be applied to the exterior of the hatch frame that will be in contact with the concrete. The hatches shall be as shown on the attached drawings.

   Hatches shall withstand AASHO H20 loads at a minimum. Additional capacity will be required if a facility is large enough to experience interior vehicle loads. The City of Burnsville will provide a lock for each hasp on the access hatches upon substantial completion of the lift station. No part of hatch or lock shall protrude above the flush hatch installation.

   The hatch shall include an OSHA approved integral grating covering the opening.

5. Wet Well Size and Dimensions: The wet well dimensions and size shall follow the recommendations of the most recent standards of the Hydraulics Institute. The minimum sizes for grinder and non-grinder lift stations are indicated above.

   Wet well sizing shall maintain pump cycling at or below 10 starts per hour.

   The high water alarm elevation shall be at least 6 inches below the invert of the deepest influent pipe.

   The low water alarm shall be above the pump manufacturer's minimum operating water level.

Pump and wet well settings, including high water and low water alarms and pump off and on settings, shall be separated by at least 1 foot in elevation.

Oversize wet well to accommodate increase in flows should flow increases be likely. Avoid odor production using sloped fillets and adjustable pump on/off elevation settings.

C. Discharge Piping for Vertical Turbine Lift Stations

1. Sizing: Discharge piping velocities shall be above 2.5 feet per second and below 10 feet per second.

2. Ductile Iron Piping and Fitting Materials: Unless otherwise stated, ductile iron pipe and fittings shall conform to the requirements of ANSI/AWWA C151/A21.51 for 150 pound working pressure with flange or mechanical joints. Flange joints shall conform to ANSI/AWWA C115/A21.15, drilled in accordance with ANSI B16.1 Class 125. The weight, class, or nominal thickness shall be shown on each pipe. All buried ductile iron pipe within 20 feet of lift station and valve manhole structure shall be a minimum of Class 53.

   Mechanical joint fittings shall conform to AWWA C110/ANSI A21.10 rated at 250 psi, or AWWA C153/ANSI A21.53 rated at 350 psi. Rubber gaskets shall conform to AWWA C111.

   All ductile iron pipe and fittings shall be lined with cement mortar in accordance with ANSI/AWWA C104/A21.4 unless otherwise noted.

3. Special Fittings: Flanged coupling adapters shall be Dresser Style 227, Smith Blair 912, or equal.

4. Check Valves:

   Based on hydraulics specific to each lift station, it may be advantageous to have a more controllable check valve associated with the installation. The simplest check valve that provides relatively trouble free operation shall be provided.

   Rubber Flapper Check Valves: Check valves shall be designed to be non-clog, fully automatic and specifically suited for wastewater application. Check valves shall have flanged ends drilled and faced as specified in ANSI B16.1, Class 125. Flapper shall be constructed of Buna-N. Valve body shall be constructed of cast iron conforming to ASTM A126, Class B or ductile iron conforming to ASTM A536. Valve seat shall be designed to

prevent reversal of flow when inlet pressure decreases below delivery pressure. Valve seating surfaces shall be metal-to-synthetic rubber. Valve seat shall be renewable. Valve shall pass a 3-inch diameter solid. Valve shall be provided with a backflush attachment.

When there is no flow through the line, the gate shall hang lightly against the seat. The maximum permissible leakage shall be 1 fl. oz. per hour per inch of nominal valve size.

Rubber flapper check valves shall be APCO Rubber Flapper Check Valve, Valmatic Swingflex, or approved equal.

Air Cushioned Swing Check Valves:
Swing check valves four (4) inches and larger shall be of the outside lever and weight type and meet the material requirements of AWWA C508. Check valves shall have a 316 stainless steel hinge pin. The hinge pin shall operate in bronze or babitte support bearings conforming to ASTM B16. The seat ring shall be bronze conforming to ASTM B62. Lever arms and disc shall be keyed to the shaft.

When there is no flow through the line, the gate shall hang lightly against the seat. The maximum permissible leakage shall be 1 fl. oz. per hour per inch of nominal valve size.

Air Cushioned Swing Check Valves shall be as manufactured by Clow Valve, Golden Anderson, or approved equal.

5. Gate Valves: Gate valves shall be resilient seated gate valves conforming to AWWA C515. Allowances shall be made for material thickness associated with ductile iron valves.

6. Air Release Valves: Air release valves shall be air and vacuum air release valves. Main valve body shall be cast ductile iron. Valve size shall be specific to the pumping conditions encountered. Air Release Valves shall be as manufactured by APCO, or approved equal.

   Air release valve discharge shall be routed to wet well drain using 2-inch diameter schedule 80 PVC pipe. Extend pipe to 6 inches above drain.

D. Pumps and Lift Station Appurtenances

1. Pump Type: Install Layne & Bowler, or Johnston Pump Company vertical turbine mixed flow pumps and discharge elbows capable of passing a three-inch diameter solid sphere.

2. Vertical Turbine Pump Warranty: The pump manufacturer shall warrant the total pumping package for eighteen (18) months from the date of shipment, or for twelve (12) months from the date of written acceptance by the City of Burnsville, based on whichever date is later. This total pumping package warranty will be a 100% not pro-rated warranty. The total pumping package includes all pump components, including bearings, power cables, etc. The major wear parts such as mechanical seals, impeller, pump housing, wear rings, and ball bearings, are pro-rated on a linear basis over a full five (5) years following the time period stipulated previously in this paragraph.

3. Pumps and Motors: Pumps shall be vertical mixed flow pumps capable of handling raw surface water. The pumps will be product lubricated and will not be provided with a lineshaft enclosing tube.

   The pumps shall be removable with a truck mounted hoist for inspection or service, through a roof hatch. There will be no need for personnel to enter the wet well to remove the pump from the wet well and building. No portion of the pump shall bear directly on the wet well floor.

   The mixed flow pump shall be driven by an electric motor. Drives shall be designed to carry the weight of all rotating parts and thrust loads at all operating conditions. Should a hollow shaft be used, a steady bushing shall be required for bearing support.

   The headshaft shall be provided with either and adjusting nut or an adjustable flanged coupling for impellor adjustment to maximize efficiency. Headshaft material shall be 416 stainless steel.

   The seal between the driver and the pump shall utilize an external mechanical seal.

   The discharge elbow shall be an above base discharge with full diameter elbows designed for a smooth transition of fluid from the vertical to horizontal. The discharge elbow shall be flanged. Flange shall be drilled and faced per ANSI B16.1, Class 125.

   The column assembly shall be flanged. The pump column shall support the bowl and provide a means of conducting the pumped liquid up to the surface and out through the head. The column shall be product lubricated.

Fabricated bearing retainers shall be used to support column and shaft alignment. Bearing retainers shall be either steel or bronze depending on the column size. Lineshaft bearings shall be stainless steel.

The pump shaft shall be 416 stainless steel and sized to operate without objectionable distortion or vibration in both the forward and reverse direction of rotation. Horsepower rating, straightness and machining tolerances shall conform with ANSI Spec. B58.1 and AWWA Specification E101 Standards.

Pump bowls shall be of flanged construction. Bowl bearings shall be stainless steel. A replaceable, cylindrical bowl line mounted in the discharge bowl shall be provided to increase bowl life.

Impellors shall be heavy duty cast aluminum bronze of semi-open construction balanced to assure vibration free operation and hand-finished for maximum performance. The mixed flow impellor shall be secured to the shaft by a simple key and split thrust ring and retainer to assure positive drive and adequate locking.

The suction bell shall be flared with reinforcing ribs. The suction bell will be fitted with a strainer to restrict entry of a foreign object during pump operation.

The pump bearings shall have a B10 bearing life of a minimum of 50,000 hours.

The pump and motor shall be rated for continuous duty.

Motors shall be sized so they are not loaded above full-load rating at any point on the impeller operating curve. Operation in the motor "service factor" range is not acceptable.

Minimum motor efficiency shall be designated by the City.

Motors shall be suitable for City-determined voltages, phases and hertz of operating power at a City-specified maximum rpm.

Protect all pumping equipment metal surfaces in contact with pumpage, other than stainless steel or brass, with a factory-applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish.

4. Anchor Bolts: All bolts, washers, and nuts shall be AISI Type 304 stainless steel. Main pump anchor bolts shall be cast in place using a pump manufacturer supplied template.

E. Pump Control

1. Level control shall be accomplished using a submersible pressure/level transducer and programmable logic controller (PLC) for pump control and alternation. In addition, float switches with relay logic shall be provided as a backup system to the submersible transducer and PLC. The float switch backup circuitry shall be independent of the primary level control circuitry for redundancy. Provide two float switches with the following functions:

    - High Level Alarm / Start Pumps
    - Low Level Alarm / Stop Pumps

2. Float switches shall be non-mercury type. Provide intrinsically-safe barrier relays on each float switch circuit.

F. Motor Starters / Variable Frequency Drives

1. Starters shall be NEMA-style, NEMA-rated for the application. Starters shall have replaceable contacts and solid-state type adjustable overloads that provide NEMA Class 10 protection for submersible pump motors.

2. Approved starter manufacturers:

    - Allen-Bradley Bulletin 509
    - Square D Company Class 8536

3. Where phase conversion equipment is needed to convert single-phase utility power to three-phase power for pump motors, provide variable frequency drives (VFDs) that are rated for single-phase input voltage by the drive manufacturer. When VFDs are used, the control panel shall be oversized to dissipate heat from the VFDs, and the panel shall be located in an area that is not exposed to direct sunlight.

4. Approved VFD manufacturers:

    - Allen-Bradley “Power Flex”
    - Cutler-Hammer/Westinghouse “SVX9000”

G. Permanent Standby Power - (When required)

1. Engine-generator set shall be either a diesel-powered unit with four-cycle industrial diesel engine, double-wall base fuel tank or a natural gas unit. It shall include weatherproof housing, silencer, battery, battery charger,

alternator, control panel, silencer, and related equipment. The City will determine which type of unit to use prior to electrical design.

2. Size the engine-generator set for continuous duty at peak flow conditions. Provide fuel storage for 24 hours, minimum operation at continuous peak station flow. Engine generator shall be sized to allow starting and operating both pumps at a duplex lift station and all three pumps at a triplex lift station.

3. Locate the unit on the project site, and provide adequate sound abatement so that the installation complies with Minnesota Pollution Control Agency (MPCA) noise rules.

4. Provide automatic transfer switch in the pump control panel, so that the unit will automatically start and transfer upon loss of utility power, or upon abnormal supply voltage conditions. Acceptable manufacturers:

   - Automatic Switch Company (ASCO)
   - General Electric / Zenith

5. Provide generator with an "Emergency Stop" push button located inside the lockable housing. Do not provide a shutdown switch on the outside of the housing.

6. Acceptable permanent standby power generator manufacturers:

   - Caterpillar
   - Cummins/Onan

H. Portable Standby Power - (When required)

1. Provide Crouse-Hinds connector to match available connectors on the City's existing portable generator sets. Select connector ampacity to match the station service entrance amperage rating.

2. For stations where an existing connector exists, provide a new connector on the new pump control panel.

3. Provide main and standby circuit breakers with circuit breaker manufacturer's "walking-beam interlock" to allow only one breaker to be closed at a time. A manual transfer switch located inside the pump control panel may also be used.

I. Control Panel

1. Control panel enclosure shall be NEMA Type 3R, constructed of Type 304 or Type 316 stainless steel of not less than 12 gauge thickness. The enclosure shall be low-profile, two-door design, with stainless steel hinges, stainless steel three-point latch, and stainless steel vault handle with padlock provisions. Control panel enclosure shall be free-standing type with stainless steel supporting legs and skirting secured with stainless steel tamperproof hardware.

2. Size the enclosure to accept all electrical equipment without overcrowding, and in accordance with UL 508 and UL698A requirements. The minimum panel size shall be 60" wide by 48" high with a 12" skirted area below the panel. The overall panel height, including mounting legs, shall not exceed 60 inches.

3. The completed panel shall bear UL labels in accordance with Minnesota Board of Electricity requirements, UL 508 and applicable portions of UL698A and UL913.

4. Provide front-panel components as required by equipment, and as indicated on Drawing5 located in Appendix A. The attached Drawing 5 shows the general control panel layout requirements.

5. All control devices including, but not limited to, selector switches, pushbutton switches, and indicating lights, shall be of the heavy duty, oil tight type. The contacts shall meet NEMA rating designation A600.

6. Drawings 7 and 8 show a typical two-pump control panel with stationary generator set. These schematics shall be used as a basis for the project design. Modify the schematics as required by specific requirements at each site, including service voltage, number of phases, stationary vs. portable generator set, size and quantity of pumps, pump protective circuitry, and method of SCADA communication. Control panel manufacturers shall be Control System Integrator Association (CSIA) Certified.

J. SCADA Communication

1. Communication with the City's existing supervisory control and data acquisition (SCADA) system shall be accomplished using the control panel PLC. The PLC shall communicate with the existing SCADA network using Ethernet protocol. Where fiber optic service does not exist, The City will determine whether to install a fiber optic service to the site or to use radio communication. If radio communication is selected, the

project shall include the installation of a radio, antenna cable in conduit, antenna with pole and foundation, all in accordance with City requirements.

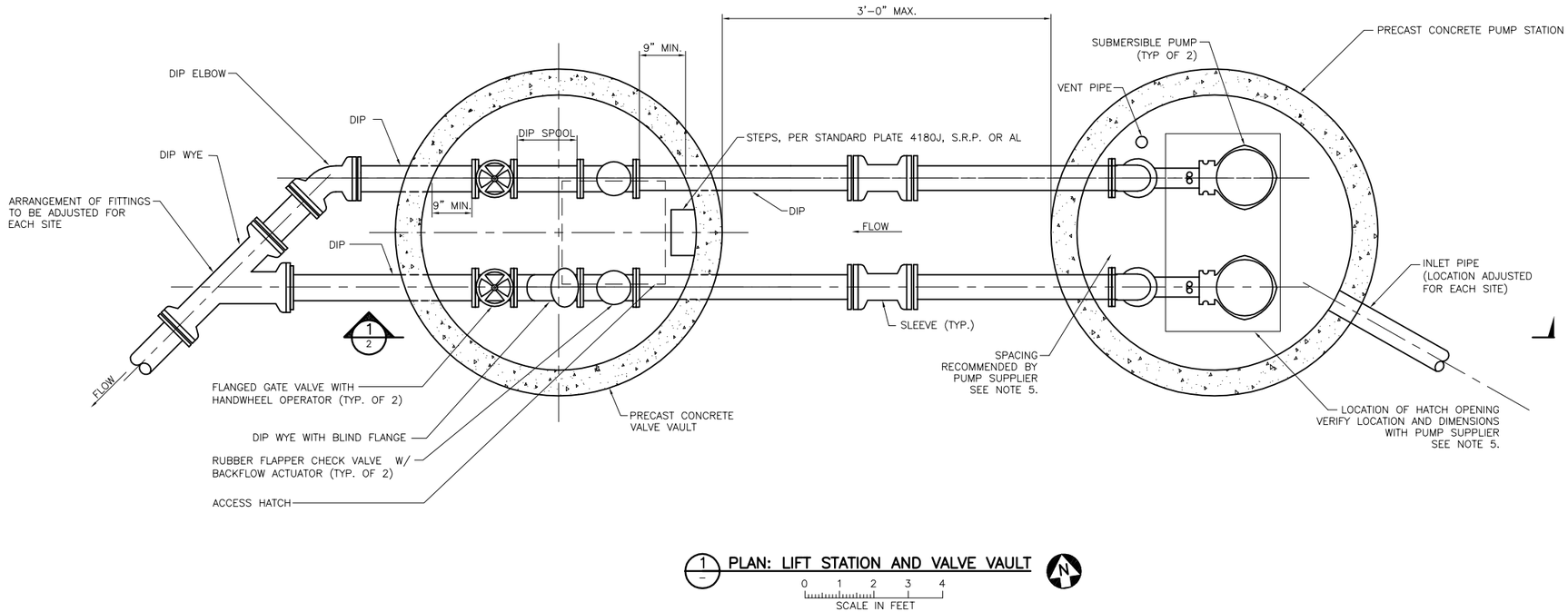
K. Spare Parts

1. A spare parts package shall be provided for each lift station. The spare parts package shall contain the following items:

a. One set of each, upper and lower seals.

b. Spare fuses and lamps, consisting of a minimum of 10% spare each type used, or quantity six (6) of each type used, whichever is greater.

APPENDIX A – DRAWINGS



1/2 PLAN: LIFT STATION AND VALVE VAULT

0 1 2 3 4
SCALE IN FEET

NOTES:

1. USE S.S. BOLTS FOR ALL FLANGED JOINTS IN VALVE VAULT.
2. VALVE VAULT STRUCTURE SHOWN IS STANDARD PRECAST DESIGN.
3. ALL BURIED DIP TO BE RESTRAINED (MECHANICAL) JOINT.
4. DIP IN LIFT STATION AND VALVE VAULT TO BE FLANGED.
5. VERIFY ALL DIMENSIONS WITH PUMP SUPPLIER.
6. INSTALL VENT TO ALLOW ACCESS HATCH TO OPEN TO LOCKED POSITION.
7. ALL BRACKETS FOR GUIDE RAILS AND LEVEL SENSING MOUNTING HARDWARE SHALL BE STAINLESS STEEL.
8. INCLUDE OSHA APPROVED METAL SAFETY GRATING WITH LIFT STATION HATCH.
9. CONTRACTOR MAY USE COMPACT FITTINGS AS REQUIRED TO ACHIEVE REQUIRED PUMP SPACING.
10. SET LOW WATER BACK-UP FLOAT 6-INCHES BELOW "PUMP OFF" LEVEL AND HIGH WATER BACK-UP FLOAT 3-INCHES ABOVE "HIGH WATER ALARM".
11. INSTALL PRESSURE TRANSDUCER LEVEL SENSOR ON SIDE OF LIFT STATION OPPOSITE INLET PIPE FROM EXISTING WET WELL. CONTRACTOR TO INSTALL TRANSDUCER AND BACK-UP FLOATS IN EXISTING SUCTION PIPE TROUGH. GROUT AREA TO DRAIN.
12. APPLY SAUERISEN BY CENTRAL SCIENTIFIC COMPANY OR QUADEX COATING TO INTERIOR LIFT STATION WALLS PER SPECIFICATIONS.

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
					CLIENT
					BID
					CONSTRUCTION
					RELEASED TO/FOR
					DATE RELEASED: A B C 0 1 2 3

BARR
Corporate Headquarters:
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Project Office:
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Scale	AS SHOWN
Date	06/15/10
Drawn	BARR
Checked	JMA
Designed	BARR
Approved	JMM3

CITY OF BURNSVILLE
BURNSVILLE, MINNESOTA

BURNSVILLE LIFT STATION
STANDARDIZATION

SUBMERSIBLE LIFT STATION
PLAN

BARR PROJECT No. 23/19-1052.00
CLIENT PROJECT No.
DWG. No. 1
REV. No. 0

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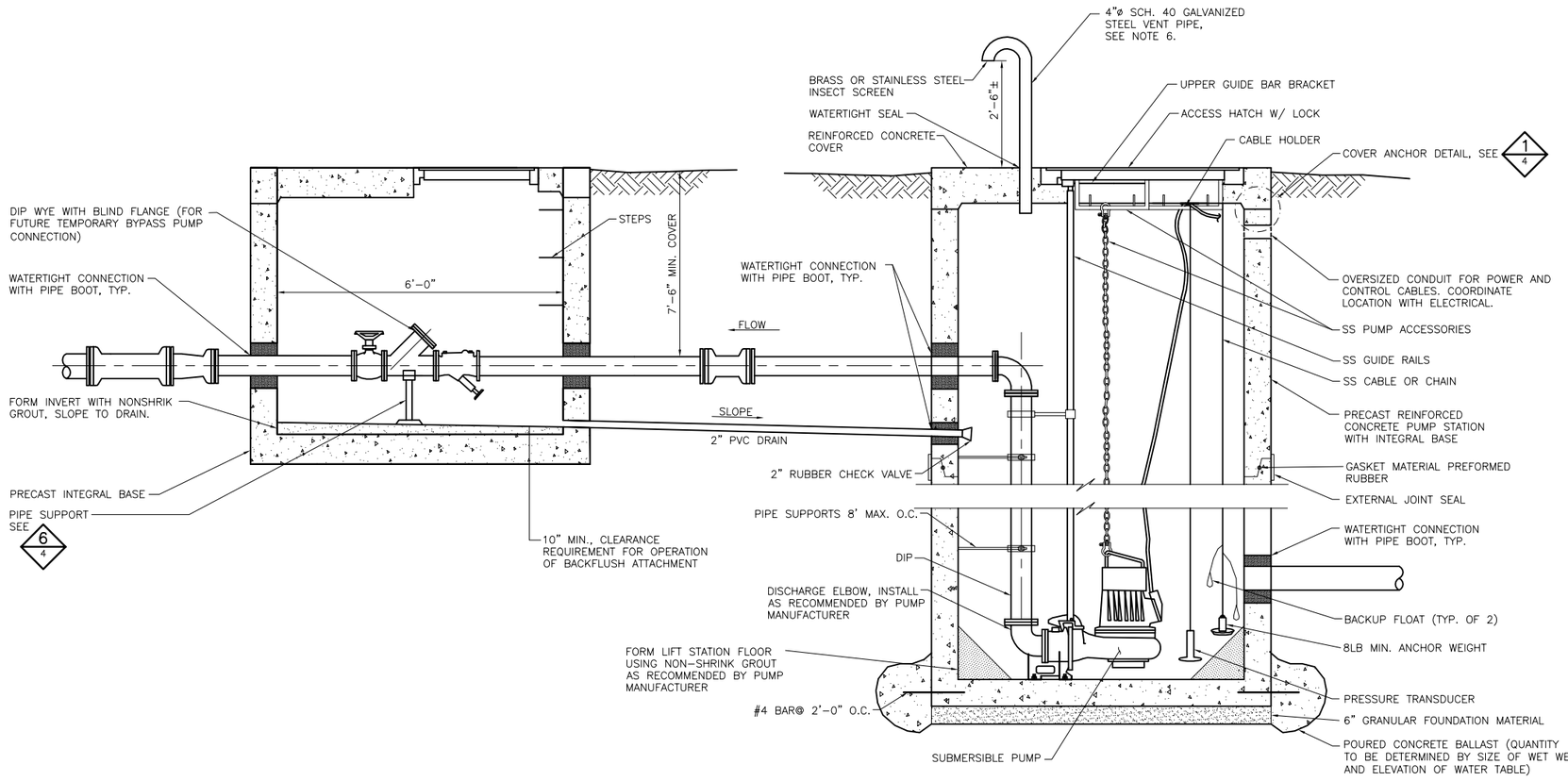

2/- SECTION: LIFT STATION AND VALVE VAULT

0 1 2 3 4
SCALE IN FEET

NOTES:

1. USE S.S. BOLTS FOR ALL FLANGED JOINTS IN VALVE VAULT.
2. VALVE VAULT STRUCTURE SHOWN IS STANDARD PRECAST DESIGN.
3. ALL BURIED DIP TO BE RESTRAINED (MECHANICAL) JOINT.
4. DIP IN LIFT STATION AND VALVE VAULT TO BE FLANGED.
5. VERIFY ALL DIMENSIONS WITH PUMP SUPPLIER.
6. INSTALL VENT TO ALLOW ACCESS HATCH TO OPEN TO LOCKED POSITION.
7. ALL BRACKETS FOR GUIDE RAILS AND LEVEL SENSING MOUNTING HARDWARE SHALL BE STAINLESS STEEL.
8. INCLUDE OSHA APPROVED METAL SAFETY GRATING WITH LIFT STATION HATCH.
9. CONTRACTOR MAY USE COMPACT FITTINGS AS REQUIRED TO ACHIEVE REQUIRED PUMP SPACING.
10. SET LOW WATER BACK-UP FLOAT 6-INCHES BELOW "PUMP OFF" LEVEL AND HIGH WATER BACK-UP FLOAT 3-INCHES ABOVE "HIGH WATER ALARM".
11. INSTALL PRESSURE TRANSDUCER LEVEL SENSOR ON SIDE OF LIFT STATION OPPOSITE INLET PIPE FROM EXISTING WET WELL. CONTRACTOR TO INSTALL TRANSDUCER AND BACK-UP FLOATS IN EXISTING SUCTION PIPE TROUGH. GROUT AREA TO DRAIN.
12. APPLY SAUERISEN BY CENTRAL SCIENTIFIC COMPANY OR QUADEX COATING TO INTERIOR LIFT STATION WALLS PER SPECIFICATIONS.

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

RELEASED TO/FOR: CLIENT / BID / CONSTRUCTION

DATE RELEASED: A B C 0 1 2 3

BARR
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55435-4803
Ph: 1-800-632-2277
Fax: (952) 832-2601
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Checked	JMA
Designed	BARR
Approved	JMM3

CITY OF BURNSVILLE
BURNSVILLE, MINNESOTA

BURNSVILLE LIFT STATION
STANDARDIZATION

SUBMERSIBLE LIFT STATION
PROFILE

BARR PROJECT No. 23/19-1052.00
CLIENT PROJECT No.
DWG. No. 2
REV. No. 0

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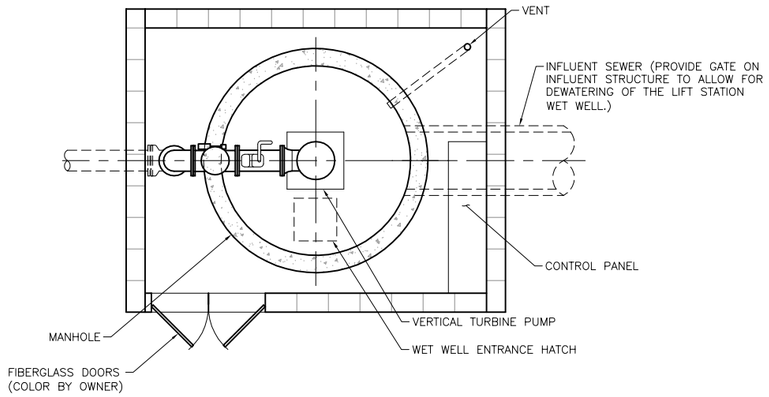
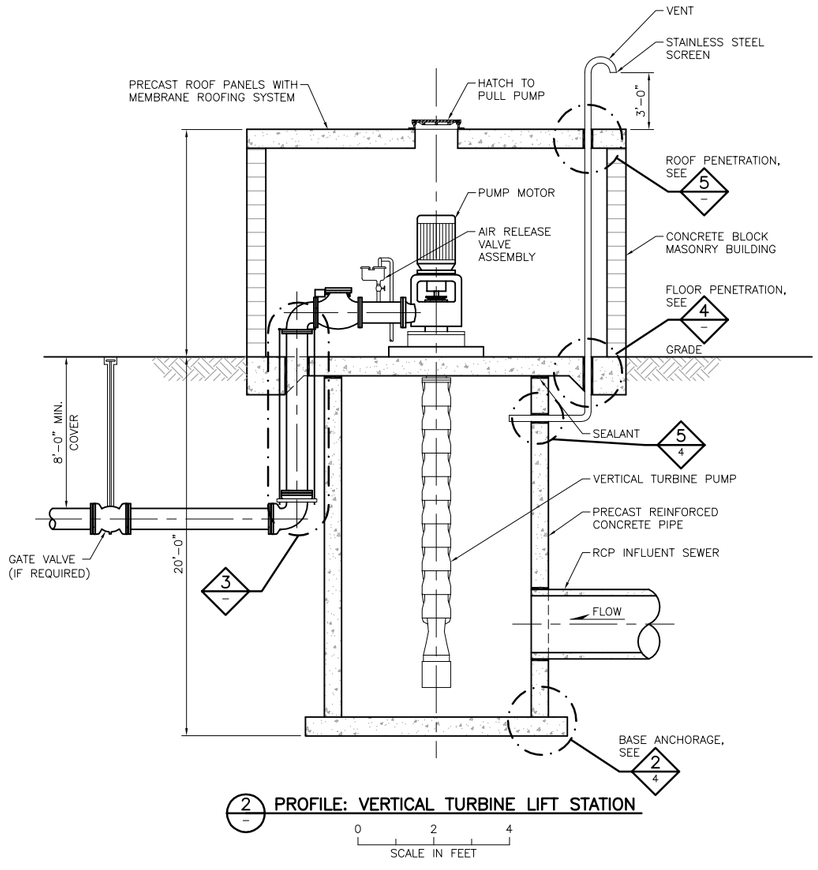


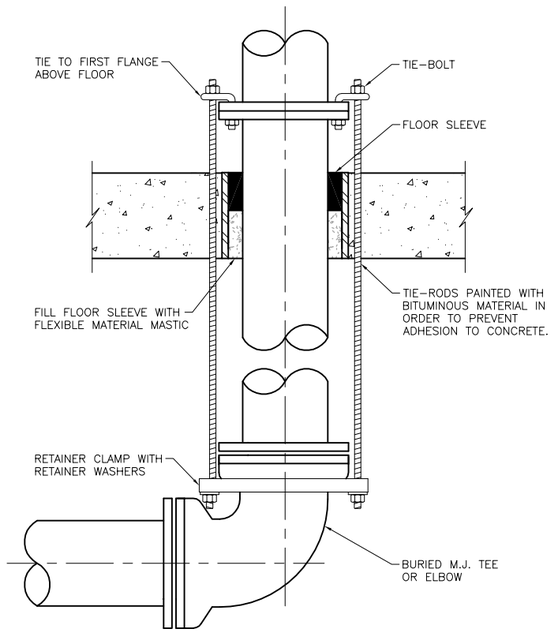
1 – PLAN: VERTICAL TURBINE LIFT STATION

0 2 4
SCALE IN FEET

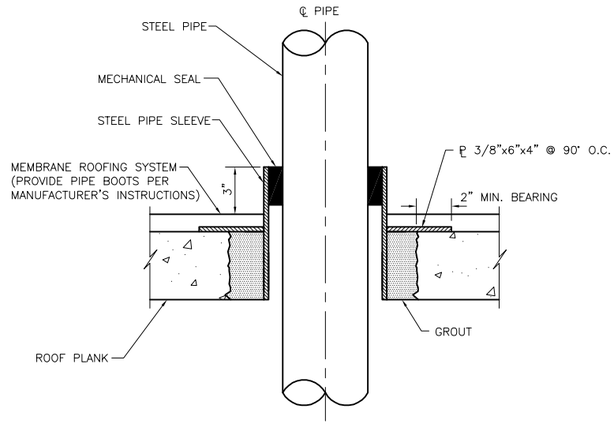


2 – PROFILE: VERTICAL TURBINE LIFT STATION

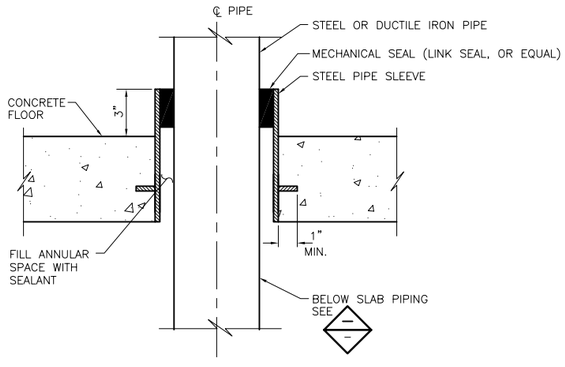
0 2 4
SCALE IN FEET



3 – DETAIL: FLOOR PENETRATION PIPE SLEEVE AND SEAL FOR HIGH PRESSURE SYSTEMS
N.T.S.



5 – DETAIL: ROOF PENETRATION PIPE SLEEVE AND SEAL FOR VENT
NOT TO SCALE



4 – DETAIL: FLOOR PENETRATION PIPE SLEEVE AND SEAL FOR VENT
NOT TO SCALE

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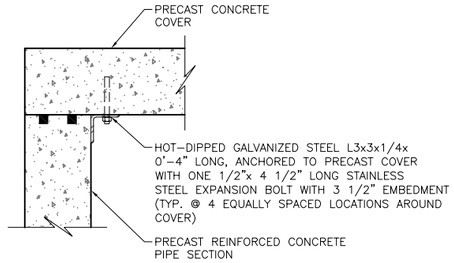
Approved	JMM3

CITY OF BURNSVILLE
BURNSVILLE, MINNESOTA

BURNSVILLE LIFT STATION
STANDARDIZATION

VERTICAL TURBINE LIFT STATION
PLAN, SECTION, AND DETAILS

BARR PROJECT No. 23/19–1052.00
CLIENT PROJECT No.
DWG. No. 3
REV. No. 0



1 – SECTION: COVER ANCHORAGE DETAIL

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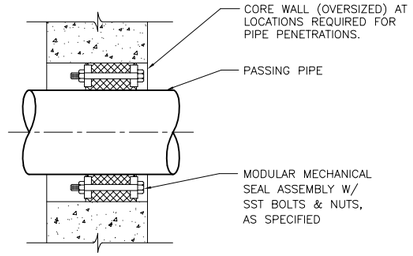
SCALE

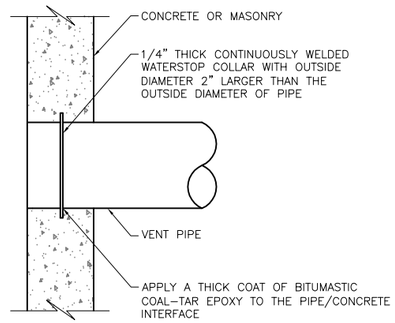


3 – SECTION: WALL PENETRATION SEAL

NOT TO SCALE

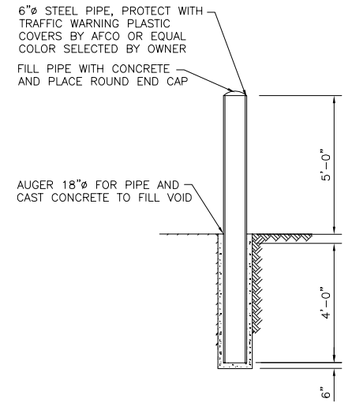
NOTE:

1. USE WHEN PSX TYPE PIPE BOOTS NOT USED.



5 – SECTION: WATER COLLAR DETAIL FOR VENT PIPE

0 3 6 9 1 2
SCALE

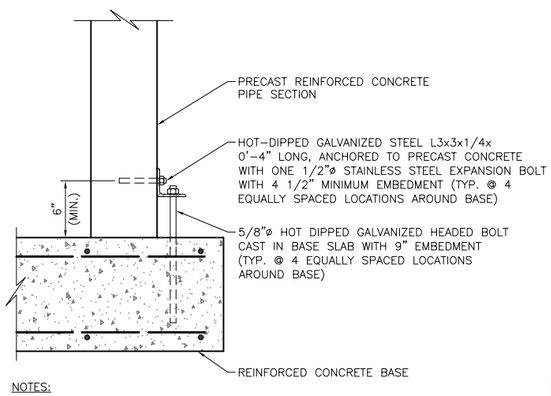


7 – SECTION: BOLLARD (TYP)

N.T.S.

NOTES:

1. TO BE INSTALLED TO PROTECT LIFT STATION AND VALVE VAULT. COORDINATE LOCATION AND QUANTITY WITH OWNER.

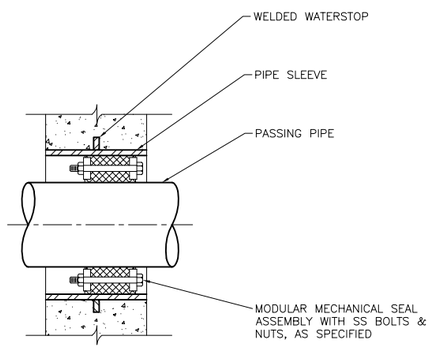


NOTES:

1. PAINT ALL CONNECTION ITEMS WITH HEAVY COAT OF BITUMASTIC PAINT.
2. BASE ANCHOR DETAIL TO BE USED WITH NON–INTEGRAL BASE MANHOLES.

2 – SECTION: BASE ANCHORAGE DETAIL

0 3 6 9 1 2
SCALE

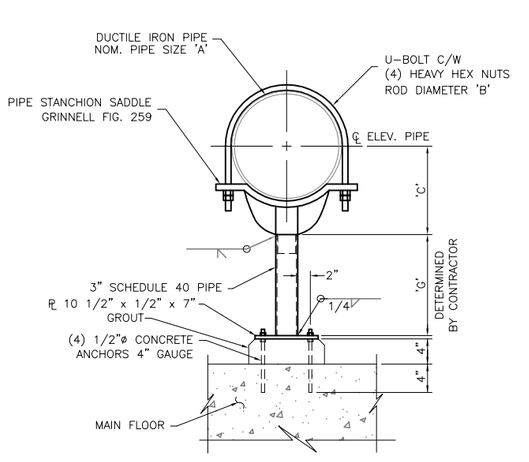


4 – SECTION: WALL PENETRATION SEAL WITH PIPE SLEEVE

NOT TO SCALE

NOTE:

1. USE WHEN PSX TYPE PIPE BOOTS NOT USED.



NOTE: SEE 'TABLE' FOR TYPICAL DIMENSIONS

6 – ELEVATION: TYPICAL TYPE 1 SUPPORT

0 6" 1' 2'
SCALE

CADD USER: Jon Minne FILE: O:\CAD\23191052\BURNSVILLE LIFT STATION DETAILS.DWG PLOT SCALE: 1:2 PLOT DATE: 8/31/2010 3:32 PM
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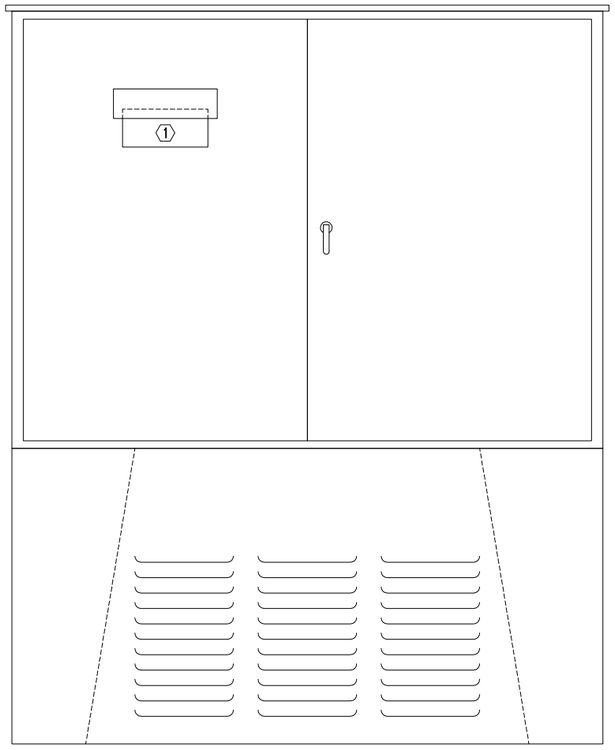
Approved	JMM3

CITY OF BURNSVILLE
BURNSVILLE, MINNESOTA

BURNSVILLE LIFT STATION
STANDARDIZATION

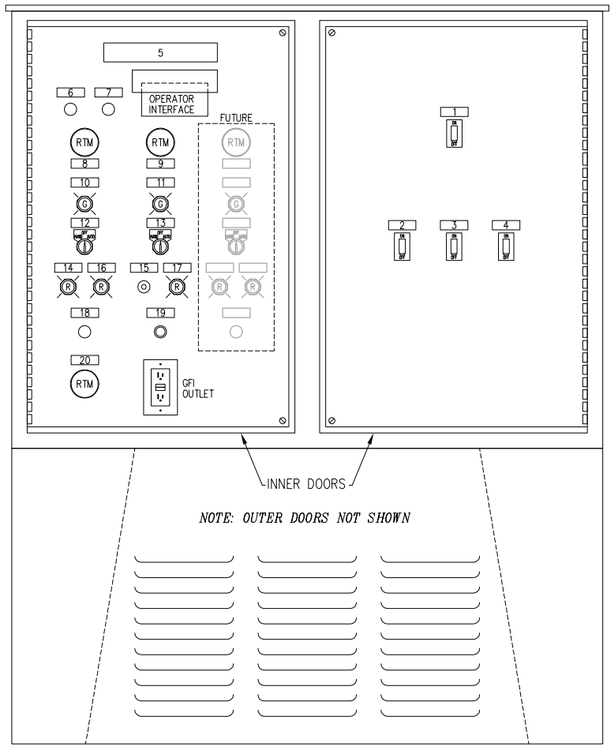
LIFT STATION DETAILS

BARR PROJECT No. 23/19–1052.00
CLIENT PROJECT No.
DWG. No. 4
REV. No. 0



TYPICAL CONTROL PANEL ENCLOSURE
NO SCALE

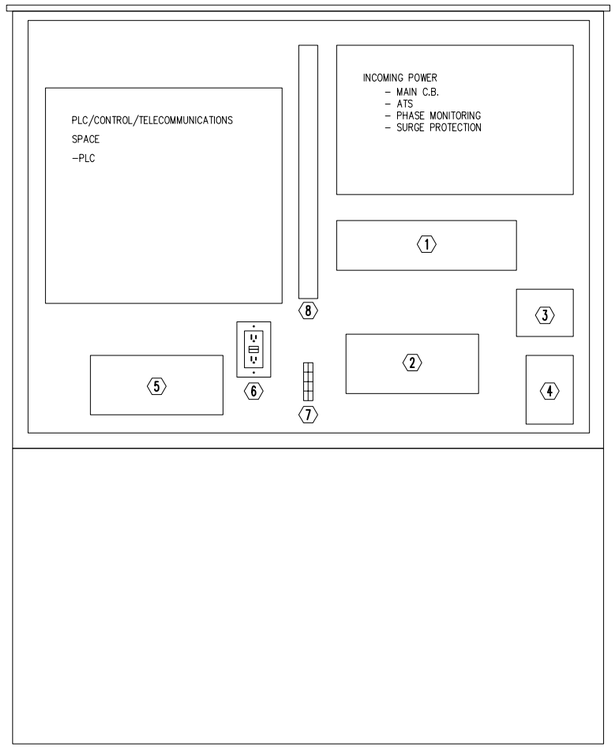
DETAIL NOTES
1. OPERATOR INTERFACE VIEWING PORT AND HOOD



NOTE: OUTER DOORS NOT SHOWN

TYPICAL CONTROL PANEL INNER DOORS LAYOUT
NO SCALE

NAMEPLATE LEGEND
1. MAIN DISCONNECT
2. PUMP 1 DISCONNECT
3. PUMP 2 DISCONNECT
4. TRANSFORMER
5. PUMP STATION NAMEPLATE
6. TEST
7. ALARM LIGHT
8. PUMP 1
9. PUMP 2
10. RUNNING
11. RUNNING
12. OFF–HAND–AUTO
13. OFF–HAND–AUTO
14. SEAL FAIL
15. SEAL FAIL
16. OVERTEMP
17. OVERTEMP
18. OVERTEMP RESET
19. OVERTEMP RESET
20. PUMP 1 & PUMP 2



TYPICAL BACKPANEL LAYOUT
NO SCALE

DETAIL NOTES
1. MOTOR CIRCUIT BREAKERS
2. MOTOR STARTERS
3. 120VAC TRANSFORMER
4. ENCLOSURE HEATER
5. UPS
6. UPS OUTLET
7. GROUND BUS
8. TERMINALS

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CITY OF BURNSVILLE
BURNSVILLE, MINNESOTA

BURNSVILLE LIFT STATION
STANDARDIZATION

CONTROL PANEL LAYOUT DETAILS

BARR PROJECT No.	23/19–1052.00
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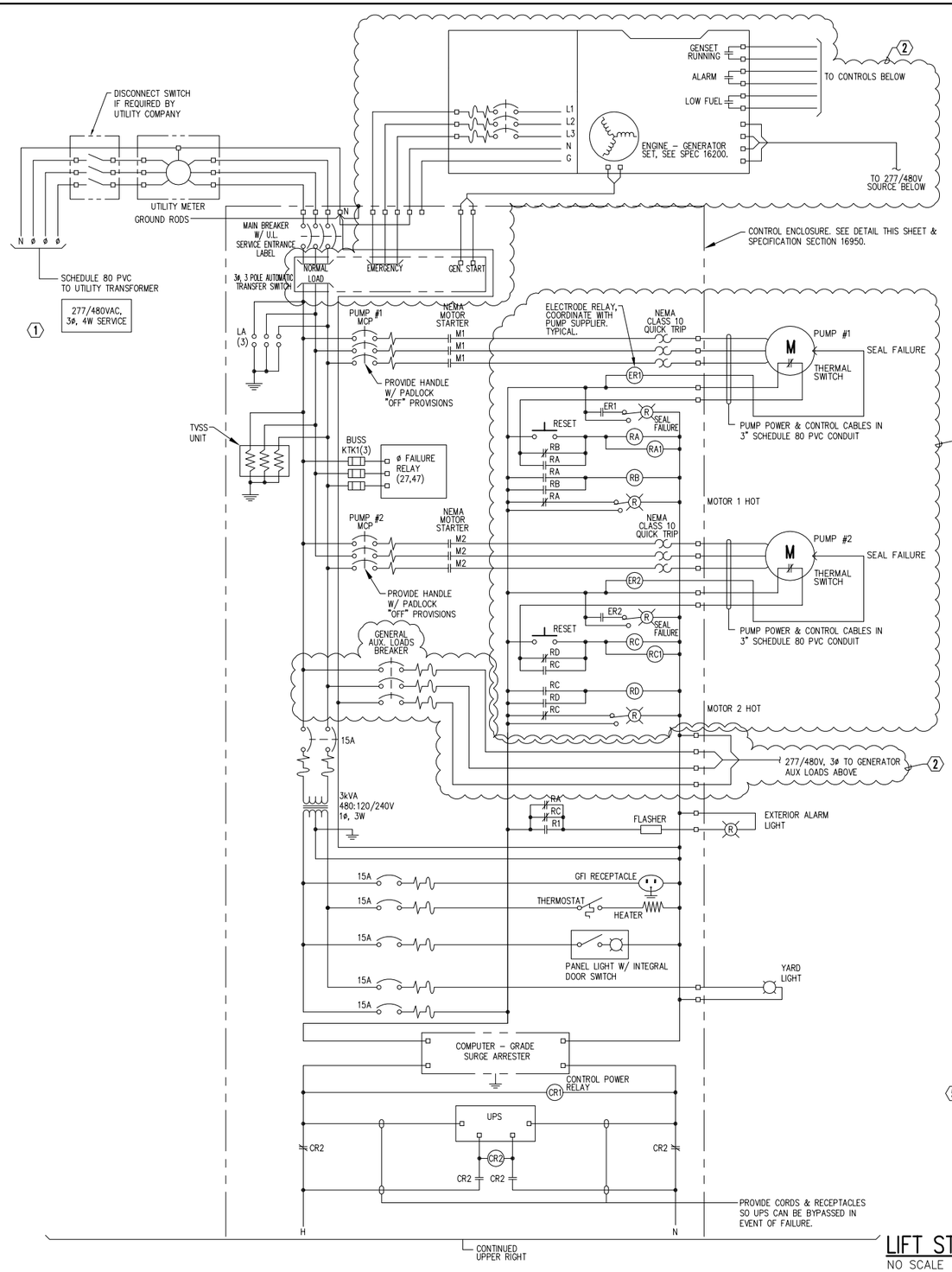
DWG. No.	5
REV. No.	0



GENERAL NOTES

1. CONTROL PANEL SHALL BEAR SERIALIZED LABEL INDICATING CONFORMANCE W/ UL508 AND UL698A.
2. STARTERS SHALL BE NEMA RATED STARTERS. IEC OR DUAL RATED STARTERS ARE NOT ACCEPTABLE
3. COORDINATE POWER SERVICE W/ UTILITY CO.
4. LIFT STATION WETWELL SHALL BE CONSIDERED A NEC CLASS 1, DIVISION 1 AREA.
5. GROUND SYSTEM PER NEC ARTICLE 250.
6. COMPONENT CABLE, AND CONDUIT SIZING PER NEC.

SCHEMATIC NOTES

1. THIS SCHEMATIC IS DESIGNED FOR A 277/480VAC, 3ø, 4W SERVICE. ADJUST THE SCHEMATIC ACCORDINGLY FOR A DIFFERENT SERVICE VOLTAGE, RECOMMENDED SERVICE RATINGS CAN BE FOUND IN THE LIFT STATION STANDARDIZATION POLICY DOCUMENT.
2. THIS SCHEMATIC IS BASED ON THE USE OF A STATIONARY GENERATOR SET. ADJUST THE SCHEMATIC ACCORDINGLY IF A PORTABLE GENERATOR IS USED.
3. THIS SCHEMATIC IS DESIGNED FOR THE USE OF SUBMERSIBLE PUMPS. VERIFY THE SCHEMATIC WITH THE PUMP SUPPLIER (OR MANUFACTURER).
4. THIS SCHEMATIC IS DESIGNED TO COMMUNICATE WITH THE CITY'S FIBER OPTIC NETWORK. IF FIBER IS NOT AVAILABLE, RADIO COMMUNICATION SHALL BE USED.
5. CONNECTION OF EXISTING EQUIPMENT SHALL DEPEND ON EACH INDIVIDUAL LIFT STATION.

PLC SYMBOLS

SYMBOL	DESCRIPTION
DO	DIGITAL OUTPUT (CONTACT)
DI	DIGITAL INPUT, REMOTELY POWERED (120VAC UNLESS NOTED OTHERWISE)
AO	ANALOG OUTPUT, 4–20mADC (SELF–POWERED)
AI	ANALOG INPUT, 4–20mADC (UNLESS NOTED OTHERWISE)

LIFT STATION SCHEMATIC

NO SCALE

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION

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BID
CONSTRUCTION

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Designed	ZMN
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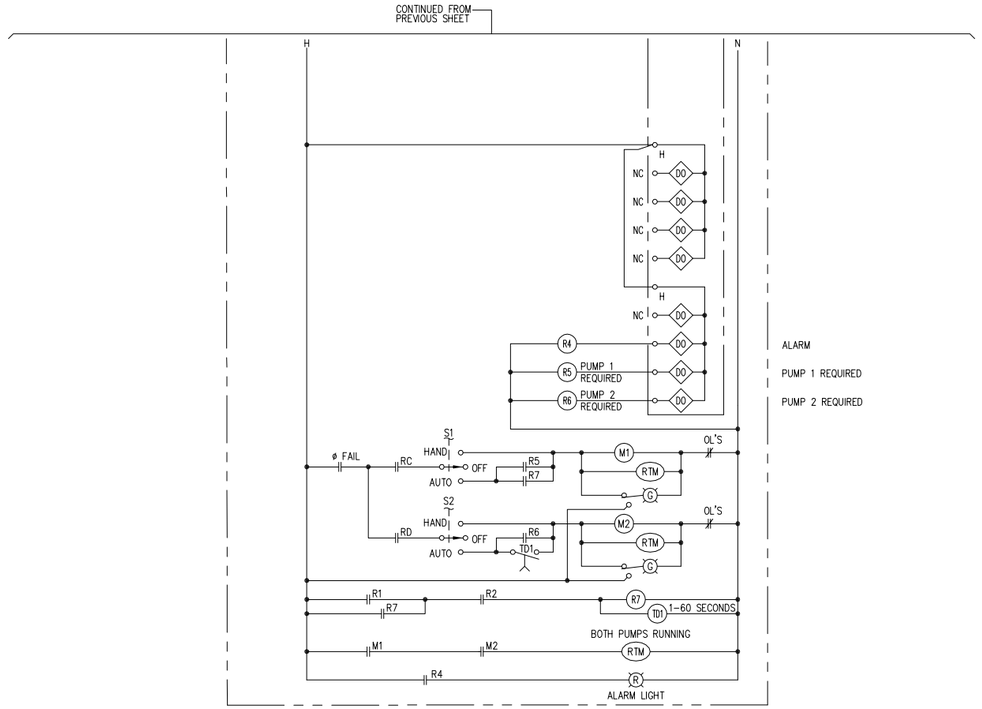
CITY OF BURNSVILLE
BURNSVILLE, MINNESOTA

BURNSVILLE LIFT STATION
STANDARDIZATION

LIFT STATION SCHEMATIC

BARR PROJECT No. 23/19–1052.00
CLIENT PROJECT No.
DWG. No. 6
REV. No. 0

CADD USER: Julia Maciejkovic FILE: M:\CAD\23191052\BURNSVILLE LIFT STATION – ELEC 2.DWG PLOT SCALE: 1:2 PLOT DATE: 6/15/2010 4:49 PM



LIFT STATION SCHEMATIC

NO SCALE

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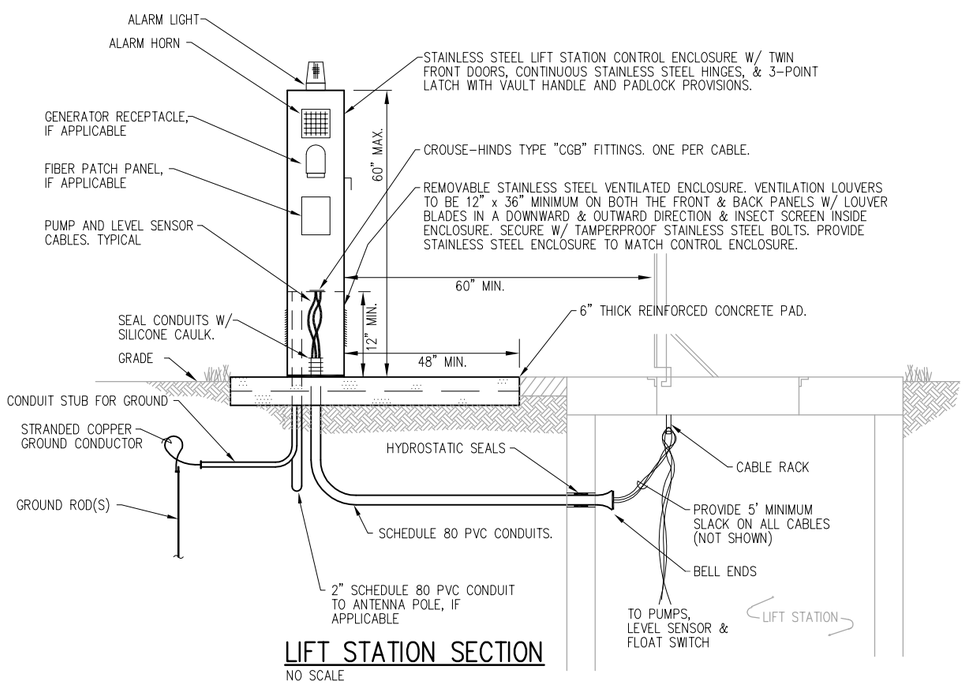

LIFT STATION SECTION

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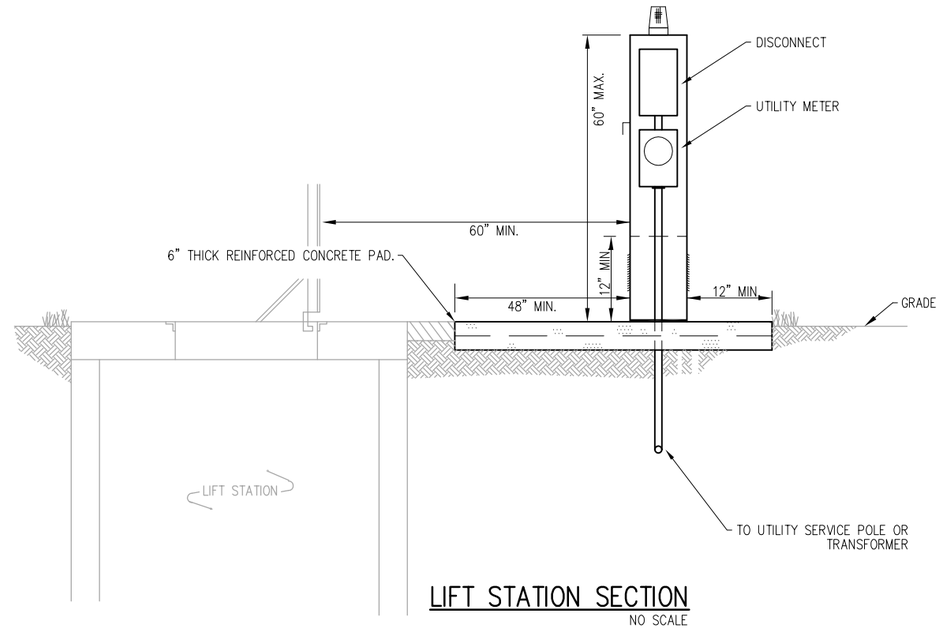

LIFT STATION SECTION

NO SCALE

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CITY OF BURNSVILLE
BURNSVILLE, MINNESOTA

BURNSVILLE LIFT STATION
STANDARDIZATION

LIFT STATION SCHEMATIC

BARR PROJECT No.	
23/19-1052.00	
CLIENT PROJECT No.	
DWG. No.	REV. No.
7	0

City Of Burnsville

Appendix N – 2018-2022 Capital Improvement Plan (CIP)

December 2017

2018-2022 CAPITAL IMPROVEMENT PLAN

Adopted by
Burnsville
City Council
December 5, 2017

Burnsville

CITY COUNCIL

Elizabeth B. Kautz, Mayor
Bill Coughlin
Dan Kealey
Dan Gustafson
Cara Schulz

CITY STAFF

Heather Johnston, City Manager
Steve Albrecht, Director of Public Works
Garrett Beck, Director of Parks, Recreation & Facilities
Ryan Peterson, City Engineer & Natural Resources Director

TABLE OF CONTENTS

PLAN POLICY OVERVIEW

1. **Introduction**

2. **Sources of Revenue Summary -** This table shows the proposed funding sources for financing the proposed improvements outlined in the CIP each year. The table also shows the extent each funding source is contributing each fiscal year.

3. **Projects by Funding Source Summary** - This table shows the proposed projects categorized by their proposed funding source. The table also shows the funding source(s) and the extent of the funding source that will be financing each project.

4. **Individual Projects by Department & Funding Source -** This table shows the proposed individual projects categorized with their funding source listed below.

5. **Maps -**This document provides maps of the proposed 2018 Street Reconstruction, Rehabilitation and Host Community Landfill Grant areas.

6. **Special Revenue Funds -** This page summarizes replacements and improvements for the Special Revenue Funds – Cable Franchise Fee, Youth Center, and Forestry (Emerald Ash Borer).

7. **Parks -** This table provides a summary of proposed renovations and improvements to the city parks.

8. **Equipment and Vehicles -** These tables provide a summary of replacement schedules and proposed revenue sources for city vehicles and large equipment.

9. **Facilities -** These tables provide a summary of replacement schedules and proposed revenue sources for improvements and large maintenance items for city buildings and facilities.

10. **IT -** This table provides a summary of proposed upgrades, replacements and development for Information Technology.

11. **Enterprise Funds -** This page summarizes replacements and improvements for the Enterprise Funds – Water & Sewer, Storm Water, Ice Center, Golf Course, Street Lighting, and Ames Center.

12. **CIP Project Narrative -** This document provides a detail listing and description of projects grouped by type of project.

13. **Debt Analysis**

CITY OF BURNSVILLE
2018 – 2022
CAPITAL IMPROVEMENT PLAN

INTRODUCTION

The City of Burnsville has prepared this plan as decision information consistent with the City's Governance Model. The City of Burnsville believes that it is necessary to annually review and update its Capital Improvements Plan. The information contained herein is the result of the City Council's desire to establish Ends and Outcomes that answer the questions: What Good, for What People, at What Cost.

The CIP is an important part of the implementation of specific projects. It is important to remember this document is only a plan. Subsequent project specific considerations and actions must be made by the Council prior to the implementation of individual projects.

WHAT GOOD

This plan includes the scheduling of public improvements for the community over a five-year period, taking into consideration the community's financial capabilities as well as its goals and priorities. The CIP is directly linked to the goals and policies of the City's Comprehensive Plan and acts as a work plan for the City's staff. The primary objective of this plan is to integrate the specific goals, policies and Council recommendations with the City's capability to pay for and maintain capital improvements.

WHAT PEOPLE

The demand for services and the cost of building and maintaining the City's infrastructure continues to increase. No City can afford to accomplish every project or meet every service demand. Therefore, a methodology must be employed that identifies a realistic mix of Commercial and Residential needs and a financing plan to meet those needs. This plan attempts to prioritize improvements to the City's infrastructure so Burnsville continues to be a community with an effective, multi-modal transportation system that connects people and goods with their destination points, and an infrastructure system that continues to provide high quality service to the City's businesses and residents.

WHAT COSTS

In 1994 the City Council adopted a Financial Management Plan which establishes policies and procedures in the areas of the CIP and debt management. The CIP development process is set forth as follows:

- Compile and prioritize projects. Staff will consolidate and prioritize recommended projects into the proposed plan.
- Devise funding sources for proposed projects. Recommended funding sources will be clearly stated for each project.
- Analyze debt service related to new projects. The CIP will include the impact on the tax levy, as well as the total dollar cost.
- Project and analyze debt service related to the total debt of the City. A debt analysis will be provided summarizing the combined impact of all existing and proposed debt.

As part of the annual budget process, the City Council will evaluate the proposed CIP and decide on project prioritization, funding source acceptability, and acceptable financial impact on the tax levy, total debt, and utility rate levels.

As part of the project development process, the City Council will evaluate the feasibility of each individual project and determine if it is consistent with the proposed financing plan and appropriate for implementation.

City of Burnsville, Minnesota

Capital Improvements Plan

2018 thru **2022**

FUNDING SOURCE SUMMARY

Source	2018	2019	2020	2021	2022	Total
General Fund					350,000	*350,000*
Host Community Grant	415,000	415,000	415,000	415,000	415,000	*2,075,000*
Infrastructure Trust Funds	2,580,000	4,100,000	1,870,000	4,170,000	3,420,000	*16,140,000*
MSAS Funds	2,800,000	1,950,000	1,695,000	1,025,000	1,210,000	*8,680,000*
Special Assessments	1,540,000	1,625,000	1,275,000	1,215,000	1,560,000	*7,215,000*
Utility - St. Lighting	170,000	170,000	170,000	170,000	170,000	*850,000*
Utility - Storm Water	1,730,000	2,280,000	2,620,000	1,845,000	2,715,000	*11,190,000*
Utility - Water & Sewer - Sanitary Sewer	485,000	1,095,000	600,000	1,580,000	825,000	*4,585,000*
Utility - Water & Sewer - Water	9,035,000	5,455,000	935,000	2,365,000	2,660,000	*20,450,000*
GRAND TOTAL	**$ 18,755,000**	**$ 17,090,000**	**$ 9,580,000**	**$ 12,785,000**	**$ 13,325,000**	**$ 71,535,000**

City of Burnsville, Minnesota

Capital Improvements Plan

2018 thru **2022**

PROJECTS BY FUNDING SOURCE

Source	Project #	2018	2019	2020	2021	2022	Total
General Fund							
35W/Burnsville Parkway Aesthetics Renovations	*09 Street*					350,000	*350,000*
Grants Total		—	—	—	—	**350,000**	***350,000***
Host Community Grant							
Host Landfill Grant Projects	*08 Street*	415,000	415,000	415,000	415,000	415,000	*2,075,000*
Host Community Grant Total		**415,000**	**415,000**	**415,000**	**415,000**	**415,000**	***2,075,000***
Infrastructure Trust Funds							
Street Rehabilitation	*02 Street*	530,000	260,000	890,000		260,000	*1,940,000*
Street Reconstruction	*03 Street*	1,920,000	3,760,000	850,000	2,810,000	3,030,000	*12,370,000*
Maintenance Overlays	*05 Street*				1,280,000		*1,280,000*
Right of Way Rehabilitation - Concrete Elements	*06 Street*	50,000		50,000		50,000	*150,000*
Multi-Modal Transportation	*07 Street*	30,000	30,000	30,000	30,000	30,000	*150,000*
Host Landfill Grant Projects	*08 Street*	50,000	50,000	50,000	50,000	50,000	*250,000*
Infrastructure Trust Funds Total		**2,580,000**	**4,100,000**	**1,870,000**	**4,170,000**	**3,420,000**	***16,140,000***
MSAS Funds							
City Owned Signal Replacement	*01 Int.*		350,000		350,000		*700,000*
County Signal Replacement	*02 Int.*	220,000	300,000	230,000	230,000	230,000	*1,210,000*
Street Rehabilitation	*02 Street*			575,000	75,000		*650,000*
Street Reconstruction	*03 Street*	2,330,000		840,000			*3,170,000*
Cliff Road Trail - Federal Project	*07 Parks*	70,000	40,000	50,000	50,000		*210,000*
Street Trail Rehabilitation	*10 Street*	60,000	260,000		70,000	280,000	*670,000*
RRFB Installation	*11 Street*	120,000					*120,000*
Cliff Road Interchange Freight Improvements	*12 Street*		1,000,000				*1,000,000*
MnDot Signal Repl	*13 Street*					200,000	*200,000*
Nicollet/13 Ped Bridge	*14 Street*				250,000	500,000	*750,000*
MSAS Funds Total		**2,800,000**	**1,950,000**	**1,695,000**	**1,025,000**	**1,210,000**	***8,680,000***
Special Assessments							
Street Rehabilitation	*02 Street*	170,000	95,000	525,000	15,000	110,000	*915,000*
Street Reconstruction	*03 Street*	1,320,000	1,480,000	700,000	1,150,000	1,400,000	*6,050,000*
Host Landfill Grant Projects	*08 Street*	50,000	50,000	50,000	50,000	50,000	*250,000*
Special Assessments Total		**1,540,000**	**1,625,000**	**1,275,000**	**1,215,000**	**1,560,000**	***7,215,000***
Utility - St. Lighting Total							
Street light Replacement	04 Street	170,000	170,000	170,000	170,000	170,000	*850,000*
Utility - St. Lighting Total		**170,000**	**170,000**	**170,000**	**170,000**	**170,000**	***850,000***
Utility - Storm Water							
Street Rehabilitation	*02 Street*	100,000	50,000	120,000	20,000	120,000	*410,000*

City of Burnsville, Minnesota

Capital Improvements Plan

2018 thru **2022**

PROJECTS BY FUNDING SOURCE

Source	Project #	2018	2019	2020	2021	2022	Total
Street Reconstruction	*03 Street*	450,000	450,000	500,000	500,000	500,000	*2,400,000*
Lateral Drainage Modifications	*03 SWM*	90,000	90,000	90,000	90,000	90,000	*450,000*
Pond Cleanout/Outfall Improvement Program	*04 SWM*	330,000	345,000	345,000	360,000	360,000	*1,740,000*
Maintenance Overlays	*05 Street*				70,000		*70,000*
Keller Lake UAA	*07 SWM*			35,000			*35,000*
Host Landfill Grant Projects	*08 Street*	30,000	30,000	30,000	30,000	30,000	*150,000*
County Overlays	*09 C/T Exp.*		110,000	65,000	65,000	65,000	*305,000*
Lift Station Rehab	*10 SWM*	250,000		250,000		250,000	*750,000*
WRMP Update	*13 SWM*				50,000		*50,000*
MRQ Stormwater & Floodplain Study/Report	*17 SWM*					50,000	*50,000*
Ravine Restoration	*19 SWM*		500,000		500,000		*1,000,000*
CMP Rehabilitation	*23 SWM*	30,000	30,000	30,000	30,000	30,000	*150,000*
Street Project Storm Sewer Televising	*26 SWM*	40,000	40,000	40,000	50,000	50,000	*220,000*
Future Ponds/Water Quality	*30 SWM*			1,000,000		1,100,000	*2,100,000*
Contract Patching	*32 SWM*	60,000	60,000	70,000	70,000	70,000	*330,000*
Resiliency Assessment of Major Drainage Systems	*43 SWM*	40,000					*40,000*
Resiliency Improvements	*44 SWM*		350,000				*350,000*
TMDL & WQ BMP CIP Maint Plan	*45 SWM*	20,000					*20,000*
Trout Stream #4 Restoration Dev Cost Share	*46 SWM*	10,000					*10,000*
Bluff Area Risk Analysis	*47 SWM*	50,000					*50,000*
Alum Treatment	*49 SWM*			25,000			*25,000*
Bicentennial Park Outlet Repair	*52 SWM*	25,000					*25,000*
H&H Model Evaluation	*53 SWM*	50,000					*50,000*
Keller Lake to MN River Level H&H Analysis	*54 SWM*		75,000				*75,000*
KMM Levee Inspection & Report	*55 SWM*				10,000		*10,000*
Park Drainage Improvements Neill & Alimagnet	*56 SWM*	155,000	150,000				*305,000*
Private Pond Maint Options Study/Report	*57 SWM*			20,000			*20,000*
Utility - Storm Water Total		**1,730,000**	**2,280,000**	**2,620,000**	**1,845,000**	**2,715,000**	***11,190,000***
Utility - Water & Sewer - Sanitary Sewer							
Lift Station Rehabilitation	*01 SSM*		520,000		750,000		*1,270,000*
Sanitary Sewer Rehabilitation	*02 SSM*	165,000	165,000	165,000	385,000	385,000	*1,265,000*
Street Rehabilitation	*02 Street*	40,000	10,000	45,000	10,000	45,000	*150,000*
Street Reconstruction	*03 Street*	250,000	250,000	300,000	300,000	300,000	*1,400,000*
Maintenance Overlays	*05 Street*				40,000		*40,000*
Host Landfill Grant Projects	*08 Street*	30,000	30,000	30,000	30,000	30,000	*150,000*
County Overlays	*09 C/T Exp.*		120,000	60,000	65,000	65,000	*310,000*
Utility - Water & Sewer - Sanitary Sewer Total		**485,000**	**1,095,000**	**600,000**	**1,580,000**	**825,000**	***4,585,000***
Utility - Water & Sewer - Water							
Street Rehabilitation	*02 Street*	20,000	10,000	25,000		25,000	*80,000*
Street Reconstruction	*03 Street*	2,510,000	2,590,000	50,000	2,050,000	1,820,000	*9,020,000*
Maintenance Overlays	*05 Street*				20,000		*20,000*
Water Production Rehab	*07 WS*	325,000	450,000	110,000	110,000		*995,000*

City of Burnsville, Minnesota

Capital Improvements Plan

2018 thru **2022**

PROJECTS BY FUNDING SOURCE

Source	Project #	2018	2019	2020	2021	2022	Total
Host Landfill Grant Projects	*08 Street*	20,000	20,000	20,000	20,000	20,000	*100,000*
Transmission & Storage Rehab	*08 WS*	200,000	2,100,000	550,000		495,000	*3,345,000*
County Overlays	*09 C/T Exp.*		40,000	20,000	25,000	25,000	*110,000*
Water Treatment Repairs & Rehab	*09 WS*	2,800,000	125,000	20,000		135,000	*3,080,000*
Street Repair of WM Breaks & Contract Patching	*10 WS*	120,000	120,000	140,000	140,000	140,000	*660,000*
Meter Replacement	*14-326*	3,040,000					*3,040,000*
Utility - Water & Sewer - Water Total		**9,035,000**	**5,455,000**	**935,000**	**2,365,000**	**2,660,000**	***20,450,000***
GRAND TOTAL		**18,755,000**	**17,090,000**	**9,580,000**	**12,785,000**	**13,325,000**	***71,535,000***

City of Burnsville, Minnesota

Capital Improvements Plan

2018 thru **2022**

PROJECTS & FUNDING SOURCES BY DEPARTMENT

Department	Project #	2018	2019	2020	2021	2022	Total
Collector\Thoroughfare Exp.							
Cliff Road Trail - Federal Project	07 Parks	70,000	40,000	50,000	50,000		*210,000*
MSAS Funds		***70,000***	***40,000***	***50,000***	***50,000***		***210,000***
County Overlays	09 C/T Exp.		270,000	145,000	155,000	155,000	*725,000*
Utility - Storm Water			***110,000***	***65,000***	***65,000***	***65,000***	***305,000***
Utility - Water & Sewer - Sanitary Sewer			***120,000***	***60,000***	***65,000***	***65,000***	***310,000***
Utility - Water & Sewer - Water			***40,000***	***20,000***	***25,000***	***25,000***	***110,000***
Street Trail Rehabilitation	10 Street	60,000	260,000		70,000	280,000	*670,000*
MSAS Funds		***60,000***	***260,000***		***70,000***	***280,000***	***670,000***
Collector\Thoroughfare Exp. Total		**130,000**	**570,000**	**195,000**	**275,000**	**435,000**	***1,605,000***
Intersection Improvement							
City Owned Signal Replacement	01 Int.		350,000		350,000		*700,000*
MSAS Funds			***350,000***		***350,000***		***700,000***
County Signal Replacement	02 Int.	220,000	300,000	230,000	230,000	230,000	*1,210,000*
MSAS Funds		***220,000***	***300,000***	***230,000***	***230,000***	***230,000***	***1,210,000***
Cliff Road Interchange Freight Improvements	12 Street		1,000,000				*1,000,000*
MSAS Funds			***1,000,000***				***1,000,000***
MnDot Signal Repl	13 Street					200,000	*200,000*
MSAS Funds						***200,000***	***200,000***
Nicollet/13 Ped Bridge	14 Street				250,000	500,000	*750,000*
MSAS Funds					***250,000***	***500,000***	***750,000***
Intersection Improvement Total		**220,000**	**1,650,000**	**230,000**	**830,000**	**930,000**	***3,860,000***
Sanitary Sewer System Mgmt							
Lift Station Rehabilitation	01 SSM		520,000		750,000		*1,270,000*
Utility - Water & Sewer - Sanitary Sewer			***520,000***		***750,000***		***1,270,000***
Sanitary Sewer Rehabilitation	02 SSM	165,000	165,000	165,000	385,000	385,000	*1,265,000*
Utility - Water & Sewer - Sanitary Sewer		***165,000***	***165,000***	***165,000***	***385,000***	***385,000***	***1,265,000***
Sanitary Sewer System Mgmt Total		**165,000**	**685,000**	**165,000**	**1,135,000**	**385,000**	***2,535,000***
Storm Water Mgmt							
Lateral Drainage Modifications	03 SWM	90,000	90,000	*90,000*	90,000	90,000	450,000
Utility - Storm Water		***90,000***	***90,000***	***90,000***	***90,000***	***90,000***	***450,000***
Pond Cleanout/Outfall Improvement Program	04 SWM	330,000	345,000	345,000	360,000	360,000	1,740,000
Utility - Storm Water		***330,000***	***345,000***	***345,000***	***360,000***	***360,000***	***1,740,000***
Keller Lake UAA	07 SWM			35,000			35,000
Utility - Storm Water				***35,000***			***35,000***
Lift Station Rehab	10 SWM	250,000		250,000		250,000	750,000
Utility - Storm Water		***250,000***		***250,000***		***250,000***	***750,000***
WRMP Update	13 SWM				50,000		50,000
Utility - Storm Water					***50,000***		***50,000***
MRQ Stormwater & Floodplain Study/ Report	17 SWM					50,000	50,000

City of Burnsville, Minnesota

Capital Improvements Plan

2018 thru **2022**

PROJECTS & FUNDING SOURCES BY DEPARTMENT

Department	Project #	2018	2019	2020	2021	2022	Total
Utility - Storm Water						***50,000***	***50,000***
Ravine Restoration	19 SWM		500,000		500,000		1,000,000
Utility - Storm Water			***500,000***		***500,000***		***1,000,000***
CMP Rehabilitation	23 SWM	30,000	30,000	30,000	30,000	30,000	150,000
Utility - Storm Water		***30,000***	***30,000***	***30,000***	***30,000***	***30,000***	***150,000***
Street Project Storm Sewer Televising	26 SWM	40,000	40,000	40,000	50,000	50,000	220,000
Utility - Storm Water		***40,000***	***40,000***	***40,000***	***50,000***	***50,000***	***220,000***
Future Ponds/Water Quality	30 SWM			1,000,000		1,100,000	2,100,000
Utility - Storm Water				***1,000,000***		1,100,000	***2,100,000***
Contract Patching	32 SWM	60,000	60,000	70,000	70,000	70,000	330,000
Utility - Storm Water		***60,000***	***60,000***	***70,000***	***70,000***	***70,000***	***330,000***
Resiliency Assessment of Major Drainage Systems	43 SWM	40,000					40,000
Utility - Storm Water		***40,000***					***40,000***
Resiliency Improvements	44 SWM		350,000				350,000
Utility - Storm Water			***350,000***				***350,000***
TMDL & WQ BMP CIP Maint Plan	45 SWM	20,000					20,000
Utility - Storm Water		***20,000***					***20,000***
Trout Stream #4 Restoration Dev Cost Share	46 SWM	10,000					10,000
Utility - Storm Water		***10,000***					***10,000***
Stormwater System Asset Mgmt Risk Analysis	47 SWM	50,000					50,000
Utility - Storm Water		***50,000***					***50,000***
Alum Treatment	49 SWM			*25,000*			25,000
Utility - Storm Water				***25,000***			***25,000***
Bicentennial Park Outlet Repair	52 SWM	25,000					25,000
Utility - Storm Water		***25,000***					***25,000***
H&H Model Evaluation	53 SWM	50,000					50,000
Utility - Storm Water		***50,000***					***50,000***
Keller Lake to MN River Level H&H Analysis	54 SWM		75,000				75,000
Utility - Storm Water			***75,000***				***75,000***
KMM Levee Inspection & Report	55 SWM				10,000		10,000
Utility - Storm Water					***10,000***		***10,000***
Park Drainage Improvements Neill & Alimagnet	56 SWM	155,000	150,000				305,000
Utility - Storm Water		***155,000***	***150,000***				***305,000***
Private Pond Maint Options Study/Report	57 SWM			*20,000*			20,000
Utility - Storm Water				***20,000***			***20,000***
Storm Water Mgmt Total		**1,150,000**	**1,640,000**	**1,905,000**	**1,160,000**	**2,000,000**	***7,855,000***
Street Projects							
Street Rehabilitation	02 Street	860,000	425,000	2,180,000	120,000	560,000	*4,145,000*
Infrastructure Trust Funds		***530,000***	***260,000***	***890,000***		***260,000***	***1,940,000***
MSAS Funds				***575,000***	***75,000***		***650,000***
Special Assessments		***170,000***	***95,000***	***525,000***	***15,000***	***110,000***	***915,000***
Utility - Storm Water		***100,000***	***50,000***	***120,000***	***20,000***	***120,000***	***410,000***
Utility - Water & Sewer - Sanitary Sewer		***40,000***	***10,000***	***45,000***	***10,000***	***45,000***	***150,000***

City of Burnsville, Minnesota

Capital Improvements Plan

2018 thru **2022**

PROJECTS & FUNDING SOURCES BY DEPARTMENT

Department	Project #	2018	2019	2020	2021	2022	Total
Utility - Water & Sewer - Water		***20,000***	***10,000***	***25,000***		***25,000***	***80,000***
Street Reconstruction	03 Street	8,780,000	8,530,000	3,240,000	6,810,000	7,050,000	*34,410,000*
Infrastructure Trust Funds		***1,920,000***	***3,760,000***	***850,000***	***2,810,000***	***3,030,000***	***12,370,000***
MSAS Funds		***2,330,000***		***840,000***			***3,170,000***
Special Assessments		***1,320,000***	***1,480,000***	***700,000***	***1,150,000***	***1,400,000***	***6,050,000***
Utility - Storm Water		***450,000***	***450,000***	***500,000***	***500,000***	***500,000***	***2,400,000***
Utility - Water & Sewer - Sanitary Sewer		***250,000***	***250,000***	***300,000***	***300,000***	***300,000***	***1,400,000***
Utility - Water & Sewer - Water		***2,510,000***	***2,590,000***	***50,000***	***2,050,000***	***1,820,000***	***9,020,000***
Street Light Replacement	04 Street	170,000	170,000	170,000	170,000	170,000	*850,000*
Utility - St. Lighting		***170,000***	***170,000***	***170,000***	***170,000***	***170,000***	***850,000***
Maintenance Overlays	05 Street				1,410,000		*1,410,000*
Infrastructure Trust Funds					***1,280,000***		***1,280,000***
Utility - Storm Water					***70,000***		***70,000***
Utility - Water & Sewer - Sanitary Sewer					***40,000***		***40,000***
Utility - Water & Sewer - Water					***20,000***		***20,000***
Right of Way Rehabilitation - Concrete Elements	06 Street	50,000		50,000		50,000	*150,000*
Infrastructure Trust Funds		***50,000***		***50,000***		***50,000***	***150,000***
Multi-Modal Transportation	07 Street	30,000	30,000	30,000	30,000	30,000	*150,000*
Infrastructure Trust Funds		***30,000***	***30,000***	***30,000***	***30,000***	***30,000***	***150,000***
Host Landfill Grant Projects	08 Street	595,000	595,000	595,000	595,000	595,000	*2,975,000*
Host Community Grant		***415,000***	***415,000***	***415,000***	***415,000***	***415,000***	***2,075,000***
Infrastructure Trust Funds		***50,000***	***50,000***	***50,000***	***50,000***	***50,000***	***250,000***
Special Assessments		***50,000***	***50,000***	***50,000***	***50,000***	***50,000***	***250,000***
Utility - Storm Water		***30,000***	***30,000***	***30,000***	***30,000***	***30,000***	***150,000***
Utility - Water & Sewer - Sanitary Sewer		***30,000***	***30,000***	***30,000***	***30,000***	***30,000***	***150,000***
Utility - Water & Sewer - Water		***20,000***	***20,000***	***20,000***	***20,000***	***20,000***	***100,000***
35W/Burnsville Parkway Aesthetics Renovations	09 Street					350,000	*350,000*
General Fund						***350,000***	***350,000***
RRFB Installation	11 Street	120,000					*120,000*
MSAS Funds		***120,000***					***120,000***
Street Projects Total		**10,605,000**	**9,750,000**	**6,265,000**	**9,135,000**	**8,805,000**	***44,560,000***
Water System							
Water Production Rehab	07 WS	325,000	450,000	110,000	110,000		*995,000*
Utility - Water & Sewer - Water		***325,000***	***450,000***	***110,000***	***110,000***		***995,000***
Transmission & Storage Rehab	08 WS	200,000	2,100,000	550,000		495,000	*3,345,000*
Utility - Water & Sewer - Water		***200,000***	***2,100,000***	***550,000***		***495,000***	***3,345,000***
Water Treatment Repairs & Rehab	09 WS	2,800,000	125,000	20,000		135,000	*3,080,000*
Utility - Water & Sewer - Water		***2,800,000***	***125,000***	***20,000***		***135,000***	***3,080,000***
Street Repair of WM Breaks & Contract Patching	10 WS	120,000	120,000	140,000	140,000	140,000	*660,000*
Utility - Water & Sewer - Water		***120,000***	***120,000***	***140,000***	***140,000***	***140,000***	***660,000***
Meter Replacement	14-326	3,040,000					*3,040,000*
Utility - Water & Sewer - Water		***3,040,000***					***3,040,000***

City of Burnsville, Minnesota

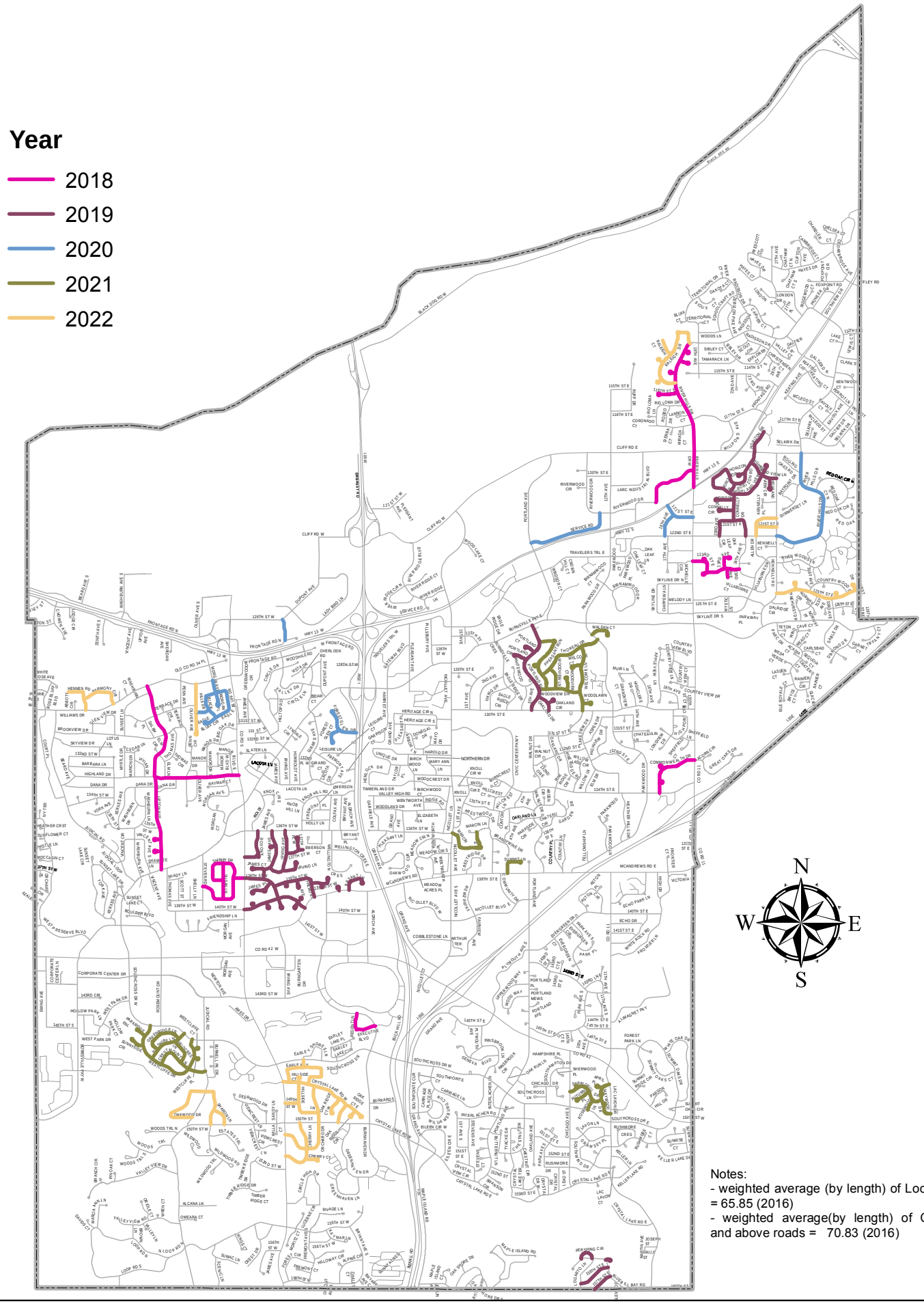
Capital Improvements Plan

2018 thru **2022**

PROJECTS & FUNDING SOURCES BY DEPARTMENT

Department	Project #	2018	2019	2020	2021	2022	Total
Water System Total		**6,485,000**	**2,795,000**	**820,000**	**250,000**	**770,000**	***11,120,000***
GRAND TOTAL		**18,755,000**	**17,090,000**	**9,580,000**	**12,785,000**	**13,325,000**	***71,535,000***

5 YEAR RECONSTRUCTION PLAN



Notes:
- weighted average (by length) of Local Roads = 65.85 (2016)
- weighted average(by length) of Collectors and above roads = 70.83 (2016)

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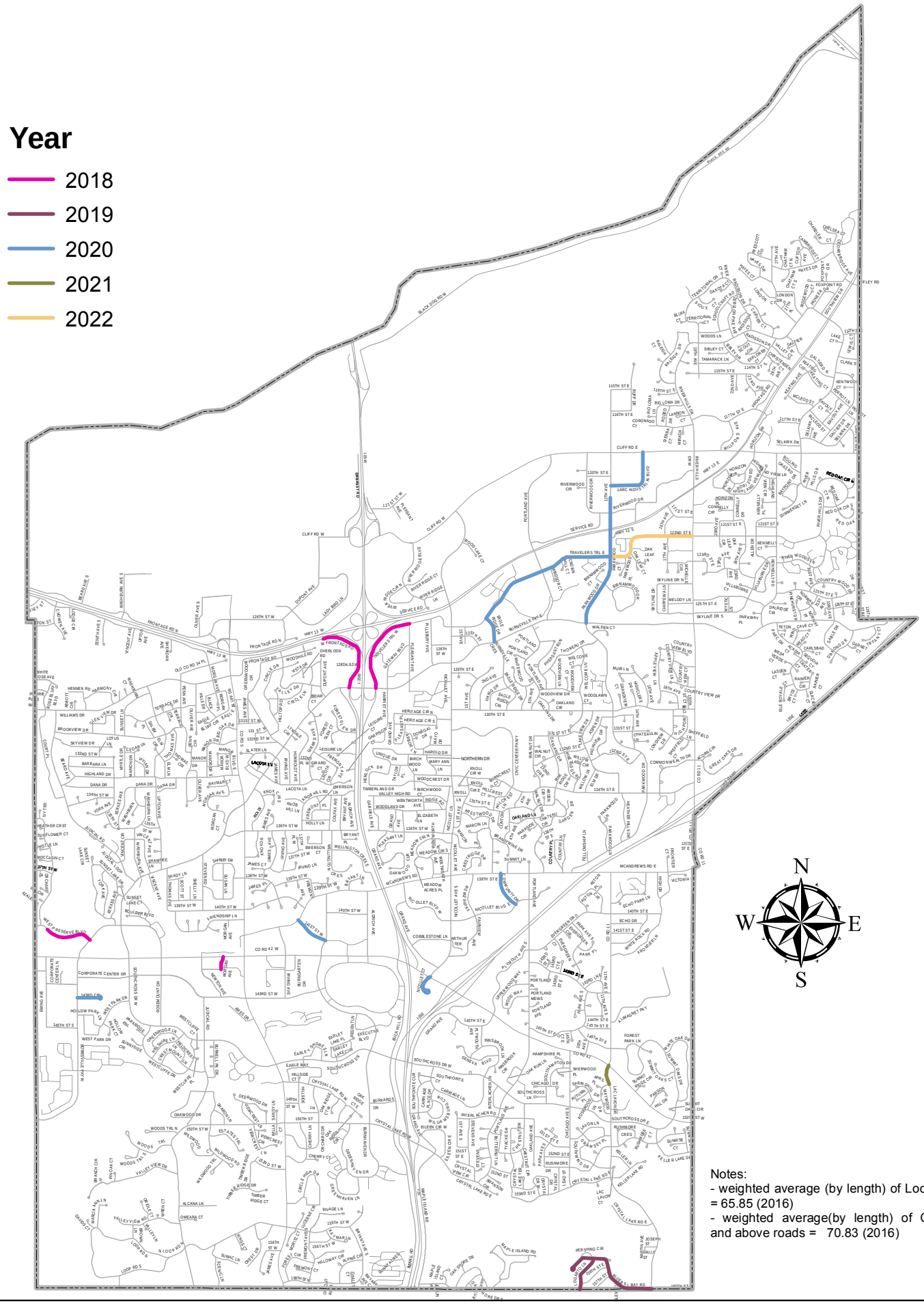
5 YEAR REHABILITATION PLAN



Notes:
- weighted average (by length) of Local Roads = 65.85 (2016)
- weighted average(by length) of Collectors and above roads = 70.83 (2016)

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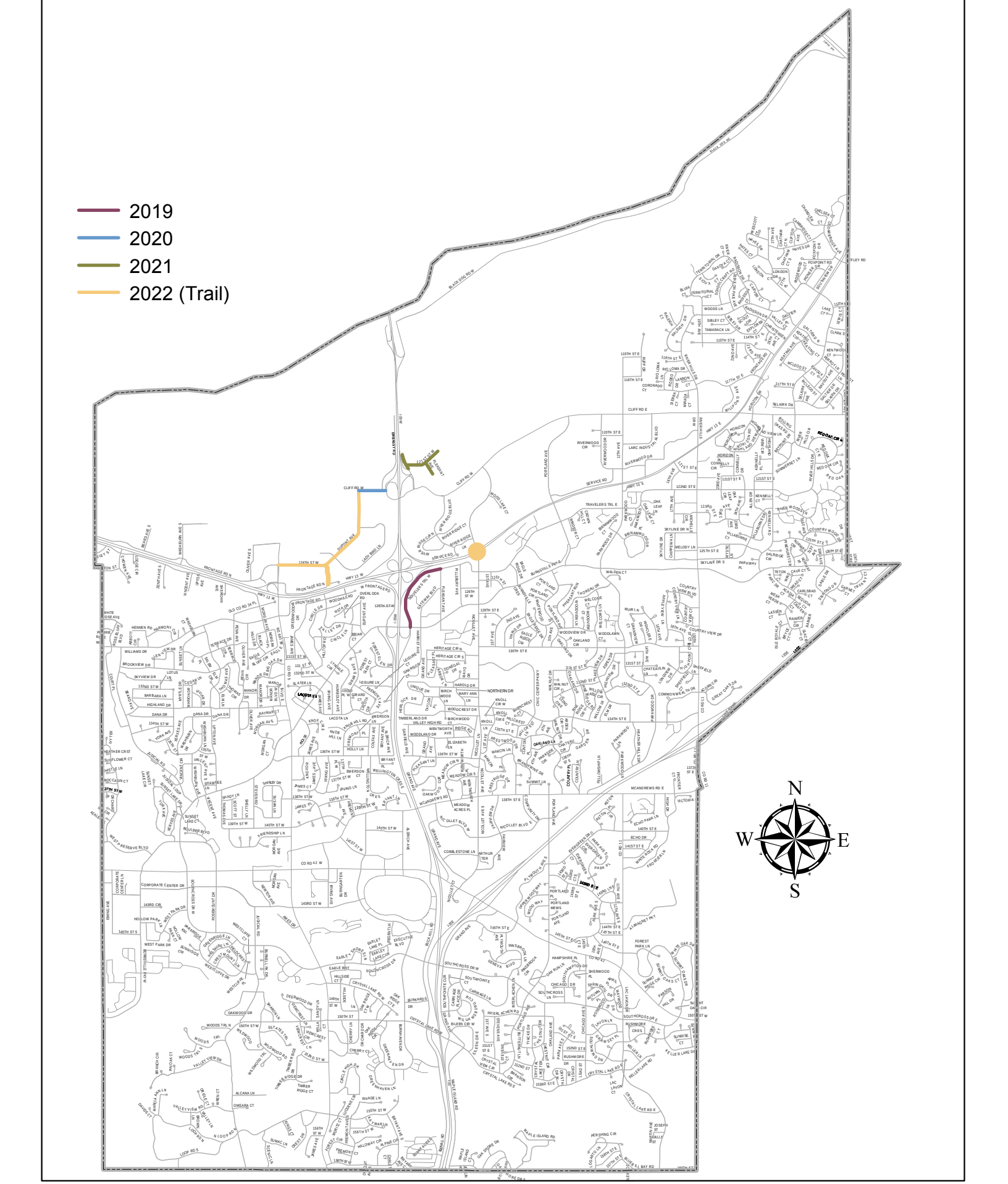
5 YEAR HOST COMMUNITY GRANT PLAN



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City of Burnsville, Minnesota

Capital Improvements Plan

2018 thru **2022**

PROJECTS BY CATEGORY AND DEPARTMENT

Department

Category		2018	2019	2020	2021	2022	Total
Special Revenue Fund							
Cable Franchise Fee Fund							
Upgrade Burnsville.org website		80,000					*80,000*
BCTV Studio Upgrades			100,000	20,000	20,000	20,000	*160,000*
BCTV Equipment				50,000			*50,000*
Computer Equipment - PC		2,600				2,500	*5,100*
Mobile Truck Upgrades		450,000					*450,000*
Field Camera Replacement			15,000				*15,000*
	Category Sub-Total	532,600	115,000	70,000	20,000	22,500	*760,100*
Forestry Fund							
Chipper		50,000					*50,000*
	Category Sub-Total	50,000	—	—	—	—	*50,000*
Sustainability Fund							
Park Recycling Truck		49,500					*49,500*
Park Recycling Containers		20,000					*20,000*
	Category Sub-Total	69,500	—	—	—	—	*69,500*
	Department Total:	**652,100**	**115,000**	**70,000**	**20,000**	**22,500**	***879,600***
	GRAND TOTAL	**652,100**	**115,000**	**70,000**	**20,000**	**22,500**	***879,600***

City of Burnsville, Minnesota

Capital Improvements Plan

2018 thru **2022**

PROJECTS BY CATEGORY AND DEPARTMENT

Department

Category	2018	2019	2020	2021	2022	Total
Parks Capital Fund						
Park Improvements						
Basic Park Amenities	20,000	20,000	20,000	20,000	20,000	*100,000*
Black Dog-Expand Parking Lot					128,125	*128,125*
Sue Fischer Security Improvements		12,915				*12,915*
Black Dog-Parking Lot Security Lights					30,750	*30,750*
Neill Park-Security Improvements				48,431		*48,431*
Terrace Oaks-Security Improvements				16,144		*16,144*
West Buck Hill-Parking Lot Lights		11,583				*11,583*
Howell Crossing	20,000					*20,000*
Sidewalk - Access to Play Equipment	20,000				20,000	*40,000*
Drainage	133,000	100,000				*233,000*
Crystal West Lighting System - Boat Ramp Parking Lot					34,749	*34,749*
Category Sub-Total	193,000	144,498	20,000	84,575	233,624	*675,697*
Park Renovation						
General Park Renovation/Amenities	25,000	25,000	25,000	25,000	25,000	*125,000*
Bituminous/Concrete Surfaces		80,987		1,390,648		*1,471,635*
Borders	67,500	40,000	47,500	60,298		*215,298*
Dugouts		190,000				*190,000*
Fencing	68,040	174,579	44,850	50,776		*338,245*
Hockey Rinks		113,006	150,675	75,338	37,669	*376,688*
Irrigation System			135,608		81,365	*216,973*
Lighting Systems	154,000	23,166	126,189	201,050	46,333	*550,738*
Play Equipment	90,500	232,000	214,500	213,000	280,500	*1,030,500*
Resurface Park Trails	61,663	41,023	26,189	136,152	508,937	*773,964*
Signs	90,405	90,405	165,743			*346,553*
Structures & Buildings		600,000			296,850	*896,850*
Tennis Court Resurfacing	184,500	21,320		42,640		*248,460*
Landscaping	130,000					*130,000*
Category Sub-Total	871,608	1,631,486	936,254	2,194,902	1,276,654	*6,910,904*
Trail System Development						
Kelleher Park Trail-Lake Marion Regional Trailhead	185,000	2,220,000				*2,405,000*
Rose Bluff Trail	680,000					*680,000*
Category Sub-Total	865,000	2,220,000	—	—	—	*3,085,000*
Department Total:	**1,929,608**	**3,995,984**	**956,254**	**2,279,477**	**1,510,278**	***10,671,601***
GRAND TOTAL	**1,929,608**	**3,995,984**	**956,254**	**2,279,477**	**1,510,278**	***10,671,601***

City of Burnsville, Minnesota

Capital Improvements Plan

2018 thru **2022**

PROJECTS BY CATEGORY AND DEPARTMENT

Department

Category	2018	2019	2020	2021	2022	Total
Equipment & Vehicle Fund						
Engineering						
Survey Equipment - Total Station and Data Collector		45,000				*45,000*
Category Sub-Total	—	45,000	—	—	—	*45,000*
Facilities						
Service Van				22,000		*22,000*
Category Sub-Total	—	—	—	22,000	—	*22,000*
Fire						
Ambulances	215,000	220,000		230,000		*665,000*
Fire Chief Vehicle		40,000				*40,000*
Fire Marshall Vehicle	38,500					*38,500*
Fire Training Captain Vehicle				40,000		*40,000*
Fire Truck (Class 9)			833,538			*833,538*
Mini Van			39,000			*39,000*
AED's	10,000	15,000	10,000			*35,000*
Body Armor	16,000					*16,000*
Cardiac Arrest Management (Lucas)		48,000	48,000		48,000	*144,000*
Cardiac Monitor			90,000	90,000		*180,000*
Hazmat Gas Monitors	18,000					*18,000*
Radio Replacement - 800 MHZ	20,000		20,000	20,000		*60,000*
SCBA's		245,000				*245,000*
Stretchers (Cot & Stair Chair)	20,000	20,000		20,000		*60,000*
Thermal Imager E-1	15,000					*15,000*
Thermal Imager E-22		15,000				*15,000*
TRT Equipment				9,000	8,700	*17,700*
Assistant Fire Chief Vehicle				42,000		*42,000*
EMS Director Vehicle	38,500					*38,500*
Ambulance Sterilizer	12,000					*12,000*
Med Vaults					14,000	*14,000*
Rapid Deployable Boat					5,000	*5,000*
Grass Rig					70,000	*70,000*
Category Sub-Total	403,000	603,000	1,040,538	451,000	145,700	*2,643,238*
Fleet						
Service Truck		65,000				*65,000*
Category Sub-Total	—	65,000	—	—	—	*65,000*
Forestry						
Truck (Class 2B)	46,500					*46,500*
Truck (Class 5)				65,000		*65,000*
Utility Cart				16,500		*16,500*

City of Burnsville, Minnesota

Capital Improvements Plan

2018 thru **2022**

PROJECTS BY CATEGORY AND DEPARTMENT

Department

Category	2018	2019	2020	2021	2022	Total
Equipment & Vehicle Fund						
Truck (Class 4)			70,000			*70,000*
Category Sub-Total	46,500	—	70,000	81,500	—	*198,000*
Inspections						
Inspector Vehicle	56,000	29,000	29,500	90,000	30,000	*234,500*
Category Sub-Total	56,000	29,000	29,500	90,000	30,000	*234,500*
Parks						
Rotary Mower (6')	40,000					*40,000*
Truck (Class 2A)		36,000				*36,000*
Truck (Class 2B)	48,500		38,500	39,000		*126,000*
Truck (Class 3)		34,500				*34,500*
Truck (Class 4)	65,000				75,000	*140,000*
Truck (Class 5)		65,500				*65,500*
Service Truck	75,000					*75,000*
Grounds master				90,000	92,000	*182,000*
Leaf/Grass VacTrailer System		25,000				*25,000*
Sweeper		35,000				*35,000*
Rotary Mowers (16')					117,000	*117,000*
Top Dresser		20,000				*20,000*
Tractor		50,000	50,000			*100,000*
Utility Cart	27,000	65,000		49,000		*141,000*
Water Truck (Class 7)				200,000		*200,000*
Groomer				8,000		*8,000*
Garbage Truck (Class 5)					100,000	*100,000*
Skid Loader					70,000	*70,000*
Trailer					18,000	*18,000*
Category Sub-Total	255,500	331,000	88,500	386,000	472,000	*1,533,000*
Police						
Patrol Squad Vehicles	218,500	220,500	222,500	224,500	226,500	*1,112,500*
Police Portable Radios w/ encryption		400,000				*400,000*
Police Mobile Radios w/encryption				260,000		*260,000*
Drug Task Force Vehicle				30,000	30,500	*60,500*
Glue Chamber		15,000				*15,000*
Alternative Light Source				10,500		*10,500*
Addition Investigation Vehicle	30,000					*30,000*
Patrol CSO Vehicle			40,000			*40,000*
Investigations Vehicle	110,500	60,000	61,000		33,500	*265,000*
Mini Van Transport Vehicle	30,000					*30,000*
Support Services Vehicles		38,000		30,000		*68,000*
Category Sub-Total	389,000	733,500	323,500	555,000	290,500	*2,291,500*

City of Burnsville, Minnesota

Capital Improvements Plan

2018 thru **2022**

PROJECTS BY CATEGORY AND DEPARTMENT

Department

Category	2018	2019	2020	2021	2022	Total
Equipment & Vehicle Fund						
Recreation						
Mini Van					27,000	*27,000*
Category Sub-Total	—	—	—	—	27,000	*27,000*
Streets						
Truck (Class 7)	240,000	245,000	245,000	250,000		*980,000*
Truck (Class 2B)		50,000				*50,000*
Truck (Class 4)	70,000					*70,000*
Grader Replacement w/ Truck (Class 7)	240,000					*240,000*
Loader			250,000	255,000		*505,000*
Pavement Planer			50,000			*50,000*
Sidewalk Plow w/attachments		150,000				*150,000*
Heavy Duty Forks			8,000			*8,000*
Truck (Class 8)					260,000	*260,000*
Category Sub-Total	550,000	445,000	553,000	505,000	260,000	*2,313,000*
Department Total:	**1,700,000**	**2,251,500**	**2,105,038**	**2,090,500**	**1,225,200**	**9,372,238**
GRAND TOTAL	**1,700,000**	**2,251,500**	**2,105,038**	**2,090,500**	**1,225,200**	***9,372,238***

City of Burnsville, Minnesota

Capital Improvements Plan

2018 thru **2022**

PROJECTS BY CATEGORY AND DEPARTMENT

Department

Category	2018	2019	2020	2021	2022	Total
Facilities Fund						
City Hall/Police						
Acoustical Ceiling Replacement	10,000		10,000		10,000	*30,000*
Card access system replacement			20,000			*20,000*
Carpet replacement - Council Chambers			13,000			*13,000*
Replace Sidewalk/Patio Concrete	7,700					*7,700*
VCT Tile Replacement-CR,LR,FT			31,700			*31,700*
Wallpaper City Hall/Police	12,000	12,000				*24,000*
Wallpaper Community Room/Lobby	17,600					*17,600*
Front doors & hardware (2) repl City Hall side		20,000				*20,000*
Chiller					100,000	*100,000*
Replace lower level bathroom stall panels	15,000					*15,000*
Transfer fan and controls for 3 electric					4,500	*4,500*
City Hall Renovation of vacated BAC space	80,000					*80,000*
Clean Brick					1,100	*1,100*
ADA Compliant Sinks (7)					6,400	*6,400*
Energy Management System Upgrades					15,000	*15,000*
Fuel Oil Leak Detection System					2,500	*2,500*
Hot Water Baseboard Heater for Restroom					3,000	*3,000*
Investigate and Correct Building Pressure Issues		15,000			5,000	*20,000*
Replace center guardrail on all stairs				10,000		*10,000*
Category Sub-Total	142,300	47,000	74,700	10,000	147,500	*421,500*
Civic Center City Garage						
Tuck Point Brick Work (20,500 Sq Ft)				307,500		*307,500*
Acoustical Ceiling Tile Replacement		7,900				*7,900*
Fire Alarm System Upgrade/Replacement		17,000				*17,000*
Furnace Replacement	10,000					*10,000*
Main Switchboard and Electrical Panels Repl			58,000			*58,000*
Roof Replacement		475,000				*475,000*
Ventilation Code Issues in Bays 1-18			130,000			*130,000*
Window Replacements (12)		12,000				*12,000*
Category Sub-Total	10,000	511,900	188,000	307,500	—	*1,017,400*
Fire Stations						
Privacy Fence - FS2	20,000					*20,000*
Acoustical Ceiling Tile Replacement			21,500			*21,500*
Bay Doors		80,000				*80,000*
Carpet Replacement FS1	25,000					*25,000*
Exterior Brickwork Sealing	14,000					*14,000*
Fire Alarm Panel			15,000	15,000		*30,000*
Garage Door Replacement	30,000		60,000			*90,000*
Garage Door Opener Replacement			6,000	6,000	6,000	*18,000*
HVAC Bay Heater Replacement - FS2		24,000				*24,000*
Lighting Exterior Replacement			2,000			*2,000*

City of Burnsville, Minnesota

Capital Improvements Plan

2018 thru **2022**

PROJECTS BY CATEGORY AND DEPARTMENT

Department

Category	2018	2019	2020	2021	2022	Total
Facilities Fund						
Lighting Upgrade for Living Quarters - FS1		16,500				*16,500*
Main Switchboard, Elec Panels & Sep Zones Repl			48,000			*48,000*
Remodel Public Bathroom/Entry FS1		13,000				*13,000*
Roof - FS1		100,000				*100,000*
Sidewalk/Patio Repair/Replacement			14,000			*14,000*
Tuck Point Brick Work (4575 sq ft) - FS1		68,700				*68,700*
MAN Door Interior & Exterior		21,000				*21,000*
Category Sub-Total	89,000	323,200	166,500	21,000	6,000	*605,700*
HOC Parking Deck/Ramp						
Parking Ramp Concrete Sealant			40,000	32,500	32,500	*105,000*
Parking Deck Traffic Membrane (recoat or replace)		215,000				*215,000*
Parking Deck Surface Lot			3,500			*3,500*
Parking Ramp Mechanical Systems			60,000			*60,000*
Parapet Wall Railing	60,000					*60,000*
Category Sub-Total	60,000	215,000	103,500	32,500	32,500	*443,500*
IT Technology						
IT Data Center Cooling Units		25,000				*25,000*
Category Sub-Total	—	25,000	—	—	—	*25,000*
Maintenance Facility						
Exhaust Fans Roof Top (20) Phase 1		10,000				*10,000*
Garage Door Replacements		70,000	29,000			*99,000*
Generator Transfer Switch Replacement		20,000				*20,000*
Hoist Light Equipment Replacement		8,000				*8,000*
Hoist Twin Post Truck Replacement	145,000					*145,000*
Make Up Air Systems (5) Replacements-Phase 1		120,000				*120,000*
Drain Replacements		30,000				*30,000*
HVAC Digital Control System Upgrade				155,300		*155,300*
Pressure Washer Replacements (2)				15,000		*15,000*
Salt Brine Making System Upgrade		40,000				*40,000*
Category Sub-Total	145,000	298,000	29,000	170,300	—	*642,300*
Parking Lots						
Seal Coat/Crack Sealing - City Hall				22,000		*22,000*
Seal Coat/Crack Sealing - Civic Center			3,000	5,000		*8,000*
Seal Coat/Crack Sealing - Civic Center Arena Side				4,500	25,000	*29,500*
Seal Coat/Crack Sealing - Fire Stations		10,000			10,000	*20,000*
Parking Lot Resurfacing & Striping - Fire Station					10,000	*10,000*
Ice Center Parking Lot					575,000	*575,000*
Category Sub-Total	—	10,000	3,000	31,500	620,000	*664,500*

City of Burnsville, Minnesota

Capital Improvements Plan

2018 thru **2022**

PROJECTS BY CATEGORY AND DEPARTMENT

Department

Category	2018	2019	2020	2021	2022	Total
Facilities Fund						
Fire						
Phase II	—	—	—	—	11,900,000	*11,900,000*
Category Sub-Total	—	—	—	—	11,900,000	*11,900,000*
Department Total:	**446,300**	**1,430,100**	**564,700**	**572,800**	**12,706,000**	**15,719,900**
GRAND TOTAL	**446,300**	**1,430,100**	**564,700**	**572,800**	**12,706,000**	***15,719,900***

City of Burnsville, Minnesota

Capital Improvements Plan

2018 thru **2022**

PROJECTS BY CATEGORY AND DEPARTMENT

Department

Category	2018	2019	2020	2021	2022	Total
IT Capital Fund						
Community Development						
CD System Replacement RFP Dev/Sys Repl		25,000	300,000	125,000		*450,000*
CRW License Additions	2,200	2,200	2,200	2,200	2,200	*11,000*
Cradlepoint ibr1100 Broadband Mobile Modems					10,000	*10,000*
Tablet Replacements for all Field Staff			18,000			*18,000*
Category Sub-Total	2,200	27,200	320,200	127,200	12,200	*489,000*
Document Imaging / Management						
EDMS Scanner Additions	3,500	3,500			3,500	*10,500*
EDMS Scanner Replacements	6,000	7,000	6,000	6,000	6,000	*31,000*
EDMS Rio Named User License Additions	11,000	11,000	6,600	6,600	6,600	*41,800*
Category Sub-Total	20,500	21,500	12,600	12,600	16,100	*83,300*
ERMS System Development						
ERMS Misc Modules for Adl Dev w/Finance System	10,000				15,000	*25,000*
Category Sub-Total	10,000	—	—	—	15,000	*25,000*
Fire Computer Equipment						
Skype Teleconference Equip for FS 1&2, Admin	3,000					*3,000*
Laptop Computers for SAFER Grant				20,000		*20,000*
PC's for SAFER Grant					4,000	*4,000*
Mounting Equipment Replacements/Add	4,000	4,000	5,000	2,000	2,000	*17,000*
EMS Tablet Replacements	7,000	7,000	7,400	7,400	7,400	*36,200*
Cradlepoint ibr600 Broadband Mobile Modems	3,200	1,600			4,200	*9,000*
TriTech CAD/AVL Monitor Replacements					10,000	*10,000*
Axon POV Cameras Equip Misc Addn Sch	3,000	6,000	1,500	1,500	1,500	*13,500*
MDC Replacements with CF-53	7,000	14,000	14,000	14,000	14,000	*63,000*
CAD Status Monitors					7,500	*7,500*
Category Sub-Total	27,200	32,600	27,900	44,900	50,600	*183,200*
GIS Equipment						
Plotter Replacement for City Hall & Maint					25,000	*25,000*
GIS Strategic Plan - GPS/Tablets yr 1	5,000	5,000	*5,000*	5,000	5,000	*25,000*
Category Sub-Total	5,000	5,000	5,000	5,000	30,000	*50,000*
GIS Software						
GIS Strategic Plan ELA	35,000	35,000	35,000	35,000	35,000	*175,000*
Category Sub-Total	35,000	35,000	35,000	35,000	35,000	*175,000*
IT Infrastructure						
Cisco Switch Replacements		80,000		40,000	20,000	*140,000*
Data Backup DR Appliance				85,000		*85,000*
Load Balancer for VD, Vmware Environment	35,000					*35,000*
A/V Projector Replacement Schedule	8,000	8,000	8,000	8,000	8,000	*40,000*
Digital Signature Appliance			15,000			*15,000*
IT Rack Replacements	3,000	1,500	1,500	1,500	1,500	*9,000*

City of Burnsville, Minnesota

Capital Improvements Plan

2018 thru **2022**

PROJECTS BY CATEGORY AND DEPARTMENT

Department

Category	2018	2019	2020	2021	2022	Total
IT Capital Fund						
SAN Node Additions Tier 1 & 2 storage		60,000	60,000			*120,000*
UPS Scheduled Replacements-Ck dates of unit	5,000	5,000	5,000	5,000	5,000	*25,000*
APC 40KVM UPS Battery Replacement for IT MER 1			6,000			*6,000*
VM Software Licensing, Addl Horizon & EsXi Hosts	6,250	5,000			5,000	*16,250*
Wireless AP Replacement/Adds	4,000	4,000	4,000	4,000	4,000	*20,000*
Mitel Phone System Add-on's Conf Phones			7,800			*7,800*
Mitel Phone Sys Add-on's-phones,handsets,headsets	5,000	3,500	3,500	3,500	3,500	*19,000*
Mitel Phone System Licenses	10,000					*10,000*
EOC Portable 3 Phase Power Trailer Hook Up-IT Data	7,000					*7,000*
Category Sub-Total	83,250	167,000	110,800	147,000	47,000	*555,050*
Mobile Command IT Equipment						
Display Replacements		2,000				*2,000*
Router/Firewall Replacement			15,000			*15,000*
IP Phone System	7,500					*7,500*
UPS Replacements		3,000				*3,000*
Laptop Replacements (4)				12,500		*12,500*
Mobile Cameras					15,000	*15,000*
Server Replacement					8,000	*8,000*
Category Sub-Total	7,500	5,000	15,000	12,500	23,000	*63,000*
PC Computers						
PC Replacements - VDI Thin Clients	33,000	55,000	55,000	55,000	55,000	*253,000*
Server Replacements	15,000	15,000	15,000		85,000	*130,000*
Printer Replacements	1,400	1,400	1,400	1,400	1,400	*7,000*
Tablet/Smartphone Replacements	8,000	8,000	3,750	3,750	3,750	*27,250*
Shared Laptop Replacements	5,400	5,400	5,400	5,400	5,400	*27,000*
EOC/Training Cart Laptop Replacements		17,600				*17,600*
Mobile Devices for Streets Staff	10,500	3,500	10,500		10,500	*35,000*
Mobile Devices for Engineering Staff	14,000	14,000			14,000	*42,000*
Mobile Devices for Parks Staff	14,000	10,500	10,500		14,000	*49,000*
Mobile Devices for Forestry Staff		7,000				*7,000*
Mounting Options	4,800	8,000				*12,800*
Laptop for City Engineer w/docking station			5,000			*5,000*
Category Sub-Total	106,100	145,400	106,550	65,550	189,050	*612,650*
Police Computer						
MDC Replacements - Toughbook C-F 54	30,400	30,400	38,000	38,000	38,000	*174,800*
MDC Mounting Equipment Replacements	4,500	4,500	4,500	4,500	4,500	*22,500*
Cradlepoint ibr1100 Broadband Mobile Modems	1,400	1,400	1,400	1,400	1,400	*7,000*
Pentex PocketJet 6 Mobile Printer Replacements	700	700	700	700	700	*3,500*
Rimage Media Duplicator Replacement				16,000		*16,000*
TriTech CAD/AVL Monitor Replacements					10,000	*10,000*
Forensics Recovery of Evidence Device (FRED)	6,500			6,500		*13,000*
ALPR POC test for Patrol Vehicle			24,000			*24,000*
APS Citation Licenses	2,000					*2,000*

City of Burnsville, Minnesota

Capital Improvements Plan

2018 thru **2022**

PROJECTS BY CATEGORY AND DEPARTMENT

Department

Category	2018	2019	2020	2021	2022	Total
IT Capital Fund						
i2 Analyst Notebook software		3,500				*3,500*
Category Sub-Total	45,500	40,500	68,600	67,100	54,600	*276,300*
Recreation Software						
POS Replacements	4,500		28,000		2,500	*35,000*
ID Badge Printer Replacements			3,000		5,000	*8,000*
Category Sub-Total	4,500	—	31,000	—	7,500	*43,000*
Security Systems						
ABLE Camera Power/Network Box Repl's	10,000					*10,000*
Security Camera Replacements		10,000				*10,000*
Security Camera Replacements - Golf/Garage				20,000		*20,000*
Addl Camera, Prox Readers for Facilities	25,000	15,000	10,000	10,000	25,000	*85,000*
Security Camera Replacements at PAC			40,000			*40,000*
Security Camera Repl at Ice Center	21,000					*21,000*
Category Sub-Total	56,000	25,000	50,000	30,000	25,000	*186,000*
Software						
DataCenter EA Addition	15,000					*15,000*
Addl Servers Lic & Misc Software	7,500		7,500	7,500	7,500	*30,000*
Adobe Acrobat Pro Addl License	1,875	1,875	1,500	1,500	1,500	*8,250*
MS SA for SQL, Srv, per core	5,000	5,500	15,000		15,000	*40,500*
O365 2016 Agreement Additions	6,000					*6,000*
Category Sub-Total	35,375	7,375	24,000	9,000	24,000	*99,750*
Department Total:	**438,125**	**511,575**	**806,650**	**555,850**	**529,050**	***2,841,250***
GRAND TOTAL	**438,125**	**511,575**	**806,650**	**555,850**	**529,050**	***2,841,250***

City of Burnsville, Minnesota

Capital Improvements Plan

2018 thru **2022**

PROJECTS BY CATEGORY AND DEPARTMENT

Department

Category	2018	2019	2020	2021	2022	Total
Enterprise Funds						
Ames Center						
Building improvements	110,000	17,500	55,000	62,500	55,000	*300,000*
Building equipment	145,000	217,500	180,000	330,392	200,000	*1,072,892*
Category Sub-Total	255,000	235,000	235,000	392,892	255,000	*1,372,892*
Golf Course						
Rotary Tri-Deck Mower		32,000				*32,000*
Parking lot replacement			142,000			*142,000*
Utility cart				22,000		*22,000*
Reel Mower					32,500	*32,500*
Category Sub-Total	—	32,000	142,000	22,000	32,500	*228,500*
Ice Center						
Bleacher replacement			90,000			*90,000*
Roof replacement - barrel & flat roof	700,000					*700,000*
Rubber flooring replacement				125,000		*125,000*
Battery Replacement for Zamboni	30,000					*30,000*
Heating System for Rink 2			40,000			*40,000*
Wood Exterior-Clean, Replace, Repair & Stain	60,000					*60,000*
Desicant Dehumidification wheels for units DH & ER					80,000	*80,000*
Accessibility Improvements - Rink 1	300,000					*300,000*
Category Sub-Total	1,090,000	—	130,000	125,000	80,000	*1,425,000*
Storm Water Management						
Public works projects - storm water	1,730,000	2,280,000	2,620,000	1,845,000	2,715,000	*11,190,000*
Vehicles - storm water			226,000	338,000	40,000	*604,000*
Category Sub-Total	1,730,000	2,280,000	2,846,000	2,183,000	2,755,000	*11,794,000*
Street Lighting						
Public works projects - street lighting	170,000	170,000	170,000	170,000	170,000	*850,000*
Category Sub-Total	170,000	170,000	170,000	170,000	170,000	*850,000*
Water & Sewer						
Public works projects - water	9,035,000	5,455,000	935,000	2,365,000	2,660,000	*20,450,000*
Public works projects - sanitary sewer	485,000	1,095,000	600,000	1,580,000	825,000	*4,585,000*
Vehicles/Equipment - water	192,000		30,000	149,000		*371,000*
Vehicles/Equipment - sanitary sewer			65,000	65,000		*130,000*
IT Infrastructure	56,000					*56,000*
Category Sub-Total	9,768,000	6,550,000	1,630,000	4,159,000	3,485,000	*25,592,000*
Department Total:	**13,013,000**	**9,267,000**	**5,153,000**	**7,051,892**	**6,777,500**	***41,262,392***
GRAND TOTAL	**13,013,000**	**9,267,000**	**5,153,000**	**7,051,892**	**6,777,500**	***41,262,392***

City of Burnsville, Minnesota
Capital Improvements Plan
2018 thru 2022
NARRATIVE

GENERAL FUND

35W/Burnsville Parkway Aesthetics Renovations - In the early 2000's the City worked with MnDOT to place aesthetic features on the Burnsville Parkway and TH 13 bridges over I-35W. The City has completed repairs to the lighting system on the Burnsville Parkway bridge and removed the lighting from the TH 13 bridge. Items needing further renovation include the arches and the decorative elements such as the bull horns and wrought iron elements. MnDOT is planning for work on this bridge in a future year. The City's aesthetic elements should be completed simultaneously to reduce the cost and impact to users. Council has discussed removing the elements from the TH 13 bridge instead of renovating them when they become too worn or a safety hazard.

COLLECTOR & THOROUGHFARE EXPENDITURES

County Road 42 Pedestrian Study - In 2015 Dakota County Transportation attempted to develop plans to replace and/or remove traffic signals in the County Road 42 corridor from Southcross Drive in Burnsville to Garden View Drive in Apple Valley. Dakota County has proposed to remove some signals in this area. However, the question of how pedestrians may cross County Road 42 has arisen if signal systems are removed. This study will attempt to answer this question and determine other impacts of signals being removed.

County Overlays - When Dakota County resurfaces its roadways it is the best time for the City to improve its utility structures on those roadways. Therefore, the City budgets an annual allotment of money to pay for repairing and improving its utility structures so it can react when Dakota County chooses to resurface a county road in Burnsville. The City does not pay for any of the street improvements.

Cliff Road Trail Extension - This federal aid project will construct a trail on the north side of Cliff Road between TH 13 and Cinnamon Ridge Trail in Eagan. This project will provide a key pedestrian way for residents east of TH 13 to the MVTA bus stop at TH 13/Cliff Road and another trail connection for the City.

Street Trail Rehabilitation - The City has several miles of trail adjacent to county highways that the City is responsible for maintaining. Dakota County assists in rehabilitation/replacement of these trails when they have used their useful life up. This project funds the City's portion of these trail rehabilitation/replacement projects.

INTERSECTION IMPROVEMENT

City Owned Signal Replacement - This project budgets and plans for future traffic signal improvements throughout the City. Currently the City has a total of 21 traffic signal systems. In addition there are 29 Dakota County owned signal systems and 17 State owned signal systems within the City.

County Signal Replacement - This project is for signals owned by Dakota County that are proposed to be replaced annualy. The City will pay for the number of legs or portion of the signal that are located on City roadways.

MnDOT Signal Replacement - This project is for signals owned by MnDOT that are proposed to be replaced. The City will pay for their portion of the cost in accordance with the MnDOT cost sharing policy.

Pedestrian Bridge at Nicollet Ave and TH 13 - This project is for the installation of a grade separated pedestrian crossing of TH 13 at Nicollet Avenue and potentially crossing of Nicollet Ave at TH 13. The grade separated crossing is eligible for application of federal funding up to 80% or $5M of the project costs with the remainder being funded by the City and Dakota County. The City will apply in the next federal funding solicitation for transportation projects. MVTA, Dakota County, and Metro Transit have all expressed interest in having the pedestrian bridge.

Cliff Road Interchange Freight Improvements - This project is for the realignment of the western loop of the interchange at Cliff Rd and TH 13. The improvements include a roundabout and a new street connection running through the southern area of the old Knox Lumber site. This project is eligible for a 20% match under the Minnesota Highway Freight Program. The remainder of the project cost would be shared between the City, Dakota County and potentially State of Minnesota Host Community Landfill Grant program.

SANITARY SEWER SYSTEM MANAGEMENT

Lift Station Rehabilitation - This program includes projects to rehabilitate the 13 sanitary sewer lift stations (LS) and installation of emergency generators when necessary. The intent of this program is to reduce the number of emergency failures and backups within the sewer system. The City continues on with this program as laid out in our Sanitary Sewer LS Condition Assessment.

Sanitary Sewer Rehabilitation - This program is to rehabilitate sanitary sewer lines in known trouble areas and areas in which root intrusion causes extensive maintenance and backups. Similar work is done within street project areas and this program funds work within areas not scheduled for a street project in the near future or more extensive work within the street project areas. The increase in funding in later years of the plans reflects the age of the gravity sewer system and the need for more end to end lining and replacement within the system.

STORM WATER MANAGEMENT

Lateral Drainage Modifications - Each year the City works in various areas of the City to improve smaller local drainage issues. The project is not used for regarding of private drainage nuisances or installation of drain tiles on private property, except where drainage problems have resulted in surface water runoff entering structures. It is also used to repair drainage issues on City owned property.

Pond Clean Out/Outfall Improvement Program - The program is for removal of sediment that has accumulated in ponds and for maintenance of pond outfall structures.

Lift Station Rehab - Routinely the City schedules lift station (LS) improvements as a preventative maintenance program. This includes repair or replacement of the lift station and installation of an emergency generator when necessary. The City continues on with this program as laid out in our Storm Sewer LS Condition Assessment.

Trout Stream #4 Restoration Development Cost Sharing - The MnDNR and MN Trout Unlimited are considering rehabilitating a trout stream near the Cedarbridge area in an existing stream. The City may need to make storm sewer and drainage improvements in the existing system to help the stream become a viable trout habitat. This project is not being lead by the City but may include some improvements to the City's drainage system or be used for cost sharing on the project.

Private Pond Maintenance Options Study and Report - This study will investigate and provide recommendations for private pond maintenance. Pond maintenance for privately owned ponds is the responsibility of the owner(s). The frequency and quality of maintenance done by private pond owners varies greatly. One option would be to develop a tracking system of private ponds/owners to ensure ponds are maintained privately. Another option would be for the City to target pond maintenance where most beneficial to

public waters and take on those activities if approval from the pond owner is obtained. Perhaps another option is to develop Maintenance of private facilities, whether done privately or publicly will benefit water quality in public waters.

Hydrologic and Hydraulic Model Evaluation Update - This will be an analysis based on the City's storm water model developed with the recent Water Resources Management Plan update to determine high water levels and emergency overflow elevations for the major drainage areas in the City to analyze the risk of flooding. Areas with high risk of flooding would be analyzed further for recommended improvements to minimize risk of flooding of private buildings.

Resiliency Assessment of Major Drainage Systems - This assessment includes a review of the City's major drainage system to identify areas where failure of the system would necessitate expensive repair in a short time and/or where failure of the system would cause significant damage to private buildings. These high risk areas will be identified to aid staff in planning future improvements.

Resiliency Improvements - This project is to provide improvements for the highest risk systems identified through the resiliency assessment of major drainage systems.

Keller Lake to Minnesota River Water Level Hydrologic and Hydraulic Analysis and Report - This analysis and report is for a study of the chain of water bodies that starts at Keller Lake and ends at the Minnesota River. This report will identify any adjustments that could be made to optimized normal/high water levels of the water bodies in the system without having negative affects of water levels on other water bodies in the system. This has been an area of concern/complaint for many years by land owners on these water bodies.

Kraemer Mining and Materials Levee Inspection and Report - This project includes inspecting the levee located at Kraemer Mining and Materials and summarizing the findings in a report. This report will help the City evaluate if any improvements are needed to the levee.

Minnesota River Quadrant (MRQ) Storm Water and Floodplain Study and Report - This study will analyze the overall storm water management system needs for the MRQ to accommodate future development. The report will guide the review of future developments in the MRQ to optimize the location of future stormwater management facilities.

Keller Lake Use Attainability Analysis - This analysis is based on a study of the lake's water chemistry and biology. This study would be used to determine an appropriate goal for water clarity in the lake and potentially identify measures that can be taken to achieve this goal. The current goal is not feasible because of the basin and watershed characteristics.

Bluff Area Risk Analysis - This analysis consists of a study of the bluffs within the City to identify areas where the risk of failure is high or the failure of which would lead to public safety risk or create a significant expense in a short time. This study would aid in the planning of related improvements in future capital improvement plans and future maintenance operations to proactively prevent slope failure.

TMDL and Water Quality Best Management Practices CIP Maintenance Plan - This plan is to identify maintenance of already installed stormwater management improvements meant to improve water quality in lakes and rivers. Maintenance of these improvements is critical to ensure they continue to function adequately.

WRMP Update -The Water Resources Management Plan (WRMP) guides and helps plan for water resources management activities within the City. The WRMP is required to be updated periodically and approved by the applicable watersheds and the Metropolitan Council. The City is completing a major update to the WRMP in 2017 and anticipates a minor update will be required in in 2021.

Ravine Restoration - The City has several steep ravines that are in various states of erosion. This project will target which ravines are most in need of maintenance and then fund their repair to prevent loss of soils retaining property values and reduce offsite deposit of these soils.

CMP Rehab - The City owns a significant amount of corrugated metal pipe storm sewers. This type of pipe is subject to rusting through providing holes for sediment to get into the storm system. This results in the downstream soil deposits and sink holes or other soil loss in the area of the hole. This project will allow for televising the condition of these pipes and then rehabilitating them by replacement or interior lining.

Alum Treatment - The Aluminum Treatment is a triennial project involving the treatment of the bottom of ponds with Aluminum Sulfate (Alum). The alum ties up the phosphorous in the pond sediment and prevents it from releasing into the water column thereby reducing algae growth.

Street Project Storm Sewer Televising - The City televises its storm sewer pipes in the following year's street improvement areas to understand if these pipes are failing or if there are any obstructions in them. If issues are discovered, improvements are designed for in the construction plans.

Future Ponds/Water Quality - Due to ongoing and ever increasing regulations for stormwater quality, it is likely that ponds or other stormwater improvements will be necessary in later years of the capital improvement plan. This allows for a placeholder for those future improvements. Ponds/stormwater improvements will only be constructed if necessary.

Contract Patching - Each year there are several drainage structures in Burnsville that need repair that aren't in the street reconstruction or rehabilitation project. These structures are repaired with this project.

Neill and Alimagnet Park Drainage Improvements - This project is for drainage improvements in Neill and Alimagnet Park. In July 2017 a drainage and park improvement study was completed for Neill and Alimagnet Park. Improvement needs were identified. This project provides those improvements and will be done in conjunction with the identified park improvements.

Bicentennial Park Outlet Repair - The storm sewer outlet in Bicentennial Park to pond C16-B outlets across a grass area and path resulting in erosion. This repair is scheduled to be completed with the Bicentennial Park project in 2018.

STREET PROJECTS

Street Rehabilitation -This project includes the annual program to mill and overlay selected streets in the City's street system. Spot replacement of curb and gutter and sidewalk is performed and minor utility repair/replacement is also completed with these projects.

A copy of the City's 2018-2022 proposed street rehabilitation map is included in the Maps section of the CIP. Selection of street segments is based upon the City's Pavement Management Program and engineering/maintenance staff's recommendation. Streets typically rehabilitated are in excess of 20 years old and are in need of rehabilitation, so total reconstruction can be avoided for another 15 years. Funding for the annual program is based upon the Special Assessment Policy and assumes that 40% of the street costs will be assessed to benefiting properties. The remainder of the project costs are paid by other funds.

Street Reconstruction - The project includes the annual replacement of a portion of the City's street system. A project is determined to be either Street Reconstruction or Street Reclamation through development of the project's preliminary report. Street reconstruction generally is replacement of the roadway pavement and base, large sections

curbs and has a significant underground utility replacement component. Street reclamation generally is replacement of the roadway pavement and base, but a majority of the curb is retained in place and may have some underground utility component, but generally not replacement of an underground utility throughout the project area.

A copy of the City's 2018-2022 proposed reconstruction map is included in the Maps section of the CIP. Selection of street segments is based upon the City's Pavement Management Program and engineering/maintenance staff's recommendation. Streets typically reconstructed and reclaimed are in excess of 30 years old and are in need of total replacement. Funding for the annual program is based upon the Special Assessment Policy and assumes that 40% of the street costs will be assessed to benefiting properties. The remainder of the project project costs are paid by other funds.

Street Light Replacement - This project will replace existing street lights. The lights to be replaced will be identified annually by the Public Works Department. Many of the lights replaced are located in the current year's street reconstruction and rehabilitation programs.

Maintenance Overlays - This project includes a mill and overlay on residential streets after that were reconstructed 20 to 30 years ago to extend the service life of the pavement to 40 years or more. The funding for this project is not expected to include special assessments.

Right of Way Rehabilitation - Concrete Elements - The City owns many assets in the right of way made out of concrete that are not addressed for maintenance in other ways. The two primary needs are retaining walls and concrete intersections. This project is an every other effort to keep these elements maintained.

Multi-Modal Transportation - This annual project addresses needs in the transportation system that provide other options to transportation stakeholders such as pedestrians, bicyclists and transit users. The funding amount does not allow for a major improvement to be made, but allows for localized improvements to be made or studies to be performed that will assist these alternate transportation users.

Rectangular Rapid Flash Beacon (RRFB) Installation - This project installs RRFBs in locations that currently do not have them but need them in order to meet the requirements of the City's pedestrian crosswalk policy. In early 2017 the City adopted an updated pedestrian crosswalk policy. The existing pedestrian crosswalk locations were analyzed to recommend improvements to bring them up to the adopted standards. RRFBs were identified as recommended improvements.

Host Landfill Grant Projects - The State of Minnesota through the Department of Employment and Economic Development has created a grant program specifically for metro cities that currently host active landfills. There is no guarantee that this program will be continued each year, but the City will continue to apply for these grants each year as long as the funding is available. The City is eligible for approximately $415,000 annually through this grant process if the specified project meets certain job creation goals. The City has identified projects as shown on the Maps section of the CIP that are good candidates for this project. For 2018 the City has identified improvements to Travelers Trail between the future Orange Line Stations. These improvements include rehabilitation of Travelers Trail, addition of sidewalks and on-street parking.

WATER SYSTEM PROJECTS

Water Production Rehab - This is a preventative maintenance program for the City's water production infrastructure. This involves rotating evaluation and rehabilitation projects of the City's 17 groundwater wells and 2 surface water pumps including the pumps, motors, well cavities, well piping and valves, well houses and power systems. Annually projects are bid in order to get to every well a minimum of once every ten years. Three wells are planned to be rehabbed 2018.

Water Treatment Repairs & Rehab - This program area includes repairs and rehabilitation projects within the Ground Water Treatment Plant (GWTP) and Surface Water Treatment Plant (SWTP). The 2018 funds are a funding source for the GWTP Generator and Rehabilitation Project awarded for construction in 2017 and the replacement of some electrical equipment within the GWTP that is not part of the project.

Transmission & Storage Rehab - This program identifies rehabilitation projects for the City's water transmission and storage infrastructure. This includes rehabilitation projects for the City's 10 High Service Pumps (HSP), the 7-mg clear well at the Water Treatment Plant (WTP), two underground reservoirs, three towers and the Pressure Reducing Valve (PRV) stations that reduce the water pressure from the towers and pumps as the water goes into the distribution system. A PRV rehabilitation project is planned for in 2018. The large value in 2019 reflects a project to rehabilitate the Heather Hills tower.

Meter/AMI Replacement Project - This project includes water meter replacements and advanced metering infrastructure that collects the water usage data from the meters for billing, conservation and customer service purposes.

Street Repairs of Water Main Breaks & Contract Patching - This project is to repair the streets sections that need to be removed and replaced to repair a water main segment that breaks. This project also is to improve street areas that have become in disrepair because of a utility element that is located in the road such as gate valves and manholes.

PARKS

Park Renovation - Park renovation is the repair or replacement of existing elements and facilities within the park system. This includes things such as fencing, backstops, athletic field lighting, hockey rinks, play equipment, bituminous surfaces, tennis courts and building renovations. The highest priority for park capital funding is maintaining the City's current park system. Projects in this category for 2018 include:

- General amenities - replacement of various benches, bleachers, grills, picnic tables, refuse receptacles, etc.
- Soft surface trail rehabilitation work to the dog park trail within Alimagnet park
- Continue renovating landscaping at Bicentennial Garden
- Replacement of play equipment at Cedarbridge and Keller Lake parks
- Replace the parking lot lights in Lac Lavon park's south parking lot
- Grading, drainage work and repair of erosion in Neill park
- Renovate the tennis facility at Red Oak park into a combined tennis and pickle ball facility
- Continue the replacement program of park signs at various parks

Park Improvements - Park improvements are the significant upgrading or the addition of new facilities to the park system. This includes items such as adding a building, shelter, trails not associated with an existing amenity, new parking lots, lighting and periodically creating planning documents. Projects in this category for 2018 include:

- General amenities - adding of park benches, bleachers, and small recreational equipment to existing parks
- Investigate a new trail connection between Howell and Sunset Pond parks

Trail System Development - These funds are for the development of new multi-modal trails outside the park system and trails that connect the park system to these regional trail systems. The priorities for this element are established by the City's Trail Master Plan. Projects in this category for 2018 include:

- Funding for final design of the Kelleher Park Trail/Lake Marion Greenway and Trail Head project
- Design and construction of the Rose Bluff trail from Kraemer Nature Preserve and Williams Drive

FACILITIES

Facilities Improvements - These funds are for the repair, replacement or improvement of existing elements at City/Hall Police, Civic Center Garage, Fire Station #1, Fire Station #2, Maintenance Facility, Parking Lots and Parking Decks and Ramps.

- **City Hall/Police -** Projects for this facility include the replacement of sections of acoustical ceiling tile, wall paper, sidewalks, bathroom panels, and the removal and renovation of temporary Phase 1 Facility Police relocation space in the lower level of City Hall.
- **City Garage** - This facility will receive scheduled replacement of a furnace.
- **Fire Station 1 -** Projects for this facility include carpet replacement, exterior brickwork sealing and scheduled door replacement to extend the life of the building.
- **Fire Station 2** - This project includes the installation of a privacy fence for safety and security.
- **Maintenance Facility** - This project is the end of service life replacement of the twin post hoist in the fleet area; as part of the project it is being upgraded to accommodate larger and heavier Fire and Public Works vehicles.
- **HOC Parking Deck/Ramps -** This project includes the addition of a parapet wall railing for safety purposes at the parking deck.

INFORMATION TECHNOLOGY

- **PC Computers, laptops, and Servers replacements -** This annual project replaces desktop and laptop equipment throughout departments on a scheduled basis. Currently there are approximately 340 devices that are replaced over five years. Server hardware infrastructure is replaced every three to five years.
- **Police Systems -** These items represent projects which replace various police equipment on a rotating basis. Mobile Data Computers (MDC) are replaced over a five year period and On Officer cameras are replaced every three years. Projects in 2018 include continued replacements of MDC's, associated supporting equipment and software and a Computer forensics workstation for investigators.
- **Fire Department Systems -** These items represent projects which replace various fire equipment on a rotating basis. Mobile Data Computers (MDC) are replaced over a five year period. This project area includes MDC replacements, some On Officer cameras for Fire investigations, and teleconferencing equipment between Fire Stations and Administration.
- **Document Imaging and Management -** This project expands the electronic document management system (EDMS) to public works and replaces existing scanner workstations on a rotating basis. Document imaging includes upgrades to take full advantage of functionality and continued integration with other city systems.
- **IT Infrastructure** - This is an ongoing program that addresses network capacity and function for 67 city facilities with rotating replacement over five to seven years, annual network storage additions and replacements, modifications and enhancements to the phone system as well as audio/visual replacements and enhancements for conference rooms. Projects in 2018 include implementation of a portable backup generator quick connection for the IT Data Center at the Maintenance facility, phone system redundant connection via the network, additional WiFi equipment replacements and additions, and a Internet connection load balancer to deliver IT services over multiple Internet connections.
- **Community Development -** A successful 2017 implementation of a new web based upgrade to the existing system allowed for the addition of mobile tablets for all inspectors. As a result of added users and easier use of the system, a minor addition of funds was added for additional user licenses.
- **Security Systems** - This program addresses security systems such as facility security, data security and security cameras. Additional security cameras will be added to City Hall and parks buildings, and new power sources and network connectivity for the Fire ABLE training facility. Also planned for 2018 is security

camera replacements for the Ice Center to address issues with existing camera quality and reliability. Projects in 2019 and 2020 include continued security camera additions and replacements.

- **Software -** This is an ongoing program for server licenses and license use renewals. Projects in 2018 include migrating more on premise servers to hosted Microsoft Azure Government Cloud environment and the third year payment of the hosted Office 365 for government environment services. Microsoft software enterprise agreement contract review and renewal will take place in 2018 for an additional three year term for 2019-2021.
- **ERMS System Development (Enterprise Resource Management Systems)** - This is an ongoing program to develop, enhance and improve interfaces and data exchanges between city systems. This includes document management access to payroll files, accounts payable and utility reports as well as data integration with the community development system for account balances and payment history. In 2018 a focus on implementing an integrated HR employee on boarding and off boarding.
- **GIS Software** - In 2018, the city will continue to move forward with GIS strategic initiatives that require the implementation of additional GIS software and software integrations with existing GIS centric city systems like: Public Safety, Community Development, Asset Management, and Utility Billing. The initiative called "Datalink" is 75% developed in is currently being utilized by staff. Continued work and initiatives are being identified and listed in future years. Site licensing for GIS software and services is included for years 2018-2022.
- **GIS Equipment** - The implementation of tools for GIS data collection field work in 2018 and City Hall plotter replacements in 2021

EQUIPMENT & VEHICLES

- **Equipment** - This is an ongoing program area to cover the acquisition and replacement of various capital equipment mostly for public safety. Each specific piece of capital equipment has a life cycle tracked within each department.
- **Vehicles -** Vehicles are replaced according to the current City Vehicle Acquisition and Replacement Policy

Debt Analysis

Measures for Debt Management

The City funds some of its capital projects by issuing debt. State statute and Council-adopted policies govern how much debt the City may issue, as well as other standards for issuing debt. This section highlights those measures, explains the rationale for them and shows how the City performs against those measures. City Council Policy No. 1.250 establishes the following measures:

Policy: The City will pay back debt within a period not to exceed the expected useful life of the projects, with at least 50% of the principal retired within 2/3 of the term of the bond issue.

- *Current Year - All debt issued in 2017 was structured within the parameters of this policy with a level annual payment schedule matched with projected revenue streams of taxes, special assessments and utility revenues.*
- *2018 Budget Year - All debt proposed for 2018 issuance is planned to have a level annual payment schedule matched with projected revenue streams.*
- *Future Years - All future debt proposed is planned to be structured within the parameters of this policy*

Explanation: Best practices for debt management dictate that the funding for an asset is aligned with the life of that issue. For example, a twenty-year bond should not be issued for a piece of equipment that has a useful life of only ten years. This policy ensures that the expense for an asset is evenly distributed throughout the terms of the bond. The City has always structured the term of bonds to be less than the useful life of the capital projects being financed. Generally, infrastructure improvement bonds have been 15 years or less.

Policy: Total general obligation debt shall not exceed 2% of the total market valuation of taxable property in the City.

	2016 Actual	2017 Estimate	2018 Estimate
G.O. Debt as a % of Total Taxable Market Value	0.6%	0.7%	0.4%

Explanation: The Council's policy is intended to be somewhat more restrictive than State statute, in order to keep the City's debt burden at a manageable level. This measure differentiates between general obligation debt, which commits the full faith and credit of the City, from other types of debt issued by the City, such as revenue bonds. This measurement is more relevant for a city like Burnsville that issues various types of debt, but the taxpayers are not committed to the repayment of all types of debt.

Policy: Direct net debt (gross debt less available debt service funds) shall not exceed 3% of the total market valuation of taxable property in the City.

	2016 Actual	2017 Estimate	2018 Estimate
Net debt as a % of Total Taxable Market Value	0.00%	0.17%	0.14%

Explanation: Minnesota Statutes, section 475.53 limits the debt issued by a municipality to a net debt limit of no more than three percent of the market value of taxable property in the municipality. (School districts and cities of the first class are subject to different limits.) The statute outlines the type of debt that is subject to this limit, which is reported annually in the City's Comprehensive Annual Financial Report. This measure is intended to insure that cities do not issue more debt than the tax base is able to bear. In addition, the limit prevents municipalities from unduly burdening future generations with the costs of capital improvements.

Other types of measures that are used to measure government debt include: debt per capita, debt to personal income, and debt service payments as a percentage of general fund revenues or expenditures. These measures vary in their usefulness depending on the type of the debt issued by the municipality.

The City has levied taxes in the Infrastructure Trust Fund to fund the City contribution toward replacement of infrastructure on a pay-as-you-go basis. Therefore most issues since 2005 have been limited to funding the special assessment and utility portions of the improvements. The City also monitors its total debt as a percentage of the city's total tax capacity and on a per capita basis:

	2016 Actual	2017 Estimate	2018 Estimate
Total debt as a % of Total Tax Capacity	73.2%	94.3%	85.2%
Debt per capita	$838	$1,101	$1,077

Debt Analysis

Debt Summary - 2018 through 2022

	2018	2019	2020	2021	2022
Debt Currently Existing at January 1					
Balance, Beginning of Year	$ 81,604,030	$ 62,124,030	$ 56,510,030	$ 50,087,030	$ 44,049,030
Principal Payments	(19,480,000)	(5,614,000)	(6,423,000)	(6,038,000)	(6,157,000)
Balance, End of Year	62,124,030	56,510,030	50,087,030	44,049,030	37,892,030
Future Debt to be Issued					
Proposed New Debt, Beginning of Year	$ —	$ 5,530,000	$ 13,282,671	$ 15,333,601	$ 19,572,350
Proposed New Issues					
Special Assessments	1,540,000	1,625,000	1,275,000	1,215,000	1,560,000
Ice Arena Improvements Bonds	1,000,000	—	—	—	—
Facilities Improvements Bonds	—	—	—	—	10,000,000
Water and Sewer Utility Bonds	2,990,000	6,425,000	1,515,000	3,935,000	2,470,000
Total Proposed New Issues	5,530,000	8,050,000	2,790,000	5,150,000	14,030,000
Principal Payments - Proposed New Issues	—	(297,329)	(739,070)	(911,251)	(1,215,486)
Proposed New Debt, End of Year	5,530,000	13,282,671	15,333,601	19,572,350	32,386,864
Total Existing and Proposed Debt, End of Year	$ 67,654,030	$ 69,792,701	$ 65,420,631	$ 63,621,380	$ 70,278,894

Debt Analysis

Existing and Projected Debt

	Outstanding Debt (in millions)			Debt Ratios		
as of	(1)	(2)		(3) To	(4) To Economic	Per
Dec. 31	Existing	Projected	Total	Tax Capacity	Market Value	Capita
Actual						
2008	$ 58.9	$	$ 58.9	73.9 %	0.9 %	$ 964
2009	52.7		52.7	65.8	0.8	863
2010	61.9		61.9	81.4	1.0	1,026
2011	59.3		59.3	83.8	1.1	978
2012	62.6		62.6	94.3	1.3	1,025
2013	60.4		60.4	95.2	1.1	985
2014	57.3		57.3	88.5	1.0	928
2015	54.6		54.6	78.5	0.9	882
2016	51.8		51.8	73.2	0.8	838
2017	68.1		68.1	94.3	1.1	1,101
Projected						
2018	62.1	5.5	67.6	86.4	1.0	1,093
2019	56.5	13.3	69.8	89.3	1.0	1,129
2020	50.1	15.3	65.4	83.6	1.0	1,057
2021	44.1	19.6	63.7	81.5	1.0	1,030
2022	37.9	32.4	70.3	89.9	1.1	1,137

(1) This column lists outstanding amounts of existing debt each year. Note that 44% of the amount of outstanding debt at December 31, 2017 will be paid off in the next five years. All bonds net of refunding bond proceeds on hand, including tax increment and utility bonds are shown in the totals above.

(2) This column indicates the net amount of outstanding new debt being projected from the 2018-2022 Capital Improvements Program.

(3) Total tax capacity is the value, after adjustments for fiscal disparities, against which taxes are levied.

(4) Economic market value is the value determined by the County Assessor and approximately the value at which the property would be sold. The State Legislature sets the policy regarding the share of taxes each property will pay on its market value through a system of property classifications and mandated class rates for the different types of property; thus growth in total estimated market value may not equate to a corresponding growth in total tax capacity value.

City Of Burnsville

Appendix O – Community Engagement

March 2018

COMMUNITY ENGAGEMENT

PURPOSE

Community engagement is a means for all people to bring their voices into the process and to share their ideas, backgrounds, and experiences to plan for a future that benefits everyone. Appendix O shows the specific comments of community members as they participated in the variety of community engagement opportunities throughout the Comprehensive Planning Process.

COMMUNITY QUESTIONNAIRE

In order to gauge community members' feelings about Burnsville, its strengths, and weaknesses, City staff and the planning consultant team collaborated and put together a Community Questionnaire. This questionnaire was available online and physical questionnaires were collected at existing community events, including the following:

- International Festival of Burnsville (July 2016)
- Night to Unite (August 2016)
- Burnsville Fire Muster (September 2016)
- International Festival of Burnsville (July 2017)

All the comments provided by community members are provided on the following several pages

Comments

What are Burnsville's Major Strengths?
Location, location. Location
Parks
Lots of Parks
Location, shopping
Location.
Infrastructure, location, city pride.
Location Location Location Right at the 35 spilt A feel of the city but the enjoyment of living in the burbs.
Tree covered streets, our small but fun Golf Coarse. We have great Police Officers. There is plenty of shopping near buy.
Proximity of businesses
Leadership, Vision, Unity
Location, retailers, housing stock,
The mayor has vision and is a huge supporter of the community and businesses. may family friendly housing areas. Nice parks!
Location -close to hospitals, clinics, airports, metro transportation, 2 down towns Good Police, Fire, EMT, shopping, restaurants,theaters, schools, athletic areas & clubs
New business entering the city.

DRAFT

What are Burnsville's Major Strengths?
Lots of commercial, and parks.
Parks and Heart of the City
Low taxes, good services, including well maintained parks and a dependable police department. We also find the location to be convenient and housing to be quite affordable
Distance from the cities. Heart of the city and its celebrations. Minnesota River Valley. Reasonably bike-able. MAss transit coverage is reasonable.
Amenities LocAtion Parks Community Ed programs/activities
Strong Mayor for many years! Intelligent and passionate for her job. Has served our community in a selfless manner. Knows that compromise is needed to make this diverse world work for all of us. Her energy and positive attitude has been a magnet for good things happening in our city. Thank You Mayor Kautz!
A forward-looking government that is planning for future needs such as infrastructure repairs. A diverse population. The Ames Center which brings in a variety of entertainment Abundant shopping centers and restaurants Many beautiful parks and playgrounds Good schools
A good variety of housing, regional retail businesses, a good school system in 191, a variety of jobs from retail to construction to IT and other specific companies. Looking to the future and building for a fast growing senior population and making daily living accessible and close to neighborhoods.
A strong history with school sports, location along 35W, mid-point proximity to both Mpls. and St. Paul, beautiful MN River and nature preserve, diverse business base. We have a great shopping base both within and in proximity to Eagan Outlook mall and MOA.
it's location, it's wonderful Police department
Variety and location
Trying to allow for growth of independent commercial enterprises. Parks and environmental support, lots of "green areas." Lots of summer free outdoor community activities.
Burnsville has maturity and name recognition. Most people from around the state know where Burnsville is because if they are driving south on 35 you will visit us. We are convenient and close to a lot of great things our state has to offer. We have great parks and athletic fields. Community sports. Police and fire are second to none. Burnsville Center and Paragon Theater are desirable features.
Close to freeways. Most majors stores are here
Community activities and spirit! Love the Burnsville pride. Heart of the city is my favorite area, small town feel to it. Great parks.
Diversity, Parks and green space, safe streets
Parks and splash pads, shopping (though the mall could use an update)
All levels of business, from cliff Rd small buildings to Burnsville center area. Vision 191. Police body cameras.
Close to shopping, restaurants, and other needs.
Many nice parks.
Location, affordable homes, access to retail.
Diversity, the arts, and the re-emerging schools. So excited to see and hear about the positive changes in our schools.
School district, mass transit options, BAC youth sports programs
Central location, parks, great shopping
Community events
Every retail store and restaurant you could want.
BV is a well-rounded community, with a wide variety of available activities, amenities, and opportunities.
Engaged active and diverse community that cares.

What are Burnsville's Major Strengths?

Location. Burnsville is within 15-30 minutes of a number of major attractions within the Twin Cities as well as close to public transportation and of course the airport. This location should be marketed and lead to attracting more businesses and young families to the area to continue to advance and grow the community. There is no reason why Burnsville shouldn't be able to attract major companies to the city, which can supply good paying jobs and help attract those young families to the area.

One of Burnsville's newest strengths is the diversity of people that live in the community. Suburbs were once very racially homogeneous, but Burnsville is now a community of people from many different racial and cultural backgrounds. This diversity represents the changing demographics in our country; communities need to become more racially and culturally diverse in order to thrive.

Good police force. Good parks.

Mature and well-established community, strong commercial base, convenient transportation access, many housing options, financially stable

Burnsville has been a wonderful city for raising a family and now for nurturing my grandchildren and great grandchildren. Burnsville has the major businesses and services that I depend on now & will be needing in the future so that as I live out the rest of my life I will be able to access what I'll need. Location...Location...Location! At this time I can access what the cities of Minneapolis and St. Paul offer via car. School system Some diverse businesses

Great twin cities suburban location with good access to the metro areas. Heart of the City area, activities, and events Burnsville Center Buck Hill

Culturally rich and diverse, diverse business community, schools that are headed in the right direction, a parks system that is widespread.

Safe. Clean. Low taxes.

It's wonderful that we have mental health training for police officers. Keep up the good work and train everyone as a CIT officer!

Burnsville's major strengths include its large, high-quality natural areas that are a regional public asset, both in the river valley and in southwest Burnsville, preserved with vision, decades ago. The city continues to support these natural resources by continuing to support low-density, rural residential home development for more than 100 years now in the southwest part of the city. Unlike Savage, whose city planning always called for allowing developers to create high density residential development right up against Murphy Hanrehan Regional Park Reserve, Burnsville has benefited from the conservation-minded stewardship of large lot owners, who effectively extend wildlife habitat into their surrounding private property. Southwest Burnsville homeowners also benefit the city as a whole, by reducing the need for additional municipal well pumping and water treatment, since they have always maintained their own, low-pumping, individual wells. The homeowners also use safe, onsite wastewater infiltration treatment, which replenishes the groundwater that Burnsville later taps for its municipal wells. Savage, on the other hand, is driving wildlife farther into the core areas of the park because of encroaching urban-serviced, dense housing development, and is likewise increasing demand for the water that Burnsville has willingly supplied Savage, to subsidize their urban development costs.

Strong emergency services; well maintained city areas (parks, roads, etc.)

Schools, police force, diversity

The police and fire departments. Both demand the highest standards and are continually training in the latest techniques. The City Council has supported them in their pursuit of the highest standards by allocating the funds for the latest equipment. The Citizens Academy is wonderful!

I think some of Burnsville's greatest strengths are its diversity. It is a suburban city with nice older homes and nice newer homes and apartments. Whether you need an apartment, condo or house you can find it here. I love shopping in Burnsville, I love the Ames center, and I love the easy access in and out of town.

Easy access to downtown/freeway access Safe neighborhoods

DRAFT

What are Burnsville's Major Strengths?

Convenient location, good city website, parks are well kept, roads are kept up satisfactorily, civic area (where the ice rink is etc) is nice, the fire muster was always fun (I didn't see signs for it last year so we missed it though). City seems responsive. Police have a good reputation as far as I know. I love the water feature and amphitheater by the Ames Center, it's probably one of our favorite places to hang out during the summer.
Diversity is a strength in Burnsville. Also, the parks and recreation areas in Burnsville are excellent, Murphy Hanrean is outstanding for hiking, mountain biking, kayaking and fishing. The Burnsville Mall is a strength because it offers a wide variety of shopping options.
Growing diversity.
Law enforcement
Strong commercial / retail base,

What are Burnsville's weaknesses?

Too much rental, need more owner occupied; utility fees (my water bill has gotten ridiculous), taxes
Gangs
Too many new multi family dwellings
Housong stock condition, community tilting towards low income demographics.
Mayor Kautz. All the low income housing. Poor major business attractors. Our neighboring cities get Hy-Vees and Freshthyme stores. We get a 2nd Aldi. Mayor Kautz has made Burnsville into the South of the River section 8 Ghetto.
Schools
Government housing to many people packed in areas. Smaller clusters show less crime Stop lights need to be in synchronization with traffic
The High School has a bad reputation. Metcalf had one of the worst teachers that I know of I had her and my son had her.
Too much Section 8. Parking lots for new businesses are horribly planned.
Too many group homes. No notification when they are moving in. Laws/regulations around these group homes should change!!
No Fireworks on the 4th of July, Need more centralized activities (like Centennial Lakes in Edina) with large indoor and outdoor spaces for kids and adults to play. I know the YMCA was supposed to take part of this on with basketball courts, pool, but it's too crowded and is hard to access.
Lack of bicycling infrastructure, lack of friendliness to gen x/y/z and millenials
Figure out how to create the Heart of the City feeling (small town - nicely decorated) all the way from Burnsville Parkway - up through Nicollet past the Burnsville Center to County Road 5. Make it all look nice so there is a path all the way through. There should be some "clean-up" to make it look nicer and renewed - refreshed. School district is "ok".
Parks except ball fields not very usable for most - excessive weeds, ponds are overgrown from 30 yrs ago so no shoreline access to several lakes that could otherwise be used for fishing, canoeing etc Roadway infrastructure :West Highway 13 entry to city, Cty Rd 42 / 35 interchange design struggling Heart of City Expensive Internet & Cable TV
Failure to enforce city codes, especially residential codes.
Schools, and roads.
Not enforcing ordinances. Just drive through any neighborhood. It brings down the value of all our properties.
Crime level in multi-family housing locations

DRAFT

What are Burnsville's weaknesses?

As a community we need to deal with aging housing stock and the needs of more senior citizens. We also worry about increased drug activity and other crime.
Traffic on county 42. Lack of parks without playing fields. We need a brewery.
?? None that I can think of right now
Too connected to the North. Let's grow to the South. Make access to Rochester a priority and be part of that huge growth and expansion. People will always find a way to get downtown. Quit worrying about it. We are not going to build another bridge to get across the river. Be Rochester focused. In 20 years, we all will be thankful.
Most of the public transportation is focused on getting to Mpls. or St. Paul, not getting around the city.
More publicity needs to be done to enhance our positive features. Too many people have a negative view of the city and the opportunities available here. Also highlighting the diverse population and the positives which come from living in our neighborhoods and city.
Schools that are not ranking well enough in relation to surrounding communities, community that is getting older as shown in housing and apartment stock, diversity that is seen as a negative rather than a positive in the community
it's becoming a cesspool. people-wise.
Traffic and roads
Very little diversity (racial, ethnic, religious) in its public city leadership, its initiatives, or its programming. As someone who works with several members of minority communities who live in Burnsville, many minorities in Burnsville do not feel that the city supports or promotes events geared toward them. Also, as someone who is under-40 years old in Burnsville, I do not feel as though Burnsville supports or encourages much community programming for those under 40, with the exception of family events geared at young children and their families. For example, look at the Ames Center programming- I love going to the theater and concerts, and in the 6 years that I have lived in Burnsville (andlive and worked in nearby cities for 11 years) I have never attended the Ames Center because its programs and shows are all geared towards the 60+ age group. I drive to Minneapolis or St. Paul at least once a month, but often more, to attend a performance instead. Also, Lakeville Arts Center (sometimes) and the Sheldon Theater (frequently) in Red Wing have shows that lure in the under 40-set. Burnsville has been undergoing a demographic shift in terms of race/ethnicity for many years and the city has not kept up with the trend to welcome its new residents, I am seeing the beginnings of and predict another demographic shift in terms of age as more young people are moving into the area. I hope that Burnsville can catch up and keep up with its changing residential demographics.
Burnsville is struggling to keep up with the Jones's. We are seeing development in Savage, Eagan and Lakeville and a significant lack of re-development in Burnsville. We have a Heat of The City project that has sat still for too long. We have aging apartments and outdated industrial buildings, all of which are becoming an eye sore. While our city continues to mature we need to continue to accommodate to young people and try and provide the things they are looking for (rental spaces, walkable downtown districts, variety and technology).
Invest in schools, technology, walking trail, community center
School district. I don't want to send my kids to our schools :-(low income housing areas feel unsafe at times. Wish there were more small businesses/ little shops.
Aging infrastructure, lack of decent public transportation
Need more grocery options than cub, how about hyvee or trader joes. Also we need a July 4th celebrations in our city, I love Burnsville week isn't very eventful.
The city is segmented by two school districts. Threat of increased msp airport noise.
Run down neighborhoods and housing. Our police department does an excellent job but adding more police on the street would help in cleaning up our city.

DRAFT

What are Burnsville's weaknesses?

Bus service needs to run a bit more frequently, especially on the weekend. Also, MVTA drivers need to stick to their schedule a bit more. Six minutes early is a huge deal when the next bus doesn't come for another hour and you've bought groceries. More and more people are depending on the transit system in Burnsville. We need to meet this demand. We need to rethink who is moving to this area and who will be moving here in the future. Building apartments is not enough. The people need to be able to get to and from work.
School system quality and rating- much worse than nearby schools
Aging houses and low income apartments.. Not wide enough offering of housing choices ... We don't o offer something for everyone... in particular those with higher incomes (few upscale townhomes, NO upscale apartments). Also, there is a perception that our schools are not very good (they are as good as any others around) and that we have high crime (we don't).
Need more biking trails, especially along major roads. Want more walkable areas.
Snow removal,
Need more things to attract families-waterpark would be great, too much low income housing
Not utilizing buildings that already exist for new businesses. The appearance of our city visually is diminishing due to the older buildings sitting and unkept while we build newer ones that quickly go vaccent due to high rental cost. I'd like to suggest offering lower lease costs on exsisting properties so new business can utilize the commerce space we already have and clean up the look of the city.
Lack of walk ability and bike paths
Racial diversity, while a good thing for our individual development, has brought more crime to our community, and for me, a feeling of being less safe while living hear.
Aging housing stock and recognition that it is perceived by visitors outside of metro as a Minneapolis suburb.
Number of industrial/energy/manufacturing businesses (newer and aging) in the area that can lead to polluting the air and waters in and around Burnsville. Climate change and environmental hazards are a very real concern now and moving forward and I hope Burnsville takes the lead on mitigating any current or potential issues that can arise from these companies. I think another concern is that Burnsville seems to have more of an aging population and the city needs to attract more young, educated families, that are willing to maintain and renovate the community.
Related to my above comment, although Burnsville is quite diverse racially and culturally, the composition of city staff, city commissions, city volunteer committees, and city events, one would not know this. The list I mentioned has a largely white composition. This is not sustainable for Burnsville as these groups do not represent the entire community. Although we have a one-day International Festival, this is a tiny, tiny piece of how the city should be welcoming and embracing our diverse community. Other cities have created paid or unpaid liaison positions to bring in different populations to city government and city events. Many other suburbs have specific commissions dedicated to developing a diverse community. Burnsville is unfortunately silent or avoiding these conversations which is a HUGE missed opportunity to make sure our community thrives.
Too many subsidized apartments/houses. Allowing too many rentals in neighborhoods. It should be limited since the renters don't keep up the property. Maximum rentals per area is needed. Enforcement of on-street parking in neighborhoods. Poor schools.
Older community, bordering on over-crowding, maxed out property growth prevents competing with newer neighboring communities with room for expansion/growth.
Rapid public transportation options within Burnsville, to Mpls & St. Paul & to the Red Line in AV. Starter housing for young families. (To keep Burnsville vibrant and thriving.) Policy makers who reflect the diversity of Burnsville.
Not enough promotion/marketing Not enough walking/biking paths/bridges
Not particularly bike friendly. Your parks/trails map shows "off street paved trail" along Burnsville Parkway, but it's actually a sidewalk. So getting from west Burnsville to Heart of the City, for instance, isn't something I'd let my kids do on their bikes. Also, no mountains, but that's probably not the city's fault.

DRAFT

What are Burnsville's weaknesses?

Too much traffic during commutes to & from St. Paul. Too many lawn chemicals going into stormwater runoff, especially from townhome associations. Traffic too noisy on Highway 13. Unsafe turns onto Highway 13 from residential areas, especially left turns. Too many big box stores and not enough independent retailers and restaurants.

Burnsville must guard against the constant drumbeat of developers hoping to make a quick buck by extending sewer and water urban services to more of southwest Burnsville, squandering the public value large lot owners have provided the city and the region for decades, and will provide for decades to come. The danger comes from a developer buying a large chunk of land or consolidating several properties "inland" of the non-sewered edge, dragging sewer and water past the existing residents, who are forced to sell off their land in chunks to pay the huge city assessments for the project--one they never sought, and actively resist. The city must guard against retiring staff and elected officials not passing on the institutional knowledge of the tradition and benefits of the cohesive Orchard Gardens neighborhood, which began 'developing' in 1915, and why it is not in the city's best interest to squander the unique public benefits of this area with a slavish, cookie-cutter approach that treats unsewered areas as "undeveloped", and just a public-works-project-in-waiting. This area has developed orderly already. Landowners make profits. The danger is from a developer who isn't satisfied with making money and letting the neighbors go on with their lives as is--he or she will push to maximize profits through higher density development, with no regard for the loss in public values.

No family recreation center, no MN River park

Virtually nothing for young people. Oh yes, the Mayor loves her park in front of Ames Center. That is fine for those three years and younger. The skateboard park is great for the skateboarders. But what about a community center with a variety of activities for all young people, especially a pool. As I drive through Apple Valley and Eagan, I see many signs of commitment to young people. Burnsville seems to be most committed to its aging population by building more Senior housing. Overall, we are old and it shows!

Public transportation is a huge weakness. We need better public transportation. We really need light rail service. We need more activities and events celebrating all of the different ethnicities in our city.

Lack of redevelopment of trail systems from old sidewalks - older roads need an update with trails rather than sidewalks and better connection of trails - in particular around County Road 11.

The intersection of 42 and Aldrich is a flat out mess. It is always backed up and cars consistently block the intersection. I will go out of my way to avoid it. The turn lane to get onto 35 needs to be revised to allow for more traffic and traffic from the mall and target should be redirected to other intersections. Or, allow only one way traffic or turns to alleviate some of the backup. I would also like to see the "downtown" be more cohesive and feature more local businesses. I find that most people who live here rely on big box stores and chain restaurants, but it would be great to offer more incentive for mom-and-pop style places in a central location. I love the walkable downtowns of cities like Northfield and Stillwater and it would be great if Burnsville had some sort of similar concept. School district 191 also needs some help.

Too many apartments and multifamily housing units.

Burnsville High School is known for being a much lower quality school than the surrounding high schools. There seems to be a higher crime rate in certain areas of Burnsville than the surrounding suburbs. These two details are extremely important for attracting or repelling families from the area and right now it seems like the latter is happening.

need to embrace diversity and minority residents now and more fully. Strive to be a model.

Landfill

Commute across the river for most residents

Forcing Change against the will of the people

DRAFT

Imagine Burnsville in the year 2040. Use three words to describe what you find appealing and attractive about the community
More revitalization projects
I will not be here
Parks trees grass
Location, middle-class, safe
Mayor Kautz Removed
Mature, clean, strong
All the Parks.
More restaurants
Easy access to everyday needs.
Activities, Riverfront, Modern
Family, retail, location
Small town feeling, good and easy, eye appealing transportation options - nice roads, bike paths, walking path, nice landscaping, more connected.
Hopeful Beautiful Burbs
In the suburbs.
Green, parks, shopping
Family-focused
Diverse, lively and affordable
pedestrians, neighborhoods, celebrations
Beautifully preserved (parks) Economically stable
Intelligent Compassionate Focused
Thriving, Friendly and Green
Variety, kind, welcoming
Superior schools, Well located, Premier recreation area along the river front (okay, more than 3...sorry)
Location, parks, view
Community-Based Inclusive Environmental
Potential for re-development that will attract more young and diverse communities that want to invest in Burnsville and call it home.
High tech, health driven community and leader in education
Community oriented. Excellent excelling schools. Clean/modern
BRT transit, modern buildings, safe streets
Parks, education, shopping center
Accessible transportation , connected community, strong schools. A rejuvenation of young families in established homes.
I want to see better schools and less crime.
Diverse, livable, safe.
Something for Everyone
Vibrant, walkable, community-pride
Education, sports and community involvement
Lots of green space, families, new homes being built, strong schools, low crime
Clean, updated, unified

DRAFT

Imagine Burnsville in the year 2040. Use three words to describe what you find appealing and attractive about the community
Make some areas between live and play more walkable/bikeable which will make it a more vibrant conmmunity. Improve transit opptions.
Opportunity Beauty Comfortable
Connected with transit and digital.
Jobs. Clean. Vibrant.
Welcoming, Diverse, Sustinable
Diverse, stable, friendly
Inclusive Recreation Transit
Happening Natural Active
Walkable, inclusive, diverse
Environmental Preservation and Restoration. Springs, streams, wetlands, ponds and lakes have high water quality, supporting the original intended uses, such as the spring creeks in the Minnesota River Valley once again supporting native brook trout and other sensitive coldwater species, instead of stormwater running into them. Southwest Burnsville remains low density rural residential, continuing to extend wildlife habitat beyond the parks and providing public benefit at no cost to public.
Closeness to metro, city parks
Many senior housing units and apartment buildings. Deteriorating single housing stock. The high school has faced declining enrollment because the city cannot attract new families. The taxes will be high because the city has used too much tax increment financing.
Where are people come together and live regardless or religion, gender or color.
Well-maintained, life-enriching, health-promoting.
A strong bike greenway that connects with surrounding cities, a lightrail that connects Burnsville to Minneapolis and/or St. Paul. Decreased crime and an excellent school district that attracts families to the area.
Thriving diverse community.
Clean, updated,safe
Rural, natural, non-regulatory

Additional Comments:
As you look at BRT station options please remember that use of a BRT line seems to depend on how direct the ride is. Getting off the freeway, passing through some stop lights and intersections seems to not fit the "rapid transit" mode. We commuters are happy to put up with such things during a bus ride but Rapid Transit should be more. Thank you.
Good morning I signed up for emails on the Burnsville website. Does this mean that I'll receive updates on the comprehensive planning going on now or do I need to connect somewhere else to do that? Thank you, Judy Lehnert
Just how will this affect our property taxes? What is the funding plan for completing our goal for 2040?
Can anyone attend the Advisory Panel Meeting On Monday Jan 30th?
this is the worst plan I have ever seen in my life

DRAFT

Additional Comments:

What can the city do to preserve Southwest Burnsville's low density rural residential development with independent utility services, preserving the natural resources being maintained on private land, which extend wildlife habitat in our adjoining parks, without public cost? Likewise, preserving current individual wells do not add to the city's pumping demands, and require no public investment to install or maintain. Unlike the city wells, the 5gpm individual wells do not draw down groundwater that sensitive natural resources like the Savage Fen and the groundwater-fed wetland complex in Kelliher Park need. In addition, we save surrounding cities' sewage capacity at Seneca, and carry the cost of sewage treatment ourselves. Well designed and maintained septic systems also replenish the groundwater, instead of sending it into the Minnesota River.

You have an aging population that will increasingly need special transportation services that are not covered by your current offerings or within your proposed Comprehensive Plan. Your city is ls 15 minutes from St. Paul and 15 minutes from Minneapolis. You are not an exurb. Currently Metro Mobility due to the language which requires them to provide full service to residents within 3/4 of one mile from an MTC bus stop is not applicable to your city since your 'shop and ride' locations are in commercial areas and i do not think any of your residents who need this service are able to make use of it. I have not been able to get to work on time. I cannot drive due to my disability but your city seems oblivious to the notion that persons with disabilities have jobs and can work and need transportation to get there on time. We pay taxes just as the rest of the residents do. But you only provide a mass transit system to middle class able bodied persons who can drive. I not able to use the service to get to the doctor. All Burnsville residents are told by Metro Mobility that it provides limited service to people residing in Burnsville. That means that we can be dropped off and picked up within 1 hour of our preferred time either side of the time. Which means that i had Metro Mobility buses come to pick me up an hour before my work shift ends. That was considered a no show ride. If it happens 4 times within a month, i am suspended for a month. I worked exactly one mile from my home in Burnsville Center. I was late 4 times within the first three months of my employment at a major dept store. I have also tried to get other jobs within Dakota county but Burnsville is so notorious for making it impossible for people to get to work on time due to this 'limited service' situation that no employer in Dakota County was willing to hire me -- they all said the same thing: no, if you have Metro Mobility, ,sorry i've had that before. That means you will never get to work on time." I have navigated Dakota County as a persons with disabilities since 1983. I have witnessed the attitude 'if you are disabled, you should really live in Minneapolis or St. Paul - that's where the services are." I have witnessed the city councils turn down group homes for disabled people. I have witnessed police depts and EMTs wrongly assume that i am not in need of emergency ambulance service -- including in Burnsviille -- by fire dept personnel who were informed by the police dept that i was mentally ill .. and to them that meant i could not possibly be ill. In fact after arguing for 4 times most recently with your personnel that i needed to be transported to Regions for a suspected bowel obstruction, the EMT refused to take any vitals and called it in as a psych call. I do not have a psych diagnosis. And, i did indeed have a bowel obstruction and a blood pressure reading of 225/120 when i got to the hospital. I could have died had i not insisted 4 times to be transported. So, what is in your comprehensive plan to ensure that persons with disbilities are treated fairly by your city employees? What is in the comprehensive plan to address the needs of residents with disabilities? you have residents who have children with disablities. Do you not think it is important to encourage the needed family ties with these grown children? is it within your understanding and compassion and sense of fairness to permit these adults to remain in the city they were born in and raised in and want to work in and live in? Is it within your understanding that the primary role of the police is to protect the sanctity of life and not to kill a disabled person who was running way from them and in obvious need of medical attention (15 seconds of running away from the police and he was killed .. i do note that the only police officer who did not feel justified in shooting him was a woman. Please hire more. I have listened to the fire chief say disabled folks cause too many calls. Well, sorry, but you are not supposed to have a job where you sit and play cards all day.

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Additional Comments:

You are supposed to respond to the needs of the entire community and that includes protected classes. How is yoru comprehensive plan addressing these needs? Where is the housing for people who need affordable housing? How are you going to deal with the systemic racis and bigotry and ignorance being disaplayed currently? How are you adderessing the fact that persons with disablities can and do work. What is the hiring practice within the city to hire persons with disablities? Does your plan only provide for the continued NIMBY instincts that have made Minnesota one of the worst in the state for racial and disability disparities? this is an embarrassment. How is your comprehensive plan addressing any of these concerns? and needs?

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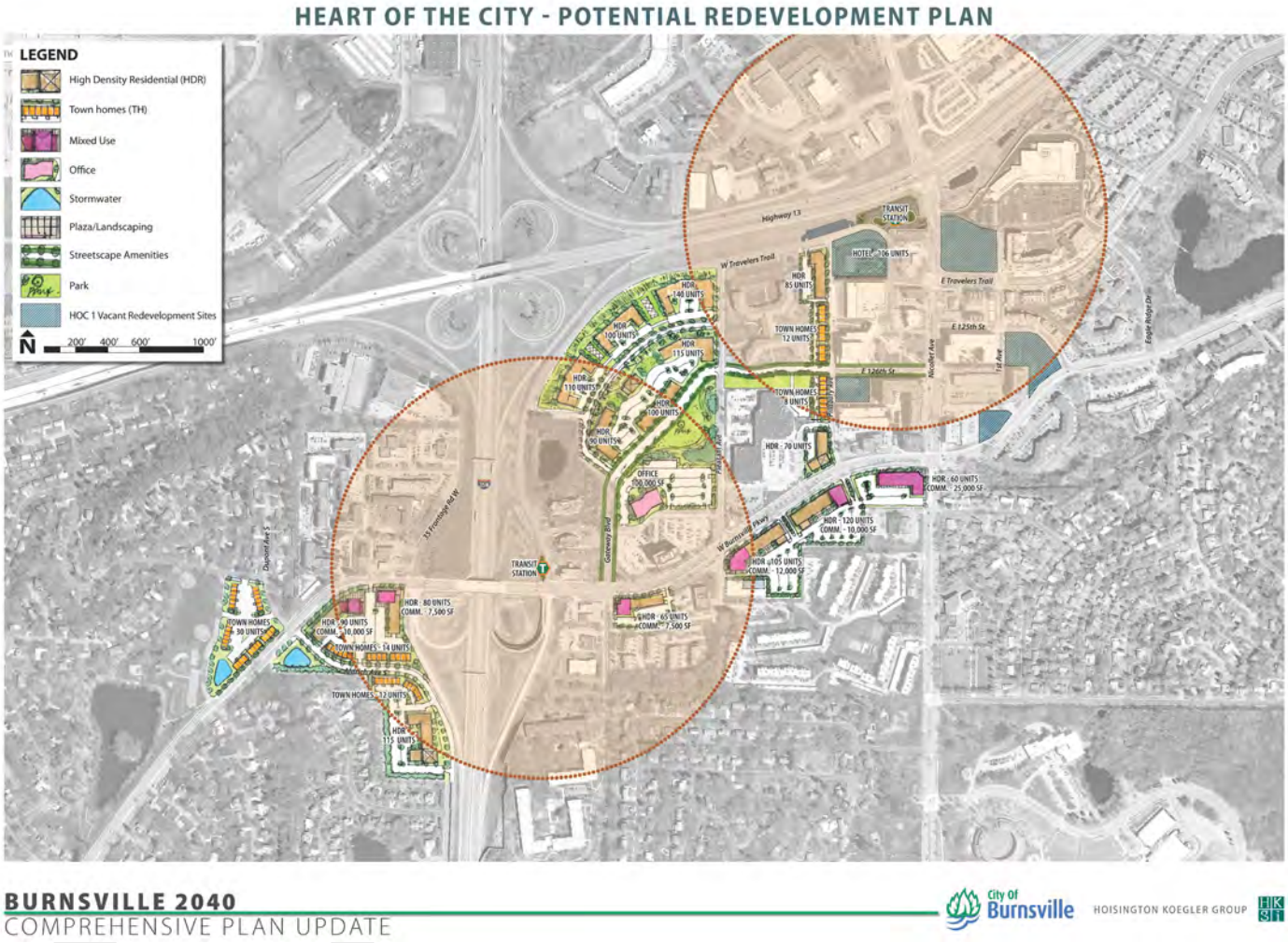
HEART OF THE CITY OPEN HOUSE

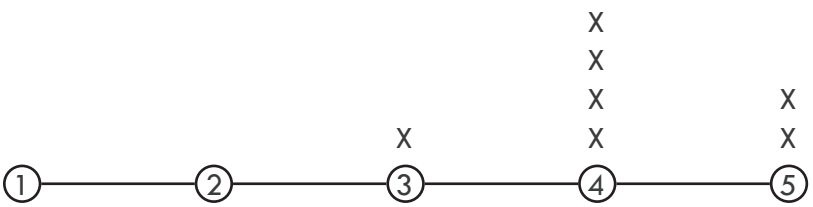
As a part of Burnsville's update of the Comprehensive Plan, the City looked for community input on the continued evolution of the Heart of the City (HOC) area. An Open House was held on June 22, 2017, open to the public, but with invites specifically sent out to residents, business owners, and land owners in and around the Heart of the City area. As the area is likely to see more housing, added business opportunities, expanded park areas and redevelopment of some properties, and changes may occur in the area just west of I-35 near the Aldrich Avenue, the planning consultant team put together a concept plan to show the development potential and possible future direction of the area.



All the comments provided by community members are provided on the following pages

Comments

On a Scale from 1-5, how would you rate the HOC concept?



What do you like about the concept?

» Love the community life style, ease of walking and access to stores and medical and it is very attractive asthectically

» The inclusion of other parts on the opposite side of 35W

» I appreciate the idea of having residential and various retail outlets in close proximity

» Bringing in more green space. More access to transportation

» Good mix of uses, transit and pedestrian connections. Glad to see there is thought of incorporating area west of interstate (35W)

» Don't know enough about who is committed to building new properites and then if known I could better answer this.

» High emphaisis on walkabiity and mixed residenital development. I'm a big fan of the integration with transit stations.

What is missing or what would make the concept better?

» More restaruants, a bakery, boutiques-fun areas to walk around and parks

» consideration of affordable housing and the demographics of Burnsville. Thinking about who this is for

» N/A

» More restaurants, small retail shops, entertainment

» More bike connections would be great!

» Taxpayer subsidies should not be used on Heart of the City. If fair market developers don't want to take risk and spend their own money make it into a car dealership

» A commitment to affordable housing would be ideal, also a mixed-use community center/library offshoot

What other comments, ideas or suggestions do you have?

» More landscaping on somre islands, noise control. I realize that comes with urban area but motorcycles and some cars could be ticketed

» N/A

» I'm concered that the economic integrity be maintained-that it is not becoming too dense and in need of continuous subsidizing and policy

» Hopefully the City will support some affordable housing in the area.

» I think the venuworks contract should be cancelled immedietlely and an open public transparent bidding process should be held to name a successor.

» Please prioritize healthy living not just active living. Access to healthy food is an important factor. Please leave room for urban gardening and small healthy food retailers.

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SOUTHWEST BURNSVILLE OPEN HOUSE

The Southwest area of Burnsville is unique to the rest of the city. Because of topographical challenges and a unique history of development, this area has large, rural residential lots, which do not sewer and water service. Residents and business owners in Southwest Burnsville were invited to an Open House in June of 2017 to talk about the Comprehensive Plan and how it would specifically impact Southwest Burnsville.

All the comments provided by community members are provided on the following page.

Comments

Southwest Burnsville: Strengths

- The wildness
- Providing public benefit of buffering natural resource of statewide value and quality
- No Response
- Green space, low density, quiet, country feel, ability to have an outbuilding, wetlands, undisturbed nature
- Open space and natural areas, privacy, wildlife, quiet

Southwest Burnsville: Weaknesses

- Trying to change that (the wildness)
- none, we love it as is

Three words to describe Southwest Burnsville's Future

- Unified Living, accepting that, diverse living
- Keep it Rural, aid landowners in maintain septic and well, continue managing parks as passive natural areas and controlling invasive
- Large lots and trees, rural living, privacy and peace
- No change to look or density, peaceful, green and quiet, maintain country feel, as remote as possible
- Minimize any development, keep the trees

Additional Comments

- In depictions of southwest Burnsville widen out to include murphy hanrehan-truer perspective of area as largely undeveloped
- we love it just the way it is

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CITIZEN'S ADVISORY COMMITTEE/PLANNING COMMISSION

The Citizen's Advisory Committee, joined by the Planning Commission, was charged with the review of all prepared materials and plan drafts, providing direction on ideas, concepts and strategies; and formulating a final recommendation at the conclusion of the planning process. A total of 12 joint advisory committee/Planning Commission meetings occurred during the planning process. Meeting notes were prepared for all Advisory Committee meetings. These meeting notes have been added to this Appendix, following this page.

The advisory committee was made up of a broad representation of the community. Advisory committee members represented the following community groups:

- Residents, including youth, seniors, diverse ethnic backgrounds, and persons with disabilities
- Faith community (Prince of Peace Church)
- Education (School District 191, South of the River Education Center)
- Healthcare (Fairview Ridges Hospital)
- Realtors (Burnsville Commercial Real Estate Council, Coldwell Banker Burnet)
- Burnsville Chamber of Commerce
- Burnsville Convention & Visitors Bureau
- Burnsville Community Foundation
- Burnsville Center (CBL & Associates Properties)
- Burnsville Athletic Club
- Members of the Planning Commission

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MEETING NOTES

Burnsville Comprehensive Plan Update

Advisory Panel Kickoff Meeting

July 18, 2016, 6:00pm
Burnsville Maintenance Facility

Advisory Panel Attending:

Jim Bradrick (PC, Chair); Steve Behnke (PC, Vice Chair); Vincent Workman (PC); Jeff Marian (Prince of Peace Church); Jeff LaFavre (BCREC & resident); Stephanie Atkinson (South of the River Education Center); Amie Burrill (CVB); Richard Tucker (Coldwell Banker Realtors & resident); Pat Belland (Fairview Ridges Hospital); Jennifer Harmening (Chamber of Commerce & resident); Megan Ballard (CBL & Associates/Burnsville Center); Steven Jensen (School District #191 Activities Coordinator/youth representative); Joe Gothard (School District #191 Superintendent/youth representative & resident); Jane Kansier (MVTA & resident); Nancy Sand (senior resident); Jerrad Solberg (high school student & resident); Adam Decknatel (Burnsville Foundation Board and CPA)

Advisory Panel Absent:

Ramraj Singh (PC); Dan Wolter (PC); Stephen Levie (PC); Bill John (Burnsville Athletic Club/youth representative)

Staff/Consultant Attendees:

Jenni Faulkner, Community Development Director; Skip Nienhaus, Economic Development Coordinator; Deb Garross, City Planner; Regina Dean, Planner; Mark Koegler, HKGi; Jeff Miller, HKGi

Introductions of Advisory Panel Members, City Staff, and Project Consultant Team

- The Advisory Panel for the 2040 Comprehensive Plan Update project consists of 21 members that represent a broad range of community interests, including the Planning Commission, residents (youth, seniors, and in between), residential real estate, commercial real estate, healthcare, people with disabilities, faith organizations, educational organizations, Burnsville Center, Chamber of Commerce, tourism, transit, recreation, and foundations.
- Each member of the Advisory Panel introduced themselves and participated in an exercise where they described the Burnsville community today and into the future in just three words or phrases. These words and phrases were used to create a Wordle (attached) that represents the group's common and divergent descriptions of the community.

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Content and Purpose of City's Comprehensive Plan

The project consultant team provided a general overview of the content and purpose of the city's comprehensive plan. The plan describes how a community wants to change and grow over a specified period of time, in this case 2016 – 2040. It articulates a community's vision, which is encapsulated in Burnsville's "Ends and Outcomes", preferred directions, and policies. It serves as a guide for decision-making by the Planning Commission and City Council. It also provides a basis for the city's zoning and subdivision ordinances. Components of the comprehensive plan include land use, economic development, housing, neighborhoods, transportation, natural environment, city services & facilities, trails, parks and recreation, and implementation. The city's first comprehensive plan was completed in 1965 and it has been updated approximately every 10 years.

Relationship to Metropolitan Council and Regional Plan

The project consultant team provided a general overview of the relationship of the comprehensive plan update to the Metropolitan Council and the Twin Cities Metro regional plan. Burnsville's comprehensive plan is required to be consistent MN Statute requirements addressing comprehensive plans as well as the Metropolitan Council's regional plans and policies. Communities are required to update their comprehensive plans every 10 years.

Thrive MSP 2040 is the Metropolitan Council's current regional development plan, which establishes the vision for the region and sets land use and development policies for the 2016 – 2040 time period. The Metropolitan Council also has updated and adopted regional system and policy plans for transportation (highways, transit, aviation), water resources (water supply, wastewater, surface/stormwater), regional parks, trails and open space, and housing. The Metropolitan Council has prepared and issued System Statements for each community in the Twin Cities metro area, which provides specific guidance to help each community update their comprehensive plan to be consistent with the regional system and policy plans. Burnsville's System Statement contains population, number of households, and employment projections for 2020, 2030, and 2040. The city previously worked and agreed to these projections with the Metropolitan Council. The System Statement contains goals for Burnsville's share of affordable housing needed to meet the projected regional affordable housing needs.

The project consultant team gave a brief overview of the Thrive MSP 2040 seven regional policies and Burnsville's role in pursuing these policies. The seven regional policies are:

- Orderly and efficient land use
- Natural resources protection
- Water sustainability
- Housing affordability and choice
- Access, mobility, and transportation choice
- Economic competitiveness

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- Building in resilience

Project Process, Timeline, and Focus Areas

The project's process consists of 7 tasks that will take place May 2016 to October 2017. Task 1 – Organizing the Process – has been completed. Task 2 – Evaluate the Current Burnsville Comprehensive Plan – is in progress. Focus areas for updating the plan are: Minnesota River Quadrant (MRQ), Heart of the City (HOC1 and HOC2), Orange Line Bus Rapid Transit (BRT) station areas, and the aging industrial area north of Hwy 13.

Community Engagement

The project consultant team explained the project's community engagement strategy, which will include city website postings, social media, public events, one-on-one conversations, and community-wide conversations. Some community events that are being considered for engaging the community are:

- International Festival
- Burnsville Fire Muster
- Night to Unite
- Farmers Markets
- State of the City
- CEO Forum
- Church of the Risen Savior (Spanish language service)
- Tawakal Restaurant (East African community)

The group brainstormed additional community engagement opportunities that could be considered for this project over the next year or so, which includes the following:

- Burnsville free recycling event in the spring (May/June)
- Wednesday in the Park free summer concerts at Civic Center Park (late June – early August)
- October is National Planning Month
- Burnsville Chamber Home Show (September 24, 2016)
- Bite of Burnsville (February)
- Islamic Institute of Minnesota, which is in Burnsville
- Senior housing cooperative has had the mayor speak at their events in the past
- Public library, which attracts a very diverse patronage
- Rotary and or Lions Clubs
- Foodshelves, which would offer a potential opportunity to reach an underrepresented segment of the community
- Prince of Peace Church, which would offer a potential to reach a large El Salvadoran community
- Fairview Ridges Hospital has a partnership with the city police & fire departments related to Somali residents' concerns

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- Advisory Panel member Tucker offered to facilitate communication with realtor organizations in the community
- Burnsville Transit Station – opportunity to communicate information during the State Fair when there is high usage of this facility
- School kids – opportunity to get information into the classroom, and possibly to students' parents as well, and reach more diverse segment of the community

Next Meeting

The next Advisory Panel meeting is tentatively scheduled for Monday, September 19, 2016.

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MEETING NOTES

Burnsville Comprehensive Plan Update

Advisory Panel Kickoff Meeting

September 19, 2016, 6:00pm
Burnsville Maintenance Facility

Advisory Panel Members Attending:

Jim Bradrick (PC, Chair); Steve Behnke (PC, Vice Chair); Vincent Workman (PC); Jeff LaFavre (BCREC & resident); Richard Tucker (Coldwell Banker Realtors & resident); Pat Belland (Fairview Ridges Hospital); Jennifer Harmening (Chamber of Commerce & resident); Steven Jensen (School District #191 Activities Coordinator/youth representative); Joe Gothard (School District #191 Superintendent/youth representative & resident); Jane Kansier (MVTA & resident); Nancy Sand (senior resident); Jerrad Solberg (high school student & resident); Adam Decknatel (Burnsville Foundation Board and CPA); Ramraj Singh (PC); Bill John (Burnsville Athletic Club/youth representative)

Advisory Panel Members Absent:

Dan Wolter (PC); Stephen Levie (PC); Jeff Marian (Prince of Peace Church); Stephanie Atkinson (South of the River Education Center); Amie Burrill (CVB); Megan Ballard (CBL & Associates/Burnsville Center)

Staff/Consultant Attendees:

Jenni Faulkner, Community Development Director; Skip Nienhaus, Economic Development Coordinator; Deb Garross, City Planner; Regina Dean, Planner; Jeff Miller, HKGi; Jess Ventrano, HKGi

Community Engagement

- Partner with the school district to reach diverse communities and coordinate on events
- Indian Palace would be another restaurant opportunity to collect diverse input
- Opportunity to make chapter regarding age (Youth Plan) more inclusive – i.e. seniors who have skills and time that are valuable for the community
- Burnsville's aging housing stock can be seen as a weakness of the community, so the plan update process should provide more information on what this means
- The issue of aging housing stock reflects some people's desire to live in communities with newer construction
- Observation that the Wordles reflecting input from the Advisory Panel and public input don't have many words related to health

Focus Areas Discussion – Aging Industrial Study Area

- Built primarily in 1960s, 70s and 80s
- Site and building reflect that time period, however, buildings no longer fit with current technology/trends
- Burnsville's prime business/manufacturing/employment area of time
- The development that exists today is no longer the highest and best use
- Concern that the area will continue to degrade if not addressed
- Tons of leasing signs in the area
- Neglected properties
- Area is quiet on the weekend but there is lots of activity during the week
- What was the goal/what types of businesses were there when it was first constructed, and how does that compare to what's there now?
    - Cliff Road was widened after most of the industrial development occurred as a more important street connection, which created some desire for retail development
    - The industrial area used to be very viable and busy, but buildings now don't structurally fit today's business climate
    - MVTA is outgrowing its facility
    - Many of the buildings are broken up into smaller offices due to lack of viability for manufacturing's contemporary technology and construction needs
- Potential for redevelopment but the city doesn't want to push existing businesses out either
- Truck traffic issues because roads were not built for that type of traffic
- There are a wide variety of businesses in the area that have already made the decision to be in Burnsville, so we should capitalize on these young businesses and figure out how to transfer them to modernized facilities
    - E-commerce has been driving boom in warehouses and distribution centers that take up a lot of space but don't employ a lot of people
    - Overhead door height clearances in buildings are much lower than current market demand
    - Current industrial development is too dense to allow any expansion; competing with the need for larger industrial lots, higher height clearance for and greater distance between loading dock doors, columns to be spread out, etc.
- Commercial real estate signs may often be there as a ruse?
- It would be beneficial to know what the vacancy rate is – seems fairly high ~ 20%
- What kinds of businesses are we gearing towards attracting?
- Set vision but change one by one to inspire further growth
- You can't portray the whole area as one issue – between Cliff Road and Highway 13 (Riverwood/Larc/12th Street) is the older, problem area with the smaller/older buildings
- The city has established zoning allowances as an incentive to spurring private redevelopment and reinvestment; there must be collaboration between businesses and the city to be successful
- Wellhead protection area

- It would be nice to see more mixed use commercial with diversity of businesses south of Cliff Road, e.g. restaurants/retail oriented areas similar to those that exist along Hwy 42 with transit opportunities
    - Potential opportunity to create an identifiable business node here – exists as just a crossroads area today
    - Convenient location between high school and residential area
- Future success will be driven by supply and demand – need to attract investment and developers – figure out what this demand is
    - Need to go after specific job base and create intellectual property sharing space to attract similar businesses that disregard location as the priority and crave the collaborative nature of an area
- Streets are not very multi-modal

Focus Areas Discussion – Heart of the City (HOC)

- Northern Orange Line Bus Rapid Transit (BRT) stop will utilize existing HOC public ramp south of Hwy 13 for park and ride
- Commuters will likely continue to use the Burnsville Transit Station north of Hwy 13
- Future Burnsville Parkway station is meant to be a walk-up BRT station due to proximity to a lot of rental housing
    - Bus will immediately hop onto I-35W to head north, so won't go any further into Burnsville
    - There will likely be some on-street parking near the BRT station
- Feet on the street and higher density neighborhoods attract millennials and cause surrounding metro cities to thrive
    - Multi-family and senior housing should not be ignored as opportunities
    - Mixed use doesn't work if you don't have high enough density in the area
    - Transit is almost unjustified based on existing density in HOC
- Who was the target audience with the original development?
    - Millenials attracted to Uptown and other urban Minneapolis neighborhoods
    - Seniors want single-level homes; want to live in HOC but all housing has stairs
    - Didn't build the housing that fits the profile of who they're trying to sell to right now
- Density can't stop at housing; needs to happen with retail/industry/transit/parking as well to make it viable (Excelsior and Grand mixed use community in St. Louis Park is a good example of this success)
- Entire HOC area should be considered for HOC1 zoning district?
- Inter-generational housing could be new trend?
- HOC doesn't have "fun things to do" which is what attracts the younger people
- 55+ residents shy away from the fun/loud activities but crave the walkability of HOC; there has to be something that attracts the older resident that already has the stuff that they need in their home
- Lack of bike trails, especially low slope ones, and parks are a big desire, including connection to them

Focus Areas Discussion – Minnesota River Quadrant (MRQ)

- Potential long-term opportunity but nature may make it intangible; hope kids like the future concepts for this area since it's very long-term
- Unique to have this future opportunity right next to the Minnesota River
- Walkways/bike paths around the lake – public opportunities around entire circumference
- A lot of corporate development, gateway center, doesn't seem feasible
- Why is there a desire to address this now?
    - We know a lot more now than we did 10 years ago – want to see if the existing vision for MRQ should remain the same when updating with expanded knowledge
    - One owner on east side of lake, which offers an exciting redevelopment opportunity
    - Southeast corner also interesting because could be redeveloped independent from the rest of the plan
    - Northern area has multiple landowners and soil is currently being tested for remediation needs
- Neighborhood meeting planning in process to collaborate with stakeholders
- Does it make more sense to focus in on the shorter term things rather than rethinking the whole long-term vision?
- Development happens much differently in different parts of the country; for example, in Texas, a large area often redevelops all at once rather than incrementally
- Prime area to attract businesses from aging industrial area east of I-35W to during MRQ transition phase
- Consider taking a larger look at whole river valley and connecting it better throughout the entire city; for example, could cater to extreme sports to tap into desire to provide entertainment opportunities to increase residents/visitors
- Access to the river is a challenging issue and addressing it could make development more desirable moving forward
- Could be higher-end housing, campus-like development, or planned community; everyone wants to be by the water
- Need more understanding regarding the river's water quality and the desires associated with water quality, in order to be realistic about community's desires and what can be developed there

New Community Enrichment Plan Chapter in 2040 Comprehensive Plan

- What groups should the plan focus on?
    - Work is currently disjointed; lack of coordination between different groups
    - Marketing benefits of multi-sport athletics (i.e. less injuries, kids better adjusted, etc.)
    - Growing up has changed a lot – should those who grew up differently be guiding current youth in the same direction? Or should we bridge the gap and try to find new trends and address the changes rather than stunting them? Need to ask youth what they want rather than guessing and forcing them
    - Spanish speaking residents are increasing exponentially
    - Somali speaking residents are still increasing but at a slower rate
    - Senior population is growing

    - Need to include people with disabilities
    - Hardest age to involve is young families (late 20s – early 40s)
        - First-time homebuyers/first-time parents
        - Bringing people back (high school grads) or bringing new people in
- What types of programs/services should be offered?
    - Lots of programs, but the challenge is pulling them together and moving them in the same direction; programs are already there – just need to be funneled in right direction
    - Addressing the parents' role in activities – different cultures have different values for what their youth are participating in and the lifestyle they can accommodate
    - Chaska found a niche (curling center) and created a super popular/all-ages activity – what could be Burnsville's niche?

Other Questions

- Hearing the discussion around green spaces/bike paths is important to addressing obesity and other health issues; increased need for services for these people (especially for aging population)
- Outpatient care is becoming more popular than inpatient care, nonetheless, Fairview Ridges is planning to increase the number of beds in the hospital and its campus will continue to grow and see additional specialties/services
- Desirability for walking crosses the spectrum of age groups, e.g. "walkscore" evaluation

Next Meeting

The next Advisory Panel meeting is tentatively scheduled for Monday, November 7, 2016.

MEETING NOTES

Burnsville Comprehensive Plan Update

Advisory Panel Kickoff Meeting

November 7, 2016, 6:00pm
Burnsville Maintenance Facility

Advisory Panel Members Attending:

Jim Bradrick (PC, Chair); Steve Behnke (PC, Vice Chair); Vincent Workman (PC); Ramraj Singh (PC); Dan Wolter (PC); Jeff LaFavre (BCREC & resident); Richard Tucker (Coldwell Banker Realtors & resident); Jennifer Harmening (Chamber of Commerce & resident); Joe Gothard (School District #191 Superintendent/youth representative & resident); Jane Kansier (MVTA & resident); Nancy Sand (senior resident); Stephanie Atkinson (South of the River Education Center); Jodi Settersten-Coyer (CBL & Associates/Burnsville Center)

Advisory Panel Members Absent:

Stephen Levie (PC); Jeff Marian (Prince of Peace Church); Amie Burrill (CVB); Pat Belland (Fairview Ridges Hospital); Jerrad Solberg (high school student & resident); Steven Jensen (School District #191 Activities Coordinator/youth representative); Adam Decknatel (Burnsville Foundation Board and CPA); Bill John (Burnsville Athletic Club/youth representative)

Staff/Consultant Attendees:

Skip Nienhaus, Economic Development Coordinator; Regina Dean, Planner; Mark Koegler, HKGi; Jeff Miller, HKGi

The consultants presented the initial land use and development concepts for each of the three focus areas, which were developed during the October 17th & 18th design charrette. The following notes summarize the questions and comments heard from the Advisory Panel members regarding the concepts for each of the focus areas.

Focus Areas Discussion – Heart of the City (HOC)

- Proposed new housing in HOC
  - Would it be rental primarily?
  - Much of the proposed housing in the concept is located on busy streets (e.g. Burnsville Parkway or overlooking major highways), which is more likely to be more desirable for rental housing.
- What are the number of stories envisioned for the proposed high density housing? (The consultants responded that the concept is assuming 3 or 4 stories generally).
- The HOC concept needs to consider what pedestrian patterns are necessary, e.g. difficult for pedestrians to cross Burnsville Parkway and Highway 13 today.

- Burnsville Parkway BRT station will remain as a station, even if the Orange Line is ultimately extended south to Burnsville Center; not a temporary station.
- Current access between HOC and the existing Hwy 13 park & ride facility for transit users consists of a crosswalk on Hwy 13 and local bus connections, but improvements for pedestrian crossings of Hwy 13 at Nicollet Avenue are needed.
- Could new development extend commercial west of Pillsbury Avenue in the HOC, such as adding commercial buildings on the edges of the school district block? Keep in mind that this school district facility is not just offices, but also contains early childhood education and the senior center.
- What should be the purpose of proposed park and open spaces in the western portion of the HOC?
    - All green spaces should contribute to linking the community to the river.
    - An additional park is needed in the HOC, which provides different opportunities than the existing Nicollet Commons, for the growing neighborhood.
    - The concept of a network of parks and open spaces within the HOC is a desirable feature.
- Does the vision for the HOC include enough activities and destinations to attract people?
    - What level of intensity of activities is needed?
    - HOC should be a unique commercial/entertainment node that is clearly different from Burnsville Center. Focus on smaller and local businesses.
    - Pleasant walking environment is important.
    - Is Burnsville Parkway bike/pedestrian-friendly enough to support the vision of the HOC?
- Other suburban "downtowns" should be investigated for identifying potential destinations, activities, and physical features that would enhance the HOC in the future, such as a movie theater, types of restaurants, "happy hours", and other types of places for hanging out.
- It is desirable to attract more retail along or near Nicollet Ave.
- What additional entertainment features are desirable? Consider the Centennial Lakes area in Edina, which offers a promenade, mini-golf, ice skating, and other activities.
- Consider whether the Gateway Blvd area, which is visible from both I-35W and Hwy 13, could attract some type of entertainment uses.
- Consider if the HOC could attract new office space and if that fits with the HOC vision.

Focus Areas Discussion – East Cliff Road Business Park

- Improve Cliff Road to look more like Burnsville Parkway.
- Allow more flexibility in the uses allowed here, e.g. some retail and restaurants.
- A benefit of the existing smaller industrial lots is that they may keep the scale of development in this area smaller rather than redeveloping with large contemporary industrial buildings.
- It is desirable to make it more pleasant to walk in this area by adding sidewalks, bus stops, and trails. The limited pedestrian amenities make it difficult for people, especially employees of the businesses, to walk to anything nearby.
- Increase the bus connections in this area. The current Dakota County East-West Transit Study has the potential to address this issue.

- Consider whether there is potential for having a circulator operating in this area for the businesses' employees.
- Potential for this area to become a prime area for research and development businesses. The existing buildings lend themselves to smaller research and development uses. R & D employees may be attracted to living in the HOC as well.

Focus Areas Discussion – Minnesota River Quadrant (MRQ)

- The concept seems to show a lot of industrial uses. Is it too much?
- Most important thing may be to plan for the major roadways in the MRQ, which would be helpful for the Planning Commission when reviewing development proposals for the area.
- Consider opportunities for future recreation and entertainment uses all around the future lake. Potential for green space surrounding the entire lake?
- Consider whether there is any possibility for the Kraemer industrial uses shown next to the lake to be moved to the south side of the rail line, retaining rail access, but away from the lakefront.
- Could the updated Comp Plan map show an area that would allow heavy industrial long-term?
- Consider the flooding risk related to the proposed residential area near the river. This area has flooded in the past.
- An example of residential near a working riverfront might be Duluth's Pier B residential development.
- Consider whether there could be additional residential areas in the MRQ.
- For any residential areas, make sure it is understood how people would actually drive to their homes, including whether they would be driving through an industrial area.
- Connections from the greater community, not just within MRQ, to the river are really important.

Next Meeting

The next Advisory Panel meeting is tentatively scheduled for Monday, January 30, 2017.

MEETING NOTES

Burnsville Comprehensive Plan Update

Advisory Panel Kickoff Meeting

January 30, 2017, 6:00pm
Burnsville City Hall

Advisory Panel Members Attending:

Jim Bradrick (PC, Chair); Steve Behnke (PC, Vice Chair); Vincent Workman (PC); Stephen Levie (PC); Jeff LaFavre (BCREC & resident); Jennifer Harmening (Chamber of Commerce & resident); Joe Gothard (School District #191 Superintendent/youth representative & resident); Jane Kansier (MVTA & resident); Nancy Sand (senior resident); Jodi Settersten-Coyer (CBL & Associates/Burnsville Center); Amie Burrill (CVB); Pat Belland (Fairview Ridges Hospital); Steven Jensen (School District #191 Activities Coordinator/youth representative); Adam Decknatel (Burnsville Foundation Board and CPA)

Advisory Panel Members Absent:

Ramraj Singh (PC); Dan Wolter (PC); Richard Tucker (Coldwell Banker Realtors & resident); Stephanie Atkinson (South of the River Education Center); Jeff Marian (Prince of Peace Church); Jerrad Solberg (high school student & resident); Bill John (Burnsville Athletic Club/youth representative)

Staff/Consultant Attendees:

Jenni Faulkner, Community Development Director; Deb Garross, City Planner; Regina Dean, Planner; Mark Koegler, HKGi; Jeff Miller, HKGi

Vision and Goals – Future Land Use Guide Plan Chapter

- Vision
  - Consider using a stronger word than "sustainable" that is more future-oriented. Vision should be more about growth rather than just sustaining.
  - Consider adding "and resilient" to the vision statement.
  - Is sustainability too narrow of a term, in that it's commonly focused on the environment?
  - Vision should incorporate cost-effectiveness that is successful in drawing people to the community.
  - Consider adding "economically and environmentally" sustainable.
- Objective
  - The current objective sums it up well. There is not much undeveloped land, so focus should be on redevelopment.
  - "Interconnectedness" could be added.
- Current Goal #3 - Develop a plan to attract and keep 25 – 34 year old residents in Burnsville.

    - Is this goal moot? Millennials have aged out of this age bracket.
    - Consider going broader with this goal by addressing lifecycle housing options.
    - What age groups is Burnsville losing? Older residents?
    - Need to look at other age groups younger and older than this age group.
    - Move away from focusing on a specific age group.
    - Could focus on a goal of achieving a mix of housing in the community to successfully attract a wider range of ages to Burnsville and to keep them here.
    - Good to target lifecycle housing as well as lifecycle businesses.
    - Goal #3 could be a policy supporting a lifecycle housing goal.
- Current Goal #5 – Add solar energy.
- Current Goal #6
    - Is redevelopment of the MRQ beyond the 20 year horizon of the Comp Plan? Staff stated that they don't believe so.
    - Consider putting this goal under goal #4.
- Current Strategy F – Don't limit this strategy just to gateways, also include places like the Heart of the City.

Vacant Land Areas

- What about disinvested and underutilized properties?
- Existing land use designations/zoning of individual vacant properties should be evaluated for potential updates.
- Vacant land east of the I-35 split – evaluate whether it should remain commercial or updated to HDR or LDR.

Major Community Areas – Burnsville Center / Future Transit Station

- TOD Potential
    - Some Advisory Panel members attended the Metro Council's recent TOD session. Presenters included Hopkins, Minnetonka, and Bloomington.
    - The future BRT station has not been sited yet.
    - TOD potential – There is a difference between the transit station being located inline on the freeway vs. off the freeway closer to the retail mall for attracting TOD.
    - In general, transit planners attempt to locate transit stations within a ½ mile of a walkable environment. If the station is located really close to the freeway, it won't be a very walkable environment.
- E-commerce is putting great pressure on regional retail centers. Look at the future of the retail center based on where retail demand seems to be going. What do we want this area to be like if/when retail center demand changes substantially?
- The time for planning for change is now! Probably need to shift planning toward a future mixed use center. Two retail anchors are primed for redevelopment – Sear's and Macy's. A unique challenge is that these two properties are under separate ownership from the actual mall building property.
- New retailers want to have visibility on Highway 42 rather than facing other directions.
- There are challenging sight lines to the north and east of the retail center from the highways.

- Potential for development of a parking garage would involve a major investment and maintenance commitment.
- Consider the potential for a hotel or multi-family residential developing on the retail center site.
- Consider adding entertainment uses, improved streetscapes, and a more walkable environment.

Major Community Areas – Fairview Ridges

- Current land use guidance is appropriate.
- A good place for achieving higher density development.

Major Community Areas – Aging Retail Strip Centers

- Learn from the Valley Ridge redevelopment experience to mixed use.
- Some retail strip centers should be reguided from commercial to mixed use, but others need to be fixed up/upgraded.
- Have other cities studied the issue of aging retail strip centers and been successful with improving them?
- Conduct an evaluation of higher and better uses?
- Need for public involvement?

Major Community Areas – Southcross Corporate Center

- Automation is reducing the number of people working in the buildings. Consider reducing parking space requirements and allowing higher lot coverages?

Public Comments

- Judy and Mike Leonard
    - Concern over adequacy of the school district to accommodate more students associated with future redevelopment of commercial areas to residential. School district superintendent, who is a member of the Advisory Panel, responded that the school district has capacity and increased households would also increase taxes to better fund schools.
    - Asked about livable ages for people working in the retail corridor. Can they afford to live here too?
- Dan Callahan - Concern about southwest Burnsville and the identified "vacant" parcels. He suggested that property owners in the area be surveyed to find out their intentions relating to future development of these parcels. Some of these property owners may not have any intention of developing their undeveloped parcels.
- Casey Silver from Open Door Food Shelf- Is planning for adding transit taking into account low income folks and affordable housing?

Next Meeting

The next Advisory Panel meeting is tentatively scheduled for Monday, February 27, 2017.

MEETING NOTES

Burnsville Comprehensive Plan Update

Advisory Panel Kickoff Meeting

February 27, 2017, 6:00pm
Burnsville City Hall

Advisory Panel Members Attending:

Jim Bradrick (PC, Chair); Steve Behnke (PC, Vice Chair); Dan Wolter (PC); Stephen Levie (PC); Jeff LaFavre (BCREC & resident); Jennifer Harmening (Chamber of Commerce & resident); Joe Gothard (School District #191 Superintendent/youth representative & resident); Jane Kansier (MVTA & resident); Amie Burrill (CVB); Steven Jensen (School District #191 Activities Coordinator/youth representative); Adam Decknatel (Burnsville Foundation Board and CPA); Stephanie Atkinson (South of the River Education Center);

Advisory Panel Members Absent:

Ramraj Singh (PC); Vincent Workman (PC); Richard Tucker (Coldwell Banker Realtors & resident); Jeff Marian (Prince of Peace Church); Pat Belland (Fairview Ridges Hospital); Nancy Sand (senior resident); Jodi Settersten-Coyer (CBL & Associates/Burnsville Center); Jerrad Solberg (high school student & resident); Bill John (Burnsville Athletic Club/youth representative)

Staff/Consultant Attendees:

Jenni Faulkner, Community Development Director; Deb Garross, City Planner; Regina Dean, Planner; Jeff Miller, HKGi; Laura Chamberlain, HKGi

Vision and Goals – Housing Plan Chapter

- Vision
  - The removal of the 70/30 split aligns with the shifting needs of the community as well as the outcomes put forward by the Council – the Chamber of Commerce supports this removal, because it currently limits the market
- Objective
  - Focus beyond current residents – what do we need to bring in new residents – what are new people looking for when it comes to housing?
- Goals
  - Specific language addressing housing in proximity to transit stations/stops should be put in one of the goals
  - Focus on upkeep, maintenance, and rehabbing of existing properties
  - The established neighborhoods were built as more "traditional" residential areas, now there's a shift to neighborhoods with more of a mix of housing types and uses – this should be reflected within the goals

- Strategies – all of these goals and strategies are very dependent on implementation and how the City approaches implementation
    - The City is currently more market-driven than aggressive when it comes to promoting upkeep, maintenance, & rehabilitation of existing housing stock – now may be the time to set new priorities for the City and shift the focus/approach

Vision and Goals – Neighborhoods Plan Chapter

- A focus on community building
- Goal of thinking about neighborhoods in terms of connectivity
    - Trails
    - Transit
    - Not just connectivity between neighborhoods, but also within neighborhoods
- A potential goal is enabling the mixing of different types of housing within neighborhoods.
- Goal of multi-generational housing options in the city
- Other changing dynamics that not only impact housing, but neighborhoods:
    - Millennials and the desire for smaller lots, but still individual spaces
    - Access to transit services
    - Addition of accessory units
    - Change in the perception of yards & "maintenance" (not necessarily grass lawns)
- Is this an opportunity to update the "House Plan Book" (Split Level How-To book) to maintain and rehab housing in 2017 and into the future – with a focus on accessibility and evaluating the adaptability of housing
    - Some of the challenges right now with rehabilitation is that the housing stock is so old that rehab projects are ones that are expensive rather than minor
- One challenge to the existing built neighborhoods is that we are a city of cul-de-sacs, which limits connectivity
- Focus on implementation to retrofit trails to access existing neighborhoods and connect them with new high density/mixed use developments
- Maintenance in terms of sidewalk safety (snow & ice removal), especially for elderly pedestrians

Housing Review

- Percent of Households Experiencing Housing Cost Burden in Burnsville – How does Burnsville's housing cost burden compare to other cities and the overall metro region?
- The fact that Burnsville has lower taxes than other communities is an incentive for attracting people to live in Burnsville.
- Physical adaptability of different housing styles is a factor for homebuyers, e.g. ramblers are more adaptable to contemporary and lifecycle housing preferences than split level homes.
- The Comprehensive Plan could guide new mixed use areas to be designed for walkability.
- Consider allowing smaller housing units in Burnsville, for both single-family lots and multi-family buildings.
- Consider the potential impact of autonomous vehicles on the community and neighborhoods in the future.

- If the use of electric vehicles increases substantially over time, consider whether less gas stations will be needed in the future.
- For the "aging in place" concept, we need to define what is meant by "place", e.g. continuing to live in the same house, neighborhood, city, etc.
- The city's mixed use land use categories will potentially have a minimum residential % added to their definitions in order to make these land use categories applicable for addressing the affordable housing needs identified by the Metropolitan Council.
- Is the "tiny house" trend something we should be considering? How can that impact our neighborhoods, either as individual (small) lots, or as accessory units?
- More housing choice needed for residents so that they have choices when their living situation changes
- Are there example cities who, 20 years ago, were facing what we're facing today? Any best practices that can be gleaned?
- When considering future neighborhoods, also think about how retail is shifting – not necessarily about shopping, but distribution and experiences (especially dining & entertainment).

Public Comments

- We need to increase the variety of housing; we should have places for people who work here to live here
- Focus on preserving naturally occurring affordable housing, including apartments – they are key to Burnsville's livability
- Look to new innovations/trends in housing: a"pod"ments in Seattle have multiple units that share one kitchen & other facilities.

Next Meeting

The next Advisory Panel meeting is scheduled for Monday, March 20, 2017.

MEETING NOTES

Burnsville Comprehensive Plan Update

Advisory Panel Meeting

April 17, 2017, 6:00pm
Burnsville City Hall

Advisory Panel Members Attending:

Jim Bradrick (PC, Chair); Steve Behnke (PC, Vice Chair); Ramraj Singh (PC); Dan Wolter (PC); Stephen Levie (PC); Pat Belland (Fairview Ridges Hospital); Jennifer Harmening (Chamber of Commerce & resident); Nancy Sand (senior resident); Jane Kansier (MVTA & resident); Amie Burrill (CVB); Steven Jensen (School District #191 Activities Coordinator/youth representative); Adam Decknatel (Burnsville Foundation Board and CPA); Stephanie Atkinson (South of the River Education Center); Jerrad Solberg (high school student & resident)

Advisory Panel Members Absent:

Vincent Workman (PC); Jeff LaFavre (BCREC & resident); Richard Tucker (Coldwell Banker Realtors & resident); Joe Gothard (School District #191 Superintendent/youth representative & resident); Jeff Marian (Prince of Peace Church); Jodi Settersten-Coyer (CBL & Associates/Burnsville Center); Bill John (Burnsville Athletic Club/youth representative)

Staff/Consultant Attendees:

Skip Neinhaus, Economic Development Coordinator; Deb Garross, City Planner; Julie Dorshak, Community Services Manager; Mark Koegler, HKGi; Jeff Miller, HKGi

Community Enrichment End Statement & Outcomes

- Suggested that Outcome #4 be changed to expand youth tobacco to all tobacco. While the Outcomes are set by the City Council, the Comprehensive Plan can address all tobacco users.

Burnsville Demographic Snapshot

- Would be helpful to see population by age projected out for the next 10 to 20 years, particularly to show the increasing number of seniors.
- Is it possible to create 10 to 20 year projections for race and ethnicity in Burnsville?

Community Enrichment Plan Approach

- Experience has shown that people of color have skills to participate and contribute and want to do so. They are not just people who need to be served by programs. The community needs to reach out to get people to come in.

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- Question #1 to help organize the new chapter: <u>What do you think will be some of the changing needs of the community relating to community enrichment/ community building/ community cohesion in the next 10 to 20 years?</u>
    - Work to integrate ethnicities into the community, rather than having concentrations of ethnicities
    - Need to look at housing – do we have enough lower income housing for the people who are moving in?
    - Attract businesses that reflect our community's diversity – look at Lake Street in Minneapolis
    - Healthcare and services that meet the changing population, such as aging and other demographic trends
    - How does Burnsville stack up with other cities relating to community enrichment? Answer – can't compare; no other comprehensive plans that we've seen contain a comparable element.
    - Look at what the community will look like in 2040 in terms of demographics and what needs to change, e.g. more collaboration with hospital needed?
    - Leadership of the community should reflect the diversity of the community – currently lacking young people of color. City should encourage diversity in appointed and elected positions.
    - New residents look at community facilities – grocery, library, healthcare, etc.
    - Seniors look for volunteer opportunities and play a significant role in supporting volunteerism in the community.
    - Realtors could be contacted to let them know what Burnsville offers for community enrichment for youth, seniors, different ethnicities, etc.
- Question #2: <u>What other segments of the community should be called out in the Comp Plan?</u>
    - Julie Dorshak commented on current programs for youth, seniors, and after-school youth programs.
    - Faith-based communities also offer programs and support for residents.
    - Key segments of the population – people with disabilities and older people may need vocational rehab, living support services, transportation (Metro Mobility). Millenials. Baby Boomers will see a shift in activities and the availability of programs to maintain a sense of worth such as mentorship.
    - Organize chapter by all community members (header) with some break outs of specific segments – seniors, ethnicities, faith-based communities, etc.
    - Minority groups request large spaces for family gatherings but the city has limited facilities – schools – which are being addressed in the new park plan. Burnsville does not have a community center today.
- Question #3: <u>What types of community enrichment will be important in the future?</u>
    - Add arts, recreation, age 0 to 5 programs. School district starts at age 0 and goes up to age 102, which is the oldest member of the senior center.
    - Recreation is different from health/fitness.
    - Community enrichment contains health, fitness, and recreation, which are three different things.

- Question #4: <u>What ideas do you have on how the city and partners can offer all community members opportunities to enrich their lives?</u>
    - Promote programs like the Fire Muster, International Festival – continue to offer those events but understand how things are changing and how those changes should be incorporated into city activities.
    - More emphasis on electronic outreach and posted information. How do we reach out to our diverse population and get them involved in the community? The Comprehensive Plan Advisory Panel is an example of an attempt to get diversity and only have limited success. Need to find the right person trusted by segments – key communicators - of the community to help get people to get involved (Somali youth example).
    - Identify effective ways to communicate with different groups, how to distribute information to them, ask them how they would like to get their information from the city.
    - Getting community enrichment information out to renters and homeowners.
    - Using the internet more for communication than mailing information out long-term.
    - Multiple languages spoken in the community in the future.
    - Continue to have some strategic printed materials, e.g. the Chamber of Commerce has printed maps that are a popular request.
    - Consider different communication techniques for different age groups, e.g. social media for young age groups.
    - Communication/format of the Comprehensive Plan – consider ways to make it easier to read and use.
- Question #5: <u>Are there any gaps in community enrichment?</u>
    - What community enrichment resources are important to have literally in Burnsville vs. having resources available nearby, but outside, of Burnsville?
    - Impacts of social media interaction replacing physical (person-to-person) interactions?
    - Impacts of working women on limiting the capacity for social interaction, involvement, volunteerism?
    - Burnsville should continue to prevent duplication of community enrichment services, e.g. know what services are available in surrounding communities.
    - Target Burnsville as a healthy community as an element of the community enrichment chapter. Note that the "Healthy Cities Initiative" no longer exists.
    - Workforce gaps include a shortage of employees and a shortage of jobs in the community. Consider the concept of "job enrichment" to address job skill gaps.
    - Make technology/internet accessible for all people in our community
    - Continue to put an emphasis on local farmers markets and healthy food options
    - Continue to make infrastructure decisions that create a social community (bike paths, walking paths)
    - What is the long-term vision of a Burnsville Community Center like they have in Eagan?

Vision and Goals – Youth / Community Enrichment Chapter

- Look at changing focus on youth to all community members

- Leave in the word "Burnsville"
- Expand post-secondary opportunities
- Strategies – group supports simply changing from youth to all community members, as shown in meeting presentation; need to clarify what all community members means
- Use the terms multi-generational and multi-cultural
- Keep some focus on youth, but also other groups like people with disabilities

Public Comments

Speakers: Judy McFarland, Judy and Mike Leonard

- In the past, the city has brought communication about city plans out to the neighborhoods, e.g. for mothers, working women, etc.
- There is a lack of single-level housing opportunities in Burnsville
- If the senior population is valuable to the community, for volunteerism as an example, then the city should address senior needs in the Comprehensive Plan.
- Don't overgeneralize the "senior" population – there are different types of seniors – with some needing lots of services and some not.
- Current diversity of senior population
    - At the YMCA
    - Needs for different communication techniques, e.g. don't use mailed flyers for the African community
    - Burnsville appreciates new diverse businesses
    - Crystal lake attracts diverse people

Next Meeting

The next Advisory Panel meeting is scheduled for Monday, May 15, 2017.

MEETING NOTES

Burnsville Comprehensive Plan Update

Advisory Panel Meeting

May 15, 2017, 6:00pm
Burnsville City Hall

Advisory Panel Members Attending:

Jim Bradrick (PC, Chair); Ramraj Singh (PC); Dan Wolter (PC); Stephen Levie (PC); Pat Belland (Fairview Ridges Hospital); Jennifer Harmening (Chamber of Commerce & resident); Nancy Sand (senior resident); Stephanie Atkinson (South of the River Education Center); and Jeff LaFavre (BCREC & resident.

Advisory Panel Members Absent:

Steve Behnke (PC, Vice Chair)Vincent Workman (PC); Jane Kansier (MVTA & resident); Amie Burrill (CVB); Steven Jensen (School District #191 Activities Coordinator/youth representative); Adam Decknatel (Burnsville Foundation Board and CPA); Richard Tucker (Coldwell Banker Realtors & resident); Joe Gothard (School District #191 Superintendent/youth representative & resident); Jeff Marian (Prince of Peace Church); Jodi Settersten-Coyer (CBL & Associates/Burnsville Center); Bill John (Burnsville Athletic Club/youth representative); and Jerrad Solberg (high school student & resident).

Staff/Consultant Attendees:

Skip Neinhaus, Economic Development Coordinator; Jenni Faulkner, Community Development Director; Ryan Peterson, City Engineer; Mark Koegler, HKGi; Tom Sohrweide, SEH; and Wayne Houle, SEH.

Goals

1. Comment that goals should include rail preparedness. Ryan Peterson indicated that all planning efforts are for Bus Rapid Transit and not rail. There will not be any rail provisions in the I-35W bridge.

Strategies

1. A – E are very general and F – G are very specific.
2. E. Expand use of transit services. What does this mean?
3. Need to move traffic east and west. Ryan commented that the best corridors for east/west connection are CR 42 and Cliff Road.
4. Need to be able to transfer hospital patients in a timely manner across the river, especially during peak hours.

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5. Address the need to service seniors
    a. Service to residential areas
    b. Autonomous vehicles

Areas to Address

1. Safety
    a. I-35W from Burnsville Parkway to Cliff Road.
        i. Ryan commented that the new I-35W bridge will add a northbound lane from Cliff Road across the river.
2. Ride Share Industry
    a. Uber
3. Bikes/Trails
    a. Education of bike riders and car drivers. How to best communicate.
    b. Bike lanes need to be plowed to allow for use.
    c. New bike trail along the river is great and should be connected to Heart of the City.
    d. I-35W bridge will accommodate bikes.
    e. Ryan indicated that the City does not get requests for bike accommodations.
    f. Connection to the footbridge over the river to Bloomington.
    g. Connections from work to shopping.
4. Transit
    a. Orange Line
        i. Need to transfer to other routes
        ii. Need to cross TH 13.
        iii. An inline stop for Phase II would not be good. Stop needs to be at Burnsville Center.
    b. Red Line
        i. Cliff Road is being discussed as a stop.
5. Traffic Forecasts
    a. What is the correlation between trips and income? There are 5 income categories that are used with the number of trips increasing as the income increases.
    b. Are seniors accounted for in the age categories? The model groups household residents in 10 age group categories with the 10th category including people 65 and over.
6. Identified Problem Areas
    a. TH 13 / Nicollet
    b. CR 42 / Aldrich
    c. CR 42 / Nicollet
    d. Assure future ability to realign MRQ access, keep options open.
    e. Sidewalks not cleared well of snow and ice in winter.
    f. Become a Walkable City per Met Council.
    g. Improve traffic flow between the two freeways.

    h. Roundabouts where appropriate.
7. Autonomous Vehicles
    a. Keep current on technology and what it will require and its impacts.
    b. Need for shuttles for business.

Public Comments

- Gather information on needs of multi-family housing development – what can be done to encourage more bike usage?

Next Meeting

The next Advisory Panel meeting is scheduled for Monday, June 19, 2017.

MEETING NOTES

Burnsville Comprehensive Plan Update

Advisory Panel Meeting

June 19, 2017, 6:00pm
Burnsville City Hall

Advisory Panel Members Attending:

Jim Bradrick (PC, Chair); Ramraj Singh (PC); Dan Wolter (PC); Jenna Majorowicz (PC); Jennifer Harmening (Chamber of Commerce & resident); Nancy Sand (senior resident); Richard Tucker (Coldwell Banker Realtors & resident); Jane Kansier (MVTA & resident); and Adam Decknatel (Burnsville Foundation Board and CPA).

Advisory Panel Members Absent:

Steve Behnke (PC, Vice Chair); Pat Belland (Fairview Ridges Hospital); Stephanie Atkinson (South of the River Education Center); Jeff LaFavre (BCREC & resident); Vincent Workman (PC); Amie Burrill (CVB); Steven Jensen (School District #191 Activities Coordinator/youth representative); Representative (School District #191); Jeff Marian (Prince of Peace Church); Representative (CBL & Associates/Burnsville Center); Bill John (Burnsville Athletic Club/youth representative); and Jerrad Solberg (high school student & resident).

Staff/Consultant Attendees:

Skip Neinhaus, Economic Development Coordinator; Deb Garross, Planner; Garrett Beck, Parks, Recreation and Facilities Director; JJ Ryan, Recreation and Facilities Superintendent; Daryl Jacobson, Water Resources Specialist; Mark Koegler, HKGi; and Mark Lobermeier, SEH.

Goals and Policies:

1. The City should be looking at "cradle to grave" recycling of all materials including organics.
2. The City should continue to be visible in all recycling efforts, including facilities at major community events like the annual Fire Muster.
3. Natural resources and environmental information in the plan should also include noise pollution and mitigating measures such as sound walls.

Water Resources Management Plan (WRMP)

Mark Lobermeier presented an overview of water resources (see presentation in Sharefile).

Parks Plan

City staff presented an overview of Parks Plan (see presentation in Sharefile).

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Public Comments

- Does the City offer canoeing/kayaking lessons?
- What is the maintenance schedule for park bathrooms?

Next Meeting

The next Advisory Panel meeting is scheduled for Monday, July 31, 2017.

City Of Burnsville

Appendix P – Adjacent and Affected Jurisdiction Review & City Responses

September 2018

Jurisdiction Type	Jurisdiction Name	Contact	Contact	Date Comp Plan Sent	Date Comments Received	Date Waiver Signed	Notes/Comments
Adjacent Community	Apple Valley	info@ci.apple-valley.mn.us	commdev@ci.apple-valley.mn.us	3/16/2018			
Adjacent Community	Bloomington	citymanager@bloomingtonmn.gov	commdev@BloomingtonMN.gov	3/16/2018		8/24/2018	No Comments
Adjacent Community	Credit River Twp.		clerk@creditriver-mn.gov	3/16/2018	N/A	Waiver Signed 7/26/2018	No Comments
Adjacent Community	Eagan	dosberg@cityofeagan.com	mridley@cityofeagan.com	3/16/2018			
Adjacent Community	Lakeville	jmiller@lakevillemn.gov	dolson@lakevillemn.gov	3/16/2018	Comments Received 7/20/18	N/A	
Adjacent Community	Savage	Bryan Tucker, Planning Manager 952-882-2660	btucker@ci.savage.mn.us	3/16/2018	N/A	Waiver Signed 6-20-18	No Comments
Adjacent Community	Dakota County	Kurt Chatfield - Dakota County Office of Planning	kurt.chatfield@co.dakota.mn.us	3/16/2018	Comments Received 8-31-18	N/A	Kurt wanted to know when the 6 month period is over. RD responded via email 9/16/18
Adjacent Community	Hennepin County	catherine.walker@hennepin.us	Dan.Patterson@hennepin.us	3/16/2018			
Adjacent Community	Scott County	Brad Davis, Planning Manager 952-496-8475	bdavis@co.scott.mn.us	3/16/2018	Comments Received 09-14-18	N/A	
School District	191; Burnsville-Eagan-Savage	Cindy Amoroso, Superintendent 952-707-2005	superintendent191@isd191.org	3/16/2018			
School District	194; Lakeville	michael.baumann@isd194.org	tony.massaros@isd194.org	3/19/18 (bad email on 3/16)			
School District	196; Rosemount-Apple Valley-Eagan	Jane Berenz, Superintendent	supt@district196.org	3/16/2018			
Watershed Management Organization	Black Dog Watershed Management Organization	Daryl Jacobson, Administrator	daryl.jacobson@burnsvillemn.gov	3/16/2018			
Watershed Management Organization	Eagan-Inver Grove Heights Watershed Management Organization	Ashley Gallagher, Administrator	ashley.gallagher@co.dakota.mn.us	3/16/2018	N/A	Waiver Signed 4-25-18	No Comments
Watershed Management Organization	Lower Minnesota River Watershed District	Linda Loomis	naiadconsulting@gmail.com	3/16/2018	Comments Received 5/28/18	N/A	
Watershed Management Organization	Scott County Watershed Management Organization	Paul Nelson, Program Manager	pnelson@co.scott.mn.us	3/16/2018			
Watershed Management Organization	Vermillion River Watershed Joint Powers Organization	Mark Zabel, Administrator 952-891-7011	mark.zabel@co.dakota.mn.us	3/16/2018			
Regional Park Implementing Agency	Dakota County		parks@co.dakota.mn.us	3/16/2018			
Transit Authority	Minnesota Valley Transit Authority	jlehmann@mvta.com	rselvig@mvta.com	3/16/2018	Comments Received 9/7/2018	n/a	
State Agency	MnDOT	metrodevreviews@dot.state.mn.us		3/16/2018	Comments Received 4/6/18	N/A	Jennifer with MnDOT called and had questions on Transportation Chapter. Referred to Ryan Peterson. 651-234-7788
State Agency	MnDNR	Molly.shodeen@state.mn.us	Jennie.Skancke@state.mn.us	3/16/2018			
State Agency	MAC	Neil.Ralston@mspmac.org	Bridget.Rief@mspmac.org	3/16/2018	N/A	Waiver Signed 09-12-18	No Comments
Other	Tree Rivers Park District	ann.rexine@threeriversparks.org		Through Scott Co???	Comments Received 7/27/18		
							Email Bounced Back

Affected & Adjacent Jurisdictions - Offical Comments - City of Burnsville Comprehensive Plan - September 21, 2018

Entity	Type	Comment	Page(s)	Response
City of Lakeville	Transportation			
City of Lakeville	Kudos	Lakeville appreciates Burnsville's commitment to increase capacity within existing transportation corridors, specifically its support for the extension of MnPASS/HOV lanes south along 1-35 into Lakeville. (Burnsville Transp. Policy 1.3)	7-325; 7-344; 7-378	Noted
City of Lakeville	Kudos	Lakeville appreciates Burnsville's commitment to the development of the METRO Orange line, specifically its support for Phase 2 extension into Lakeville. (Burnsville Transp. Policy 5.1).	7-326; 7-382	Noted
City of Lakeville	Kudos	Lakeville appreciates Burnsville's commitment to complete trail connection along the Lake Marion Greenway Regional Trail. (Burnsville Transp. Policy 5.3).	7-326; 7-390	Noted
City of Lakeville	Kudos	Lakeville supports Burnsville's interest in considering the Canadian Pacific railroad as a future trail corridor if the rail line is ever abandoned (Burnsville Transp. Policy 5.8).	7-327; 7-354	Noted
City of Lakeville	Map Change	Review Figure 7-4 (Functional Road Classification Map) for continuity at city limits.	7.332	Noted
City of Lakeville	Text Change	Lakeville identifies Buck Hill Road and Kenrick Avenue/Maple Island Road as major collectors- Burnsville identifies both as minor collectors	7-332	These roads function in Burnsville as minor collectors. Will discuss if desired.
City of Lakeville	Figure Change	Review Figure 7-8 (Metropolitan Council 2040 Transitway System Map) for accuracy with Cedar Avenue Transitway Implementation Plan Update, December 2015. Current service stops at Apple Valley Transit Station. Lakeville improvements are identified in Stages 4, 5, and beyond 2040	7-345	Updated the figure
City of Lakeville	City Services and Facilities			
City of Lakeville	FYI	Plans reflect City's participation in: 1) Black Dog Watershed Management Organization; 2) Dakota County Electronic Crimes Unit	8-414; 8-426	Noted
City of Lakeville	FYI	Plan appropriately references Lakeville's contributing future sanitary sewer flow projections	8-451	Noted
City of Lakeville	FYI	Plan appropriately references Lakeville's water supply JPA	8-463	Noted
City of Lakeville	Natural Environment			
City of Lakeville	FYI	Plan references Burnsville's adopted Emerald Ash Borer Management Plan – supports Lakeville's interest in managing the spread of EAB	5-244; 5-254; 5-265; 5-284; 5-287	Noted
City of Lakeville	FYI	Plan references Burnsville's concerns and issues regarding the Canadian Pacific Railroad – supports Lakeville's concerns	5-247	Noted
City of Lakeville	FYI	Plan reflects City's participation in Dakota Valley Recycling	5-251	Noted
City of Lakeville	FYI	Lake management is not included in the Plan	n/a	Noted
Entity	**Type**	**Comment**	**Page(s)**	**Response**
Dakota County	Transportation			
Dakota County	Addition	Highway Expansion: The Dakota County Comprehensive Plan has identified a number of County highways that need to be expanded. We suggest that the following highway expansions be referenced in the Burnsville Plan: 1) County State Aid Highway (CSAH) 32, from Trunk Highway (TH) 13 to the east city border as a 6-lane need; 2) CSAH 42, from the west city border to 145th St E, as more than a 6-lane need; 3) CSAH 42, from 145th St E to the east city border, as a 6-lane need; and 4) CSAH 46, for all portions bordering Burnsville, as a 6-lane need.	7.359	Added

Dakota County	As a Note	Travel Demand Management: Dakota County will update its travel demand forecasts as part of an upcoming County Transportation Plan update. The new forecast will incorporate 2040 land use projections from each city. Dakota County will work with the City of Burnsville to include the City's 2040 land use projections and will re-evaluate highway expansion needs in the City and throughout Dakota County as part of that effort.	n/a	Noted
Dakota County	Addition	Transit: Please consider adding language to the description of Transit Link Service (page 7-350) that states that the service is available in areas where fixed route services are not available.	7.346	Added
Dakota County	Recommendation	Bicycles & Pedestrians: The plan references the City's bicycle and pedestrian policies with respect to ADA requirements, trail development and transitway development. It may be useful to include a statement that Dakota County also has policies for pedestrian and bicycle modes that provide guidance for the County highways throughout the City.	7.323	Noted - no change made
Dakota County	Environmental Resources			
Dakota County	Addition	"On Site Septic Systems" on page 5-243 could be clarified to state that failing septic systems are of concern to the natural environment. Properly managed systems can benefit natural systems by replenishing groundwater after treatment.	5.241	Language Added
Dakota County	Parks & Greenways			
Dakota County	Addition	Please consider adding labels to the map in this section that identify regional greenways. There is a reference to the "Dakota South Urban Regional Trail" which should be updated to the new name "McAndrews Greenway Regional Trail."	7.324	Name Updated
Entity	**Type**	**Comment**	**Page(s)**	**Response**
Scott County	Label Update	The correct name of the regional park in Credit River Township is Murphy-Hanrehan Park Reserve. Incorrect references are on pages: 110, 116, 280,340, 447, 448, and 449.	110, 116, 280, 340, 447, 448, 449	Updated
Scott County	Map Update	The segment of trail on figure 7-29 within Murphy-Hanrehan Park Reserve is not an existing (or planned) trail. It may be a reference to the very generically depicted connection around Murphy-Hanrehan Park Reserve that is included in Dakota County's Lake Marion Greenway Regional Trail master plan. Please remove from the figure.	7.395	Revised the figure
Scott County	Change	The reference on page 340 to the Scott County East Regional Trail should be the Lake Marion Greenway.	7.324	Updated
Scott County	Change	On page 449 the plan references an MOU between Scott County and Three Rivers - It is now managed through a Joint Powers Agreement.	8.443	Updated
Entity	**Type**	**Comment**	**Page(s)**	**Response**
Lower Minnesota Watershed District	Recommended Policy	In Title 10, Chapter 10, “Floodplain Regulations”: Require the lowest level of proposed structures to be a minimum of two feet above the 100-year flood elevation.	n/a	The City will consider recommended changes to ordinance language through implementation of the Comprehensive Plan
Lower Minnesota Watershed District	Recommended Policy	In Title 10, Chapter 10, “Floodplain Regulations”: When the placement of fill in the 100-year floodplain causes a rise in the 100-year flood elevation, require the creation of compensatory floodplain storage equal to or greater than the volume of fill placed.	n/a	The City will consider recommended changes to ordinance language through implementation of the Comprehensive Plan
Lower Minnesota Watershed District	Recommended Policy	In Title 10, Chapter 8, “Environmental Overlay Districts”: Refine the definition of bluff so it is the same throughout the chapter and better matches the District’s proposed Steep Slopes standard, which has replaced “bluff” with “steep slope” and defines it as a natural topographic feature having average slopes of 18 percent or greater over a horizontal distance of 25 feet or more.	n/a	The City will consider recommended changes to ordinance language through implementation of the Comprehensive Plan
Lower Minnesota Watershed District	Recommended Policy	In Title 10, Chapter 8, “Environmental Overlay Districts”: Remove the requirement that a bluff (or steep slope, if the term is changed) must be in a shoreland area. Correspondingly, shift the bluff management information in Chapter 8, Section 10, “Shoreland Overlay District,” to an alternative location in Chapter 8.	n/a	The City will consider recommended changes to ordinance language through implementation of the Comprehensive Plan

Lower Minnesota Watershed District	Recommended Policy	Identify all steep slope (bluff) protection measures in a single overlay district—for example, the Soil Erosion Overlay District Standard.	n/a	The City will consider recommended changes to ordinance language through implementation of the Comprehensive Plan
Lower Minnesota Watershed District	Recommended Policy	In Appendix C of the City's Water Resources Management Plan, Development Standards: Define and include fens in Section 6, "Special Waters and Wetlands."	n/a	The City will consider recommended changes to ordinance language through implementation of the Comprehensive Plan
Lower Minnesota Watershed District	Recommended Policy	In Appendix C of the City's Water Resources Management Plan, Development Standards: On land that contributes runoff to a trout water and/or fen, require a higher level of protection by applying the standards of the water quality treatment, volume control, water quantity, and rate control requirements in the WRMP to any development that includes disturbing 5,000 square feet or more of surface area, excavating 50 cubic yards or more of earth, or creating more than 10,000 square feet of new impervious area.	n/a	The City will consider recommended changes to ordinance language through implementation of the Comprehensive Plan
Entity	**Type**	**Comment**	**Page(s)**	**Response**
MVTA	Addition	Burnsville Transit Station also has several local routes: "…transit station which includes a 1200-space public parking ramp with daily commuter transit service,…"	2.92	Change made
MVTA	Consideration	Consider including both Express and Local services offered by MVTA to ED Policy 3.5	3.123	Change made
MVTA	Clarification	Please clarify how the Orange Line will strengthen transit service to the Cliff Road Business Park. The only connection from the future Orange Line stop to this area is via MTVA's Route 444, which is in operation today and serves south of Hwy 13	3.154	Confusing element removed
MVTA	Change	Burnsville also has an Emerging Market Area II	7.344	Added text
MVTA	Consideration	MVTA comment on 2015 System Statement: "Transit Market Area descriptions in the TPP may not represent the full service needs of the City of Burnsville. MVTA is available to work with the City to determine the appropriate level of service for each area, regardless of its designation"	7.344	Added text
MVTA	Addition	MVTA routes currently use/benefit from MnPASS lanes and bus-only shoulders	7.344	Added text
MVTA	Change	"… and also features many amenities including an indoor climate-controlled waiting area, restrooms, a 'ticket vending machine', transit information center…"	7.346	Change made
MVTA	Figure Change	Routes using I-35 south of CR 42 were re-routed in 2016. MVTA can provide updated route data if needed	7.347	Map Updated
Entity	**Type**	**Comment**	**Page(s)**	**Response**
Minnesota Department of Transportation	Text Change	On page 7-357 it discusses the development of the Minnesota River Quadrant (MRQ) and that development being a factor in the two interchanges for I-35W (Black Dog Road and Cliff Road) remaining open. If there is no development it is discussed that a new interchange will be added at 118th street and that Black Dog Road and Cliff Road will be removed as interchanges. MnDOT recommends that the City does not preemptively identify which interchanges will remain or be removed, but instead just identifies the number of interchanges needed for each scenario since the exact interchanges that remain or are removed may change depending on future conditions.	7-353	Revised text
Minnesota Department of Transportation	Consideration	The following comments are focused on freight transportation and derived from the recent completion of the 2018 Statewide Freight System and Investment Plan and its Freight Action Agenda. The Freight Action Agenda outlines next steps for MnDOT and the state's public and private sector freight partners. Local planning agencies such as City of Burnsville play an essential role in supporting objectives and strategies in the Freight Action Agenda. Specifically, MnDOT recommends the City of Burnsville consider leading freight planning in the following areas;	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan
Minnesota Department of Transportation		Truck Routes – Coordination of truck routes/planning in industrial and urban areas with restrictions and enforcement in adjacent residential areas	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan

Minnesota Department of Transportation		Complete Streets – Treatments that consider truck movement as part of total vehicle traffic, which can include time-of-day delivery windows to reduce conflicts with other street users, and design guidelines for curb pullouts that can be used at different times for bus, truck parking , and others	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan
Minnesota Department of Transportation		Land Use Planning and Polices - Land use planning and policies to ensure freight development areas are designated and preserved, and that development occurs adjacent to existing infrastructure	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan
Minnesota Department of Transportation	Consideration	The City of Burnsville may also consider a supporting role for MnDOT in the following areas (also discussed in the plan):	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan
Minnesota Department of Transportation		Freight as a Good Neighbor	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan
Minnesota Department of Transportation		Integrate Freight into all Planning Projects	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan
Minnesota Department of Transportation		First-/Last –Mile Connections	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan
Minnesota Department of Transportation		Intermodal and Multimodal Facilities	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan
Minnesota Department of Transportation		Urban Goods Movement Programs	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan
Minnesota Department of Transportation		Truck Size and Weight	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan
Minnesota Department of Transportation	Comment	Continue to coordinate planning efforts that involve MnDOT facilities that are within the City of Burnsville.	n/a	Noted
Entity	**Type**	**Comment**	**Page(s)**	**Response**
Three Rivers Park District	Text Change	Please revise the text throughout the document to read Murphy-Hanrehan Park Reserve. Note the hyphen between Murphy and Hanrehan, the exclusion of “Regional” and its designation as a “Reserve” and not “Preserve or Nature Reserve.”	2-99, 2-105, 5-268, 5-287, 7-326, 7-396 (Figure 7-29) 8-432, 8-433, 8-434	Updated
Three Rivers Park District	Text Change	The image has cut off the last sentence, which makes it appear as a caption to the picture. Recommend moving “arriving at Murphy-Hanrehan Park Reserve” up to complete the paragraph.	7-390	Addressed
Three Rivers Park District	Map Change	Figure 7.29 depicts a green existing trail extending west from the Burnsville/Dakota County border. There is no trail currently in place, and advisement is to delete this green alignment from the figure. The planned Lake Marion South Creek Greenway alignment extension through Scott County will be master planned as a future project with the Three Rivers Park District/Scott County partnership. Perhaps you may consider an arrow on the map to show that the trail is intended to continue west into Scott County.	7-395	Revised the figure

Three Rivers Park District	Text Change	“Murphy-Hanrehan Park Reserve’s implementing agency is the Three Rivers Park District through a joint powers agreement with Scott County."	8-434	Change Made

City Of Burnsville

952-895-4400

100 Civic Center Parkway • Burnsville, Minnesota 55337-3817 www.burnsville.org

August 24, 2018

RE: City of Burnsville 2040 Comprehensive Plan Update-Adjacent and Affected Jurisdiction Review and Comment Form

Per Minnesota Statute 473.858 Subd. 2 and the Metropolitan Council, we are distributing the proposed City of Burnsville 2040 Comprehensive Plan Update for your review and comment. The 2040 Comprehensive Plan Update can be found here: www.burnsville.org/2040.

On Tuesday, December 19, 2017 the Burnsville City Council authorized submittal to neighboring jurisdictions for the required six month review and comment period.

It is respectfully requested that you review the proposed 2040 Comprehensive Plan Update and send any **comments or indication of no comment** to 100 Civic Center Parkway, Burnsville MN 55337. With regard to review of the Comprehensive Plan Update, we ask that you provide feedback as timely as possible within the requested 6-month comment period. Please be advised that email response is also acceptable and may be sent to regina.dean@burnsvillemn.gov.

In the event that there are questions regarding the Comprehensive Plan Update, or if additional information is needed, please contact Regina Dean at 952-895-4453 or regina.dean@burnsvillemn.gov.

On behalf of the City of Burnsville, we would like to thank you in advance for your assistance and prompt response.

Please check the appropriate box:

- [x] We have reviewed the proposed Plan Update, do not have any comments, and are therefore waiving further review.
- [ ] We have reviewed the proposed Plan Update and offer the following comments (attach additional sheets if necessary)

Name of Reviewer Julie Farnham Senior Planner Date Aug 24, 2018

Signature of Reviewer Julie Farnham

City Of Burnsville
100 Civic Center Parkway • Burnsville, Minnesota 55337-3817
952-895-4400
www.burnsville.org

July 26, 2018

RE: City of Burnsville 2040 Comprehensive Plan Update-Adjacent and Affected Jurisdiction Review and Comment Form

Per Minnesota Statute 473.858 Subd. 2 and the Metropolitan Council, we are distributing the proposed City of Burnsville 2040 Comprehensive Plan Update for your review and comment. The 2040 Comprehensive Plan Update can be found here: www.burnsville.org/2040.

On Tuesday, December 19, 2017 the Burnsville City Council authorized submittal to neighboring jurisdictions for the required six month review and comment period.

It is respectfully requested that you review the proposed 2040 Comprehensive Plan Update and send any **comments or indication of no comment** to 100 Civic Center Parkway, Burnsville MN 55337. With regard to review of the Comprehensive Plan Update, we ask that you provide feedback as timely as possible within the requested 6-month comment period. Please be advised that email response is also acceptable and may be sent to regina.dean@burnsvillemn.gov.

In the event that there are questions regarding the Comprehensive Plan Update, or if additional information is needed, please contact Regina Dean at 952-895-4453 or regina.dean@burnsvillemn.gov.

On behalf of the City of Burnsville, we would like to thank you in advance for your assistance and prompt response.

Please check the appropriate box:

- ☑ We have reviewed the proposed Plan Update, do not have any comments, and are therefore waiving further review.
- ☐ We have reviewed the proposed Plan Update and offer the following comments (attach additional sheets if necessary)

Name of Reviewer Cynthia Nash, AICP Date 7/26/18

Signature of Reviewer Cynthia Nash

Credit River Township

City Of Burnsville

952-895-4400

100 Civic Center Parkway • Burnsville, Minnesota 55337-3817 www.burnsville.org

July 20, 2018

RE: City of Burnsville 2040 Comprehensive Plan Update-Adjacent and Affected Jurisdiction Review and Comment Form

Per Minnesota Statute 473.858 Subd. 2 and the Metropolitan Council, we are distributing the proposed City of Burnsville 2040 Comprehensive Plan Update for your review and comment. The 2040 Comprehensive Plan Update can be found here: www.burnsville.org/2040.

On Tuesday, December 19, 2017 the Burnsville City Council authorized submittal to neighboring jurisdictions for the required six month review and comment period.

It is respectfully requested that you review the proposed 2040 Comprehensive Plan Update and send any **comments or indication of no comment** to 100 Civic Center Parkway, Burnsville MN 55337. With regard to review of the Comprehensive Plan Update, we ask that you provide feedback as timely as possible within the requested 6-month comment period. Please be advised that email response is also acceptable and may be sent to regina.dean@burnsvillemn.gov.

In the event that there are questions regarding the Comprehensive Plan Update, or if additional information is needed, please contact Regina Dean at 952-895-4453 or regina.dean@burnsvillemn.gov.

On behalf of the City of Burnsville, we would like to thank you in advance for your assistance and prompt response.

Please check the appropriate box:

- € We have reviewed the proposed Plan Update, do not have any comments, and are therefore waiving further review.
- X We have reviewed the proposed Plan Update and offer the following comments (attach additional sheets if necessary)

_The Planning Department does not have any comments on the plan. Please see the attached memo from City Engineer Zach Johnson.

Name of Reviewer _Kris Jenson_____ Date __July 20, 2018_____

Signature of Reviewer Kris Jenson

City of Lakeville
Engineering

Memorandum

To:	Kris Jenson, Associate Planner
From:	Zach Johnson, City Engineer
Copy:	Justin Miller, City Administrator
	David Olson, Community & Economic Development Director
	Daryl Morey, Planning Director
	John Hennen, Parks & Recreation Director
	Neil Normandin, Interim Public Works Director
Date:	July 20, 2018
Subject:	Adjacent Jurisdiction Comp. Plan Review – City of Burnsville

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The City of Lakeville (Lakeville) Public Works – Engineering Division offers the following comments on the City of Burnsville's (Burnsville) draft 2040 Land Use Plan:

Transportation

- Lakeville appreciates Burnsville's commitment to increase capacity within existing transportation corridors, specifically its support for the extension of MnPASS/HOV lanes south along I-35 into Lakeville. (Burnsville Transp. Policy 1.3 – pp 7-325; pp 7-344; pp 7-378)
- Lakeville appreciates Burnsville's commitment to the development of the METRO Orange line, specifically its support for Phase 2 extension into Lakeville. (Burnsville Transp. Policy 5.1 - pp 7-326; pp 7-382).
- Lakeville appreciates Burnsville's commitment to complete trail connection along the Lake Marion Greenway Regional Trail. (Burnsville Transp. Policy 5.3 - pp 7-326; pp 7-390).
- Lakeville supports Burnsville's interest in considering the Canadian Pacific railroad as a future trail corridor if the rail line is ever abandoned (Burnsville Transp. Policy 5.8 pp 7-327; pp 7-354).
- Review Figure 7-4 (*Functional Road Classification Map*) for continuity at city limits. Lakeville identifies Buck Hill Road and Kenrick Avenue/Maple Island Road as major collectors – Burnsville identifies both as minor collectors (pp 7-336).
- Review Figure 7-8 (*Metropolitan Council 2040 Transitway System Map*) for accuracy with *Cedar Avenue Transitway Implementation Plan Update, December 2015*. Current service stops at Apple Valley Transit Station. Lakeville improvements are identified in Stages 4, 5 and beyond 2040 (pp 7-349).

City Services and Facilities

- No public comment.
  - ***FYI***
    - Plans reflects City's participation in:
      - Black Dog Watershed Management Organization (pp 8-414)
      - Dakota County Electronic Crimes Unit (pp 8-426)
    - Plan appropriately references Lakeville's contributing future sanitary sewer flow projections (pp 8-451)
    - Plan appropriately references Lakeville's water supply JPA (pp 8-463)

Natural Environment

- No public comment.
  - ***FYI***
    - Plan references Burnsville's adopted Emerald Ash Borer Management Plan – supports Lakeville's interest in managing the spread of EAB (pp 5-244; pp 5-254; pp 5-265; pp 5-284; pp 5-287)
    - Plan references Burnsville's concerns and issues regarding the Canadian Pacific Railroad – supports Lakeville's concerns (pp 5-247)
    - Plan reflects City's participation in Dakota Valley Recycling (pp 5-251)
    - Lake management is not included in the Plan.

City Of Burnsville

952-895-4400

100 Civic Center Parkway • Burnsville, Minnesota 55337-3817 www.burnsville.org

March 16, 2018

RE: City of Burnsville 2040 Comprehensive Plan Update-Adjacent and Affected Jurisdiction Review and Comment Form

Per Minnesota Statute 473.858 Subd. 2 and the Metropolitan Council, we are distributing the proposed City of Burnsville 2040 Comprehensive Plan Update for your review and comment. The 2040 Comprehensive Plan Update can be found here: www.burnsville.org/2040.

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It is respectfully requested that you review the proposed 2040 Comprehensive Plan Update and send any **comments or indication of no comment** to 100 Civic Center Parkway, Burnsville MN 55337. With regard to review of the Comprehensive Plan Update, we ask that you provide feedback as timely as possible within the requested 6-month comment period. Please be advised that email response is also acceptable and may be sent to regina.dean@burnsvillemn.gov.

In the event that there are questions regarding the Comprehensive Plan Update, or if additional information is needed, please contact Regina Dean at 952-895-4453 or regina.dean@burnsvillemn.gov.

On behalf of the City of Burnsville, we would like to thank you in advance for your assistance and prompt response.

Please check the appropriate box:

- [x] We have reviewed the proposed Plan Update, do not have any comments, and are therefore waiving further review.
- [ ] We have reviewed the proposed Plan Update and offer the following comments (attach additional sheets if necessary)

Name of Reviewer Bryan Tucker Planning Manager Date 6/20/18

Signature of Reviewer

Physical Development Division
Steven C. Mielke, Director

Dakota County
Western Service Center
14955 Galaxie Avenue
Apple Valley, MN 55124-8579

952.891.7000
Fax 952.891.7031
www.dakotacounty.us

Environmental Resources
Environmental Initiatives
Groundwater Protection
Land Conservation
Vermillion River Watershed
Water Resources
Waste Regulation

Office of Planning

Operations Management
Capital Projects Management
Facilities Management
Fleet Management
Parks

Transportation
Highway
Surveyor's Office
Transit Office

August 30, 2018

Regina Dean, City Planner
City of Burnsville
100 Civic Center Parkway
Burnsville, MN 55337

Dear Ms. Dean:

Thank you for the opportunity to review the Burnsville 2040 Comprehensive Plan Update. Dakota County staff reviewed the Plan for consistency with the County's Comprehensive Plan and policies.

Dakota County staff comments on the plan are on the following page. Please contact Kurt Chatfield at 952-891-7022 or kurt.chatfield@co.dakota.mn.us if you would like to discuss the County review. We look forward to working with the City of Burnsville to achieve our shared objectives.

Sincerely,

Erin Stwora
Assistant Director, Physical Development Division

Cc: Commissioner Liz Workman, District 5
Matt Smith, County Manager
Patrick Boylan, Metropolitan Council Sector Representative

Transportation Comments

The City of Burnsville's 2040 Comprehensive Plan Transportation Section appears to be consistent with Dakota County's Comprehensive Plan.

Highway Expansions

The Dakota County Comprehensive Plan has identified a number of County highways that need to be expanded. We suggest that the following highway expansions be referenced in the Burnsville Plan:

- County State Aid Highway (CSAH) 32, from Trunk Highway (TH) 13 to the east city border as a 6-lane need;
- CSAH 42, from the west city border to 145th St E, as more than a 6-lane need;
- CSAH 42, from 145th St E to the east city border, as a 6-lane need; and
- CSAH 46, for all portions bordering Burnsville, as a 6-lane need.

Travel Demand Forecasts

Dakota County will update its travel demand forecasts as part of an upcoming County Transportation Plan update. The new forecast will incorporate 2040 land use projections from each city. Dakota County will work with the City of Burnsville to include the City's 2040 land use projections and will re-evaluate highway expansion needs in the City and throughout Dakota County as part of that effort.

Transit

Please consider adding language to the description of Transit Link Service (page 7-350) that states that the service is available in areas where fixed route services are not available.

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The plan references the City's bicycle and pedestrian policies with respect to ADA requirements, trail development and transitway development. It may be useful to include a statement that Dakota County also has policies for pedestrian and bicycle modes that provide guidance for the County highways throughout the City.

Environmental Resources Comments

"On Site Septic Systems" on page 5-243 could be clarified to state that failing septic systems are of concern to the natural environment. Properly managed systems can benefit natural systems by replenishing groundwater after treatment.

Parks and Greenways Comments

Please consider adding labels to the map in this section that identify regional greenways. There is a reference to the "Dakota South Urban Regional Trail" which should be updated to the new name "McAndrews Greenway Regional Trail."

City Of Burnsville

952-895-4400

100 Civic Center Parkway • Burnsville, Minnesota 55337-3817 www.burnsville.org

March 16, 2018

RE: City of Burnsville 2040 Comprehensive Plan Update-Adjacent and Affected Jurisdiction Review and Comment Form

Per Minnesota Statute 473.858 Subd. 2 and the Metropolitan Council, we are distributing the proposed City of Burnsville 2040 Comprehensive Plan Update for your review and comment. The 2040 Comprehensive Plan Update can be found here: www.burnsville.org/2040.

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In the event that there are questions regarding the Comprehensive Plan Update, or if additional information is needed, please contact Regina Dean at 952-895-4453 or regina.dean@burnsvillemn.gov.

On behalf of the City of Burnsville, we would like to thank you in advance for your assistance and prompt response.

Please check the appropriate box:

- ☐ We have reviewed the proposed Plan Update, do not have any comments, and are therefore waiving further review.
- ☒ We have reviewed the proposed Plan Update and offer the following comments (attach additional sheets if necessary)

Name of Reviewer Brad Davis Date 9/14/18

Signature of Reviewer

SCOTT COUNTY COMMUNITY DEVELOPMENT
Planning Department

GOVERNMENT CENTER 114 · 200 FOURTH AVENUE WEST · SHAKOPEE, MN 55379-1220
(952) 496-8475 · Fax (952) 496-8496 · Web www.co.scott.mn.us

September 14, 2018

Regina Dean, Planner
100 Civic Center Parkway
Burnsville, MN 55337-3817

RE: Response to City of Burnsville 2040 Comprehensive Plan

Dear Ms. Dean,

Thank you for the opportunity to review and comment on Burnsville's draft 2040 Comprehensive Plan. Staff members from Scott County's planning, highway, transit, parks and natural resources departments have completed a review of the city's draft plan and provide the following comments based on adopted 2030 and draft 2040 Scott County plans and policies as well as current program information.

Parks and Trails:

- The correct name of the regional park in Credit River Township is Murphy-Hanrehan Park Reserve. Incorrect references are on pages: 110, 116, 280,340, 447, 448, and 449.

- The segment of trail on figure 7-29 within Murphy-Hanrehan Park Reserve is not an existing (or planned) trail. It may be a reference to the very generically depicted connection around Murphy-Hanrehan Park Reserve that is included in Dakota County's Lake Marion Greenway Regional Trail master plan. Please remove from the figure.

- The reference on page 340 to the Scott County East Regional Trail should be the Lake Marion Greenway.

- On page 449 the plan references an MOU between Scott County and Three Rivers – It is now managed through a Joint Powers Agreement.

Overall the draft plan is well done and provides a great vision for your community. If you have any questions about the County's review, please contact me at 952-496-8654 or bdavis@co.scott.mn.us.

Sincerely,

Brad Davis, AICP
Planning Manager

City Of Burnsville
952-895-4400
100 Civic Center Parkway • Burnsville, Minnesota 55337-3817
www.burnsville.org

April 6, 2018

RE: City of Burnsville 2040 Comprehensive Plan Update-Adjacent and Affected Jurisdiction Review and Comment Form

Per Minnesota Statute 473.858 Subd. 2 and the Metropolitan Council, we are distributing the proposed City of Burnsville 2040 Comprehensive Plan Update for your review and comment. The 2040 Comprehensive Plan Update can be found here: www.burnsville.org/2040.

On Tuesday, December 19, 2017 the Burnsville City Council authorized submittal to neighboring jurisdictions for the required six month review and comment period.

It is respectfully requested that you review the proposed 2040 Comprehensive Plan Update and send any **comments or indication of no comment** to 100 Civic Center Parkway, Burnsville MN 55337. With regard to review of the Comprehensive Plan Update, we ask that you provide feedback as timely as possible within the requested 6-month comment period. Please be advised that email response is also acceptable and may be sent to regina.dean@burnsvillemn.gov.

In the event that there are questions regarding the Comprehensive Plan Update, or if additional information is needed, please contact Regina Dean at 952-895-4453 or regina.dean@burnsvillemn.gov.

On behalf of the City of Burnsville, we would like to thank you in advance for your assistance and prompt response.

Please check the appropriate box:

- [x] We have reviewed the proposed Plan Update, do not have any comments, and are therefore waiving further review.
- [ ] We have reviewed the proposed Plan Update and offer the following comments (attach additional sheets if necessary)

Name of Reviewer Ashley Gallagher Date 4-19-18

Signature of Reviewer Ashley Gallagher on behalf of E-JGHWMO

City Of Burnsville
952-895-4400
100 Civic Center Parkway • Burnsville, Minnesota 55337-3817
www.burnsville.org

May 28, 2018

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- ☐ We have reviewed the proposed Plan Update and offer the following comments (attach additional sheets if necessary)

See Attached

Name of Reviewer _Della Young, Young Environmental Consulting Group_ Date May 22,2018

Signature of Reviewer Linda Loomis, Administrator

Young Environmental Consulting Group, LLC

Technical Memorandum

To: Linda Loomis, Administrator

From: Lisa Buchli, PE
Della Schall Young, CPESC, PMP

Date: May 22, 2018

Re: City of Burnsville 2040 Comprehensive Plan Update Review

The *City of Burnsville 2040 Comprehensive Plan Update* (*Burnsville 2040*) was reviewed by the Lower Minnesota River Watershed District (District). The District compared the *Burnsville 2040* to its *Watershed Management Plan* (*Plan*) to better understand how the District and the City of Burnsville (City) can work together to protect, preserve, and manage the surface water resources and groundwater within the District.

The section of the *Burnsville 2040* relevant to the District is Chapter 5, "Natural Environment." Many of the goals and policies found in the *Burnsville 2040* are similar to the goals, policies, and strategies found in the District *Plan*, especially those related to the management of surface waters, groundwater, floodplains, and wetlands. The City relies on several overlay district standards in its zoning ordinance to meet the goals and policies of the *Burnsville 2040*. The following sections describe how the City standards in the ordinance compare to the District regulations on topics of concern to both entities.

Construction Erosion Control Standard

Chapter 8 of the City of Burnsville zoning ordinance addresses all the environmental overlay districts that have been established in the City. Section 10-8-8, "Controlling Erosion and Sediment from Land-Disturbing Activities," of the chapter states that any land-disturbing activities that involve 90 or more cubic yards of earthwork must comply with the requirements of the section. This standard is more stringent than the District's Construction Erosion Control Standard, which requires erosion and sediment control measures to meet the requirements of the National Pollutant Discharge Elimination System (NPDES) general permit. An NPDES general permit is required for construction activity that results in land disturbance of equal to or greater than one acre. The City code goes on to state that the erosion and sediment control measures must comply with the most recent regulations of the Minnesota Pollution Control Agency's (MPCA)

NPDES/State Disposal System permit program. The specific erosion control plan inspection and maintenance requirements in the code closely match the District's erosion and sediment control standards.

STORMWATER MANAGEMENT

In Chapter 8, Section 10-8-11, "Stormwater Management Overlay District Standards," states that "development shall comply with the water resources management plan adopted by the city council in 2002 and any future amendments." The 2017 *Burnsville Water Resources Management Plan* (WRMP) is included as an appendix to the *Burnsville 2040* and was reviewed. The Development Standards included as Appendix C to the WRMP state that any development that disturbs one-half acre or more or creates 5,000 square feet or more of new impervious surface must meet the water quality treatment, volume control, water quantity, and rate control requirements of the WRMP. This standard is more stringent than the District's existing and proposed general Stormwater Management Standard, which requires compliance for development, redevelopment, and drainage alterations (including roads) creating new impervious areas of more than one acre.

The existing District standard requires that 0.5 inches of runoff from development and redevelopment sites must be infiltrated, so the City's requirement is stricter than the District's. However, the District standard is currently being updated, and the proposed standard requires one inch of runoff from new impervious surfaces to be retained on site. The City's water quality treatment requirement for new development and redevelopment includes redeveloping more than 50 percent of the site which is still stricter than the District's proposed standard. However, the City's requirement for redevelopment that includes redeveloping less than or equal to 50 percent of the site is less strict than the District's proposed standard. The proposed District standard does not differentiate between development and redevelopment. If a project creates one acre or more of new impervious surface, one inch of runoff from the new impervious surface must be retained on site.

The City's phosphorus removal requirements are unique to the City's WRMP. The existing District standard does not have any specific phosphorus removal requirements. Instead, it requires water quality stormwater management to comply with the requirements of the MPCA general permit, which has additional requirements if the receiving water of a construction site is impaired by phosphorus. The proposed District stormwater management standard requires that projects have no net increase from existing conditions in total phosphorus and total suspended solids.

The existing and proposed District standard includes the same rate control requirements and constraints on infiltration practices as the City standard.

Section 10-8-10 of Burnsville's zoning ordinance for the shoreland overlay district

contains the following additional stormwater management requirements that the District does not include these guidelines:

1. Where 50 percent or more of the lot area lies within the shoreland overlay district, the maximum impervious surface coverage is 25 percent of the lot area.
2. In certain zoning districts, impervious surface may be increased if the proposed development mitigates additional stormwater runoff to a level consistent with 25 percent impervious surface coverage under a 1.5-inch rainfall design storm.

Floodplain Management

Chapter 10 of Burnsville's zoning ordinance addresses floodplain management. Like the existing and proposed District Floodplain and Drainage Alteration Standard, the City ordinance prohibits placing fill in the floodway that will cause an increase in the 100-year or regional flood or cause an increase in flood damages in the reach or reaches affected. Fill is allowed in the flood fringe if it does not adversely affect the hydraulic capacity of the channel. The cumulative placement of more than 1,000 cubic yards of fill on a parcel is allowable only as a conditional use, unless the fill is specifically intended to elevate a structure. An erosion/sedimentation control plan that clearly specifies methods to stabilize the fill on site for the 100-year flood event must be submitted to the City. Unlike the District, Burnsville does not require fill placed in the flood fringe that causes a rise in the high-water level to be offset by compensatory storage.

Appendix C of the WRMP states that for all structures in the flood fringe, the lowest floor of the structure (including the basement) must be at or above the regulatory flood protection elevation. The regulatory flood protection elevation is defined as one foot above the regional (100-year) flood plus any increase in flood elevation caused by encroachments on the floodplain that result from designation of a floodway (0.5 feet in Minnesota). This means that the lowest floor of structures can't be less than 1.5 feet above the 100-year flood elevation. In contrast, the existing and proposed District standard requires the lowest level of proposed structures be a minimum of two feet above the 100-year flood elevation.

Bluff Management

In the definitions section of the zoning ordinance, a bluff is defined as a topographic feature located in a shoreland area with a slope that drains toward a water body, rises at least 25 feet above the ordinary highwater level of the water body, and has an average slope of 30 percent or more. The bluff impact zone is defined as a bluff and land located within 20 feet from the top of a bluff. The toe and top of the bluff are defined as the lower and higher points of a 50-foot segment with an average slope exceeding 18 percent. Steep slopes are defined as lands having average slopes over 12 percent, as measured over horizontal distances of 50 feet or more, that are not

bluffs.

Section 10-8-6, “Soil Erosion Overlay District Standards,” of the zoning ordinance states that a 40-foot building setback must be established along the Minnesota River bluffs. The bluff line is defined as the point at which the slope gradient exceeds 40 percent. It isn’t clear whether this building setback and slope gradient, which differ from those defined at the beginning of the ordinance, are meant to be specific to only the Minnesota River bluffs or whether the inconsistencies are errors. Section 10-8-10, “Shoreland Overlay District,” of the ordinance requires a structure setback of 30 feet from the top of a bluff, but it also states that structures must not be placed within bluff impact zones (which were earlier defined as a bluff and land within 20 feet from the top of a bluff).

The shoreland section of the zoning ordinance includes the following bluff requirements:

1. Intensive vegetation clearing within bluff impact zones and on steep slopes is prohibited.
2. On steep slopes or within bluff impact zones, a grading and filling permit is required for the movement of more than 10 cubic yards of material (outside of steep slopes and bluff impact zones, a grading and filling permit is not required until more than 90 cubic yards of material are moved).
3. Fill or excavated material must not be placed in bluff impact zones.
4. Roads, driveways, and parking areas must not be placed within bluff impact zones.

The District’s existing Bluff Standard’s slope threshold is 30 percent or greater and includes aspects of the Minnesota Department of Natural Resources (MnDNR) bluff definition, which tied it to shoreland areas. The District standard includes a 30-foot structure setback requirement, a minimum 50-foot setback for sewage treatment systems, and stormwater features that involve soil saturation. Like the City’s, the District’s standard does not allow extensive vegetation removal, such as clear-cutting, in the Bluff Impact Zone. Unlike the City’s, the District’s existing standard prohibits all grading, vegetation removal, and other land-disturbing activities as well.

The District’s proposed steep slopes standard includes a Steep Slopes Overlay district based on slopes greater than 18 percent and doesn’t restrict structure location in the overlay zone. The District standard does not explicitly prohibit intensive vegetation clearing, although it is strongly discouraged. Land-disturbing activities that involve excavation of 50 cubic yards or more in the Steep Slopes Overlay district require a qualified professional or a professional engineer registered in the state of Minnesota, to certify that the area for the proposed activity, structure, or use is suitable.

High Value Resource Areas

Most of the wetlands along the Minnesota River within the City of Burnsville are included within the Minnesota Valley National Wildlife Refuge (MVNWR). The Black Dog wetland complex, located south of Black Dog Lake, is a designated calcareous fen. The Black Dog Scientific and Natural Area (BDSNA) is a designated protected area that includes portions of the Black Dog fen. The MVNWR is under the authority of the US Fish and Wildlife Service, and the BDSNA is managed by the MnDNR and the Nature Conservancy. The City has three designated trout streams in the northeast portion of the city, all of which are located within the District boundary and drain into the Minnesota River through Black Dog Lake. The three trout streams include Unnamed Trout Stream Segment #7, One Mile Creek (also identified as Segment #4 and Unnamed Stream #4), and a very small portion draining into Harnack Creek (Harnack Creek is also identified as Segment #1 or Unnamed Stream #1).

Black Dog fen and the trout streams are fed by groundwater from natural springs. The *Burnsville 2040* states that limiting the amount of impervious surface cover and reducing stormwater discharge volume is critical for maintenance of these cold-water–dependent resources. The City also recognizes that encouraging natural infiltration of stormwater is important in protecting surface water features that depend on groundwater. Therefore, the City's WRMP stresses incorporating infiltration to the maximum extent practicable, as discussed previously.

Appendix C of the City WRMP includes the following requirements for special waters and wetlands:

1. Sites discharging to Trout Streams #1, #4, or #7 must incorporate BMPs that address runoff temperature requirements, maintain an undisturbed buffer zone of at least 100 feet between the project site and the trout stream, and cover exposed slopes that are steeper than 3:1 (H:V) within three days of the disturbance.
2. Horizontal vegetated buffer zones shall be established and/or maintained around existing wetlands and stormwater treatment ponds. New development and redevelopment projects shall provide a buffer zone around wetlands in accordance with the requirements in the City's *Wetland Protection and Management Plan*.
3. Water level fluctuations in wetlands shall be managed in accordance with the City's *Comprehensive Wetland Protection and Management Plan*. A rise (bounce) in elevation greater than 12 inches during a 10-year storm shall be avoided.
4. New discharge points to all wetlands and waters must include pretreatment. New direct discharges to Management II wetlands must have at least grit removal prior to discharge.

The District is home to several rare fens and sensitive trout waters. The specific hydrologic and chemical requirements of fens and trout waters make them especially sensitive to sedimentation, stormwater runoff, and changes to groundwater level and quality. It is the District's policy to prevent resource degradation due to erosion and sedimentation and protect and improve natural resources within the watershed to halt further degradation. This is especially true for high-value resources such as fens and trout waters. The existing District *Plan* does not include any standards specific to fens or trout waters. According to the existing *Plan*, fen protection in the District is regulated under MN Rule 7050, "Non-degradation for outstanding resource value waters," which is administered by the MPCA. Trout streams within the District are managed by the MnDNR.

The establishment of stricter protections for areas contributing runoff to a trout water or fen (referred to as high value resource areas [HVRA] in the proposed District standards) is critical for preventing further destruction of these unique and irreplaceable resources.

The proposed District standards include stricter requirements for HVRAs. The District Erosion and Sediment Control standard, which normally applies to land-disturbing activities of one acre or more, applies to the alteration or removal of 5,000 square feet or more of surface area or the excavation of 50 cubic yards or more of earth within HVRAs. Similarly, the District Stormwater Management standard, which normally applies to development, redevelopment, and drainage alterations (including roads) that create new impervious areas greater than one acre, applies to new impervious areas greater than 10,000 square feet in HVRAs.

Groundwater

The *Burnsville 2040* states that the most sensitive areas with the shortest lengths of time required for surface water to infiltrate to the aquifer in the City of Burnsville are generally located in the outwash terraces along the bluff line and in the floodplain. A large area that extends from just east of I-35W to the Savage border between Highway 13 and the river, as well as a smaller floodplain area in the Black Dog Preserve east of I-35W, possesses very high sensitivity ratings, indicating that waterborne contaminants can travel from the surface to the aquifer in as little as a few hours to a few months.

Studies indicate the Minnesota River and river valley serve as groundwater discharge areas rather than recharge areas. In other words, the natural groundwater in this area flows from the glacial overburden and St. Peter and Prairie du Chien-Jordan aquifers into the river and associated river valley lakes, wetlands, and springs rather than from the surface downward into the aquifers. This natural direction of flow limits the transmission of contaminates downward into the deeper aquifers and, instead, tends to divert surface them into the Minnesota River.

The City recognizes that groundwater sustainability is an emerging issue. The community requires a safe and reliable source of drinking water, which makes it essential to preserve and protect the groundwater aquifers that supply the City's drinking water. Burnsville has developed a groundwater model that focuses on the Burnsville well field, Kraemer Quarry, and Black Dog and Savage fens. The model will be used in the design of groundwater withdrawal and the minimization of impacts to protected surface waters. The *Burnsville 2040* also recognizes that restoring wetlands is an important part of promoting groundwater recharge.

Section 10-8-12, "Drinking Water Protection Overlay District," of the zoning ordinance includes performance standards intended to protect groundwater from contamination. The ordinance addresses proper location and construction of wells; necessary modifications and reconstruction; operation, maintenance, and repair; permanent sealing; and annual maintenance permitting, including registered used and unused wells. The ordinance does not, however, address the issue of groundwater quantity. Excessive consumption of drinking water for uses that do not require drinkable water quality can threaten the long-term supply of drinking water. It is unclear whether groundwater supplies are adequate in some areas of the County to meet drinking water demand. In addition, a sustainable, nonfluctuating supply of groundwater is required to maintain water levels and soil chemistry in fens and temperature in trout waters. The county's storm sewer system ordinance does stress incorporating infiltration to the maximum extent practicable and requires the runoff volume from 1.1 inches of rainfall from the new and/or redeveloped impervious surfaces to be treated by infiltration practices.

Potential Projects for Partnering with the District

Capital Improvements Plan, 2018–2022

- Trout Stream #4 Restoration – The MnDNR and MN Trout Unlimited are considering rehabilitating a trout stream near the Cedarbridge area in an existing stream. The City may need to make storm sewer and drainage improvements in the existing system to help the stream become a viable trout habitat. This project is not being led by the City but may include some improvements to the City's drainage system or be used for cost sharing on the project ($10K – 2018).
- Resiliency Assessment of Major Drainage Systems – This assessment includes a review of the City's major drainage system to identify areas where failure of the system would necessitate expensive repair in a short time and/or cause significant damage to private buildings. These high-risk areas will be identified to aid staff in planning future improvements ($40K – 2018).
- Resiliency Improvements – This project is designed to provide improvements for the highest-risk systems identified through the resiliency assessment of major

drainage systems ($350K – 2019).

- Keller Lake to Minnesota River Water Level Hydrologic and Hydraulic Analysis and Report – Analysis of the chain of water bodies that starts at Keller Lake and ends at the Minnesota River to identify adjustments that could be made to optimize water levels in the system ($75K – 2019).
- Minnesota River Quadrant (MRQ) Stormwater and Floodplain Study and Report – Analysis of the overall stormwater management system needs for the MRQ to accommodate future development. The report will guide the review of future developments in the MRQ to optimize the location of future stormwater management facilities ($50K – 2022).
- Bluff Area Risk Analysis – Analysis of the bluffs within the City to identify areas where the risk of failure is high or where the failure of which would lead to public safety risk or create a significant expense in a short time. This study would aid in the planning of related improvements in future capital improvement plans and future maintenance operations to proactively prevent slope failure ($50K – 2018).
- Ravine Restoration – Analysis of ravines to target those most in need of maintenance and then to fund their repair to prevent loss of soils retaining property values and reduce off-site deposit of these soils ($500K – 2019, $500K – 2021).

SUMMARY

The District commends the City for developing a thoughtful and thorough comprehensive plan. The City clearly takes pride in its efforts to conserve and protect natural resources. A comparison of the *Burnsville 2040* to the District's *Watershed Management Plan* shows that the City and the District share several goals in efforts to preserve and manage surface water resources and groundwater.

The following recommendations are suggested for inclusion in the *Burnsville 2040* to strengthen the City's plan and to better align the *Burnsville 2040* with the District's existing and proposed standards:

- In Title 10, Chapter 10, "Floodplain Regulations":
    - Require the lowest level of proposed structures to be a minimum of two feet above the 100-year flood elevation.
    - When the placement of fill in the 100-year floodplain causes a rise in the 100-year flood elevation, require the creation of compensatory floodplain storage equal to or greater than the volume of fill placed.
- In Title 10, Chapter 8, "Environmental Overlay Districts":
    - Refine the definition of bluff so it is the same throughout the chapter and better matches the District's proposed Steep Slopes standard, which has

replaced “bluff” with “steep slope” and defines it as a natural topographic feature having average slopes of 18 percent or greater over a horizontal distance of 25 feet or more.

- Remove the requirement that a bluff (or steep slope, if the term is changed) must be in a shoreland area. Correspondingly, shift the bluff management information in Chapter 8, Section 10, “Shoreland Overlay District,” to an alternative location in Chapter 8.

- Identify all steep slope (bluff) protection measures in a single overlay district—for example, the Soil Erosion Overlay District Standard. In Appendix C of the City’s *Water Resources Management Plan*, Development Standards:
  - Define and include fens in Section 6, “Special Waters and Wetlands.”
  - On land that contributes runoff to a trout water and/or fen, require a higher level of protection by applying the standards of the water quality treatment, volume control, water quantity, and rate control requirements in the WRMP to any development that includes disturbing 5,000 square feet or more of surface area, excavating 50 cubic yards or more of earth, or creating more than 10,000 square feet of new impervious area.

The District looks forward to future partnerships with the City as we work to complete potential projects that meet our common goal of reducing the flow of pollutants and sediment to the Minnesota River and protecting, preserving, and managing our shared surface and groundwater resources.

cc: Jeff Thuma, Burns & McDonnell

City Of
Burnsville

952-895-4400

100 Civic Center Parkway • Burnsville, Minnesota 55337-3817

www.burnsville.org

September 7, 2018

RE: City of Burnsville 2040 Comprehensive Plan Update-Adjacent and Affected Jurisdiction Review and Comment Form

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On behalf of the City of Burnsville, we would like to thank you in advance for your assistance and prompt response.

Please check the appropriate box:

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- ☑ We have reviewed the proposed Plan Update and offer the following comments (attach additional sheets if necessary)

SEE ATTACHMENT

Name of Reviewer AARON BARTLING Date 9-7-18

Signature of Reviewer

Commercial Recreation Business (CRB)

The intent of the Commercial Recreation Business land use category is to designate lands that include important private recreation facilities as well as supporting businesses such as restaurants, hotel/conference facilities, golf courses and other forms of outdoor recreation. The classification seeks to promote high quality, large-scale recreational facilities that reserve the natural character of woodlands, steep slopes, wetlands and other conditions. This area is applied to the Buck Hill ski facility to recognize the importance of this facility and to promote business that helps sustain the use for years to come.

This land use category has also been applied to the former Freeway Landfill property, and Burnsville Sanitary Landfill site (future 18-hole championship golf course area). The designation is intended to recognize the special characteristics of these uses. While they are privately owned, they serve the general public in a way similar to other publicly owned recreation facilities like Birnamwood Golf Course. The corresponding zoning districts are CRD, Commercial Recreation District and PUD, Planned Unit Development District.

Heart of the City (HOC)

The HOC redevelopment area is a mixed use, pedestrian-oriented downtown area for Burnsville and is bound by I-35W to the west, existing residential uses to the south of Burnsville Parkway, Eagle Ridge Drive to the east and Trunk Highway 13 to the north. The HOC is Burnsville's most ambitious and largest redevelopment effort to date and grew from the citizen driven 1996 community visioning project "Partnerships for Tomorrow." The City Council adopted a Framework Design Manual and specific zoning ordinance standards (HOC-1 and HOC-2 Districts) that outline design parameters and other requirements for redevelopment. Since the year 2000, numerous projects have been approved and built bringing new commercial, office, entertainment, recreation, and residential opportunities to the city in addition to Nicollet Commons Park and the Ames Center as the community gathering area.

The HOC concept is designed to cater to pedestrians, offer a gathering place for community civic events, provide access and exposure to public arts, and attract unique restaurants, office space and retail that support the residential neighborhood. The HOC has been designed with walkability and transit service in mind. The HOC is adjacent to the Minnesota Valley Transit Authority transit station which includes a 1200-space public parking ramp with daily 1bmmuter transit service, office space and future retail developments. Within HOC there are two City parking structures. A 350-stall ramp is located on Pillsbury Avenue and includes MVTA transit stops. There is also a 389-stall public parking deck located adjacent to Nicollet Commons Park and the Ames Center.

Highway BRT Transitway TOD Standards

- Metropolitan Council policy is that density expectations for highway BRT transitway station area (area within 10-minute walk or ½ mile) are a minimum of 10 units per acre, with a target density of 20-40+ units per acre.
- Two future Orange Line BRT stations are planned within the Heart of the City, with a possible additional station being considered near Burnsville Center
- These locations are within the HOC and MIX land use categories, with residential densities at 20-60 u/a, and 15-30 u/a, respectively

Summary of Comments on Burnsville Comprehensive Plan 2040_20180316142523228 8_AB comments.pdf

Page: 103

Number: 1 Author: abartling Subject: Highlight Date: 8/15/2018 12:48:46 PM
Burnsville Transit Station also has several local routes.

ED Goal 2. Burnsville strengthens its skilled workforce through providing post-secondary education and job training opportunities for residents.*[2]

ED Policy 2.1. Partner with post-secondary education providers and organizations, such as South of the River Education Center and Burnsville Promise, to strengthen secondary educational and career readiness opportunities in Burnsville including internships.

ED Policy 2.2. Collaborate with the Minnesota Workforce Center, private employers and schools to match potential employees with job opportunities.

ED Policy 2.3. Work with community partners and all school districts in the city to advance job training and career readiness initiatives.

ED Goal 3. Burnsville's identity as an attractive and desirable place in which to live, work, shop and play is actively promoted.

ED Policy 3.1. Communicate the city's livability, assets, and business orientation through the news media, newsletter, cable television and the City's website.

ED Policy 3.2. Identify all gateways into Burnsville with unique features.

ED Policy 3.3. Enhance and connect Burnsville's recognized amenity areas (MRQ, HOC, Burnsville Center, Southcross Business Park, Ridges Medical Campus, Cliff Road Business Park) with improved pedestrian and bicycle facilities, "high impact" streetscapes, water features, public areas, way finding signage, public art, and signature buildings.

ED Policy 3.4. Showcase the Minnesota River through amenities, trails, lighting, and building orientation.

ED Policy 3.5. Embrace bus rapid transit service (Orange Line), and leverage it to attract additional investment in Burnsville.

ED Policy 3.6. Support repositioning and strengthening Burnsville Center Mall and the County Road 42 corridor for the future by partnering with their marketing, branding, retail positioning, and development strategies.

ED Policy 3.7. Continue to foster development in Heart of the City that builds the residential community, attracts people to the area, and adds to its vibrancy.

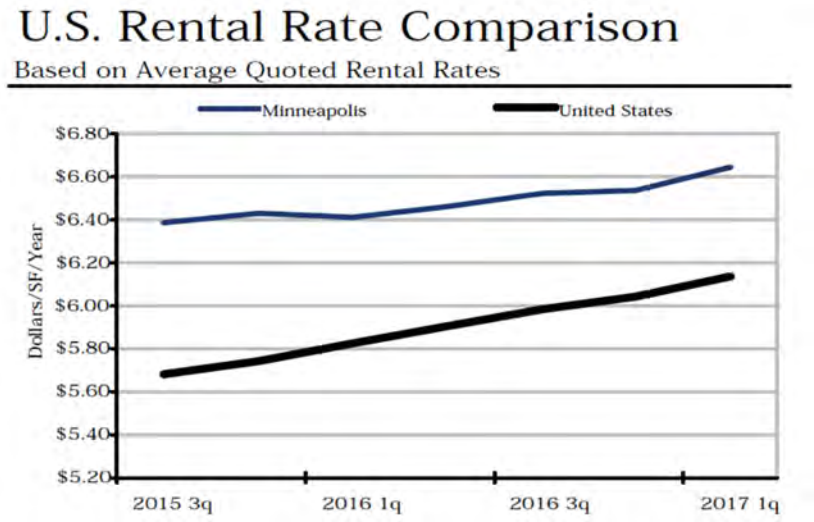
[2] * Indicates a Goal or Policy that references the Council's adopted Ends and Outcomes.

Page: 137

Number: 1 Author: abartling Subject: Highlight Date: 8/15/2018 12:52:43 PM
Consider including both Express and Local services offered by MVTA.

excellent access to transportation infrastructure, and it is well positioned as the region's center of gravity has shifted southward. There are amenities nearby, including the Minnesota River, bike trails, and nearby restaurants. The variety of small-to-medium size spaces are ideal for small businesses, business start-ups, and local entrepreneurs, and can help attract new businesses to Burnsville. The City has a reputation of being supportive of business and easy to work with. All of these characteristics add up to a business park that has a lot of inherent value.

Figure 3-15: Rental Rate Comparison – Minneapolis & U.S.



Source: Costar

There are weaknesses as well. The older buildings have low clear heights (14') and the configuration of loading docks and interiors are sometimes restrictive. Some of the buildings appear tired, with poor signage, cracked facades and unkempt parking and border areas. Deteriorating physical conditions in the area may be a disincentive for property owners to invest in their own properties, leading to longer-term disinvestment. Some property owners have not reinvested in their properties due to the fact that they are occupied and continue to have positive cash flow.

Transit service to the Cliff Road Business Park is not strong, although it will be strengthened when Orange Line Bus Rapid Transit (BRT) service comes online. Parking is not sufficient for some properties. The area lacks identity, or even an identifying label. Unifying elements, such as streetscaping, signage or landscaping themes, are lacking. The encroachment of potentially incompatible uses may be taken as a signal that the area won't be protected for business use over the long term.

Findings

The Cliff Road Business Park is still viable, and it offers a complementary business setting to the newer Southcross Industrial Park. Start-ups, research, local food production and processing may find these buildings attractive

Page: 168

Number: 1 Author: abartling Subject: Highlight Date: 8/15/2018 12:56:42 PM

Please clarify how the Orange Line will strengthen transit service to the Cliff Road Business Park. The only connection from the future Orange Line stop to this area is via MVTA's Route 444, which is in operation today and serves south of Hwy 13.

The entire city of Burnsville is located within Transit Market Area III which is defined as:

> Urban along with portions of the Suburban, Suburban Edge, and Emerging Suburban Edge and is generally characterized by overall lower density and less transit-supportive urban form along with some pockets of denser development. The primary emphasis of transit service in this area is express and commuter service with some suburban local routes providing basic coverage.

Transit Market Area III has moderate density and can support a variety of transit services, but at lower intensity than Areas I and II. In some cases, general public dial-a-ride services may be appropriate in this market. The suggested service types for Market Area III include a mix of regular route and community circulator service complemented by dial-a-ride service in specific cases. Community circulators should tie into regular route regional service at a transfer point. The service types are general descriptions for each market area. Specific implementation of transit services will depend on available resources, specific analysis of transit demand, complementary and competing services, and other factors. Detailed analysis of specific communities may generate additional transit service delivery strategies.

Figure 7-8 illustrates the 2040 Transitway System as developed by the Metropolitan Council.

The region made progress in developing transitways in the past several years. The I-35W MnPASS lanes on I-35W have been constructed which will facilitate Phase 1 of the METRO Orange BRT line which will begin operation in 2020. Phase 2 of the Orange Line is being studied for future construction. The Cedar BRT line, which serves and runs through the far northeast corner of Burnsville, has also been constructed and is currently operating with bus-only shoulder lanes.

The following sections describe the various components of transit service and facilities in Burnsville.

Page: 362

Number: 1 Author: abartling Subject: Highlight Date: 8/15/2018 1:03:54 PM
Burnsville also has an Emerging Market Area II.

Number: 2 Author: abartling Subject: Highlight Date: 8/15/2018 1:04:14 PM
MVTA comment on 2015 System Statement: "Transit Market Area descriptions in the TPP may not represent the full service needs of the City of Burnsville. MVTA is available to work with the City to determine the appropriate level of service for each area, regardless of its designation.

Number: 3 Author: abartling Subject: Highlight Date: 8/15/2018 1:05:30 PM
MVTA routes currently use/benefit from MnPASS lanes and bus-only shoulders.

Fixed Route Transit Service and Facilities

The City is one of seven cities (Apple Valley, Burnsville, Eagan, Prior Lake, Rosemount, Savage and Shakopee) and two counties (Dakota and Scott), that have followed the "Opt-Out" transit option. By opting out, these cities and counties are able to provide alternative transit services by utilizing funds that would have otherwise gone to the Metro Transit. All seven communities and the two counties entered into a Joint Powers Agreement to form the Minnesota Valley Transit Authority (MVTA) to provide transit services their communities. The MVTA Board is comprised of elected officials from each of the seven cities and two counties in the service area. City Resolution No. 08- 5634, identified MVTA as Burnsville's primary transit provider. In 2010, Lakeville joined with the Metro Transit and a new park-and-ride facility was constructed along I-35W just south of Burnsville.

MVTA has proven successful based on ridership. The MVTA Board has also developed strategies and future plans for transit operations and expansions. MVTA has a number of regular transit routes and operates two park-and-ride facilities in Burnsville. A major transit hub and park-and-ride facility with 1,300 spaces is located at 100 Highway 13 East in Burnsville as well. This facility provides direct access to I-35W via an High Occupancy Vehicle (HOV) lane and also features many amenities including an indoor climate-controlled waiting area, restrooms, a bus pass sales window, transit information center, pay phones, drinking fountains, vending machines, an ATM, newspaper sales. This park-and-ride currently has a three-deck parking structure; the City has also approved the addition of a fourth deck which would accommodate an additional 300 - 400 vehicles. The other park-and-ride facility is located at the HOC and contains 350 spaces as well as an indoor climate-controlled waiting area.

The transit routes and park-and-ride facilities serving Burnsville are identified on Figure 7-9: Transit Service and Facilities.

Non-Fixed Route Transit

While the regular-route transit system is planned to meet the needs of the majority of transit users, some customers can be more effectively served through demand-responsive alternatives. The Americans with Disabilities Act (ADA) requires this service be provided and funded. Burnsville is served by Metro Mobility and Dakota County Transit Link Service.

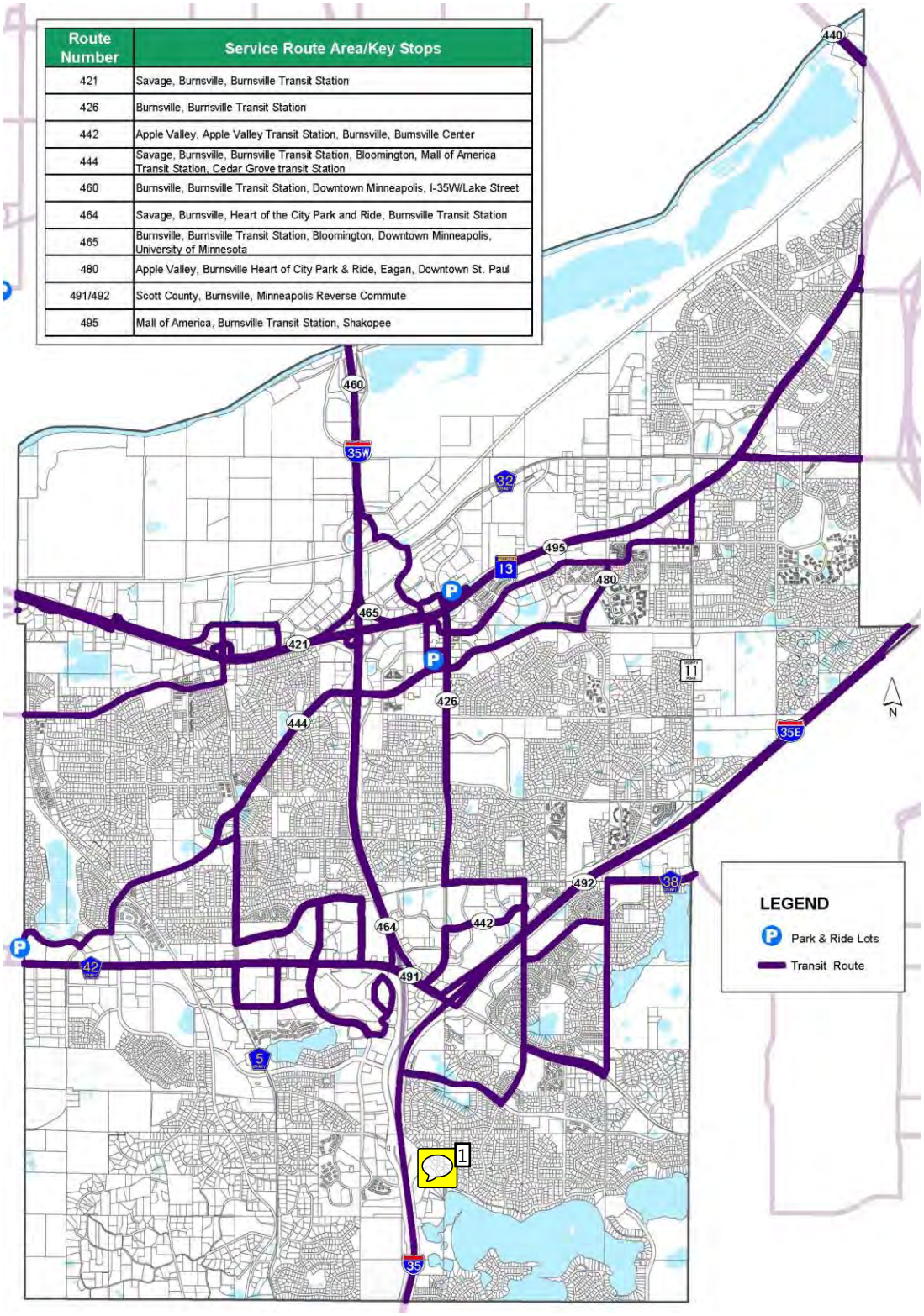
Metro Mobility will meet the requirements of the ADA by providing transit service to people with disabilities certified as not able to use the regular-route transit system. Under the ADA, the metropolitan region is required to provide complementary paratransit service within 3/4 of a mile of all local regular-route transit service during the same times that the service operates. Minnesota state law also requires the service to be provided in areas beyond the requirements of the ADA.

Page: 364

Number: 1 Author: abartling Subject: Highlight Date: 8/15/2018 1:06:55 PM
ticket vending machine

Dakota County Transit Link Service provides a benefit of connecting to regular transit routes for those passengers that are so able. Transit hubs for this service are at the Burnsville Transit Station and the Burnsville Center.

Figure 7-9: Transit Service and Facilities



Page: 365

Number: 1 Author: abartling Subject: Sticky Note Date: 8/15/2018 1:08:28 PM
Routes using I-35 south of CR 42 were re-routed in 2016. MVTA can provide updated route data if needed.

DEPARTMENT OF TRANSPORTATION

Metropolitan District
Waters Edge Building
1500 County Road B2 West
Roseville, MN 55113

April 6th, 2018

Regina Dean
100 Civic Center Parkway
Burnsville, MN 55337

SUBJECT: City of Burnsville Comprehensive Plan
MnDOT Review # CPA18-005
Burnsville City Limits
Burnsville, Dakota

Dear Regina Dean,

Thank you for the opportunity to review the City of Burnsville 2040 Comprehensive Plan Draft. MnDOT has reviewed the document and has the following comments:

Minnesota River Quadrant (MRQ) Redevelopment
On page 7-357 it discusses the development of the Minnesota River Quadrant (MRQ) and that development being a factor in the two interchanges for I-35W (Black Dog Road and Cliff Road) remaining open. If there is no development it is discussed that a new interchange will be added at 118th street and that Black Dog Road and Cliff Road will be removed as interchanges.

MnDOT recommends that the City does not preemptively identify which interchanges will remain or be removed, but instead just identifies the number of interchanges needed for each scenario since the exact interchanges that remain or are removed may change depending on future conditions.

Freight:
The following comments are focused on freight transportation and derived from the recent completion of the 2018 Statewide Freight System and Investment Plan and its Freight Action Agenda. The Freight Action Agenda outlines next steps for MnDOT and the state's public and private sector freight partners. Local planning agencies such as City of Burnsville play an essential role in supporting objectives and strategies in the Freight Action Agenda. Specifically, MnDOT recommends the City of Burnsville consider leading freight planning in the following areas;

- Truck Routes – Coordination of truck routes/planning in industrial and urban areas with restrictions and enforcement in adjacent residential areas
- Complete Streets – Treatments that consider truck movement as part of total vehicle traffic, which can include time-of-day delivery windows to reduce conflicts with other street users, and design guidelines for curb pullouts that can be used at different times for bus, truck parking , and others
- Land Use Planning and Polices - Land use planning and policies to ensure freight development areas are designated and preserved, and that development occurs adjacent to existing infrastructure

An equal opportunity employer

The City of Burnsville may also consider a supporting role for MnDOT in the following areas (also discussed in the plan):

- Freight as a Good Neighbor
- Integrate Freight into all Planning Projects
- First-/Last –Mile Connections
- Intermodal and Multimodal Facilities
- Urban Goods Movement Programs
- Truck Size and Weight

For more details on implementation and coordination of objectives and strategies, please contact Jon Solberg (651-234-7729 or jon.solberg@state.mn.us), South Area Manager.

Design:
Continue to coordinate planning efforts that involve MnDOT facilities that are within the City of Burnsville.

Review Submittal Options:
MnDOT's goal is to complete the review of plans within 30 days. Submittals sent in electronically can usually be turned around faster. There are four submittal options. Please submit either:

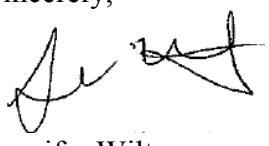
1. One (1) electronic pdf version of the plans. MnDOT can accept the plans via e-mail at metrodevreviews.dot@state.mn.us provided that each separate e-mail is under 20 megabytes.
2. Three (3) sets of full size plans. Although submitting seven sets of full size plans will expedite the review process. Plans can be sent to:

   MnDOT – Metro District Planning Section
   Development Reviews Coordinator
   1500 West County Road B-2
   Roseville, MN 55113

3. One (1) compact disc.
4. Plans can also be submitted to MnDOT's External FTP Site. Please send files to: ftp://ftp2.dot.state.mn.us/pub/incoming/MetroWatersEdge/Planning Internet Explorer doesn't work using ftp so please use an FTP Client or your Windows Explorer (My Computer). Also, please send a note to metrodevreviews.dot@state.mn.us indicating that the plans have been submitted on the FTP site.

If you have any questions concerning this review, please contact me at (651) 234-7788.

Sincerely,



Jennifer Wiltgen
Principal Planner

Copy sent via E-Mail:
Becky Parzyck, Right of Way
Almin Ramic, Traffic
Jon Solberg, Area Manager
Molly Kline, Area Engineer
John Tompkins, Freight
Nicholas Olson, Water Resources
Nancy Jacobson, Design
Buck Craig, Permits
Cameron Muhic, Bike/Ped
Mackenzie Turner-Bargen, Bike/Ped
Carl Jensen, Transit
Russell Owen, Metropolitan Council

City Of Burnsville
952-895-4400
100 Civic Center Parkway • Burnsville, Minnesota 55337-3817
www.burnsville.org

September 12, 2018

RE: City of Burnsville 2040 Comprehensive Plan Update-Adjacent and Affected Jurisdiction Review and Comment Form

Per Minnesota Statute 473.858 Subd. 2 and the Metropolitan Council, we are distributing the proposed City of Burnsville 2040 Comprehensive Plan Update for your review and comment. The 2040 Comprehensive Plan Update can be found here: www.burnsville.org/2040.

On Tuesday, December 19, 2017 the Burnsville City Council authorized submittal to neighboring jurisdictions for the required six month review and comment period.

It is respectfully requested that you review the proposed 2040 Comprehensive Plan Update and send any **comments or indication of no comment** to 100 Civic Center Parkway, Burnsville MN 55337. With regard to review of the Comprehensive Plan Update, we ask that you provide feedback as timely as possible within the requested 6-month comment period. Please be advised that email response is also acceptable and may be sent to regina.dean@burnsvillemn.gov.

In the event that there are questions regarding the Comprehensive Plan Update, or if additional information is needed, please contact Regina Dean at 952-895-4453 or regina.dean@burnsvillemn.gov.

On behalf of the City of Burnsville, we would like to thank you in advance for your assistance and prompt response.

Please check the appropriate box:

- ☒ We have reviewed the proposed Plan Update, do not have any comments, and are therefore waiving further review.
- ☐ We have reviewed the proposed Plan Update and offer the following comments (attach additional sheets if necessary)

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Name of Reviewer Neil Ralston, Airport Planner Date 9/12/18

Signature of Reviewer _____

ThreeRivers
PARK DISTRICT

July 27, 2018

Three Rivers Park District Board of Commissioners

Penny Steele
District 1

Jennifer DeJournett
District 2

Daniel Freeman
Vice Chair
District 3

John Gunyou
Chair
District 4

John Gibbs
District 5

Steven Antolak
Appointed
At Large

Gene Kay
Appointed
At Large

Boe Carlson
Superintendent

Regina Dean, Planner
Regina.Dean@Burnsvillemn.gov
100 Civic Center Parkway
Burnsville, MN 55337

RE: City of Burnsville, 2040 Comprehensive Plan Update

Dear Regina:

Three Rivers Park District (Park District) submits the following comments regarding your 2040 Comprehensive Plan. If you have further questions or comments, please contact Ann Rexine, Principal Planner at ann.rexine@threeriversparks.org or by phone at 763-694-1103.

Text revisions requested. Please revise the text throughout the document to read **Murphy-Hanrehan Park Reserve**. Note the hyphen between Murphy and Hanrehan, the exclusion of "Regional" and its designation as a "Reserve" and not "Preserve or Nature Reserve."	**Page** 2-99, 2-105, 5-268, 5-287, 7-326, 7-396 (Figure 7-29) 8-432, 8-433, 8-434
Text revisions requested. The image has cut off the last sentence, which makes it appear as a caption to the picture. Recommend moving "arriving at Murphy-Hanrehan Park Reserve" up to complete the paragraph.	**Page** 7-390
Map revisions requested. Figure 7.29 depicts a green existing trail extending west from the Burnsville/Dakota County border. There is no trail currently in place, and advisement is to delete this green alignment from the figure. The planned Lake Marion South Creek Greenway alignment extension through Scott County will be master planned as a future project with the Three Rivers Park District/Scott County partnership. Perhaps you may consider an arrow on the map to show that the trail is intended to continue west into Scott County.	**Page** 7-396
Text revisions requested. "Murphy-Hanrehan Park Reserve's implementing agency is the Three Rivers Park District through ~~an annual memo of understanding~~ **joint powers agreement** with Scott County.	**Page** 8-434

CC: File
Metropolitan Council, Patrick Boylan
Nathan Moe, Parks Planner, Three Rivers Park District in Partnership with Scott County

City Of Burnsville

Appendix Q – Metropolitan Council Preliminary Review and City Responses

September 2018

Metropolitan Council Preliminary Review

Type	Comment	Page(s)	Response
Required			
Forecasts	The Plan is incomplete for forecast-related components primarily due to the Transportation Analysis Zone (TAZ) forecasts, Table 7-11 in the Transportation section provides TAZ forecasts, but this table includes forecasts for portions of TAZs outside of the City, Burnsville shares a few TAZs with neighboring communities.	7.363	Updated
Forecasts	Revise the forecasts for those few shared TAZs to include only portions inside the City boundaries. Once completed, these TAZ forecasts need to add up to the City's official forecasts,	7.363	Addressed
Forecasts	Sewer serviced forecasts in Chapter 8 are inconsistent with Metropolitan Council forecasts, Table 8-4 uses the Council sewered population and employment forecasts, which show City's total future population and employment served by sewer, The projected population in Tables 8-5 and 8-6, however, show 300 fewer people for 2020-2040, To be complete and for consistency, the City should use the same sewer-serviced forecasts throughout the Plan,	8.448-8.449	Tables updated to correct projections
Housing	The Plan is incomplete for housing, Existing housing data requirements is missing and others are not provided in numerical value,	Chapter 4	Addressed Below
Housing	Number of publicly subsidized housing units, including number of senior affordable and units affordable to people with disabilities is missing,	4.191	Subsection added to pg 4.191
Housing	Numerical values need to be provided for the percent of single family and multifamily homes,	4.176	Table added to pg 4.176
Housing	We also recommend using 2016 data provided by the Council instead of 2010 Census data, as it is more current and relevant to long range planning,	n/a	Noted - For housing we used multiple sources of data, including Metropolitan Council, American Community Survey, and Dakota County Housing Studies by Maxfield Research. Where we could, we used the most updated data, but sometimes to compare the same elements over time, we had to utilize 2010 Census data
Housing	There are several tools the City is considering to address housing needs without enough description to fully evaluate, The Plan needs to include sufficient description of what types of housing needs the City would consider using these tools to support and when they would be considered, The tools that require more context include: Low Income Housing Tax Credits, CDBG and HOME funds, housing bonds, and tax increment financing.	4.212-4.218	The housing needs identified on pages 4.203-204 are also listed within the Housing Tools implementation table on page 4.212-218; some additional information has been added to the "Sequence of use" column to clarify a few programs listed
Housing	Land guided to address the city's allocation of affordable housing need for 2021-2030 is not sufficiently described for review.	4.203	Updated within chapter, and addressed within Appendix F
Housing	A staging table indicating which acres meant to address the affordable need are expected to develop between 2021 and 2030,	Appendix F	Updated within chapter, and addressed within Appendix F
Housing	Correct page 4-202 where the need allocation is described as addressing the time period of now to 2030, The number needs to represent anticipated additional households between 2021 and 2030, Land guided to address the need must also therefore include information about when it is expected to develop, Since future land use totals include development through 2040, land use staging by decade is needed to determine if sufficient land has been guided to address the need,	4.203	Updated within chapter, and addressed within Appendix F

Land Use	That Plan needs to include details on guided densities for all land use categories that allow residential uses, location mapping of areas for development and redevelopment, and supportive policy language.	Appendix F	Noted and Addressed within Appendix F
Land Use	The Plan needs to provide clarity in the text and for the Council's review of Tables 2-7 and Table 2-8 and the supportive text regarding vacant residential land and residential unit projections for the planning period. The Future Land Use Table in Appendix F illustrates no changes between totals for 2020 and 2040. To be complete, the Plan needs to include a breakdown of expected acreage changes by decade.	2.95 & Appendix F	Noted and Updated, with updates to text and Appendix F
Land Use	While the Plan provides intensity measures for several neighborhood and satellite centers in Appendices D and E, the final Plan needs to provide a table showing the measure of employment intensity for all non-residential land uses, not just the neighborhood and satellite center areas.	Appendix F	Noted and Addressed within Appendix F
Sanitary Sewer	As noted previously, a table that details adopted community sewered forecasts in 10-year increments to 2040 including households and employment. This data needs to be broken down by areas served by the Metropolitan Disposal System and subsurface sewage treatment systems (SSTS).	8.448	Addressed & Updated in Table 8-4
Sanitary Sewer	An electronic map or maps (GIS shape files or equivalent) showing the existing sanitary sewer system, including lift stations, the existing connections points to the metropolitan disposal system and future connection points for new growth if needed. The final Plan should also show local sewer service districts by connection point and any intercommunity connections.	8.443	Figure 8-4 includes the layout of the Burnsville sanitary collection system, lift stations, and the MCES interceptors. The intercommunity connection points are not identified specifically but the existing connection points from other cities into the City of Burnsville to the MCES are included on Figure 8-5. Limited growth is anticipated from connections outside of the City limits but small intercommunity connections along the City borders could be coming in from adjacent communities. Additional GIS data would need to included from the City if needed.
Sanitary Sewer	The City should submit a copy of intercommunity service agreements entered into with an adjoining community after December 31, 2008, including a map of areas covered by the agreement		
Sanitary Sewer - Inflow & Infiltration	Define your community's goals, policies, and strategies for preventing and reducing excessive inflow and infiltration (I/I) in the local municipal (city) and private (private property) sanitary sewer systems.	8.446-447	The City of Burnsville goal is to reduce I/I whenever feasible to reduce cost for maintenance and operation (O&M) of their sanitary sewer collection system and overall MCES wastewater treatment costs to the City. Their strategy is to maintain an efficent and effective collection system through regular maintenance of the system including scheduled inspection, repair and replacement as needed accomplish this goal. The City of Burnsville performs routine collection system inspection, sewer manhole and pipe testing and rehabilitation each year focused on O&M and I/I issues.

Sanitary Sewer - Inflow & Infiltration	Include a summary of activities or programs intended to mitigate Ill from both public and private property sources.	8.446-447	As stated above, the City's program includes annual schedule cleaning and televising of the sanitary sewer collection system. In addition, the City's inspection program is active in monitoring any clear water discharges from sump pump connections to the system. The City has been aggressive at maintaining it's sanitary collection system and has not exceeded the peak hour allowable discharges established under the MCES I/I program.
Sanitary Sewer - Inflow & Infiltration	Describe the requirements and standards in your community for minimizing inflow and infiltration.	8.446-447	The City's goal is to continue to maintain their sanitary sewer collection system in a manner which is efficient and conveys waterwater to MCES treatment facilities while minimizing clear water or I/I. To that end, the standard will be to continue monitoring I/I to reduce and maintain peak rates below acceptable MCES criteria (established peak hour rates established for Burnsville).
Sanitary Sewer - Inflow & Infiltration	Include a copy of the local ordinance or resolution that prohibits discharge from sump pumps, foundation drains, and/or rain leaders to the sanitary sewer system; also, include a copy of the local ordinance or resolution requiring the disconnection of existing foundation drains, sump pumps, and roof leaders from the sanitary sewer system.	8.446-447	A copy of the City ordinance governing the lawful discharge of water into the sanitary sewer is presented on the City of Burnsville's website. does not include language which prohibits clear water discharges from storm or surface waters. The specific ordinance is listed under Title 7 Health and Safety, Chapter 2 Water and Sewer, Section 7-2-21 Prohibited Discharges to the Sanitary Sewers and Storm Sewer Drainange System. Specific language prohibiting sump pump, etc. discharges is not listed in the City's ordinance.
Sanitary Sewer - Inflow & Infiltration	Describe the sources, extent, and significance of existing inflow and infiltration in both the municipal and private sewer systems.	8.446-447	The City of Burnsville goal is to reduce I/I whenever feasible to reduce cost for maintenance and operation (O&M) of their sanitary sewer collection system and overall MCES wastewater treatment costs to the City. Their strategy is to maintain an efficent

Sanitary Sewer - Inflow & Infiltration	Include a description of the existing sources of I/I in the municipal and private sewer infrastructure.	8.446-447	I/I can never be removed completely and although Burnsville has been diligent in locating many I/I sources some existing sources still have not been located and removed. The City continues to perform inspection of their collection system to maintain I/I amounts within acceptable standards and believe the majority of their I/I issues are through small defects throughout the system which are difficult to remove effectively and effeciently.
Sanitary Sewer - Inflow & Infiltration	Include a summary of the extent of the systems that contributes to Ill such as locations, quantities of piping or manholes, quantity of service laterals, or other measures. If an analysis has not been completed, include a schedule and scope of future system analysis.	8.446-447	The City has not engaged in an active I/I analysis because they have consistently managed their I/I rates and volumes below MCES and Ten States Standards for allowable I/I entering their sanitary sewer collection system.
Sanitary Sewer - Inflow & Infiltration	Include a breakdown of residential housing stock age within the community into pre- and post-1970 era, and what percentage of pre-1970 era private services have been evaluated for I/I susceptibility and repair.	8.446-447	Approximately 50 percent of the residential housing was built between 1960 and 1975. The City does not see private property I/I as being a significant I/I issue.
Sanitary Sewer - Inflow & Infiltration	Include the measured or estimated amount of clearwater flow generated from the public municipal and private sewer systems. Some communities have used the EPA guidance to determine the annual I/I and peak month I/I	8.446-447	The City has not been above the MCES I/I program guidance criteria and has stayed below the peak hour allowable discharge criteria. Typical measured I/I during wet weather periods is below the 3.0 peak hour to average flow rate (P/A) criteria.
Sanitary Sewer - Inflow & Infiltration	Include a cost summary for remediating the I/I sources identified in the community. If previous I/I mitigation work has occurred in the community, include a summary of flow reductions and investments completed. If costs for mitigating I/I have not been analyzed, include the anticipated wastewater service rates or other costs attributed to inflow and infiltration.	8.446-447	The cost of mitigating I/I is included in the allocation of their annual O&M budget. The City has not included any additional costs set aside for I/I because the existing efforts are meeting standards acceptable to MCES I/I program goals as well as acceptable Ten State Standards for allowable I/I amounts (P/A Wastewater Flow Rate criteria) in the Burnsville sanitary sewer collection system.
Sanitary Sewer - Inflow & Infiltration	Describe the implementation plan for preventing and eliminating excessive inflow and infiltration from entering both the municipal and private sewer systems.	8.446-447	The City has allocated funds in the future as part of their CIP to address long term maintenance of their sanitary sewer system. Continued inspection, evaluation, and sewer rehabilitation is part of the program and strategy to address continued maintenance and I/I reduction.

Sanitary Sewer - Inflow & Infiltration	Include the strategy for implementing projects, activities, or programs planned to mitigate excessive I/I from entering the municipal and private sewer systems.	8.446-447	The strategy will continue as planned with routine scheduled cleaning, CCTV, pipe condition assessments to determine any future sewer rehabilitation. Overall, the City does not have any excessive I/I in the system but will continue to schedule planned collection system O&M to evaluate the sanitary sewer using the monitoring and investigative tools listed above.
Sanitary Sewer - Inflow & Infiltration	Include a list of priorities for I/I mitigation projects based on flow reduction, budget, schedule, or other criteria.	8.446-447	The criteria for sewer system maintence will include the results from inspection based on pipe conditions based on O&M and I/I issues.
Sanitary Sewer - Inflow & Infiltration	Include a schedule and the related financial mechanisms planned or needed to implement the I/I mitigation strategy.	8.446-447	The schedule is annual monitoring, inspection, collection system assessment and continued sewer rehabilitation.
Solar Access Protection & Development	a Solar Suitability Analysis Map;	2.108	Already within Plan
Solar Access Protection & Development	calculations of the community's gross solar and rooftop solar resource;	2.107	Added to page 2.107
Solar Access Protection & Development	a policy or policies relating to the development of access to direct sunlight for solar energy systems;	2.112; 3.162; 4.205; 5.225; 5.280;	Already within Plan
Solar Access Protection & Development	a supporting strategy or strategies for that policy or those policies	2.112; 3.162; 4.205; 5.225; 5.280;	Already within Plan
Transportation - Roadways	Identify planned improvements to principal arterials and new/improved interchanges to the principal arterial system.	7.359	Added text
Transportation - Roadways	Include the future number of lanes along the City's principal and A-minor arterial network.	7.366	Added new figure
Transportation - Roadways	Identify the future rights-of-way that will need to be preserved for the proposed/planned principal and A-minor expansions.	7.367	Added text
Transportation - Transit	Page 7-348 needs clarification: the text states that the entire City is located in Transit Market Area III, yet a portion of the City (as shown on the map on 7-347) is within Emerging Market Area II.	7.344	Added text
Transportation - Transit	The Plan needs to discuss existing or planned transit advantages.	7.344	Added text
Transportation - Transit	The Plan should also discuss the City's role in the Orange Line and the transit relationship to the Plan.	7.38	Added text
Transportation - Transit	The Plan should distinguish between the fact that Orange Line Phase I is funded and in the 2040 Transportation Policy Plan's (TPP) "Current Revenue Scenario" and that Orange Line Phase 2 is unfunded and can be found in the "Increased Revenue Scenario."	7.38	Added text

Transportation - Aviation	The Plan needs to include a section that identifies the policies and ordinances that protect regional airspace from obstructions and how the City will notify the FAA of any proposed structures.	7.351	Added text
Transportation - Freight	The Plan needs to identify important nodes within the City that may generate freight movement (e.g. industrial parks, large shopping areas, etc.)	7.350.	Added text
Transportation - Freight	The Plan needs to include a brief analysis of any local roadway which may present a problem for the efficient movement of good, such as weight-restricted bridges, bridges with insufficient height, or other problem areas.	7.350.	Added text
Advisory			
Water Supply	The Plan is consistent with WRPP policies related to water supply, including the policy ·on sustainable water supplies, the policy on assessing and protecting regional water resources, and the pol icy on water conservation and reuse. If changes are made the local water supply plan resulting from DNR's review of that local water supply plan or from changes as the full comprehensive plan is finalized - such as changes to forecasts -the City will need to provide the Council with the updated information,	n/a	Noted
Forecasts	The household forecast in Table 2-6 should read 27,600 (not 77,600),	2.95	Change made
Housing	In general, the Plan allocates much of the responsibility of addressing its affordable housing needs to Dakota County CDA. While we recognize that the CDA is the primary source of affordable housing resources to its cities, it is important to identify and state the local housing priorities for which the City would support the various resources available -whether those resources come from Dakota County CDA or external sources. For example, what types of affordable housing does Burnsville want to see and would encourage LIHTC applications, CDBG and HOPE funds, Housing Bonds, or TIF districts for?	4.212-4.218	Noted. Some additional information has been added to the "Sequence of use" column to clarify a few programs listed
Housing	On page 4-217, Twin Cities Land Bank has been renamed as Land Bank Twin Cities.	4.216	Change made
Housing	On p. 4-219, the inclusionary housing language in the housing tools matrix is inconsistent with the strategy described on p. 4-211. We encourage the City to consider an inclusionary or mixed income policy - local examples of adopted policies include Brooklyn Park, St. Louis Park, and Golden Valley.	4.210.	Noted. Conflicting language removed
Housing	We encourage the Plan to reiterate the language supporting its Manufactured Home Parks in the Future Land Use Guide chapter in the Housing element.	4.179	Manufactured Home Park support language already within Housing Chapter
Housing	On P. 4-172, we encourage reconsidering the statement that the City's housing meets all the needs of all sectors of the population. With over 5,500 housing cost burdened households, that statement seems optimistic.	4.170.	Noted. Language updated
Housing	On p. 4-186 the vacancy rate data is outdated. The most current report from Marquette Advisors shows a 2017 04 Vacancy rate of 1.8% in Burnsville. This is significantly lower than the 7% cited here (a healthy vacancy rate is considered 5%). Furthermore, this part of the Plan is inconsistent with p. 4-205 where the vacancy rate is more accurately described as low.	4.184	Addressed & Updated
Housing	All of the existing housing data (including the owner-occupied home values map) sourced from the Metropolitan Council has been updated with 2016 data. We recommend reviewing the updated Existing Housing Assessment on Burnsville's Community page in the Local Planning Handbook and updating any relevant data.	Chapter 4	Noted & Updated where possible
Housing	We strongly encourage the consideration of additional tools to address existing and future housing needs, including Accessory Dwelling Units, participation in regional housing collaboratives, and a local housing advisory group.	n/a	Noted. These elements will be considered as available tools by staff but not added to the Plan at this time

May 18, 2018

Jenni Faulkner, CD Director
City of Burnsville
100 Civic Center Parkway
Burnsville, MN 55337

RE: Preliminary Review of the City of Burnsville's 2040 Comprehensive Plan Update
Metropolitan Council Review File No. 21907-0
Metropolitan Council District 15

Dear Ms. Faulkner:

Metropolitan Council staff have reviewed the preliminary draft of the City of Burnsville's 2040 Comprehensive Plan Update (Plan), received on March 26, 2018. In the preliminary review, staff focused on whether the draft Update appeared to be complete and contained any major system issues or policy conflicts. Time did not permit as thorough a review as will occur when the Update is officially submitted for Council review. A more detailed review may reveal other important matters that were not identified during this preliminary review.

When addressing the matters in this letter, City staff are advised to refer to the City's Checklist of Minimum Requirements in the Community pages of the online Local Planning Handbook and the City's System Statement:

City of Burnsville's Checklist of Minimum Requirements:
https://metrocouncil.org/Handbook/Files/Checklist/02393472_Burnsville_Checklist.aspx

City of Burnsville's Community Page:
https://lphonline.metc.state.mn.us/CommPage?ctu=2393472&applicant=Burnsville

City of Burnsville's System Statement: *https://metrocouncil.org/Communities/Planning/Local-Planning-Assistance/System-Statements/System-Statements/02393472_Burnsville_2015SS.aspx*

Staff offers the following preliminary review comments for your consideration.

Complete for Review
The preliminary review process found the following sections **complete** for review and did not identify any major system issues or policy conflicts: Aggregate Resources, Local Surface Water Management Plan (LSWMP), Community and Sub-Surface Treatment Systems (SSTS), and Water Supply

The following sections of the draft Update are considered **complete but staff has identified issues** that may require changes. Staff offers the following advisory comments.

Water Supply *(Lanya Ross, 651-602-1803)*
The Plan is consistent with WRPP policies related to water supply, including the policy on sustainable water supplies, the policy on assessing and protecting regional water resources, and the policy on water conservation and reuse. If changes are made the local water supply plan resulting from DNR's review of that local water supply plan or from changes as the full

comprehensive plan is finalized – such as changes to forecasts – the City will need to provide the Council with the updated information.

Incomplete for Review
The following sections of the draft Plan are considered incomplete. Changes in the draft Update are needed before the Update is submitted to the Council for formal review.

Forecasts *(Dennis Farmer, 651-602-1552)*
The Plan is incomplete for forecast-related components primarily due to the Transportation Analysis Zone (TAZ) forecasts. Table 7-11 in the Transportation section provides TAZ forecasts, but this table includes forecasts for portions of TAZs outside of the City. Burnsville shares a few TAZs with neighboring communities. To be complete, the Plan needs to: address the following:

- Revise the forecasts for those few shared TAZs to include only portions inside the City boundaries. Once completed, these TAZ forecasts need to add up to the City's official forecasts.
- Sewer serviced forecasts in Chapter 8 are inconsistent with Metropolitan Council forecasts. Table 8-4 uses the Council sewered population and employment forecasts, which show City's total future population and employment served by sewer. The projected population in Tables 8-5 and 8-6, however, show 300 fewer people for 2020-2040. To be complete and for consistency, the City should use the same sewer-serviced forecasts throughout the Plan.

Advisory Comments
The household forecast in Table 2-6 should read 27,600 (not 77,600).

Housing *(Tara Beard, 651-602-1051)*
The Plan is incomplete for housing. Existing housing data requirements is missing and others are not provided in numerical value. To be complete, the Plan must address the following:

- Number of publicly subsidized housing units, including number of senior affordable and units affordable to people with disabilities is missing.
- Numerical values need to be provided for the percent of single family and multifamily homes. We also recommend using 2016 data provided by the Council instead of 2010 Census data, as it is more current and relevant to long range planning.
- There are several tools the City is considering to address housing needs without enough description to fully evaluate. The Plan needs to include sufficient description of what types of housing needs the City would consider using these tools to support and when they would be considered. The tools that require more context include: Low Income Housing Tax Credits, CDBG and HOME funds, housing bonds, and tax increment financing.
- Land guided to address the city's allocation of affordable housing need for 2021-2030 is not sufficiently described for review. To be complete, the final Plan needs to include:
  - A staging table indicating which acres meant to address the affordable need are expected to develop between 2021 and 2030.
  - Correct page 4-202 where the need allocation is described as addressing the time period of now to 2030. The number needs to represent anticipated additional households between 2021 and 2030. Land guided to address the need must also therefore include information about when it is expected to develop. Since future land use totals include development through 2040, land use staging by decade is needed to determine if sufficient land has been guided to address the need.

Advisory Comments

- In general, the Plan allocates much of the responsibility of addressing its affordable housing needs to Dakota County CDA. While we recognize that the CDA is the primary source of affordable housing resources to its cities, it is important to identify and state the *local* housing priorities for which the City would support the various resources available – whether those resources come from Dakota County CDA or external sources. For example, what types of affordable housing does Burnsville want to see and would encourage LIHTC applications, CDBG and HOPE funds, Housing Bonds, or TIF districts for?
- On page 4-217, Twin Cities Land Bank has been renamed as Land Bank Twin Cities.
- On p. 4-219, the inclusionary housing language in the housing tools matrix is inconsistent with the strategy described on p. 4-211. We encourage the City to consider an inclusionary or mixed income policy – local examples of adopted policies include Brooklyn Park, St. Louis Park, and Golden Valley.
- We encourage the Plan to reiterate the language supporting its Manufactured Home Parks in the Future Land Use Guide chapter in the Housing element.
- On P. 4-172, we encourage reconsidering the statement that the City's housing meets all the needs of all sectors of the population. With over 5,500 housing cost burdened households, that statement seems optimistic.
- On p. 4-186 the vacancy rate data is outdated. The most current report from Marquette Advisors shows a 2017 Q4 Vacancy rate of 1.8% in Burnsville. This is significantly lower than the 7% cited here (a healthy vacancy rate is considered 5%). Furthermore, this part of the Plan is inconsistent with p. 4-205 where the vacancy rate is more accurately described as low.
- All of the existing housing data (including the owner-occupied home values map) sourced from the Metropolitan Council has been updated with 2016 data. We recommend reviewing the updated Existing Housing Assessment on Burnsville's Community page in the Local Planning Handbook and updating any relevant data.
- We strongly encourage the consideration of additional tools to address existing and future housing needs, including Accessory Dwelling Units, participation in regional housing collaboratives, and a local housing advisory group.

Land Use *(Patrick Boylan, 651-602-1438)*

The Plan is incomplete for review. The Plan needs address the following to improve clarity and consistency within the document:

- That Plan needs to include details on guided densities for all land use categories that allow residential uses, location mapping of areas for development and redevelopment, and supportive policy language.
- The Plan needs to provide clarity in the text and for the Council's review of Tables 2-7 and Table 2-8 and the supportive text regarding vacant residential land and residential unit projections for the planning period. The Future Land Use Table in Appendix F illustrates no changes between totals for 2020 and 2040. To be complete, the Plan needs to include a breakdown of expected acreage changes by decade.
- While the Plan provides intensity measures for several neighborhood and satellite centers in Appendices D and E, the final Plan needs to provide a table showing the measure of employment intensity for all non-residential land uses, not just the neighborhood and satellite center areas.

Sanitary Sewer *(Roger Janzig, 651-60-1119)*
The Update is incomplete for sanitary sewer requirements. To be complete, the Plan must include the following items:

- As noted previously, a table that details adopted community sewered forecasts in 10-year increments to 2040 including households and employment. This data needs to be broken down by areas served by the Metropolitan Disposal System and subsurface sewage treatment systems (SSTS).
- An electronic map or maps (GIS shape files or equivalent) showing the existing sanitary sewer system, including lift stations, the existing connections points to the metropolitan disposal system and future connection points for new growth if needed. The final Plan should also show local sewer service districts by connection point and any intercommunity connections.
- The City should submit a copy of intercommunity service agreements entered into with an adjoining community after December 31, 2008, including a map of areas covered by the agreement.

Inflow and Infiltration (I/I)
The Plan needs to adequately address the following items regarding I/I:

- Define your community's goals, policies, and strategies for preventing and reducing excessive inflow and infiltration (I/I) in the local municipal (city) and private (private property) sanitary sewer systems.
- Include a summary of activities or programs intended to mitigate I/I from both public and private property sources.
- Describe the requirements and standards in your community for minimizing inflow and infiltration.
- Include a copy of the local ordinance or resolution that prohibits discharge from sump pumps, foundation drains, and/or rain leaders to the sanitary sewer system; also, include a copy of the local ordinance or resolution requiring the disconnection of existing foundation drains, sump pumps, and roof leaders from the sanitary sewer system.
- Describe the sources, extent, and significance of existing inflow and infiltration in both the municipal and private sewer systems.
- Include a description of the existing sources of I/I in the municipal and private sewer infrastructure.
- Include a summary of the extent of the systems that contributes to I/I such as locations, quantities of piping or manholes, quantity of service laterals, or other measures. If an analysis has not been completed, include a schedule and scope of future system analysis.
- Include a breakdown of residential housing stock age within the community into pre- and post-1970 era, and what percentage of pre-1970 era private services have been evaluated for I/I susceptibility and repair.
- Include the measured or estimated amount of clearwater flow generated from the public municipal and private sewer systems. Some communities have used the EPA guidance to determine the annual I/I and peak month I/I :*https://www3.epa.gov/region1/sso/pdfs/Guide4EstimatingInfiltrationInflow.pdf*
- Include a cost summary for remediating the I/I sources identified in the community. If previous I/I mitigation work has occurred in the community, include a summary of flow reductions and investments completed. If costs for mitigating I/I have not been analyzed, include the anticipated wastewater service rates or other costs attributed to inflow and infiltration.

- Describe the implementation plan for preventing and eliminating excessive inflow and infiltration from entering both the municipal and private sewer systems.
- Include the strategy for implementing projects, activities, or programs planned to mitigate excessive I/I from entering the municipal and private sewer systems.
- Include a list of priorities for I/I mitigation projects based on flow reduction, budget, schedule, or other criteria.
- Include a schedule and the related financial mechanisms planned or needed to implement the I/I mitigation strategy.

Solar Access Protection & Development (*Cameran Bailey 651-602-1212*)
The Plan is incomplete for Council policy regarding planning for the protection and development of access to direct sunlight for solar energy systems as required by the Metropolitan Land Planning Act (MLPA). To be complete, the Plan is needs to include the four required planning elements:

1. a Solar Suitability Analysis Map;
2. calculations of the community's gross solar and rooftop solar resource;
3. a policy or policies relating to the development of access to direct sunlight for solar energy systems; and
4. a supporting strategy or strategies for that policy or those policies.

The Council has provided resources specific to Burnsville to address the first three items above on the City's Community Page in the Local Planning Handbook.

Advisory Comments
The Plan is admirable for its consistent integration of comprehensive sustainability considerations, goals, policies, and strategies throughout the document. However, please do review the "Applying Rooftop Generation Potential to Your Community" section of the Metropolitan Council's factsheet titled "Solar Resource Protection" to assist in utilizing and applying the data the City has available to it through its participation in the Regional Indicators Initiative and Xcel Energy's Community Energy Profile Reports to inform the potential future of energy in the City of Burnsville. Additional resources include:

- Metropolitan Council's "Solar Resource Protection:" *https://metrocouncil.org/Handbook/Files/Resources/Fact-Sheet/RESILIENCE/Solar-Resource-Protection-Requirement.aspx*
- Regional Indicators Initiative: *https://www.regionalindicatorsmn.com/energy-chart*
- Xcel Energy's Community Energy Profile Reports: *https://www.xcelenergy.com/working_with_us/municipalities/community_energy_reports*

Transportation (*Russ Owen, 651-602-1724)*
The Plan is incomplete for the roadways and transit requirements. To be complete, the Plan must address the following items.

Roadways
- Identify planned improvements to principal arterials and new/improved interchanges to the principal arterial system.

- Include the future number of lanes along the City's principal and A-minor arterial network.
- Identify the future rights-of-way that will need to be preserved for the proposed/planned principal and A-minor expansions.

Transit

- Page 7-348 needs clarification: the text states that the entire City is located in Transit Market Area III, yet a portion of the City (as shown on the map on 7-347) is within Emerging Market Area II.
- The Plan needs to discuss existing or planned transit advantages.
- The Plan should also discuss the City's role in the Orange Line and the transit relationship to the Plan.
- The Plan should distinguish between the fact that Orange Line Phase I is funded and in the *2040 Transportation Policy Plan's* (TPP) "Current Revenue Scenario" and that Orange Line Phase 2 is unfunded and can be found in the "Increased Revenue Scenario."

Aviation

- The Plan needs to include a section that identifies the policies and ordinances that protect regional airspace from obstructions and how the City will notify the FAA of any proposed structures.

Freight

- The Plan needs to identify important nodes within the City that may generate freight movement (e.g. industrial parks, large shopping areas, etc.)
- The Plan needs to include a brief analysis of any local roadway which may present a problem for the efficient movement of good, such as weight-restricted bridges, bridges with insufficient height, or other problem areas.

In summary, the submitted draft Update is missing a number of items and may require revision. If you have any questions or need further information regarding the comments in this letter, please contact Patrick Boylan, Principal Reviewer at 651-602-1438.

Sincerely,

LisaBeth Barajas, Manager
Local Planning Assistance

CC: Steven Chávez, Metropolitan Council District 15
Patrick Boylan, Sector Representative, Principal Reviewer
Raya Esmaeili, Reviews Coordinator

City Of Burnsville

Appendix R – Planning Commission & Public Hearings Staff Reports & Minutes

November 13, 2017

December 11, 2017

November 14, 2018

Chair Vincent Workman
Vice Chair Daniel Wolter
Commissioner Ramraj Singh
Commissioner Jim Bradrick
Commissioner Steve Behnke
Commissioner Jenna Majorowicz (alt)

Burnsville City Hall
100 Civic Center Pkwy
Burnsville, MN 55377
www.burnsville.org

PLANNING COMMISSION AGENDA

Monday, November 13, 2017	**6:30 PM**	***Council Chambers***

CALL TO ORDER

1. Approve Agenda
2. Approve Minutes of the October, 23, 2017 Planning Commission Meeting
3. Public Hearing to consider approval of the 2040 Comprehensive Plan Draft to submit to adjacent jurisdictions for mandatory six month review period.
4. Application of Discover Church for a Planned Unit Development Amendment to allow leasable showroom space for a business located at 14300 Burnsville Parkway.
5. Public Hearing - Interim Use Permit for LA LA LA, LLC 771 Ladybird Lane and 721 Ladybird Lane
6. Updates

ADJOURNMENT

The City of Burnsville does not discriminate on the basis of race, color, national origin, sex, religion, age or disability in the admission or access to, or treatment or employment in, its programs, activities or services. To obtain this information in alternative forms please contact the City of Burnsville at (952) 895- 4400 or visit www.burnsville.org

BURNSVILLE PLANNING COMMISSION MINUTES
MEETING OF OCTOBER 23, 2017

MEMBERS PRESENT	MEMBERS ABSENT	OTHERS PRESENT
Vincent Workman, Chair		Deb Garross
Jim Bradrick		
Steve Behnke		
Ramraj Singh		
Daniel Wolter, Vice Chair		
Jenna Majorowicz, Alternate		

The meeting was called to order by Chair Workman at 6:30 p.m.

1. Adoption of Agenda.

Wolter moved and Behnke seconded a motion for adoption of the October 23, 2017 Agenda.

Ayes: Workman, Bradrick, Behnke, Singh, Wolter. Nays: None. Motion passed (5-0).

2. Consider Approval of Minutes for Previous Meeting of October 9, 2017.

Bradrick moved and Behnke seconded a motion for approval of the October 9, 2017 Minutes.

Ayes: Workman, Bradrick, Behnke, Majorowicz. Nays: None. Abstained: Singh, Wolter. Motion passed (4-0).

3. Public Hearing –Application of Junction 35W & 13, LLC for a Planned Unit Development (PUD) Amendment to install four 30' foot tall storage tanks and allow wall signs exceeding ordinance standards at 12600 West Frontage Road.

Deb Garross presented an overview of the proposed application and summarized the Planning Background Report. Garross advised staff recommends approval of the PUD Amendment subject to the following conditions:

1. All previous Conditional Use Permits and PUD conditions shall remain in full force and effect.

2. The tanks shall be painted a dark brown color similar to the building roof color.

3. The tanks shall be removed at such a time as the existing businesses cease operations at the site.

4. Grading and erosion control plans shall be approved by the City Engineer prior to construction at the site.

The Commission discussed the color of the tanks and the general consensus was to leave them white and not require them to be painted. Commissioners commented that the storm water from the site will need to be routed so that it does not impact the adjacent property to the west. Questions were raised related to the proposed placement of the tanks and associated loading, environmental issues related to the proposed plastic pellets and the permit status for the two wall signs.

Earnest Delange 12600 West Frontage Road is the owner of the site and he explained to the Commission that the tanks are proposed to be filled via a stainless steel pipe across the roof of the building and that he did not believe painting the tanks brown would have an impact on the pellets. Mr. Delange indicated that the 2014 PUD approval for a two story addition on the north side of the building will be too costly due to improvements required for footings to support the structure. It is likely that at some point in the future they may apply to have an addition constructed on the south side of the building but there is no timeline for the addition.

At 7:01 p.m. Workman opened the public hearing.

No one from the public spoke for or against the application.

At 7:02 p.m. Workman closed the public hearing.

Wolter moved and Singh seconded a motion to recommend to the City Council approval of the PUD Amendment to allow four, 30' foot tall storage tanks to be installed on the west side of the building and allow existing wall signs on the north side of the building to be larger than the maximum 300 square foot ordinance standard subject to the following conditions:

1. All previous Conditional Use Permits and PUD conditions shall remain in full force and effect.

2. The tanks shall be removed at such a time as the existing businesses cease operations at the site.

3. Grading and erosion control plans shall be approved by the City Engineer prior to construction at the site.

Ayes: Workman, Bradrick, Behnke, Singh, Wolter. Nays: None. Motion passed (5-0).

4. Discussion – Commissioners to discuss meeting start time and possible changes.

The Commissioners discussed options to change meeting times from 6:30 p.m. to an earlier time and considered the impacts to the public, applicants, and ability of Commissioners to be at earlier meetings if they are employed outside of the City, have families, allowing for people to get home from work, have dinner and then attend meetings. Some of the Commissioners indicated that earlier start times would be difficult while others could meet earlier. Some Commissioners felt it would be good for all City meetings to be held at the same time for consistency and others did not think having differing meeting times would

be an issue. Commissioners agreed that the meeting time should be established and if changed, go into effect in July once new Commissioners are appointed. The consensus of the Commission was to wait to find out what the thoughts are from other City Commissions and to bring this item back for future discussion.

5. Updates:

There were no updates

6. Adjournment.

Motion by Singh, seconded by Bradrick to adjourn the meeting at 7:29 p.m.

Ayes: Workman, Bradrick, Behnke, Singh, Wolter. Nays: None. Motion passed (5-0).

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Planning Commission
AGENDA REPORT

11/13/2017
Item No. 3.

ITEM

Public Hearing to consider approval of the 2040 Comprehensive Plan Draft to submit to adjacent jurisdictions for mandatory six month review period.

PRESENTER(S)

Jenni Faulkner, Community Development Director
Jeff Miller, HKGI Planner

60-DAY RULE SUMMARY

Application Accepted: N/A
60-Day Review Deadline: N/A
Extension Granted To: N/A

BACKGROUND/OVERVIEW

This item is to get public input on the draft 2040 Comprehensive Plan and for the Planning Commission to approve the draft plan for submittal to adjacent jurisdiction for the mandatory six-month review period.

The City has spent the past 18 months preparing this draft plan under the input and review of a Citizen Advisory Committee that has included the Planning Commission. This committee, with the assistance from City staff and consultants, provided input and direction on each element and chapter. In addition, the City solicited for public comments through a specific Community Outreach Plan. This outreach included social media, public meetings, neighborhood meetings, business meetings, school meetings, commission meetings, and Council meetings. All of the Citizen Committee meetings were open to the public and public comments were taken at the end of each meeting. Public input occurred at International Festival, Night to Unite, Mayor's CEO Forum, Fire Muster, and several other Community events. There was significant marketing of the update provided on the City's website and in the Burnsville Bulletin, including materials in Spanish and Somali.

This draft plan is a forward thinking document meant to guide the City's development and infrastructure needs into the year 2040. The plan represents an update to the 2030 Comprehensive Plan. That plan incorporated a larger community visioning effort, which due to the recession that started in 2008, has not come to fruition within the timeline in the 2030 plan. However, what changes Burnsville has experienced since the last plan and what is now being planned is significant and will shape our future going forward.

As a fully developed community, there is not a lot to plan for on surface. There are however outside forces that are changing who we are as a community and where we want to be in the future. The City is in a mode of preservation, enhancement, and adaptation. The plan in general speaks to preservation and the opportunities to enhance what we have. The markets are influencing our society and adaptation to meet those needs is ever changing. Throughout the document sustainability themes are incorporated into each chapter from the lens of the environment, economy and social aspects. With that, there are four focus areas that were studied.

The focus area included the Heart of the City, the Minnesota River Quadrant (MRQ), E. Cliff Business Park area, and TOD/Burnsville Center. The ideas and future plans are incorporated into the draft document and will be highlighted during the presentation. As a part of this, there are several parcels where the Future Land Use is proposed to be changed. Attached is a map. Those parcels will also be reviewed at the meeting. The property owners within the four focus areas as will as those with proposed land use changes were sent hearing notices.

The Comprehensive Land Use Plan draft is available on the City's webpage under Planning Department. A hardcopy is available at City Hall and will be available for the meeting. This draft is in the editing phase and there are some substantial layout changes yet to be made and some content changes as well. Because of this, staff is recommending that the Planning Commission open the public hearing, take public comment, and then continue the hearing to December 11th. At that meeting, an overview of each chapter will be provided, any outstanding issues or additional information can be provided and the final draft will be ready for the Planning Commission consideration.

RECOMMENDATION

The City staff recommends that the Planning Commission continue the public hearing unitl December 11, 2017. Any additional information needed should be also be noted.

RELATED ENDS & OUTCOMES STATEMENT(S)

ATTACHMENTS:

Schedule
FLU
Change in FLU

Burnsville Comprehensive Plan - Meetings Schedule

CITY COUNCIL MEETING – MAY 10, 2016

Agenda:

- *Project Overview*
- *Review Panel*
- *Community Outreach*
- *Schedule*

ADVISORY PANEL MEETING - JULY 18, 2016

Agenda:

- *What is a Comprehensive Plan?*
- *Metropolitan Council and Thrive 2040*
- *Planning Process and Timeline*
- *Focus Areas*
- *Community Engagement*

ADVISORY PANEL MEETING - SEPTEMBER 19, 2016

Agenda:

- *Community Engagement*
  - *Input Received So Far*
  - *Community Engagement Plan*
- *Focus Areas Discussion*
  - *Aging Industrial*
  - *Heart of the City (HOC)*
  - *Orange Line Bus Rapid Transit (BRT) Station Areas*
  - *Minnesota River Quadrant (MRQ)*
- *Community Enrichment Plan*
  - *Youth Plan Chapter will be broadened into a Community Enrichment Chapter in 2040 Comprehensive Plan*

ADVISORY PANEL MEETING - NOVEMBER 7, 2016

Agenda:

- *Summary of Focus Areas Charrette*
- *Heart of the City (HOC) Focus Area*
  - *HOC 2 district concept*
  - *Orange Line Bus Rapid Transit (BRT) station areas concept*
  - *Vision elements*
- *East Cliff Road Industrial District Focus Area*
  - *District concept*
  - *Vision elements*
- *Minnesota River Quadrant (MRQ) Focus Area*
  - *High level concept*
  - *Vision elements*

MAYOR'S CEO ROUNDTABLE – DECEMBER 9, 2016

Agenda:

- *What is a Comprehensive Plan*
- *Review Panel*
- *Focus Areas*
  - *Focus Areas Charrette*
  - *Heart of the City (HOC) and BRT Station Areas*
  - *East Cliff Road Business Park*
- *Minnesota River Quadrant (MRQ)*
- *Schedule*

CITY COUNCIL MEETING – JANUARY 10, 2017

Agenda:

- *Comprehensive Plan Process Update*

ECONOMIC DEVELOPMENT COMMISSION – JANUARY 11, 2017

Agenda:

- *Overview/Observations/Discussion – East Cliff Road Business Park*
- *Overview – Minnesota River Quadrant (MRQ)*
- *Overview – Heart of the City (HOC)/Transit Improvements*

ADVISORY PANEL MEETING – JANUARY 30, 2017

Discussion Topic(s):

- *Comprehensive Plan Process/Schedule Review*
- *Future Land Use and Community Design*
  - *Vision and Objectives*
  - *Goals, Policies and Strategies*
  - *Vacant Land*
  - *Major Community Areas*
    - *Burnsville Center*
    - *Southcross Center*
    - *Fairview Ridges*
    - *Aging Retail Strip Centers*

ECONOMIC DEVELOPMENT COMMISSION – FEBRUARY 8, 2017

Discussion Topic(s):

- *Heart of the City(HOC)/Transit*
- *Minnesota River Quadrant (MRQ)*

ADVISORY PANEL MEETING – FEBRUARY 27, 2017

Discussion Topic(s):

- *Comprehensive Plan Process and Schedule Review*
- *Vision and Goals - Housing Plan Chapter*
- *Vision and Goals - Neighborhood Plan Chapter*
- *Housing Review*

ADVISORY PANEL MEETING – MARCH 20, 2017

Discussion Topic(s):

- *Comprehensive Plan Process and Schedule Review*
- *Vision and Goals - Economic Development Chapter*
- *Focus Areas - Implementation Overview*
- *Economic Competitiveness*

CITY COUNCIL – APRIL 11, 2017

Discussion Topic(s):

- *Comprehensive Plan Process Update*

ADVISORY PANEL MEETING – APRIL 17, 2017

Discussion Topic(s):

- *Community Enrichment End Statement & Outcomes*
- *Burnsville Demographics Snapshot*
- *Vision and Goals - Youth/Community Enrichment Chapter*
- *Community Enrichment Plan Approach*

ECONOMIC DEVELOPMENT COMMISSION – MAY 10, 2017

Discussion Topic(s):

- *Economic Competitiveness*
- *Implementation Strategies*

ADVISORY PANEL MEETING – MAY 15, 2017

Discussion Topic(s):

- *Comp Plan Process and Schedule Review*
- *Vision and Goals – Transportation Plan Chapter*
- *Transportation Topics*
  - *Bike Lane Types*
  - *Orange Line BRT*
  - *East/West Transit Plan*
- *Transportation System Discussion*
  - *Change in modelling – trip based to activity based*
  - *Observations about local issues and challenges*
- *Autonomous Vehicles*

ADVISORY PANEL MEETING – JUNE 19, 2017

Discussion Topic(s):

- *Comp Plan Process and Schedule*
- *Vision and Goals - Natural Environment chapter*
- *Water Resources Management Plan (WRMP)*
- *Parks Plan*

CITY COUNCIL – JULY 11, 2017

Discussion Topic(s):

- *Comprehensive Plan Process Update*

ADVISORY PANEL MEETING – JULY 31, 2017

Discussion Topic(s):

- *Comprehensive Plan Process and Schedule Review*
- *Vision and Goals*
- *Community Services and Facilities*

ADVISORY PANEL MEETING – AUGUST 21, 2017

Discussion Topic(s):

- *Comp Plan Meetings Schedule Update*
- *Review Economic Development and Redevelopment Chapter*
- *Review Land Use Chapter*
- *Review Housing Chapter*

MEETING SCHEDULE CONTINUED ON NEXT PAGE

Meeting Key

COMPLETED MEETINGS IN ITALICS

FUTURE MEETINGS IN REGULAR

Type of Meeting

- *City Council*
- *Advisory Panel*
- *Economic Development Commission*
- *Parks and Natural Resources Commission*
- *Planning Commission*
- *Community Engagement*

Hoisington Koegler Group Inc.

Note: This listing of meetings will be updated on a regular basis and discussion topics are subject to change. Meeting dates may be modified and additional meetings may be added as well.

9/26/2017

Burnsville Comprehensive Plan - Meetings Schedule - pg. 2

MAYOR'S CEO ROUNDTABLE MEETING - SEPTEMBER 1, 2017

Discussion Topic(s):

» *Review Economic Development and Redevelopment*

ECONOMIC DEVELOPMENT COMMISSION – SEPTEMBER 13, 2017

Discussion Topic(s):

» *Review Draft Plan – Economic Development and Redevelopment*

CITY COUNCIL – OCTOBER 10, 2017

Discussion Topic(s):

» *General Plan Overview*

ADVISORY PANEL MEETING – OCTOBER 16, 2017

Discussion Topic(s):

» *Community Overview, Natural Environment, Community Enrichment, Transportation and City Services, and Facilities*

COMMUNITY OPEN HOUSE – OCTOBER 18, 2017, FROM 5 - 7 PM

Discussion Topic(s):

» *Review Draft Plan*

PARKS & NATURAL RESOURCES COMMISSION – OCTOBER 23, 2017

Discussion Topic(s):

» *Parks element of City Services and Facilities Plan and Natural Environment chapter*

COMMUNITY OPEN HOUSE – OCTOBER 24, 2017 FROM 7:30-9:30AM

Discussion Topic(s):

» *Review Draft Plan*

PLANNING COMMISSION MEETING – NOVEMBER 13, 2017 - PUBLIC HEARING

Discussion Topic(s):

» Future Land Use Plan Changes

PLANNING COMMISSION MEETING - DECEMBER 11, 2017 - PUBLIC HEARING CONTINUED

Discussion Topic(s):

» Plan Review

CITY COUNCIL – DECEMBER 19, 2017

Discussion Topic(s):

» Plan Review

Meeting Key

COMPLETED MEETINGS IN ITALICS

FUTURE MEETINGS IN REGULAR

Type of Meeting

- *City Council*
- *Advisory Panel*
- *Economic Development Commission*
- *Parks and Natural Resources Commission*
- *Planning Commission*
- *Community Engagement*

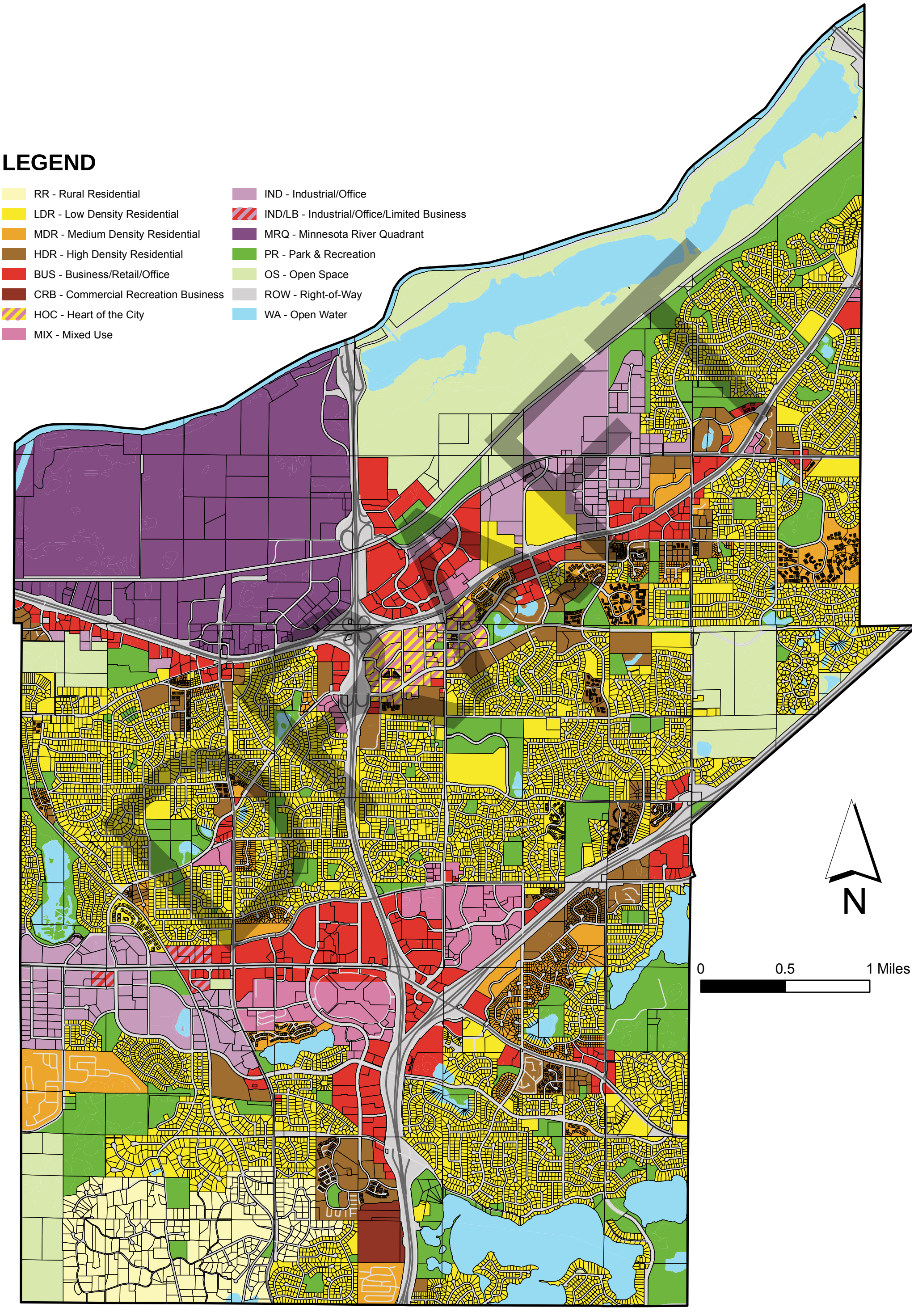
Note: This listing of meetings will be updated on a regular basis and discussion topics are subject to change. Meeting dates may be modified and additional meetings may be added as well.

11/2/2017

Future Land Use 2040

LEGEND

- RR - Rural Residential
- LDR - Low Density Residential
- MDR - Medium Density Residential
- HDR - High Density Residential
- BUS - Business/Retail/Office
- CRB - Commercial Recreation Business
- HOC - Heart of the City
- MIX - Mixed Use
- IND - Industrial/Office
- IND/LB - Industrial/Office/Limited Business
- MRQ - Minnesota River Quadrant
- PR - Park & Recreation
- OS - Open Space
- ROW - Right-of-Way
- WA - Open Water



Change in FLU from 2010-2017

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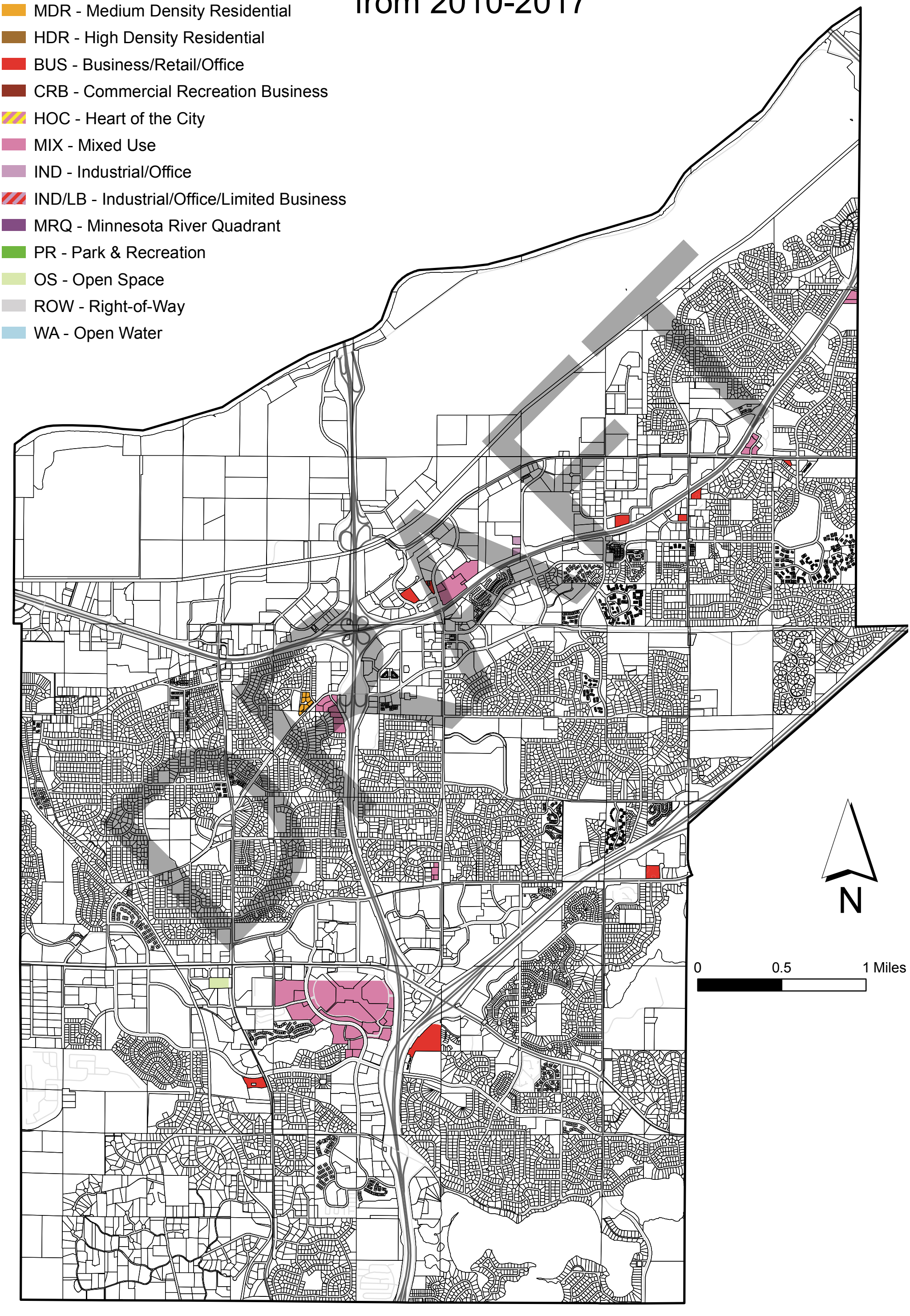

BURNSVILLE PLANNING COMMISSION MINUTES
MEETING OF NOVEMBER 13, 2017

MEMBERS PRESENT	MEMBERS ABSENT	OTHERS PRESENT
Vincent Workman, Chair	Ramraj Singh	Regina Dean
Jim Bradrick	Jenna Majorowicz, Alternate	Jenni Faulkner
Daniel Wolter, Vice Chair	Steve Behnke	Jeff Miller, HKGi

The meeting was called to order by Chair Workman at 6:30 p.m.

1. Adoption of Agenda.

Wolter moved and Bradrick seconded a motion for adoption of the November 13, 2017 Agenda.

Ayes: Workman, Bradrick, Wolter. Nays: None. Motion passed (3-0).

2. Consider Approval of Minutes for Previous Meeting of October 23, 2017.

Bradrick moved and Wolter seconded a motion for approval of the October 23, 2017 Minutes.

Ayes: Workman, Bradrick, Wolter. Nays: None. Motion passed (3-0).

3. Public Hearing – Application of City of Burnsville to consider approval of the 2040 Comprehensive Plan Draft to submit to adjacent jurisdictions for mandatory six month review period.

Jenni Faulkner, Community Development Director presented an overview of the 2040 Draft Comprehensive Plan including statutory requirements, the consultant team and their roles, draft chapter content, specific study areas analyzed and community outreach conducted. Jeff Miller, Consultant with HKGi presented specific background on the Land Use changes that are proposed as a result of the update. Commissioner Bradrick asked for clarification on the change in land use near the Burnsville Center Property and questioned if the line on the map should follow property lines. Faulkner stated that this would be evaluated further as the City studies the County Road 42 retail corridor. Faulkner stated that staff recommends that the Planning Commission continue the item to allow time for additional comments and

revisions to be incorporated into a final draft. Commissioner Workman thanked staff for their work on the Comprehensive Plan Update.

At 6:58 p.m. Workman opened the public hearing.

No one from the public spoke for or against the application.

Bradrick moved and Wolter seconded a motion to continue the public hearing until December 11, 2017.

Ayes: Workman, Bradrick, Wolter. Nays: None. Motion passed (3-0).

4. Public Hearing – Application of Discover Church for a Planned Unit Development Amendment to allow leasable showroom space for a business located at 14300 Burnsville Parkway.

Regina Dean presented an overview of the proposed application for a Planned Unit Development Amendment for leasable space for a retail showroom within an existing church building. Dean described that there are no changes planned for parking lot or landscaping onsite. Dean described that a PUD is required because it is a change from the PUD approval for the 2008 Crossroad Church project and because retail showroom as a principal use is not allowed in the I-3 zoning district. Dean advised the Commission that staff recommends approval of the application as conditioned.

Commissioner Bradrick asked for clarification on the comprehensive sign plan requirement and if it was the responsibility of the tenant. Dean responded that it is the property owner's responsibility to provide the sign plan for the property.

Commission Chair Workman requested clarification on property taxes since Discover Church has tax exempt status. Dean stated that the business owner would be responsible for any business sales taxes. Jeff LaFavre, IAG Commercial and the leasing agent representing property owner, provided additional background on the future goals of the Discover Church which are to grow within the space. If the church goals including attendance are met the lease to the business would discontinue and the church would occupy the entire site again.

At 7:09 p.m. Workman opened the public hearing.

No one from the public spoke for or against the application.

At 7:10 p.m. Workman closed the public hearing.

Wolter moved and Bradrick seconded a motion to recommend to the City Council approval of the PUD Amendment to allow showroom and office space in unit 14300 Burnsville Parkway subject to the following conditions:

1. The conditions of previously approved PUDs and CUPs shall remain in full force and effect.

2. All required parking stalls shall be provided on site based on the occupancy information submitted for formal review at the time of building permit.

3. An updated Comprehensive Sign Plan and separate sign permit will need to be provided prior to installation of any exterior signs on the building /site.

Ayes: Workman, Bradrick, Wolter. Nays: None. Motion passed (3-0).

5. Public Hearing – Application of City of Burnsville Interim Use Permit for LA LA LA, LLC at 771 and 721 Ladybird Lane.

Regina Dean presented an overview of the proposed Interim Use Permit request. Dean stated that the IUP request is a result of a recent court settlement with the property owner. Dean stated that the recommended IUP conditions are consistent with the court settlement, the 2015 draft development contract and City Code. She advised the commission that staff recommends approval of the application as conditioned.

At 7:15 p.m. Workman opened the public hearing.

No one from the public spoke for or against the application.

At 7:16 p.m. Workman closed the public hearing.

Bradrick moved and Wolter seconded a motion to recommend to the City Council approval of the Interim Use Permit for mining and soil remediation for properties located at 721 and 771 Ladybird Lane with the following conditions:

1. La La La or its successors in interest shall remediate the soil at the Property ("Work"), starting on the north side of the Property and continuing south toward the building on the Property. The Work shall commence on or about September 1, 2018, and be completed by December 31, 2021 ("Work Period"). It is understood that the Work will occur during the last four months of each calendar year.

   a. The current building on the Property shall be removed no later than December 31, 2021.

   b. The Work shall include the removal of a minimum of 11,000 cubic yards of soil per year, located below street level, and filling to an elevation depicted in the remediation plan prepared by Bolton & Menk, which is attached as Exhibit A.

   c. The Property will be compacted for construction of a building by the end of the Work Period.

   d. Storing, stockpiling, mining, excavating or selling soil for current remediation on the Property is permitted.

   e. Contractor trailers and heavy equipment ancillary to the Work is permitted on the Property.

2. La La La or its successors in interest shall submit a progress report to the City Planning Department by each December 31 of the Work Period ("Report"). The Report will detail the quantities of soil removed and replaced.

   a. No later than December 31, 2022, La La La or its successors in interest shall provide the City Planning Department a separate report prepared by a soils engineer to verify that the poor soils have been removed, appropriate soils have been brought in, and the new soils have been compacted to industry standards to provide a building pad.

3. A maximum of 10% of imported soils may be stored on the Property of the purpose of selling to customers without mixing. There shall be no limit imposed on the amount of soil stored on the Property for the purpose of combining with soil excavated as part of the Work.

4. La La La or its successors in interest will have the ability to continue the operation of a wholesale landscaping supply company on the Property for a period of seven years from the date of the grant of the IUP ("Operating Period").

   a. In connection with the wholesale landscaping supply company, a mobile office trailer will be allowed to be on the Property starting at the time the building on the Property is being removed.

   b. The mobile trailer shall be removed at the termination of the operation of the whole sale landscaping supply company or at the termination of the IUP, whichever occurs sooner.

5. La La La, or its successors in interest, will not apply for a renewal or extension of the IUP.

6. The following additional conditions shall be incorporated into the new IUP (from the 2005 IUP):

   a. The outdoor storage and display for all other landscape materials is permitted for the entire length (seven years) of the IUP.

   b. The maximum height of material is 10 feet.

   c. La La La or its successors shall provide screening from the street for the entire outdoor storage/display area including the proposed mulch bins.

   d. La La La or its successors shall continue to provide the required minimum 30% green area for the southerly portion of the Property.

   e. All new driveway areas shall be hard surfaced.

   f. All bins shall meet setbacks for accessory structures (40 feet front yard setback, 10 feet side yard setback, and 20 feet rear yard setback required).

   g. La La La or its successors shall obtain any necessary and required driveway, building and grading permits.

   h. All outside storage is to be contained to the area identified in the plan.

7. Per Title 10-9-1 a development contract will be required that will incorporate conditions as referenced in the ordinance.

8. Final design of the access point, berms, erosion control and stormwater management shall be subject to review and approval of the City Engineer.

9. The applicant shall obtain a NPDES (National Pollutant Discharge Elimination System) Industrial Stormwater Permit from the Minnesota Pollution Control Agency.

10. The perimeter berms shall not be part of the end land use plan for the property and shall be removed upon site development.

Ayes: Workman, Bradrick, Wolter. Nays: None. Motion passed (3-0).

6. Updates:

Dean stated that the next Planning Commission meeting is on Monday, November 27, 2017 and provided a draft agenda.

7. Adjournment.

Motion by Bradrick, seconded by Wolter to adjourn the meeting at 7:17 p.m.

Ayes: Workman, Bradrick, Wolter. Nays: None. Motion passed (3-0).

"The City of Burnsville does not discriminate on the basis of race, color, national origin, sex, religion, age, sexual preference, disability, or any other basis protected by law in the admission or access to, or treatment or employment in, its programs, activities, or services." To obtain this information in alternative forms such as braille, large print, audio tape or qualified readers, please contact the City of Burnsville at (952) 895-4400, TDD: (952) 895-4567. *Minutes* ***are available electronically through our website at www.burnsville.org, and can be emailed to you by subscribing through our subscription service link located on our home page.***

ITEM

Continue Public Hearing to consider approval of the 2040 Comprehensive Plan Draft to submit to adjacent jurisdictions for mandatory six month review period

PRESENTER(S)

Jenni Faulkner, Community Development Director
Mark Koegler, HKGi

60-DAY RULE SUMMARY

Application Accepted: N/A
60-Day Review Deadline: N/A
Extension Granted To: N/A

BACKGROUND/OVERVIEW

The 2040 Draft Comprehensive Plan was presented to the Planning Commission at the November 13th meeting. The presentation included an overview of the statutory requirements for the plan, the consultant team and their roles, draft chapter content, specific study areas analyzed and community outreach conducted. The presentation also included specific background on the Land Use changes that are proposed as a result of the update. At the November 13th meeting staff requested that the Planning Commission continue the meeting so that additional editing, content and layout changes could be made. Staff also explained that a more thorough review of each chapter would be presented at that meeting.
Access to the draft 2040 Comprehensive Plan Update can be found at www.burnsville.org/2040. At the December 11th Planning Commission meeting an overview of each chapter summarized below will be provided:
Chapter 1: Community Overview – This chapter provides a summary overview of the 2040 Comprehensive Plan Update. Throughout each chapter of the document sustainability opportunities are incorporated and implementation strategies are included at the end of each chapter. As a community that is nearly fully developed, Burnsville's future driven by an overarching ideal of maintaining what we have, enhancing what we can, and adapting to meet future needs all within a sustainable framework.
Chapter 2: Land Use - The future land use guide plan establishes the foundation upon which all other elements of the 2040 Comprehensive Plan are developed. This chapter has three main purposes: 1) to identify how land should be developed to accomplish the city's Ends & Outcomes, as set by the City Council; 2) to ensure that resources will be available to provide a consistent level of public infrastructure and services to support the community's future land use patterns and densities; and 3) to provide a land use vision, goals and policies that promote improvement of the community's livability, including support for a balanced mix of land uses, wide variety of housing options, opportunities for people to live and work in our community, appropriate development density/intensity, consideration of community design and identity, sustainable development practices, redevelopment opportunities, and economic development and continuing investment in Burnsville. Focus in the Land Use chapter also includes expansion of the HOC, bus rapid transit (BRT) station areas, Burnsville Center area, aging neighborhood and satellite retail strip centers, and the MRQ.
Chapter 3: Economic Development - This chapter addresses how Burnsville will promote a secure economic base through creation of a culture of business revitalization, industrial, office, and commercial development.
Chapter 4: Neighborhoods & Housing - This Chapter provides housing goals and policies, a housing profile indicating the status of Burnsville's housing, affordable housing, future housing demand and strategies/recommendations to accomplish the stated goals and policies. This Chapter satisfies the requirements of the Mandatory Planning Act and stipulations of Chapter 462C of Minnesota Statutes which

requires a housing plan prior to the sale of mortgage revenue bonds.

Chapter 5: Natural Environment - The Natural Environment Plan seeks to enhance and preserve our unique natural resources that define Burnsville. This Chapter outlines how the city will plan for and maintain its natural environment. The Natural Environment Plan is comprised of several larger management plans: The 2007 Natural Resources Master Plan and the 2017 Wetland Protection and Management Plan. In addition this chapter includes the 2017 Water Resources Management Plan and the significant changes are listed below:

1. Water Quality has taken over as the number 1 priority. Past versions had water quantity (flooding) as the number priority. The City has spent millions of dollars mitigating past drainage/flooding concerns and is now focusing more on water quality and maintaining our existing surface water assets.
2. Nuisance aquatic vegetation was the number 1 item that residents brought to the City's attention. As a result, the City updated the aquatic plant management policy to allow for more city flexibility on treating or removing vegetation from lakes.
3. The stormwater management development standards were modified modestly primarily to conform with the newer regional standards known as Minimal Impact Design Standards (MIDS). Many cities and watersheds around the metro use these standards and developers are familiar with them. It resulted in a small increased requirement for developers. For instance, past requirements stipulated that developers treat a 1" rainfall event whereas MIDS calls for the 1.1" event to be treated.
4. Emerging issues in the world of water resources management are invasive species infestations and climate change. The City monitors for things such as zebra mussels, there are no known zebra mussels in Burnsville lakes at this time. We are taking on many efforts in the area of resiliency attempting to locate areas susceptible to climate change issues (large rain events) and developing solutions to mitigate the concerns prior to those high risk areas failing.

The Water Resources Management Plan was reviewed by the Parks Rec and Natural Resources Commission, 3-watershed districts that are within Burnsville, the Metropolitan Council and ultimately approved the City Council. This plan was identified in the 2015 and 2016 PC workplan for review and implementation as part of the Comprehensive Plan.

Chapter 6: Community Enrichment - This chapter focuses on programs, services and events offered throughout the city. It also examines partnerships within the city organization and with external stakeholders.

Chapter 7: Transportation - This chapter provides information about Burnsville's transportation system and provides guidance for decision makers for investments to enhance and maintain the system into the future. The plan identifies future deficiencies and expands on the use of Bus Rapid Transit, MnPASS lanes and autonomous vehicles. Through community surveys, Parks and Recreation Master Plan and 2040 Comprehensive Plan Update processes there was strong support expressed for a system of trails to provide residents with safe and enjoyable access to services, parks, schools, natural areas, the Heart of the City (HOC) and to the future Minnesota River Quadrant (MRQ) area. As Burnsville heads to 2040, the transportation plan identifies goals, policies and strategies to guide the City in its quest for a diverse transportation infrastructure that meets the communities needs safely and efficiently.

Chapter 8 City Services & Facilities - The City Services and Facilities Plan describes the public safety and other services provided by the City of Burnsville. Information is provided about the City's organizational structure, public buildings and facilities. This Plan also includes the Parks and Recreation Plan, telecommunications information, Sanitary Sewer Plan, and Comprehensive Water Plan. City facilities and services protect public health, safety, and welfare, improve quality of life and are an integral part of the city's land use pattern. In addition to existing facilities, this Chapter identifies areas where new services will be needed to accommodate future growth expected over the next two decades.

PLANNING CONSIDERATIONS:

Any outstanding issues or additional information should be provided at this time.

Once Planning Commission and the City Council are satisfied with the changes then the draft will be sent to adjacent jurisdictions for a mandatory six month review period.

ROLE OF THE PLANNING COMMISSION:

The role of the Planning Commission is to review the technical aspects of the proposed Comprehensive Plan.

RECOMMENDATION:

Staff recommends that the Planning Commission recommend to the City Council approval of the draft 2040 Comprehensive Plan Update and authorize submittal to neighboring jurisdictions for the required six month review and comment period.

RELATED ENDS & OUTCOMES STATEMENT(S)

People find BURNSVILLE an attractive, well-balanced city of residences and businesses, which through a combination of amenities and public/private partnerships, provides a wide range of opportunities for citizens to live, work, learn and play, for a reasonable investment.

BURNSVILLE PLANNING COMMISSION MINUTES
MEETING OF DECEMBER 11, 2017

MEMBERS PRESENT	MEMBERS ABSENT	OTHERS PRESENT
Vincent Workman, Chair		Regina Dean
Jim Bradrick		Deb Garross
Steve Behnke		Jenni Faulkner
Ramraj Singh		Steve Albrecht
Daniel Wolter, Vice Chair		Mark Koegler, HKGi
Jenna Majorowicz, Alternate		Eric Zweber, WSB

The meeting was called to order by Chair Workman at 6:30 p.m.

1. Adoption of Agenda.

Singh moved and Bradrick seconded a motion for adoption of the December 11, 2017 Agenda.

Ayes: Workman, Bradrick, Behnke, Singh, Wolter. Nays: None. Motion passed (5-0).

2. Consider Approval of Minutes for Previous Meeting of November 27, 2017.

Wolter moved and Bradrick seconded a motion for approval of the November 27, 2017 Minutes.

Ayes: Workman, Bradrick, Singh, Wolter, Majorowicz. Nays: None. Motion passed (5-0).

3. Continued Public Hearing –Hearing to consider approval of the 2040 Comprehensive Plan Draft to submit to adjacent jurisdictions for mandatory six month review period.

Mark Koegler, HKGi presented an overview of the Draft 2040 Comprehensive Plan Update. He stated that this is a continued discussion and public hearing from the November 13th Planning Commission meeting. The previous meeting focused on the purpose of a comprehensive plan, the focus areas studied and community engagement activities that occurred. Koegler explained that the Chapters follow the Ends and Outcomes (goals and results) that are adopted by the City Council. He also described that themes of sustainability and implementation strategies woven throughout the document.

The presentation included a summary of each chapter.

Chapter 1: Community Overview—Includes Ends & Outcomes, Demographic, Residential and Business Survey information.

Chapter 2: Land Use Chapter—Addresses existing land use, vacant land and future land use, growth projections for household size and employment, development and redevelopment objectives, community design, focus areas of Heart of the City, Burnsville Center area, Transit Oriented Development, Minnesota River Quadrant, and the East Cliff Road Business Park.

Chapter 3: Economic Development Chapter—Includes demographics on jobs and wages, economic competiveness, Tools and Resources, opportunities and changeless and a closer look at the focus areas.

Chapter 4: Neighborhood and Housing—Housing demographics, future forecasts and needs, allocation of affordable housing and future housing needs.

Steve Albrecht, Public Works Director presented an overview of Chapters 5:

Chapter 5: Natural Environment—this chapter highlights the natural environment and related assets. An overview of the Natural Resource Management Plan, Water Resources Management Plan and the Wetland Protection Management Plan is summarized in Chapter 5. Albrecht stated that implementation may include looking into our wetland buffer standards and coordination with watershed districts. Albrecht also stated that the chapter discusses our future of the natural environment and topics related to sustainability. The plan highlights urban forest management, drinking water protection, and water quality in lakes. He stated that the County is in the process of completing a solid waste management plan so the City and Dakota Valley Recycling will be looking at implementation which may include organics and recycling changes.

Chapter 6: Community Enrichment—this chapter that is unique to the City of Burnsville. It contains information about different resident groups ranging from youth and seniors. The chapter highlights partnerships with the school districts, community non-profits, and volunteer opportunities.

Steve Albrecht, Public Works Director continued the presentation on Chapters 7 and 8:

Chapter 7: Transportation-this chapter addresses the existing road, trail and transit network, describes existing capacities and congestion, highlights transportation studies that have been completed related to County Road 42, Highway 13, Minnesota River Quadrant (MRQ) and Cliff Road West. This chapter explores the future transportation needs of the City which include Orange Line Bus Rapid Transit planning and local bus service conditions. The chapter also addresses needs for improvement to address future transportation capacity, which may include potential widening of roadways as an example. Albrecht explained that the desire to use trails for recreation and transportation is increasing as voiced by residents. The chapter explores non-motorized routes including local and connecting to regional trails. He explained that the City will work actively with Dakota County and the regional solicitation for Federal dollars on implementation related to transportation. The chapter also briefly explores ideas related autonomous vehicles.

Chapter 8: City Services and Facilities—this chapter details the City's organizational structure and highlights City facilities including recent upgrades to city hall and future needs for the fire department. Albrecht stated that the Park System Master Plan will help inform the next steps on how to prioritize updates and renovation to structures and amenities within city parks.

Koegler explained the next steps including City Council approval of the proposed draft on December 19th, a six month review period by neighboring jurisdictions, submittal of the final plan to the Metropolitan Council, revisions of the plan based on Metropolitan Council comments, and then final adoption of the plan by City council.

At 7:05 p.m. Workman reopened the public hearing.

No one from the public spoke.

At 7:06 p.m. Workman closed the public hearing.

The Commission thanked staff and the consultants for their hard work on the draft Comprehensive Plan.

Commissioner Singh thanked staff and the consultants for their hard work. Singh stated that he thought the sustainability and implementation at the end of each chapter is important and commendable. Singh said would prefer to see Chapter 4 title changed from "Neighborhoods and Housing" to "Housing and Neighborhoods".

Commissioner Behnke asked for clarification on the stormwater management plan and requirements within the Natural Environment Chapter. Albrecht stated the goal is to standardize the requirements and to make sure they are consistent with surrounding communities. The goal is to treat stormwater on a regional level rather than small ponds on individual properties. Behnke also asked on how any changes would be implemented. Jenni Faulkner stated that the goal is to use the Comprehensive Plan as a working document and the City will use it as an opportunity to check in with City Commission's and Council. Behnke thanked staff and noted that this will help drive the city in a more obvious sense. Albrecht stated that it will also help inform the Capital Improvement Plan (CIP) and show follow through.

Commissioner Bradrick thanked the consultant on the Comprehensive Plan work. Bradrick stated that he liked the implementation piece at the end of each chapter He stated that the City Facilities Chapter is one of the most important chapter on essential services that a City provides.

Chair Workman had further questions about the areas guided industrial in the Southcross and the East Cliff Road business park areas. Faulkner explained that the zoning and the guide plan are required to be consistent, however there is flexibility on what specific uses can be within the area. A guide plan change and approval through the Metropolitan Council is required if the land use were to change, for example, from industrial to residential. Faulkner provided a historical background on the Southcross business area. She stated that previous councils wanted to preserve head of household type jobs west of the railroad tracks that follow Judicial Road and west of County Road 5 Faulkner stated that a diversified land use can provide for a stronger community during a downturn in the economy. Faulkner also stated that zoning would be examined further through the Planning Commission economic competiveness work plan item.

Singh moved and Wolter seconded a motion to recommend to the City Council approval of the Draft 2040 Comprehensive Plan Update and authorize submittal to neighboring jurisdictions for a required 6 month review and comment period.

Ayes: Workman, Bradrick, Behnke, Singh, Wolter. Nays: None. Motion passed (5-0).

4. Discussion on the Study of Zoning Uses & Economic Competiveness (2017 Planning Commission Work Plan Item)

Eric Zweber, consultant planner with WSB, Inc. presented an overview of the work plan item including research conducted. A booklet titled "City of Burnsville Commercial and Industrial Uses Review" was provided to each Commissioner. The Study provides a comparison of uses listed in Burnsville's Zoning Ordinance with Apple Valley, Bloomington, Eagan, Lakeville, Savage and Shakopee and if they are considered to be permitted as conditional or interim uses. In addition to comparing Burnsville with surrounding cities, the Study also utilizes the North American Industrial Classification System as a means to evaluate uses in the Burnsville Zoning Ordinance. The objective is to determine if the uses and associated land use clearance processes in Burnsville are more restrictive than surrounding cities. If so, the City may want to make changes to the ordinance to maximize the opportunities for business uses to locate in the City.

City ordinance use definitions are varied with some ordinances using generalized categories and others with specific detailed use descriptions. Of the Cities evaluated, the "Continuum of Zoning Districts" indicates Lakeville had the most general list of uses and Apple Valley has the most specific list of uses. Burnsville is tied with Eagan as the second most specific list of uses. More detailed use descriptions provide more clarity on the characteristics of the use making it easier to identify if the use is consistent with the ordinance.

The "Continuum of Approval Process" plots each city with respect to the complexity of the approval process. Burnsville has the friendliest approval process (more administrative approval options) followed by Eagan, Shakopee and Lakeville. Apple Valley and Savage have the most complicated approval process with all uses in new buildings needing a Planning Commission Recommendation and City Council approval.

The number of commercial, industrial and mixed-use zoning districts in Burnsville's ordinance is twelve, with Bloomington being the only City with more individual zoning districts (21 zones). Savage has only six zones and has the fewest of all cities surveyed. For this Study, the more zoning districts a community has indicates more complexity of the ordinance as related to a community with few zones.

A "Commercial & Industrial Uses Comparison" is included in the Study that summarizes the difference between the way that communities regulate similar uses (i.e. uses that are permitted outright or the number of uses that need an additional approval such as a CUP or IUP). Based on this analysis, Burnsville has the highest average ranking meaning that it is the most accommodating community.

The Planning Commission evaluated a number of options to make Burnsville's zoning ordinance more accommodating. Their discussion findings are as follows:

Manufacturing Uses: No changes needed at this time as most manufacturing uses are permitted uses.

Retail Uses: Support changing Liquor Store from conditional use to a permitted use in B2, B3, HOC, and MIX zones as there are existing licensing standards and performance requirements in the City Code. Support changing "Stone and Monument Sales, provided it is conducted entirely within a building" as a permitted use in B3 zone. Any accessory outdoor storage would still require the processing of a CUP.

Accessory Retail Uses: Support modifying the ordinance with respect to the amount of accessory retail sales allowed in industrial zones. Current ordinance limits accessory retail sales to 20% of floor area provided it does not exceed a total of 1,000 s.f. Accessory sales greater than 1,000 s.f. up to 20% of

the total floor area can be approved with a CUP. Modify the standard to allow accessory retail up to 20% of the total square footage as a permitted use.

Wholesale Use: Support making Wholesale Showroom a permitted use in the B3 zone as opposed to requiring a CUP. Any outdoor storage can be addressed through a separate CUP.

Information Use: Planning Commission would like additional information to be provided to determine if "Data and call center" should be divided into separate uses and if "call center" should be a conditional use. Additional information about how to define the uses, performance standards, parking requirements should be provided for further consideration.

Waste Management Uses: There is not an immediate need to make changes to these uses. This is a low priority and no pressing need to make changes at this time.

Education Uses: There is not a need to modify the ordinance with regard to educational uses and the provisions should remain as currently allowed.

Health Care Uses: There is not a need to modify regulations to make assisted living and group therapy uses permitted uses in commercial zones. Keep the ordinance as is.

Recreation: Heath Club Use: Health Clubs should continue to be a conditional use in the B1 zone and permitted use in the B2, B3 and B4 zones.

Recreation Sports Performance Training Center Use: This use should be changed to allow it as a permitted use instead of conditional use in the I1, I2 and GIM zones.

Food Service Uses: The current ordinance requires a CUP for restaurants in the B2 and MIX zones. Restaurants should continue to be a CUP in B2, Neighborhood Business zones to evaluate potential impacts to neighborhoods. However, restaurants should be a permitted use in the MIX and B3 zones.

Other Service Uses: "Veterinary clinic/hospital, not including outdoor runs" is a use that currently requires a CUP in the B3 and I1 zones. The Commission concurs that this use should be changed to a permitted use in the B3 and I1 zoning districts and a permitted accessory use in the B4 zone. Outdoor runs should be conditional uses in the B3 and I1 zones.

The current ordinance allows administrative approval for up to a 10% increase in the cube of a building for PUD and CUPs. The Planning Commission had mixed views about a process change that would allow the staff Development Review Committee (DRC) to administratively approve CUP or PUD amendments that increase the cube of the building up to a 50% percent. The majority of Commissioners were supportive of staff review of more than a 10% increase but not a 50% increase. Some on the Commission think that administrative approval should be restricted to 5% increase or less. No consensus by the Planning Commission was reached on this item.

Staff will take the direction from the Commissioners under advisement and bring the requested item back for future consideration.

5. Discussion on Planning Ends & Outcomes and the 2018 Planning Commission Work Plan

Regina Dean provided an overview of the draft Planning Commission Work Plan. Dean requested feedback from the Commission on the Ends and Outcomes for the City Council to consider during their all day work session.

The Commission did not have any changes or recommendations on the Ends and Outcomes. The proposed 2018 Work Plan should include the following items: Solar ordinance review; Architectural Review Tool review to incorporate changes identified by the commercial/industrial materials study completed in 2017; review fence materials for single family and commercial/industrial districts and completion of the 2040 Comprehensive Plan Update including implementation and further study of retail along County Road 42. The Commission recommended removing the following two items from the Work Plan: 1) Upkeep of private residential entry monument signs and 2) Illumination standards for B zones adjacent to residential.

6. Updates:

Deb Garross informed the Commission members that the next meeting will be on January 8, 2018.

7. Adjournment.

Motion by Wolter, seconded by Behnke to adjourn the meeting at 8:58 p.m.

Ayes: Workman, Bradrick, Behnke, Singh, Wolter. Nays: None. Motion passed (5-0).

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Planning Commission
AGENDA REPORT

ITEM

Public Hearing for City of Burnsville to consider approval of the Final Draft 2040 Comprehensive Plan Update for submittal to the Metropolitan Council.

PRESENTER(S)

Deb Garross, City Planner
Laura Chamberlain, HKGI

60-DAY RULE SUMMARY

Application Accepted: N/A
60-Day Review Deadline: N/A
Extension Granted To: N/A

BACKGROUND/OVERVIEW

The purpose of this item is to hold the public hearing to consider approval of the final draft Burnsville 2040 Comprehensive Plan so that it can be submitted to the Metropolitan Council for formal review and approval. Once the Metropolitan Council approves the 2040 Plan, the City Council will need to formally adopt a Resolution to place the Plan into effect. The draft Plan is available for review on the City's website at the following link:
http://www.burnsville.org/2040

Minnesota law requires local comprehensive plans to be updated every 10 years (following the national census), and incorporate objectives of regional plans adopted by the Metropolitan Council. The City received notice from the Metropolitan Council via issuance of the 2015 System Statement, identifying changes Burnsville needs to incorporate into our Comprehensive Plan to meet the Thrive MSP 2040 Regional Policy Plan. The 2040 Comprehensive Plan is the 5th update to the original 1965 Burnsville plan. The City's Plan is required by law to be submitted to the Metropolitan Council by December 31, 2018.

The 2040 Plan incorporates updated demographic and socioeconomic information along with the studies and improvements that have occurred since the last plan update (Burnsville 2030 Comprehensive Plan). This update addresses the requirements of the Metropolitan Council and provides long range plans for future growth, development and redevelopment of the City. Between now and 2040 the City is expected to add about 6,300 people, 2,350 households and 5,200 jobs. This Plan has been developed around the City Council's Ends and Outcomes which are policy objectives and measurement parameters established and summarized in the Monitoring Report.

The Plan includes eight chapters that are summarized in the December 11, 2017 Planning Commission background report. The Plan focuses on redevelopment in four focus areas (Heart of the City, Minnesota River Quadrant, Cliff Business Park and the Burnsville Center/County Road 42 Corridor). Conceptual plans for each of these focus areas are included in Chapter 3, Economic Development and Redevelopment Plan. Sustainability is built into each chapter of the Plan along with the specific implementation strategies. The Plan addresses how the City will provide services and programs now and over the next 20 years to accommodate the needs of an aging and more diverse population and workforce.

Plan Update Process:

The update process has been underway since May 2016 with the Planning Commission in the lead role for developing the plan with the assistance of consultant Hoisington Koegler Group Inc. (HKGI), a 22 member volunteer Advisory Committee and city staff. HKGI is the primary consultant responsible for coordinating the plan update with three other consultants responsible for specific technical plans:

- Short Elliott Hendrickson Inc. (SEH) – transportation planning, water, sanitary sewer, stormwater and parks
- Emmons & Oliver Resources, Inc. – sustainability and natural resources
- Tangible Consulting Services – market analysis, project economics and development financing needs

The Advisory Committee was established specifically to provide wide representation from Burnsville's diverse population including all age sectors, local businesses, schools, medical, and faith communities, visitors, and work force. The Advisory Committee reviewed the updates to the Plan chapters, provided direction on the ideas, concepts and strategies and recommendation of the draft Plan. All Advisory Committee meetings were open to the public and the agenda packets and meeting notes were available on the City's website. The City Council and City commissions were all part of the update process including presentations at regular meetings and work sessions where feedback on the plan was provided. All City Council and commission meetings were open to the public and continue to be available for public viewing through web streaming.

An extensive Public Engagement Plan was followed to maximize public participation and feedback for the 2040 Comprehensive Plan. A specific webpage for the 2040 Comprehensive Plan Update was added to the City website where people could access information, provide feedback on questionnaires, review the draft Plan and sign up for subscription opportunities to receive e-newsletters and emails/text alerts about the Update. Information was made available in multiple languages including Somali and Spanish. The City also utilized social media and the Burnsville Bulletin to provide information on the plan and engage citizens with the process. HKGI and city staff attended community events and forums to provide information and seek input on the Plan including attending the Fire Muster, International Festival, Night to Unite, and Mayor's CEO Forums.

The attached Burnsville Comprehensive Plan – Meeting Schedule and Task Schedule identify all of the steps, meetings and parties that have been involved with the update to the 2040 Comprehensive Plan. To date the process included:

- 11 Advisory Panel Meetings
- Chamber of Commerce Meeting
- ISD 191 Meeting
- Economic Development Commission
- Parks & Natural Resources Commission
- 4 Neighborhood Meetings
    - Heart of the City
    - East Cliff Business Park
    - Minnesota River Quadrant
    - SW Burnsville
- 3 Public Open House Meetings
- Regular Comprehensive Plan process updates to City Council
- Public Hearing on the preliminary draft Plan
- City Council approval to submit the draft Plan for jurisdiction/agency review)

Plan Referral for 6-Month Jurisdiction/Agency Review:

The initial public hearing on the draft 2040 Comprehensive Plan was held by the Planning Commission on December 11, 2017 and unanimously recommended for approval. The City Council approved the draft 2040 Comprehensive Plan on December 19, 2018 and authorized submittal of the Plan to affected jurisdictions and

agencies for the required six month review and comment period. On March 16, 2018 the City submitted the draft plan to the following agencies/jurisdictions for their review and comment:

Apple Valley	Bloomington	Credit River Township
Eagan	Lakeville	Savage
Dakota County	Hennepin County	Scott County
ISD 191 Burnsville-Eagan-Savage	ISD 194 Lakeville	ISD 196 Rosemount-Apple Valley-Eagan
Black Dog WMO	Eagan-Inver Grove Heights WMO	Lower MN River WMO
Vermillion River Watershed JPO	MN Valley Transit Authority MVTA	MN Department of Transportation
Metropolitan Airports Commission	Metropolitan Council	MN Department of Natural Resources
Three Rivers Park District	Dakota County Regional Park Implementing Agency	

The formal 6-month jurisdiction/agency review period ended on September 16, 2018. The City received feedback comments from the following jurisdictions/agencies indicating that they had no comments on Burnsville's draft plan and waive further review: Bloomington, Credit River Township, Savage, Eagan-Inver Grove Heights WMO, and Metropolitan Airports Commission.

The following jurisdictions/agencies provided review comments that have been reviewed by the City and incorporated into the draft plan and/or noted as indicated on the attached Agency & Public Comments spreadsheet. Lakeville, Dakota County, Scott County, Lower MN River Watershed District, MVTA, Mn Department of Transportation, and Three Rivers Park District.

In summary, the majority of agency/jurisdiction comments on the draft plan were minor corrections and additions to text, tables and maps. A number of changes and clarifications were made to the Transportation Plan including future interchanges along I-35W in the Minnesota River Quadrant, transit services related to MVTA and the future Orange Line BRT, trails and corrections to indicate the correct name of the Murphy-Hanrehan Park Reserve. The Lower Minnesota River Watershed District provided a number of comments that are related to ordinances as opposed to the Comprehensive Plan. These comments will be addressed when the City is notified that our local Water Resources Management Plan will need to be updated to reflect the updated LMRWD Plan (anticipated in 2019 – 2020).

The draft plan was also submitted to the Metropolitan Council for informal review and their comments have been reviewed and responses have been addressed and/or incorporated into the draft Plan as indicated on the attached Metropolitan Council Preliminary Review spreadsheet.

The City received the attached letter from All Parks Alliance for Change on September 14, 2018 related to manufactured housing provisions in the draft Plan. City staff has modified Chapter 4, Neighborhoods and Housing to address the changes. The redline changes are shown on attached Housing Chapter Changes 11-6-2018.

There are three separate projects with associated amendments to the current 2030 Comprehensive Plan, in various stages of review by the Metropolitan Council. The three applications have been approved by the City Council subject to approval of the Metropolitan Council to place the amendments into effect. The site location maps and respective changes proposed to the Land Use Guide Plan map are attached in order to provide reference to the specific amendments requested. The proposed future land use plan changes currently under review by the Metropolitan Council include:

1. Northland Real Estate Group LLC – Change 5.7 acres of land from LDR, Low Density Residential to Mixed Use for property located at 15309 Maple Island Road.
2. Roush General Contracting LLC – Change 5.0 acres of land from IND/LB, Industrial/Office/Limited Business to BUS, Business/Retail/Office for property located at 2350 County Road 42 West.

3. HR Burnsville Limited Partnership – Change 31.23 acres of land from BUS, Business/Retail/Office to MIX, Mixed Use for property located north of Southcross Drive West, east of Grand Avenue South and the 35E, and south of 145th Street East

Once the Metropolitan Council approves the land use plan amendments for the three projects, the City Council will be able to formally adopt the changes and the 2040 Future Land Use Plan map and text will be updated to show the changes.

PLANNING CONSIDERATIONS:

Any outstanding issues or additional information should be provided at this time. Once all recommended changes are incorporated into the final draft, the Plan will be submitted to the Metropolitan Council for formal review and approval.

ROLE OF THE PLANNING COMMISSION:

The role of the Planning Commission is to hold the public hearing, take public testimony and to forward a recommendation to the City Council to approve the Plan as presented or with changes identified by the Commission. The Planning Commission has been actively involved in preparing and reviewing the plan for the past 2 ½ years. This is the last review of this document by the Planning Commission. The next step is for the Council to review and approve before submitting to the Metropolitan Council for formal review and approval. It is important to note that the City cannot formally adopt the Plan until it has been reviewed by the Metropolitan Council and the City receives approval to place the Plan into effect.

RECOMMENDATION:

Staff recommends that the Planning Commission recommend to the City Council approval of the final draft 2040 Comprehensive Plan for submittal to the Metropolitan Council subject to the following conditions:

1. Incorporation of the Future Land Use Plan changes associated with the Northland Real Estate Group LLC, Roush General Contracting LLC and HR Burnsville Limited Partnership amendments upon approval of the Metropolitan Council.
2. Incorporate changes as directed by the City Council.
3. The Plan will not be in effect until the Metropolitan Council approves the Plan and subsequent final adoption by the City Council occurs to effectuate the Plan.

RELATED ENDS & OUTCOMES STATEMENT(S)

People find BURNSVILLE an attractive, well-balanced city of residences and businesses, which through a combination of amenities and public/private partnerships, provides a wide range of opportunities for citizens to live, work, learn and play, for a reasonable investment.

DEVELOPMENT/ REDEVELOPMENT: People find Burnsville a balanced city of residential and business development enhanced by redevelopment.

ATTACHMENTS:

12-11-2017 Planning Commission Background Report
Burnsville Comprehensive Plan - Meeting Schedule
Burnsville Comprehensive Plan - Task Schedule
Agency & Public Comments Spreadsheet
Metropoltian Council Preliminary Review Spreadsheet
All Parks Alliance for Change Letter 9-14-2018
Housing Chapter Changes 11-6-2018

Northland Real Estate Group LLC Comp Plan Amendment Map
Roush General Contracting LLC Comp Plan Amendment Map
HR Burnsville Limited Partnership Comp Plan Amendment Map

ITEM

Continue Public Hearing to consider approval of the 2040 Comprehensive Plan Draft to submit to adjacent jurisdictions for mandatory six month review period

PRESENTER(S)

Jenni Faulkner, Community Development Director
Mark Koegler, HKGi

60-DAY RULE SUMMARY

Application Accepted: N/A
60-Day Review Deadline: N/A
Extension Granted To: N/A

BACKGROUND/OVERVIEW

The 2040 Draft Comprehensive Plan was presented to the Planning Commission at the November 13th meeting. The presentation included an overview of the statutory requirements for the plan, the consultant team and their roles, draft chapter content, specific study areas analyzed and community outreach conducted. The presentation also included specific background on the Land Use changes that are proposed as a result of the update. At the November 13th meeting staff requested that the Planning Commission continue the meeting so that additional editing, content and layout changes could be made. Staff also explained that a more thorough review of each chapter would be presented at that meeting.
Access to the draft 2040 Comprehensive Plan Update can be found at www.burnsville.org/2040. At the December 11th Planning Commission meeting an overview of each chapter summarized below will be provided:
Chapter 1: Community Overview – This chapter provides a summary overview of the 2040 Comprehensive Plan Update. Throughout each chapter of the document sustainability opportunities are incorporated and implementation strategies are included at the end of each chapter. As a community that is nearly fully developed, Burnsville's future driven by an overarching ideal of maintaining what we have, enhancing what we can, and adapting to meet future needs all within a sustainable framework.
Chapter 2: Land Use - The future land use guide plan establishes the foundation upon which all other elements of the 2040 Comprehensive Plan are developed. This chapter has three main purposes: 1) to identify how land should be developed to accomplish the city's Ends & Outcomes, as set by the City Council; 2) to ensure that resources will be available to provide a consistent level of public infrastructure and services to support the community's future land use patterns and densities; and 3) to provide a land use vision, goals and policies that promote improvement of the community's livability, including support for a balanced mix of land uses, wide variety of housing options, opportunities for people to live and work in our community, appropriate development density/intensity, consideration of community design and identity, sustainable development practices, redevelopment opportunities, and economic development and continuing investment in Burnsville. Focus in the Land Use chapter also includes expansion of the HOC, bus rapid transit (BRT) station areas, Burnsville Center area, aging neighborhood and satellite retail strip centers, and the MRQ.
Chapter 3: Economic Development - This chapter addresses how Burnsville will promote a secure economic base through creation of a culture of business revitalization, industrial, office, and commercial development.
Chapter 4: Neighborhoods & Housing - This Chapter provides housing goals and policies, a housing profile indicating the status of Burnsville's housing, affordable housing, future housing demand and strategies/recommendations to accomplish the stated goals and policies. This Chapter satisfies the requirements of the Mandatory Planning Act and stipulations of Chapter 462C of Minnesota Statutes which

requires a housing plan prior to the sale of mortgage revenue bonds.

Chapter 5: Natural Environment - The Natural Environment Plan seeks to enhance and preserve our unique natural resources that define Burnsville. This Chapter outlines how the city will plan for and maintain its natural environment. The Natural Environment Plan is comprised of several larger management plans: The 2007 Natural Resources Master Plan and the 2017 Wetland Protection and Management Plan. In addition this chapter includes the 2017 Water Resources Management Plan and the significant changes are listed below:

1. Water Quality has taken over as the number 1 priority. Past versions had water quantity (flooding) as the number priority. The City has spent millions of dollars mitigating past drainage/flooding concerns and is now focusing more on water quality and maintaining our existing surface water assets.
2. Nuisance aquatic vegetation was the number 1 item that residents brought to the City's attention. As a result, the City updated the aquatic plant management policy to allow for more city flexibility on treating or removing vegetation from lakes.
3. The stormwater management development standards were modified modestly primarily to conform with the newer regional standards known as Minimal Impact Design Standards (MIDS). Many cities and watersheds around the metro use these standards and developers are familiar with them. It resulted in a small increased requirement for developers. For instance, past requirements stipulated that developers treat a 1" rainfall event whereas MIDS calls for the 1.1" event to be treated.
4. Emerging issues in the world of water resources management are invasive species infestations and climate change. The City monitors for things such as zebra mussels, there are no known zebra mussels in Burnsville lakes at this time. We are taking on many efforts in the area of resiliency attempting to locate areas susceptible to climate change issues (large rain events) and developing solutions to mitigate the concerns prior to those high risk areas failing.

The Water Resources Management Plan was reviewed by the Parks Rec and Natural Resources Commission, 3-watershed districts that are within Burnsville, the Metropolitan Council and ultimately approved the City Council. This plan was identified in the 2015 and 2016 PC workplan for review and implementation as part of the Comprehensive Plan.

Chapter 6: Community Enrichment - This chapter focuses on programs, services and events offered throughout the city. It also examines partnerships within the city organization and with external stakeholders.

Chapter 7: Transportation - This chapter provides information about Burnsville's transportation system and provides guidance for decision makers for investments to enhance and maintain the system into the future. The plan identifies future deficiencies and expands on the use of Bus Rapid Transit, MnPASS lanes and autonomous vehicles. Through community surveys, Parks and Recreation Master Plan and 2040 Comprehensive Plan Update processes there was strong support expressed for a system of trails to provide residents with safe and enjoyable access to services, parks, schools, natural areas, the Heart of the City (HOC) and to the future Minnesota River Quadrant (MRQ) area. As Burnsville heads to 2040, the transportation plan identifies goals, policies and strategies to guide the City in its quest for a diverse transportation infrastructure that meets the communities needs safely and efficiently.

Chapter 8 City Services & Facilities - The City Services and Facilities Plan describes the public safety and other services provided by the City of Burnsville. Information is provided about the City's organizational structure, public buildings and facilities. This Plan also includes the Parks and Recreation Plan, telecommunications information, Sanitary Sewer Plan, and Comprehensive Water Plan. City facilities and services protect public health, safety, and welfare, improve quality of life and are an integral part of the city's land use pattern. In addition to existing facilities, this Chapter identifies areas where new services will be needed to accommodate future growth expected over the next two decades.

PLANNING CONSIDERATIONS:

Any outstanding issues or additional information should be provided at this time.

Once Planning Commission and the City Council are satisfied with the changes then the draft will be sent to adjacent jurisdictions for a mandatory six month review period.

ROLE OF THE PLANNING COMMISSION:

The role of the Planning Commission is to review the technical aspects of the proposed Comprehensive Plan.

RECOMMENDATION:

Staff recommends that the Planning Commission recommend to the City Council approval of the draft 2040 Comprehensive Plan Update and authorize submittal to neighboring jurisdictions for the required six month review and comment period.

RELATED ENDS & OUTCOMES STATEMENT(S)

People find BURNSVILLE an attractive, well-balanced city of residences and businesses, which through a combination of amenities and public/private partnerships, provides a wide range of opportunities for citizens to live, work, learn and play, for a reasonable investment.

Burnsville Comprehensive Plan - Meetings Schedule

CITY COUNCIL MEETING – MAY 10, 2016
Agenda:
- *Project Overview*
- *Review Panel*
- *Community Outreach*
- *Schedule*

ADVISORY PANEL MEETING - JULY 18, 2016
Agenda:
- *What is a Comprehensive Plan?*
- *Metropolitan Council and Thrive 2040*
- *Planning Process and Timeline*
- *Focus Areas*
- *Community Engagement*

ADVISORY PANEL MEETING - SEPTEMBER 19, 2016
Agenda:
- *Community Engagement*
  - *Input Received So Far*
  - *Community Engagement Plan*
- *Focus Areas Discussion*
  - *Aging Industrial*
  - *Heart of the City (HOC)*
  - *Orange Line Bus Rapid Transit (BRT) Station Areas*
  - *Minnesota River Quadrant (MRQ)*
- *Community Enrichment Plan*
  - *Youth Plan Chapter will be broadened into a Community Enrichment Chapter in 2040 Comprehensive Plan*

ADVISORY PANEL MEETING - NOVEMBER 7, 2016
Agenda:
- *Summary of Focus Areas Charrette*
- *Heart of the City (HOC) Focus Area*
  - *HOC 2 district concept*
  - *Orange Line Bus Rapid Transit (BRT) station areas concept*
  - *Vision elements*
- *East Cliff Road Industrial District Focus Area*
  - *District concept*
  - *Vision elements*
- *Minnesota River Quadrant (MRQ) Focus Area*
  - *High level concept*
  - *Vision elements*

MAYOR'S CEO ROUNDTABLE – DECEMBER 9, 2016
Agenda:
- *What is a Comprehensive Plan*
- *Review Panel*
- *Focus Areas*
  - *Focus Areas Charrette*
  - *Heart of the City (HOC) and BRT Station Areas*
  - *East Cliff Road Business Park*
- *Minnesota River Quadrant (MRQ)*
- *Schedule*

CITY COUNCIL MEETING – JANUARY 10, 2017
Agenda:
- *Comprehensive Plan Process Update*

ECONOMIC DEVELOPMENT COMMISSION – JANUARY 11, 2017
Agenda:
- *Overview/Observations/Discussion – East Cliff Road Business Park*
- *Overview – Minnesota River Quadrant (MRQ)*
- *Overview – Heart of the City (HOC)/Transit Improvements*

ADVISORY PANEL MEETING – JANUARY 30, 2017
Discussion Topic(s):
- *Comprehensive Plan Process/Schedule Review*
- *Future Land Use and Community Design*
  - *Vision and Objectives*
  - *Goals, Policies and Strategies*
  - *Vacant Land*
  - *Major Community Areas*
    - *Burnsville Center*
    - *Southcross Center*
    - *Fairview Ridges*
    - *Aging Retail Strip Centers*

ECONOMIC DEVELOPMENT COMMISSION – FEBRUARY 8, 2017
Discussion Topic(s):
- *Heart of the City(HOC)/Transit*
- *Minnesota River Quadrant (MRQ)*

ADVISORY PANEL MEETING – FEBRUARY 27, 2017
Discussion Topic(s):
- *Comprehensive Plan Process and Schedule Review*
- *Vision and Goals - Housing Plan Chapter*
- *Vision and Goals - Neighborhood Plan Chapter*
- *Housing Review*

ADVISORY PANEL MEETING – MARCH 20, 2017
Discussion Topic(s):
- *Comprehensive Plan Process and Schedule Review*
- *Vision and Goals - Economic Development Chapter*
- *Focus Areas - Implementation Overview*
- *Economic Competitiveness*

CITY COUNCIL – APRIL 11, 2017
Discussion Topic(s):
- *Comprehensive Plan Process Update*

ADVISORY PANEL MEETING – APRIL 17, 2017
Discussion Topic(s):
- *Community Enrichment End Statement & Outcomes*
- *Burnsville Demographics Snapshot*
- *Vision and Goals - Youth/Community Enrichment Chapter*
- *Community Enrichment Plan Approach*

ECONOMIC DEVELOPMENT COMMISSION – MAY 10, 2017
Discussion Topic(s):
- *Economic Competitiveness*
- *Implementation Strategies*

ADVISORY PANEL MEETING – MAY 15, 2017
Discussion Topic(s):
- *Comp Plan Process and Schedule Review*
- *Vision and Goals – Transportation Plan Chapter*
- *Transportation Topics*
  - *Bike Lane Types*
  - *Orange Line BRT*
  - *East/West Transit Plan*
- *Transportation System Discussion*
  - *Change in modelling – trip based to activity based*
  - *Observations about local issues and challenges*
- *Autonomous Vehicles*

ADVISORY PANEL MEETING – JUNE 19, 2017
Discussion Topic(s):
- *Comp Plan Process and Schedule*
- *Vision and Goals - Natural Environment chapter*
- *Water Resources Management Plan (WRMP)*
- *Parks Plan*

CITY COUNCIL – JULY 11, 2017
Discussion Topic(s):
- *Comprehensive Plan Process Update*

ADVISORY PANEL MEETING – JULY 31, 2017
Discussion Topic(s):
- *Comprehensive Plan Process and Schedule Review*
- *Vision and Goals*
- *Community Services and Facilities*

ADVISORY PANEL MEETING – AUGUST 21, 2017
Discussion Topic(s):
- *Comp Plan Meetings Schedule Update*
- *Review Economic Development and Redevelopment Chapter*
- *Review Land Use Chapter*
- *Review Housing Chapter*

MEETING SCHEDULE CONTINUED ON NEXT PAGE

Meeting Key

COMPLETED MEETINGS IN ITALICS

FUTURE MEETINGS IN REGULAR

Hoisington Koegler Group Inc.

Type of Meeting

- *City Council*
- *Advisory Panel*
- *Economic Development Commission*
- *Parks and Natural Resources Commission*
- *Planning Commission*
- *Community Engagement*

Note: This listing of meetings will be updated on a regular basis and discussion topics are subject to change. Meeting dates may be modified and additional meetings may be added as well.

9/26/2017

Burnsville Comprehensive Plan - Meetings Schedule - pg. 2

MAYOR'S CEO ROUNDTABLE MEETING - SEPTEMBER 1, 2017
Discussion Topic(s):
» *Review Economic Development and Redevelopment*

ECONOMIC DEVELOPMENT COMMISSION – SEPTEMBER 13, 2017
Discussion Topic(s):
» *Review Draft Plan – Economic Development and Redevelopment*

CITY COUNCIL – OCTOBER 10, 2017
Discussion Topic(s):
» *General Plan Overview*

ADVISORY PANEL MEETING – OCTOBER 16, 2017
Discussion Topic(s):
» *Community Overview, Natural Environment, Community Enrichment, Transportation and City Services, and Facilities*

COMMUNITY OPEN HOUSE – OCTOBER 18, 2017, FROM 5 - 7 PM
Discussion Topic(s):
» *Review Draft Plan*

PARKS & NATURAL RESOURCES COMMISSION – OCTOBER 23, 2017
Discussion Topic(s):
» *Parks element of City Services and Facilities Plan and Natural Environment chapter*

COMMUNITY OPEN HOUSE – OCTOBER 24, 2017 FROM 7:30-9:30AM
Discussion Topic(s):
» *Review Draft Plan*

PLANNING COMMISSION MEETING – NOVEMBER 13, 2017 - PUBLIC HEARING
Discussion Topic(s):
» Future Land Use Plan Changes

PLANNING COMMISSION MEETING - DECEMBER 11, 2017 - PUBLIC HEARING CONTINUED
Discussion Topic(s):
» Plan Review

CITY COUNCIL – DECEMBER 19, 2017
Discussion Topic(s):
» Plan Review

Meeting Key

COMPLETED MEETINGS IN ITALICS

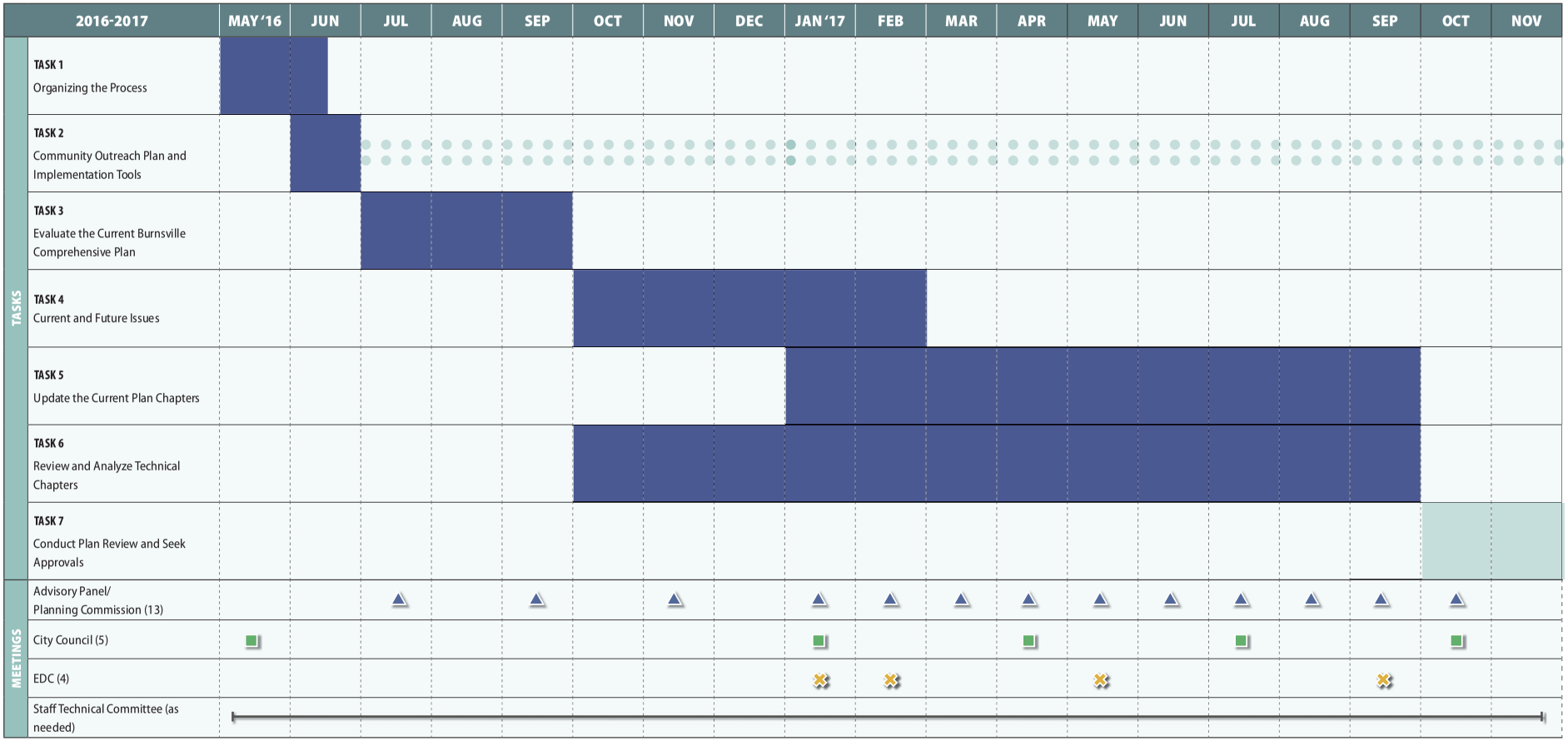
FUTURE MEETINGS IN REGULAR

Type of Meeting

- *City Council*
- *Advisory Panel*
- *Economic Development Commission*
- *Parks and Natural Resources Commission*
- *Planning Commission*
- *Community Engagement*

Note: This listing of meetings will be updated on a regular basis and discussion topics are subject to change. Meeting dates may be modified and additional meetings may be added as well.

Burnsville Comprehensive Plan - Task Schedule



11/02/2017

Completed Tasks

Future or In Process Tasks

Hoisington Koegler Group Inc.

Jurisdiction Type	Jurisdiction Name	Contact	Contact	Date Comp Plan Sent	Date Comments Received	Date Waiver Signed	Notes/Comments
Adjacent Community	Apple Valley	info@ci.apple-valley.mn.us	commdev@ci.apple-valley.mn.us	3/16/2018			
Adjacent Community	Bloomington	citymanager@bloomingtonmn.gov	commdev@BloomingtonMN.gov	3/16/2018		8/24/2018	No Comments
Adjacent Community	Credit River Twp.		clerk@creditriver-mn.gov	3/16/2018	N/A	Waiver Signed 7/26/2018	No Comments
Adjacent Community	Eagan	dosberg@cityofeagan.com	mridley@cityofeagan.com	3/16/2018			
Adjacent Community	Lakeville	jmiller@lakevillemn.gov	dolson@lakevillemn.gov	3/16/2018	Comments Received 7/20/18	N/A	
Adjacent Community	Savage	Bryan Tucker, Planning Manager 952-882-2660	btucker@ci.savage.mn.us	3/16/2018	N/A	Waiver Signed 6-20-18	No Comments
Adjacent Community	Dakota County	Kurt Chatfield - Dakota County Office of Planning	kurt.chatfield@co.dakota.mn.us	3/16/2018	Comments Received 8-31-18	N/A	Kurt wanted to know when the 6 month period is over. RD responded via email 9/16/18
Adjacent Community	Hennepin County	catherine.walker@hennepin.us	Dan.Patterson@hennepin.us	3/16/2018			
Adjacent Community	Scott County	Brad Davis, Planning Manager 952-496-8475	bdavis@co.scott.mn.us	3/16/2018	Comments Received 09-14-18	N/A	
School District	191; Burnsville-Eagan-Savage	Cindy Amoroso, Superintendent 952-707-2005	superintendent191@isd191.org	3/16/2018			
School District	194; Lakeville	michael.baumann@isd194.org	tony.massaros@isd194.org	3/19/18 (bad email on 3/16)			
School District	196; Rosemount-Apple Valley-Eagan	Jane Berenz, Superintendent	supt@district196.org	3/16/2018			
Watershed Management Organization	Black Dog Watershed Management Organization	Daryl Jacobson, Administrator	daryl.jacobson@burnsvillemn.gov	3/16/2018			
Watershed Management Organization	Eagan-Inver Grove Heights Watershed Management Organization	Ashley Gallagher, Administrator	ashley.gallagher@co.dakota.mn.us	3/16/2018	N/A	Waiver Signed 4-25-18	No Comments
Watershed Management Organization	Lower Minnesota River Watershed District	Linda Loomis	naiadconsulting@gmail.com	3/16/2018	Comments Received 5/28/18	N/A	
Watershed Management Organization	Scott County Watershed Management Organization	Paul Nelson, Program Manager	pnelson@co.scott.mn.us	3/16/2018			
Watershed Management Organization	Vermillion River Watershed Joint Powers Organization	Mark Zabel, Administrator 952-891-7011	mark.zabel@co.dakota.mn.us	3/16/2018			
Regional Park Implementing Agency	Dakota County		parks@co.dakota.mn.us	3/16/2018			
Transit Authority	Minnesota Valley Transit Authority	jlehmann@mvta.com	rselvig@mvta.com	3/16/2018	Comments Received 9/7/2018	n/a	
State Agency	MnDOT	metrodevreviews@dot.state.mn.us		3/16/2018	Comments Received 4/6/18	N/A	Jennifer with MnDOT called and had questions on Transportation Chapter. Referred to Ryan Peterson. 651-234-7788
State Agency	MnDNR	Molly.shodeen@state.mn.us	Jennie.Skancke@state.mn.us	3/16/2018			
State Agency	MAC	Neil.Ralston@mspmac.org	Bridget.Rief@mspmac.org	3/16/2018	N/A	Waiver Signed 09-12-18	No Comments
Other	Tree Rivers Park District	ann.rexine@threeriversparks.org		Through Scott Co???	Comments Received 7/27/18		
							Email Bounced Back

Affected & Adjacent Jurisdictions - Offical Comments - City of Burnsville Comprehensive Plan - September 21, 2018

Entity	Type	Comment	Page(s)	Response
City of Lakeville	Transportation			
City of Lakeville	Kudos	Lakeville appreciates Burnsville's commitment to increase capacity within existing transportation corridors, specifically its support for the extension of MnPASS/HOV lanes south along 1-35 into Lakeville. (Burnsville Transp. Policy 1.3)	7-325; 7-344; 7-378	Noted
City of Lakeville	Kudos	Lakeville appreciates Burnsville's commitment to the development of the METRO Orange line, specifically its support for Phase 2 extension into Lakeville. (Burnsville Transp. Policy 5.1).	7-326; 7-382	Noted
City of Lakeville	Kudos	Lakeville appreciates Burnsville's commitment to complete trail connection along the Lake Marion Greenway Regional Trail. (Burnsville Transp. Policy 5.3).	7-326; 7-390	Noted
City of Lakeville	Kudos	Lakeville supports Burnsville's interest in considering the Canadian Pacific railroad as a future trail corridor if the rail line is ever abandoned (Burnsville Transp. Policy 5.8).	7-327; 7-354	Noted
City of Lakeville	Map Change	Review Figure 7-4 (Functional Road Classification Map) for continuity at city limits.	7.332	Noted
City of Lakeville	Text Change	Lakeville identifies Buck Hill Road and Kenrick Avenue/Maple Island Road as major collectors- Burnsville identifies both as minor collectors	7-332	These roads function in Burnsville as minor collectors. Will discuss if desired.
City of Lakeville	Figure Change	Review Figure 7-8 (Metropolitan Council 2040 Transitway System Map) for accuracy with Cedar Avenue Transitway Implementation Plan Update, December 2015. Current service stops at Apple Valley Transit Station. Lakeville improvements are identified in Stages 4, 5, and beyond 2040	7-345	Updated the figure
City of Lakeville	City Services and Facilities			
City of Lakeville	FYI	Plans reflect City's participation in: 1) Black Dog Watershed Management Organization; 2) Dakota County Electronic Crimes Unit	8-414; 8-426	Noted
City of Lakeville	FYI	Plan appropriately references Lakeville's contributing future sanitary sewer flow projections	8-451	Noted
City of Lakeville	FYI	Plan appropriately references Lakeville's water supply JPA	8-463	Noted
City of Lakeville	Natural Environment			
City of Lakeville	FYI	Plan references Burnsville's adopted Emerald Ash Borer Management Plan – supports Lakeville's interest in managing the spread of EAB	5-244; 5-254; 5-265; 5-284; 5-287	Noted
City of Lakeville	FYI	Plan references Burnsville's concerns and issues regarding the Canadian Pacific Railroad – supports Lakeville's concerns	5-247	Noted
City of Lakeville	FYI	Plan reflects City's participation in Dakota Valley Recycling	5-251	Noted
City of Lakeville	FYI	Lake management is not included in the Plan	n/a	Noted
Entity	**Type**	**Comment**	**Page(s)**	**Response**
Dakota County	Transportation			
Dakota County	Addition	Highway Expansion: The Dakota County Comprehensive Plan has identified a number of County highways that need to be expanded. We suggest that the following highway expansions be referenced in the Burnsville Plan: 1) County State Aid Highway (CSAH) 32, from Trunk Highway (TH) 13 to the east city border as a 6-lane need; 2) CSAH 42, from the west city border to 145th St E, as more than a 6-lane need; 3) CSAH 42, from 145th St E to the east city border, as a 6-lane need; and 4) CSAH 46, for all portions bordering Burnsville, as a 6-lane need.	7.359	Added

Dakota County	As a Note	Travel Demand Management: Dakota County will update its travel demand forecasts as part of an upcoming County Transportation Plan update. The new forecast will incorporate 2040 land use projections from each city. Dakota County will work with the City of Burnsville to include the City's 2040 land use projections and will re-evaluate highway expansion needs in the City and throughout Dakota County as part of that effort.	n/a	Noted
Dakota County	Addition	Transit: Please consider adding language to the description of Transit Link Service (page 7-350) that states that the service is available in areas where fixed route services are not available.	7.346	Added
Dakota County	Recommendation	Bicycles & Pedestrians: The plan references the City's bicycle and pedestrian policies with respect to ADA requirements, trail development and transitway development. It may be useful to include a statement that Dakota County also has policies for pedestrian and bicycle modes that provide guidance for the County highways throughout the City.	7.323	Noted - no change made
Dakota County	Environmental Resources			
Dakota County	Addition	"On Site Septic Systems" on page 5-243 could be clarified to state that failing septic systems are of concern to the natural environment. Properly managed systems can benefit natural systems by replenishing groundwater after treatment.	5.241	Language Added
Dakota County	Parks & Greenways			
Dakota County	Addition	Please consider adding labels to the map in this section that identify regional greenways. There is a reference to the "Dakota South Urban Regional Trail" which should be updated to the new name "McAndrews Greenway Regional Trail."	7.324	Name Updated
Entity	**Type**	**Comment**	**Page(s)**	**Response**
Scott County	Label Update	The correct name of the regional park in Credit River Township is Murphy-Hanrehan Park Reserve. Incorrect references are on pages: 110, 116, 280,340, 447, 448, and 449.	110, 116, 280, 340, 447, 448, 449	Updated
Scott County	Map Update	The segment of trail on figure 7-29 within Murphy-Hanrehan Park Reserve is not an existing (or planned) trail. It may be a reference to the very generically depicted connection around Murphy-Hanrehan Park Reserve that is included in Dakota County's Lake Marion Greenway Regional Trail master plan. Please remove from the figure.	7.395	Revised the figure
Scott County	Change	The reference on page 340 to the Scott County East Regional Trail should be the Lake Marion Greenway.	7.324	Updated
Scott County	Change	On page 449 the plan references an MOU between Scott County and Three Rivers - It is now managed through a Joint Powers Agreement.	8.443	Updated
Entity	**Type**	**Comment**	**Page(s)**	**Response**
Lower Minnesota Watershed District	Recommended Policy	In Title 10, Chapter 10, “Floodplain Regulations”: Require the lowest level of proposed structures to be a minimum of two feet above the 100-year flood elevation.	n/a	The City will consider recommended changes to ordinance language through implementation of the Comprehensive Plan
Lower Minnesota Watershed District	Recommended Policy	In Title 10, Chapter 10, “Floodplain Regulations”: When the placement of fill in the 100-year floodplain causes a rise in the 100-year flood elevation, require the creation of compensatory floodplain storage equal to or greater than the volume of fill placed.	n/a	The City will consider recommended changes to ordinance language through implementation of the Comprehensive Plan
Lower Minnesota Watershed District	Recommended Policy	In Title 10, Chapter 8, “Environmental Overlay Districts”: Refine the definition of bluff so it is the same throughout the chapter and better matches the District’s proposed Steep Slopes standard, which has replaced “bluff” with “steep slope” and defines it as a natural topographic feature having average slopes of 18 percent or greater over a horizontal distance of 25 feet or more.	n/a	The City will consider recommended changes to ordinance language through implementation of the Comprehensive Plan
Lower Minnesota Watershed District	Recommended Policy	In Title 10, Chapter 8, “Environmental Overlay Districts”: Remove the requirement that a bluff (or steep slope, if the term is changed) must be in a shoreland area. Correspondingly, shift the bluff management information in Chapter 8, Section 10, “Shoreland Overlay District,” to an alternative location in Chapter 8.	n/a	The City will consider recommended changes to ordinance language through implementation of the Comprehensive Plan

Lower Minnesota Watershed District	Recommended Policy	Identify all steep slope (bluff) protection measures in a single overlay district—for example, the Soil Erosion Overlay District Standard.	n/a	The City will consider recommended changes to ordinance language through implementation of the Comprehensive Plan
Lower Minnesota Watershed District	Recommended Policy	In Appendix C of the City's Water Resources Management Plan, Development Standards: Define and include fens in Section 6, "Special Waters and Wetlands."	n/a	The City will consider recommended changes to ordinance language through implementation of the Comprehensive Plan
Lower Minnesota Watershed District	Recommended Policy	In Appendix C of the City's Water Resources Management Plan, Development Standards: On land that contributes runoff to a trout water and/or fen, require a higher level of protection by applying the standards of the water quality treatment, volume control, water quantity, and rate control requirements in the WRMP to any development that includes disturbing 5,000 square feet or more of surface area, excavating 50 cubic yards or more of earth, or creating more than 10,000 square feet of new impervious area.	n/a	The City will consider recommended changes to ordinance language through implementation of the Comprehensive Plan
Entity	**Type**	**Comment**	**Page(s)**	**Response**
MVTA	Addition	Burnsville Transit Station also has several local routes: "…transit station which includes a 1200-space public parking ramp with daily commuter transit service,…"	2.92	Change made
MVTA	Consideration	Consider including both Express and Local services offered by MVTA to ED Policy 3.5	3.123	Change made
MVTA	Clarification	Please clarify how the Orange Line will strengthen transit service to the Cliff Road Business Park. The only connection from the future Orange Line stop to this area is via MTVA's Route 444, which is in operation today and serves south of Hwy 13	3.154	Confusing element removed
MVTA	Change	Burnsville also has an Emerging Market Area II	7.344	Added text
MVTA	Consideration	MVTA comment on 2015 System Statement: "Transit Market Area descriptions in the TPP may not represent the full service needs of the City of Burnsville. MVTA is available to work with the City to determine the appropriate level of service for each area, regardless of its designation"	7.344	Added text
MVTA	Addition	MVTA routes currently use/benefit from MnPASS lanes and bus-only shoulders	7.344	Added text
MVTA	Change	"… and also features many amenities including an indoor climate-controlled waiting area, restrooms, a 'ticket vending machine', transit information center…"	7.346	Change made
MVTA	Figure Change	Routes using I-35 south of CR 42 were re-routed in 2016. MVTA can provide updated route data if needed	7.347	Map Updated
Entity	**Type**	**Comment**	**Page(s)**	**Response**
Minnesota Department of Transportation	Text Change	On page 7-357 it discusses the development of the Minnesota River Quadrant (MRQ) and that development being a factor in the two interchanges for I-35W (Black Dog Road and Cliff Road) remaining open. If there is no development it is discussed that a new interchange will be added at 118th street and that Black Dog Road and Cliff Road will be removed as interchanges. MnDOT recommends that the City does not preemptively identify which interchanges will remain or be removed, but instead just identifies the number of interchanges needed for each scenario since the exact interchanges that remain or are removed may change depending on future conditions.	7-353	Revised text
Minnesota Department of Transportation	Consideration	The following comments are focused on freight transportation and derived from the recent completion of the 2018 Statewide Freight System and Investment Plan and its Freight Action Agenda. The Freight Action Agenda outlines next steps for MnDOT and the state's public and private sector freight partners. Local planning agencies such as City of Burnsville play an essential role in supporting objectives and strategies in the Freight Action Agenda. Specifically, MnDOT recommends the City of Burnsville consider leading freight planning in the following areas;	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan
Minnesota Department of Transportation		Truck Routes – Coordination of truck routes/planning in industrial and urban areas with restrictions and enforcement in adjacent residential areas	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan

Minnesota Department of Transportation		Complete Streets – Treatments that consider truck movement as part of total vehicle traffic, which can include time-of-day delivery windows to reduce conflicts with other street users, and design guidelines for curb pullouts that can be used at different times for bus, truck parking , and others	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan
Minnesota Department of Transportation		Land Use Planning and Polices - Land use planning and policies to ensure freight development areas are designated and preserved, and that development occurs adjacent to existing infrastructure	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan
Minnesota Department of Transportation	Consideration	The City of Burnsville may also consider a supporting role for MnDOT in the following areas (also discussed in the plan):	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan
Minnesota Department of Transportation		Freight as a Good Neighbor	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan
Minnesota Department of Transportation		Integrate Freight into all Planning Projects	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan
Minnesota Department of Transportation		First-/Last –Mile Connections	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan
Minnesota Department of Transportation		Intermodal and Multimodal Facilities	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan
Minnesota Department of Transportation		Urban Goods Movement Programs	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan
Minnesota Department of Transportation		Truck Size and Weight	n/a	The City will consider policy recommendations through implementation of the Comprehensive Plan
Minnesota Department of Transportation	Comment	Continue to coordinate planning efforts that involve MnDOT facilities that are within the City of Burnsville.	n/a	Noted
Entity	**Type**	**Comment**	**Page(s)**	**Response**
Three Rivers Park District	Text Change	Please revise the text throughout the document to read Murphy-Hanrehan Park Reserve. Note the hyphen between Murphy and Hanrehan, the exclusion of "Regional" and its designation as a "Reserve" and not "Preserve or Nature Reserve."	2-99, 2-105, 5-268, 5-287, 7-326, 7-396 (Figure 7-29) 8-432, 8-433, 8-434	Updated
Three Rivers Park District	Text Change	The image has cut off the last sentence, which makes it appear as a caption to the picture. Recommend moving "arriving at Murphy-Hanrehan Park Reserve" up to complete the paragraph.	7-390	Addressed
Three Rivers Park District	Map Change	Figure 7.29 depicts a green existing trail extending west from the Burnsville/Dakota County border. There is no trail currently in place, and advisement is to delete this green alignment from the figure. The planned Lake Marion South Creek Greenway alignment extension through Scott County will be master planned as a future project with the Three Rivers Park District/Scott County partnership. Perhaps you may consider an arrow on the map to show that the trail is intended to continue west into Scott County.	7-395	Revised the figure

Three Rivers Park District	Text Change	“Murphy-Hanrehan Park Reserve’s implementing agency is the Three Rivers Park District through a joint powers agreement with Scott County."	8-434	Change Made

All Parks Alliance for Change ▪ APAC

An Organization of Manufactured Home Park Residents

September 14, 2018

Ms. Regina Dean, City Planner
City of Burnsville
100 Civic Center Parkway
Burnsville, Minnesota 55337

Dear Ms. Dean:

We are writing to follow up on our first letter, dated October 12, 2016, which discussed manufactured housing and Burnsville's Comprehensive Plan 2018 update.

Manufactured Housing Language in Burnsville's 2040 Comprehensive Plan Draft

To help you complete your draft, we created the following schema for evaluating Comprehensive Plan language as it relates to manufactured housing. Comprehensive Plan draft language usually falls within multiple categories.

Negative – Mention of manufactured housing in the Comprehensive Plan is negative, whether furthering stigma, calling for closure, or describing plans for redevelopment, zoning, or land use changes that reduce protection of manufactured housing parks.

No obvious examples present in draft.

Invisible – Little or no mention of manufactured housing or relevant data exists in the Comprehensive Plan, or clear opportunities to provide meaningful data on manufactured housing are present but not acted upon. Similar to the category, "Purely Descriptive," described below, the category, "Invisible" applies to Comprehensive Plans that fail to substantially engage with strategies that support a city's manufactured housing. Engaging with and supporting all residents ensures that the entire community is strengthened in the long-run.

Manufactured housing is mentioned in draft.

Purely Descriptive – Mention of manufactured housing is limited to statistics related to how much manufactured housing exists in the city, or other basic facts without discussion of improvement. The Comprehensive Plan provides an important opportunity for describing methods of supporting manufactured housing in the City as an unsubsidized and primarily owner-occupied affordable housing resource, and an important source of affordable housing in Burnsville. The City can go further in describing tangible support strategies for these communities.

Examples of Purely Descriptive Language from Burnsville's 2040 Comprehensive Plan Draft:

"In the ten years between 2006 and 2016, only 283 units of housing were built: 111 single family detached homes, 121 townhomes, and 51 manufactured homes" (2-61).

"Medium Density Residential (MDR) This category provides for a broader range of medium density housing opportunities. Much of the community's smaller townhome

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developments are included in this category. Allowed uses include single-family attached housing (townhomes, small apartment buildings), small lot detached townhomes, and manufactured homes (mobile homes) within the three existing manufactured home parks (Camelot Acres, Rambush Estates, and Sunny Acres). Lands within this category are served with municipal utilities" (2-90).

Identifies manufactured housing as affordable housing – Comprehensive Plan language clearly states that manufactured housing provides affordable housing in the City. This is the primary example of positive language towards manufactured housing that is found in your comprehensive plan draft, but no additional supporting language is included that states how the City will preserve, support, and improve this resource.

Example of language identifying manufactured housing as affordable from Burnsville's 2040 Comprehensive Plan Draft:

None – The City can add language that identifies manufactured housing as a resource that increases available affordable housing units.

Identifies clear strategies to support manufactured housing – Comprehensive Plan language describes tangible methods to improve manufactured housing.

Example of a clear strategy to support manufactured housing from Burnsville's 2040 Comprehensive Plan Draft:

"Manufactured Homes Burnsville is home to three manufactured/mobile home parks, with a total of 766 lots. People own their unit but do not own the underlying land and as such, they can be faced with enormous relocation costs if the park owner sells the park for another use. To protect mobile/manufactured housing park residents, the Burnsville City Council enacted an ordinance that requires the owner and/or developer to pay reasonable relocation costs to the residents. The City is not aware of any planned park closures" (4-181).

The above example is positive in that it shows that the City has identified a need present in its manufactured housing community and responded to it with a clear policy.

Identifies funding sources to support manufactured housing – Comprehensive Plan language describes funding sources that can be used to improve manufactured housing.

Examples of funding sources to support manufactured housing from Burnsville's 2040 Comprehensive Plan Draft:

None

Connects improvement strategies to funding – Comprehensive Plan language describes both clear strategies to improve manufactured housing and identifies funding sources that can be applied towards them.

Examples connecting strategies to funding from Burnsville's 2040 Comprehensive Plan Draft:

None

Burnsville's 2040 Comprehensive Plan draft does not **identify manufactured housing as affordable, identify funding sources to support manufactured housing**, or **connect improvement strategies to funding**. It can improve its language towards manufactured housing across all of the categories described above.

If your City has additional ways that it supports manufactured housing that are not clearly mentioned, we encourage you to address them explicitly in your updated Comprehensive Plan.

Based on our analysis, we would like to make the following specific recommendations:

- Create, describe, and maintain a policy of at least a one to one ratio replacement of affordable housing units if any are removed from the City's housing stock.
- Fill vacancies in current parks.
- Incentivize the current owners of manufactured housing parks to residents by creating incentives to do so, which could include forgiving back-taxes, utilities, or providing tax breaks if it is sold to a non-profit with the intention of creating a resident-owned community. Creation of a resident ownership-structure can help reduce tensions between residents and management, provide incentives for residents to get even more involved in supporting the well-being of their community, and ensure that manufactured housing parks remain a valuable affordable housing resource.

In general, it would help to reflect on the following key points regarding manufactured housing and to address them in your updated comprehensive plan language:

- Manufactured housing is unsubsidized affordable housing.
- Manufactured housing provides more affordable housing in Minnesota than any other form of affordable housing.
- Manufactured housing is valuable to local businesses because it provides workforce housing.
- Manufactured housing provides owner-occupied housing.
- Manufactured housing provides housing to seniors, youth, and low-income individuals, enabling them to stay in a neighborhood and community they value.
- Modern construction of manufactured housing is more cost-effective, generates less waste, is more energy efficient, and more timely than site-built housing.
- Manufactured housing communities are more stable than terms like "mobile homes" or "trailers" suggest, and homes often stay in place and are used like any other type of residence for many years.
- Many issues can be resolved through the creation of a resident-owned community, which incentivizes residents to invest in their park.

We encourage you use the 2018 update process as an opportunity to incorporate positive language towards manufactured housing into your City's 2040 Comprehensive Plan. Doing so

does not need to be overly complicated. Start by identifying manufactured housing as an affordable housing resource, describe tangible ways that it can be improved, and identify funding opportunities that support these methods.

We encourage you to contact us when you are working on issues related to manufactured housing. We can help you engage with residents and resolve problems with satisfactory outcomes for all parties. Thank you.

Sincerely,

Owen Hawkins
Program Associate

Dave Anderson
Executive Director

Manufactured Homes

Manufactured housing is generally considered unsubsidized affordable housing and provides owner-occupied housing to a broad range of residents. Burnsville is home to three manufactured/mobile home parks, with a total of 766 lots. People own their unit but do not own the underlying land and as such, they can be faced with enormous relocation costs if the park owner sells the park for another use. To protect mobile/manufactured housing park residents, the Burnsville City Council enacted an ordinance that requires the owner and/or developer to pay reasonable relocation costs to the residents. The City is not aware of any planned park closures.

Age of Housing Stock

Because most of Burnsville developed between 1970 and 2000, the overall housing stock in the city is beginning to age. Approximately 92 percent of the total housing units that exist today were built prior to 2000. Structures surpassing 20 years of age begin to require major repairs such as siding, roof and furnace replacements, and any lack of regular maintenance begins to show. In 2015, there were a total of 26,108 residential housing units in Burnsville, of which, 69.8 percent were more than 25 years old.

Table 4-1: Year Built of Housing Stock, 2015

Year Built	Units	Percent
Pre-1960	1,123	4.3%
1960 – 1969	3,940	15.1%
1970 – 1979	6,995	38.0%
1980 – 1989	6,187	23.7%
1990 – 1999	5,679	21.8%
2000 – 2009	2,059	7.9%
2009 – 2015	125	0.5%
Total – 2015	26,108	100.0%

Source: Dakota County Assessor

The current policy of the city is to encourage housing and property maintenance through proactive inspections and code enforcement procedures. Inspectors notify property owners of code compliance issues, provide information on available funds/programs for improvements and work together with owners to achieve compliance with city standards. As the housing stock continues to age, it may be necessary to increase inspections/compliance activities and/or review what tools may be available to assist homeowners in improving or repairing their homes. This may include revisions to policies, financing, ordinances, as well as looking to alternative programs to encourage property maintenance. Figure 4-4 displays locations where older housing stock is located by year constructed.

Choice

Over the next 20 years, the choices available to residents, workers and to people looking at Burnsville as a place to live or work will be expanded. Burnsville's vitality draws on diversity that exists and will grow in the future. A variety of housing types, jobs, recreational facilities and cultural attractions opens doors of opportunity for larger numbers of people. In addition, as the costs of housing continue to rise, and personal and family needs change, the City may want to consider more housing choices as well as a variety of housing types.

Offering a variety of housing types creates more opportunities for future Burnsville residents such as: access to more jobs and services, improved transit service and the connection of neighborhoods with activity, shopping and recreational areas. Broadening choices means in part that the City will need to be involved with improving transit service such as: improving access to transit, developing bus shelters and bus bench amenities close proximity to where people live and work.

There is a strong desire on the part of the City to have a living environment that will not only attract young adults (25-34 year olds) but also encourage youth to stay in Burnsville. By offering choices for housing, entertainment, recreation, education and employment, Burnsville will be the type of community that young adults desire. In addition to the activities, programs and policies identified as part of this Comprehensive Plan, the City will continue to research and focus attention on other ways to attract and keep young adults in Burnsville.

~~Environmental Assessment Worksheet~~

~~Since 1991, the City has required an Environmental Assessment Worksheet (EAW) for all residential projects with a density of 20 dwelling units per acre or higher. The City adopted this formal policy requiring discretionary EAWs to assure high-density residential projects were assessed for their potential environmental effects and impacts/demand for municipal services. The City Council may want to revisit this policy at some point in the future to see if the extra requirement for environmental assessment is still relevant. It is possible that removing this requirement will significantly reduce the cost of developing multifamily residential properties, which may help affordability in the future.~~

Neighborhood Oriented Mixed Use Redevelopment

Through this 2040 Comprehensive Plan Update, the City encourages redevelopment and infill development of neighborhood-oriented-mixed-use centers to provide residents with local service/retail options that can be visited by walking, biking or other personal transit service. Prime locations for neighborhood oriented mixed use are the current locations of aging retail strip centers and future transit station areas, especially within large areas currently dedicated to parking lots. As the city's population ages and becomes more diverse, new opportunities for investment in neighborhood

oriented business will occur. By encouraging future redevelopment to be pedestrian- and transit-oriented and to cater to the needs of residents living in close proximity (1/4 mile), existing neighborhoods may be revitalized by the resulting local gathering places. The objective is to provide both desired and necessary services, business and interactive and entertainment establishments that will cater to the needs of neighborhoods such as daycare for youth and older adults, medical services, prescriptions, smaller groceries and places to dine.

National Trends Impacting the Future of Housing in Burnsville

In addition to local demographic and economic trends that will impact housing demand in Burnsville, it is important to note that national trends may also have an impact. It is uncertain to what extent these national trends could have on Burnsville, but they should be carefully considered for proper integration into existing neighborhoods as housing decisions are made.

Increase in the number of single-person households

- Increase in both young, unmarried people, as well as seniors who live alone
- Affordability for single-person households is a concern

Increasing desire by single-family detached homeowners to add additional units to their properties

- Income producing properties
  - Accessory dwelling units
  - Short-term rentals
- Additional space to care for family members, especially elders
  - Mother-in-law apartments
  - Temporary healthcare dwelling
- Variety of types of additional units
  - Building addition
  - Over garage
  - Basement unit
  - Carriage~~h~~ House
  - "Tiny house"
  - Trailers

Increasing demand for affordable group living (households of unrelated adults)

- Special housing needs (rehabilitation, sex offender, etc.)
- Affordable senior housing that provides opportunities for companionship within the housing units
- More office space needed in homes with shift toward telecommuting
- Broadband
- Well-connected neighborhoods to coffee shops and other daytime facilities

Source: HKGi, 2017

Future Neighborhood and Housing Needs

Reinvestment in Burnsville's Aging Housing Stock

» Existing housing stock includes a mix of single family, multi-family, owner occupied or rental including manufactured homes.

» The city's aging housing stock will require more significant and expensive maintenance

» A substantial portion of the city's housing stock is older housing styles (e.g. split level homes) that are affordable, but these housing styles are less desirable today from a buyer's standpoint

» Deferred housing maintenance can negatively impact neighborhood character and desirability

» Many of the city's older housing units are considered "naturally occurring" affordable housing, so preservation of aging housing stock provides great opportunities for first-time home buyers as well as households in need of affordable housing

Housing Options to Accommodate Burnsville's Growing and Diversifying Population

» Low vacancy rates for rentals and owner-occupied homes creates pent-up demand for housing in Burnsville

» Burnsville's projected population/household growth will require an average of 105 new housing units per year while the past ten years have had an average of 26 units per year

» The growing population/households have diverse housing needs:

- Affordable rental housing for young heads of household and seniors (0-2 BR)
- "Starter" homes in well-connected neighborhoods for young families
- "Move-up" homes that have investment/expansion potential
- "Executive" homes
- Downsizing options for empty-nesters and those shifting in lifestyle
- Senior housing options, including active, assisted, and affordable
- Mixed-use neighborhoods with walkability to commerce and amenities as an alternative to traditional suburban development

» An increasingly diverse population, especially as Burnsville remains a destination for first- and second-generation immigrant families, presents new housing needs: intergenerational living; cultural resources, and connection to community members, services, and resources

Increased Housing Options to Fit Changing Housing/Neighborhood Style Preferences of Current and Future Residents

» Increase in the number of single-person households

» Increasing desire by homeowners to add additional units to their property, for income purposes or to provide care for family members, especially elderly

» Millennials and retiring boomers place an increasing importance on character of neighborhoods, their connectivity to amenities and walkability

» More people will be working from home or telecommuting in the future, shifting commuting patterns, as well as what residents need out of their housing

Affordable Housing Options for a Broader Range of Household Types and Income Levels

» An increasing number of people are experiencing a housing cost burden that is not sustainable

» Preservation of Burnsville's "naturally occurring" affordable housing, including apartments and manufactured homes

Stronger Neighborhood Organizations, Identity and Amenities

» Expand neighborhood level coordination and communication with residents and joint participation with civic and neighborhood improvement projects

» Continue neighborhood initiatives to address issues and provide enhancement mechanisms to maintain and improve neighborhood vitality by empowering residents to enhance neighborhood vitality Established single-family detached neighborhoods were built in previous decades when connectivity, walkability, and proximity to transit/services were not as much of a priority

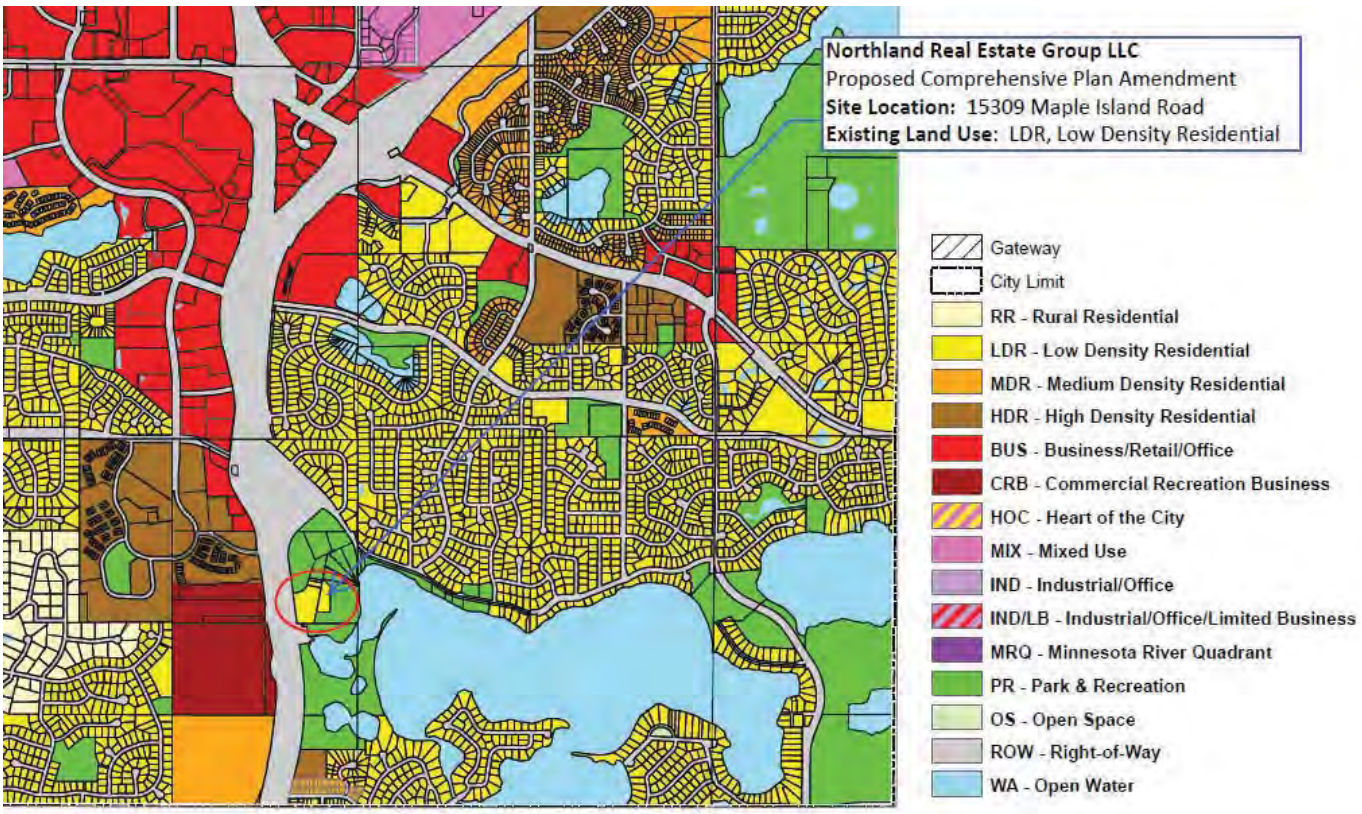
Sustainability

There are some limitations to what the City can implement or regulate within the neighborhood and housing context, since much of this development is driven by the private sector. However, there are many areas where sustainable initiatives can be encouraged, incentivized, and sometimes required. Some of the main areas within sustainability that provide opportunities are related to the turnover and reconstruction of the housing stock, including: energy, water, waste, and use of infrastructure/land. As neighborhoods go through major shifts and

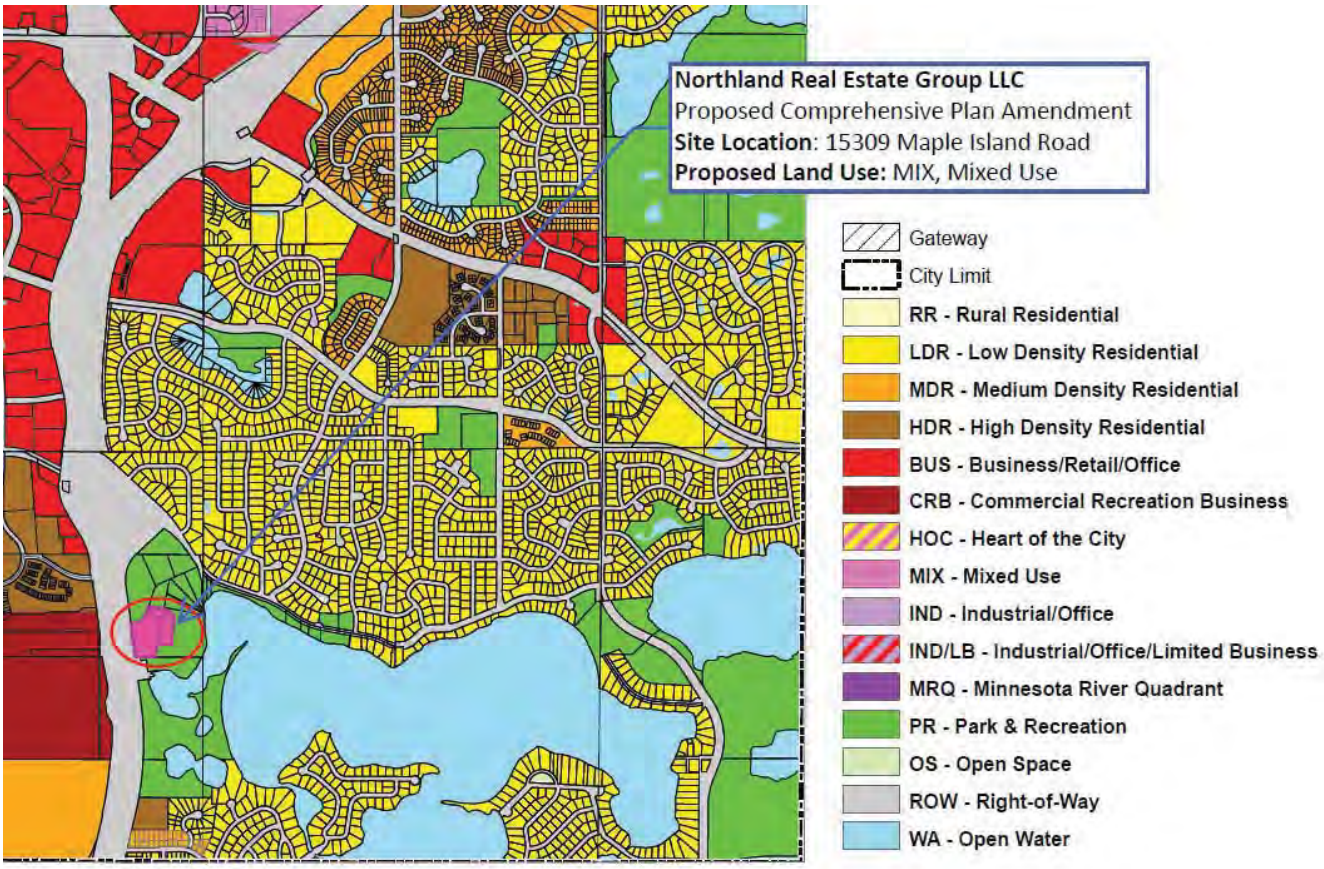
Tool	Description	Circumstances & Sequence of Use	Housing Need
Inclusionary Housing Ordinances	State Statutes that allow for cities to adopt an ordinance requiring developers to provide for a certain number of affordable housing units under certain circumstances.	Given the current amount of affordable housing, the City does not need to adopt inclusionary policy at this time or in the near future.	
Annual ~~Remodeling Fair~~Home Improvement Seminars	The City hosts several home improvement seminars throughout the year. ~~The Burnsville Chamber of Commerce in partnership with the City organizes an "Annual Home Remodeling Fair" that features home improvement vendors, seminars, and prizes.~~	The City will continue to provide resources for residents to improve and maintain their homes.	» Reinvestment in Burnsville's aging housing stock » Increased housing options to fit changing housing/neighborhood style preferences of current and future residents
Habitat for Humanity	The City partners with organizations such as Twin Cities Habitat for Humanity and others to provide affordable home ownership opportunities in Burnsville.	The City will continue to advice of potential sites for Habitat for Humanity homes.	» Affordable housing options for a broader range of household types and income levels
Site Assembly		The City does not plan on actively assembling sites for residential development at this time	
Guiding land at densities that support affordable housing	Medium and High densities are deemed to more opportunistic to provide future affordable housing.	See our future land use plan and projected housing needs section of the housing chapter of this comprehensive plan	» Tool to address multiple housing needs and improve our housing strategy capacity in general
Fair Housing Policy	Fair housing policy is a means to identify how the City will advance Federal Fair housing requirements.	The City ~~will be~~ adopted~~ing~~ a Fair Housing Policy in 2018~~by 2019~~	» Tool addresses multiple housing needs and improve our housing strategy capacity in general
Zoning and Subdivision Ordinances	Adopted ordinances are the way the city implements the Comprehensive Plan	The City will continue to review our zoning and subdivision ordinances on an ongoing basis to identify any regulations that inhibit the housing priorities in this document.	» Tool addresses multiple housing needs and improve our housing strategy capacity in general
Accessory Dwelling Units	Accessory Dwelling Unit attached and/or detached	The City adopted an ADU ordinance in 2018	»

Tool	Description	Circumstances & Sequence of Use	Housing Need
Micro Units	The City reduced minimum apartment size to allow micro units to increase density	The City adopted the ordinance in 2018	»

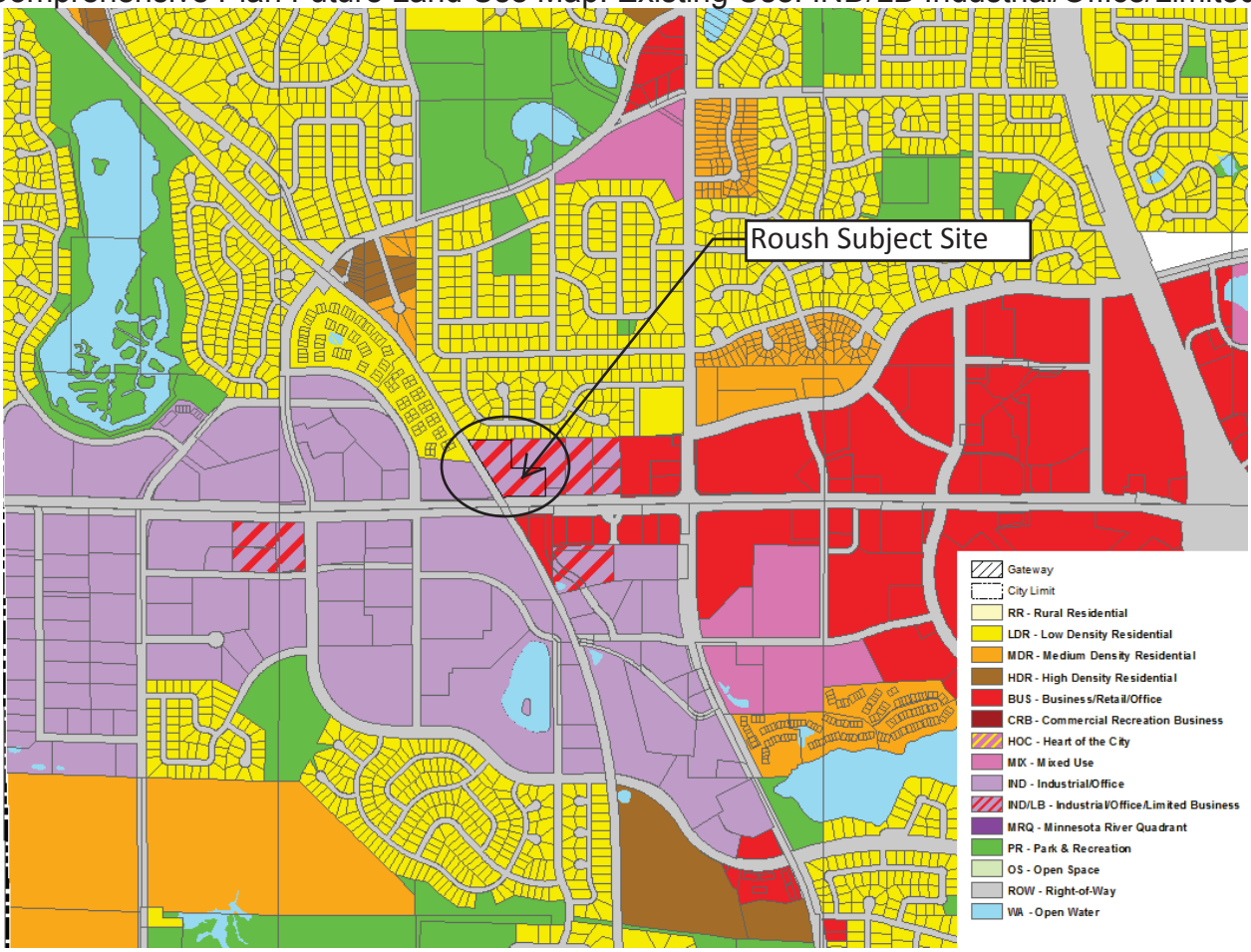
2030 Comprehensive Plan Future Land Use Map – Existing Use: LDR, Low Density Residential



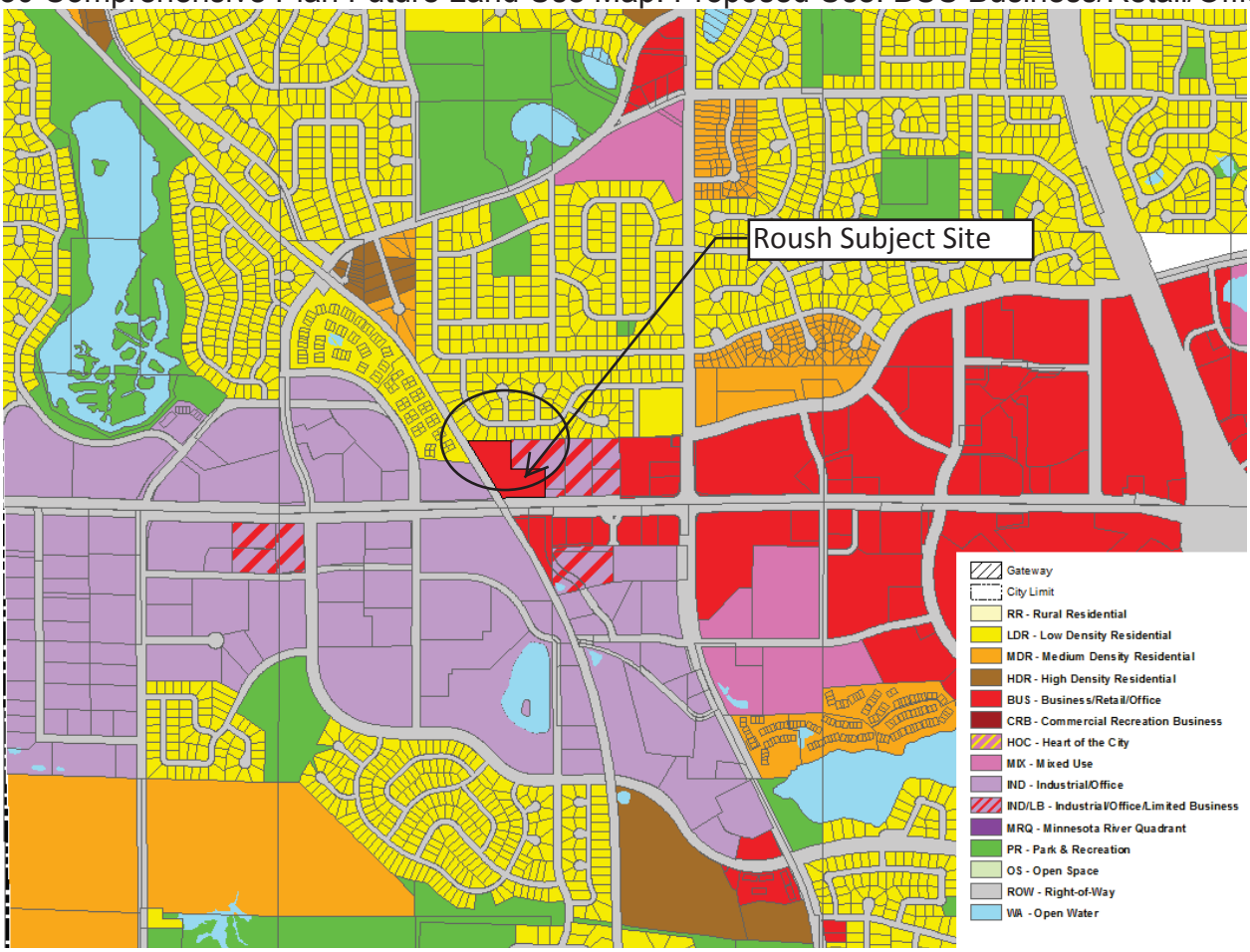
2030 Comprehensive Plan Future Land Use Map – Proposed Use: MIX, Mixed Use



2030 Comprehensive Plan Future Land Use Map. Existing Use: IND/LB Industrial/Office/Limited Business

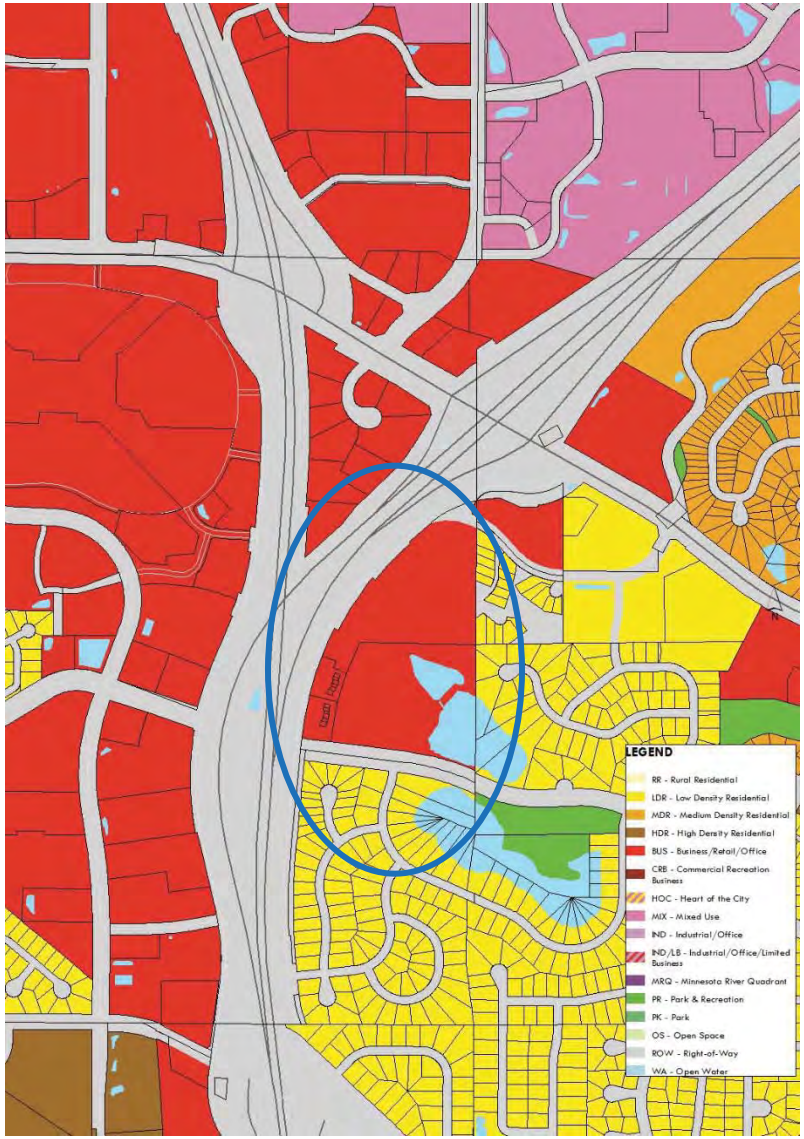


2030 Comprehensive Plan Future Land Use Map. Proposed Use: BUS Business/Retail/Office

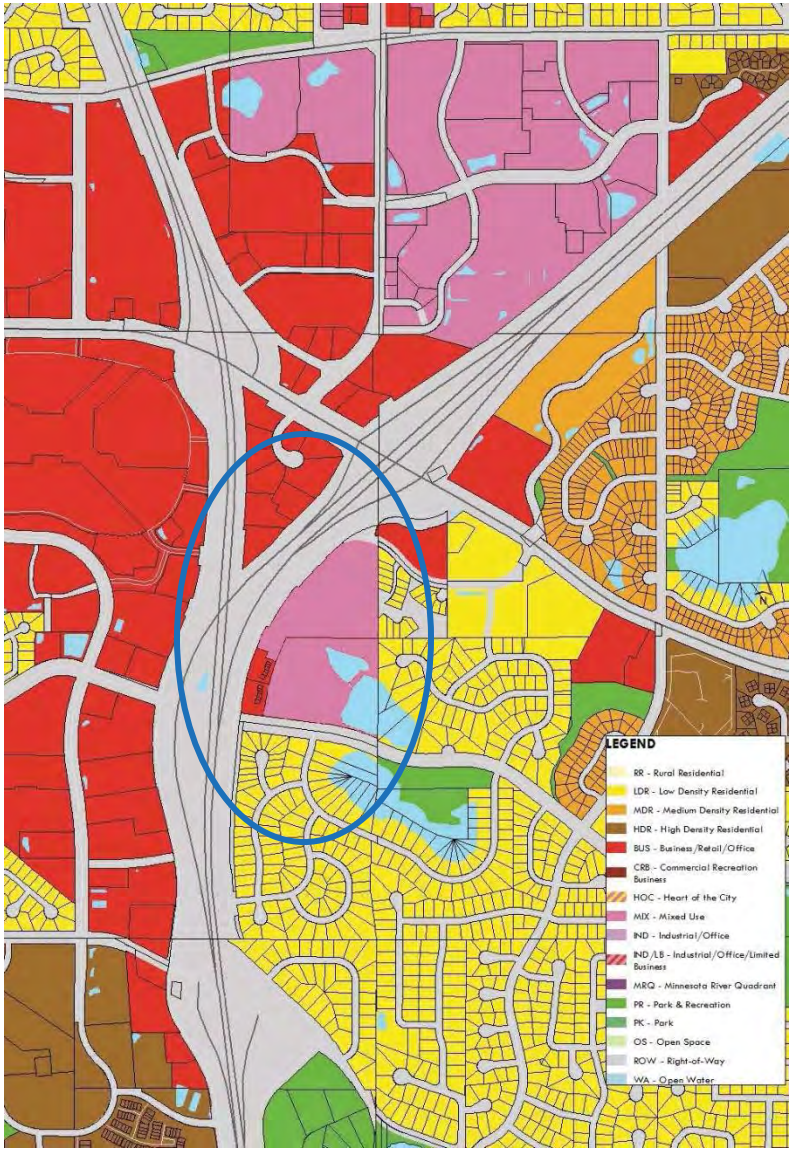


HR BURNSVILLE LIMITED PARTNERSHIP

2030 Comprehensive Plan Future Land Use Map
– Existing Use: BUS, Business/Retail/Office



2030 Comprehensive Plan Future Land Use Map
– Proposed use: MIX, Mixed Use



The applicant requested the public hearing be continued to the November 26, 2018 meeting to allow additional time for the applicant to host a neighborhood meeting.

At 6:34 p.m. Wolter opened the public hearing.

Tom Burns 1101 Circle High Drive— Lives about ½ mile away. Felt the first concert was too loud, however the last concert was not too loud. He was concerned with the number of concerts. Would like to see what the conditions will be related to sound, time and enforcement of regulations. Mr. Burns was concerned that the noise study and actual sound related to the concerts were not consistent.

Rhonda Bernard—15287 Stonewood Court— has been engaged in the Buck Hill temporary concert series approval process since 2017. She lives in the townhouses adjacent to Buck Hill and is concerned with the noise and hours of operation. She stated that the noise during the middle of the week was of concern for children and people that need to go to work the next morning.

Wayne Bernard—15287 Stonewood Court—Stated that he recorded decibels using a phone app. He noted that he is not sure of the accuracy of the app, but suggested having the noise consultant measure the sound during actual concert event. He was concerned that the noise study was not reflective of the actual noise projected that evening.

Allison Gipp—15333 Greenhaven Lane #111- Has lived in a townhouse behind Buck Hill for the past 13 years. She is aware of Buck Hill's winter activities such as snowmaking, but did not anticipate concert events when she purchased her home. She is concerned that the music went beyond the 9:30pm, which was a condition of approval. She stated that the three concerts held lasted until 10:10pm, 9:46pm, and 9:52pm. She is concerned with the noise and vibration experienced inside her home and noted that she could not hear her television.

Henderson moved and Roberts seconded a motion to continue the public hearing to the November 26, 2018 Planning Commission meeting.

Ayes: Wolter, Henderson, Roberts, Workman, Timmerman. Nays: None. Motion passed (5-0).

5. <u>Public Hearing – for City of Burnsville to consider approval of the Final Draft 2040 Comprehensive Plan Update for submittal to the Metropolitan Council.</u>

Deb Garross presented an overview of the planning process and the focus areas including Heart of the City, Minnesota River Quadrant, East Cliff Road Business Park and Burnsville Center/County Road 42 Area.

Planning Consultant, Laura Chamberlain, HKGI presented a summary of the jurisdiction reviews and the comments received from the Metropolitan Council. Ms. Chamberlain advised that all of the comments are summarized on spreadsheets that include the review statements and how they have been addressed in the Plan.

At 7:28 p.m. Wolter opened the public hearing.

No one from the public spoke for or against the application.

At 7:29 p.m. Wolter closed the public hearing.

Commissioner Henderson identified a number of minor edits to some of the graphics and charts to make them easier to understand and better differentiate category colors in the charts by using different colors for Figure 1-5, 1-12, 1-45, 1-62, and Figure 410. Commissioners discussed the overall process and the steps to finalize and implement the Plan.

Timmerman moved and Workman seconded a motion to recommend to the City Council approval of the final draft 2040 Comprehensive Plan for submittal to the Metropolitan Council subject to the following conditions:

1. Incorporation of the Future Land Use Plan changes associated with the Northland Real Estate Group LLC, Roush General Contracting LLC and HR Burnsville Limited Partnership amendments to the 2030 Comprehensive Plan Future Land Use Guide Plan Map upon approval of the Metropolitan Council.

2. Incorporate edits identified by Commissioner Henderson and changes as directed by the City Council.

3. The Plan will not be in effect until the Metropolitan Council approves the Plan and subsequent final adoption by the City Council occurs to effectuate the Plan.

Ayes: Wolter, Henderson, Roberts, Workman, Timmerman. Nays: None. Motion passed (5-0).

6. Updates:

City Council approved Comprehensive Plan Amendment for Roush General Contracting LLC from IND/LB to BUS located at 2350 County Road 42 West

Next Planning Commission Meeting November 26, 2018.

7. Adjournment.

Motion by Roberts, seconded by Henderson to adjourn the meeting at 7:32 p.m.

Ayes: Wolter, Henderson, Roberts, Workman, Timmerman. Nays: None. Motion passed (5-0).

"The City of Burnsville does not discriminate on the basis of race, color, national origin, sex, religion, age, sexual preference, disability, or any other basis protected by law in the admission or access to, or treatment or employment in, its programs, activities, or services." To obtain this information in alternative forms such as braille, large print, audio tape or qualified readers, please contact the City of Burnsville at (952) 895-4400, TDD: (952) 895-4567. *Minutes* ***are available electronically through our website at www.burnsville.org, and can be emailed to you by subscribing through our subscription service link located on our home page.***

City Of Burnsville

Appendix S – City Council Resolution, Packet, & Minutes

November 20, 2018

RESOLUTION NO. 18-6599

CITY OF BURNSVILLE, MINNESOTA

RESOLUTION APPROVING THE FINAL DRAFT 2040 COMPREHENSIVE PLAN UPDATE

WHEREAS, the Burnsville Planning Commission held a public hearing on the draft 2040 Comprehensive Plan Update on December 11, 2017; and

WHEREAS, the City Council approved the draft 2040 Comprehensive Plan Update on December 19, 2017 for the purpose to submit the draft Plan to adjacent jurisdictions for the mandatory six month review period; and

WHEREAS, the draft Plan was submitted to affected jurisdictions and the Metropolitan Council on March 16, 2018; and

WHEREAS, the formal jurisdiction six month review period ended on September 16, 2018; and

WHEREAS, the following agencies provided written feedback that they had no comments on Burnsville's draft Plan and waived further review: Bloomington, Credit River Township, Savage, Eagan-Inver Grove Heights WMO, and Metropolitan Airports Commission; and

WHEREAS, the following jurisdictions/agencies: (Lakeville, Dakota County, Scott County, Lower Minnesota River Watershed District, Minnesota Valley Transit Authority, Minnesota Department of Transportation, and Three Rivers Park District), provided review comments that have been reviewed by the City and incorporated into the draft Plan and/or noted as indicated on the Agency & public Comments spreadsheet attached to the November 14, 2018 Planning Commission report; and

WHEREAS, the Burnsville Planning Commission conducted a public hearing on November 14, 2018 on the Final Draft of the Burnsville 2040 Comprehensive Plan Update; and

WHEREAS, notice of the public hearing on said application has been duly published and posted in accordance with the applicable Minnesota Statutes; and

WHEREAS, the Planning Commission then proceeded to hear all persons interested in said application and persons interested were afforded the opportunity to present their views and objections to the granting of said application; and

WHEREAS, it is the recommendation of the Planning Commission that the City Council approve the final draft of the Burnsville 2040 Comprehensive Plan Update subject to:

1. Incorporation of the Future Land Use Plan changes associated with the Northland Real Estate Group LLC, Roush General Contracting LLC and HR Burnsville Limited Partnership amendments to the 2030 Comprehensive Plan Future Land Use Guide Plan Map upon approval of the Metropolitan Council.

2. Incorporate edits identified by Commissioner Henderson and changes as directed by the City Council.

3. The Plan will not be in effect until the Metropolitan Council approves the Plan and subsequent final adoption by the City Council occurs to effectuate the Plan.

WHEREAS, the City Council held a meeting on November 20, 2018, to consider said final draft 2040 Comprehensive Plan Update; and

WHEREAS, the City Council found that the final draft 2040 Comprehensive Plan Update incorporates requirements of the Metropolitan Council System Statement, is consistent with the requirements of the Metropolitan Land Planning Act and Metropolitan Council Thrive MSP 2040 Regional Policy Plan; and

WHEREAS, all comments received from the Comprehensive Plan Advisory Committee, Planning Commission, public and from all of the jurisdictions and affected agencies (following the mandatory six month review), and Metropolitan Council preliminary review have been considered.

NOW THEREFORE, BE IT RESOLVED that the City of Burnsville hereby approves the final draft 2040 Comprehensive Plan Update subject to the following conditions:

1. Incorporation of the Future Land Use Plan changes associated with the Northland Real Estate Group LLC, Roush General Contracting LLC and HR Burnsville Limited Partnership amendments to the 2030 Comprehensive Plan Future Land Use Guide Plan Map upon approval of the Metropolitan Council.

2. Incorporate edits identified by Commissioner Henderson and changes as directed by the City Council.

3. The Plan will not be in effect until the Metropolitan Council approves the Plan and subsequent final adoption by the City Council occurs to effectuate the Plan.

Passed and duly adopted by the City Council of the City of Burnsville, Minnesota this 20th day of November, 2018.

Elizabeth B. Kautz, Mayor

ATTEST:

Macheal Collins, City Clerk

CITY COUNCIL
REGULAR AGENDA REPORT

11/20/2018
Item No. 4.J.

ITEM

Approve the Final Draft 2040 Comprehensive Plan Update for Submittal to Metropolitan Council; Adopt Resolution

POLICY DECISION / ACTION REQUESTED

Approve the final draft of the 2040 Comprehensive Plan Update as recommended by the Planning Commission and adopt the Resolution.

BACKGROUND

The purpose of this item is to review the final draft 2040 Comprehensive Plan Update and the changes incorporating jurisdiction/agency review comments. The next step is for the Council to review and approve the final draft Plan before submitting to the Metropolitan Council for formal review and approval. It is important to note that the City cannot formally adopt the Plan until it has been reviewed by the Metropolitan Council and the City receives approval to place the Plan into effect. The final draft Plan is available for review on the City's website at the following link: http://www.burnsville.org/2040

Following a public hearing held by the Planning Commission on December 11, 2017, the City Council approved the preliminary draft Plan in December 2017 for the purpose of routing the plan to jurisdictions/agencies for the required six month review period. The review deadline was September 16, 2018 and all of the comments received are provided in the attached Planning Commission background. The comments have been incorporated into the Plan and/or addressed as shown in the spreadsheets attached with the comment letters and memorandums. For detailed review of the specific agency comments refer to the Planning Commission background report.

The Planning Commission held the public hearing on November 14, 2018 to consider the final draft 2040 Comprehensive Plan Update. The Commissioners discussed the planning process and public hearing procedures and identified a number of minor formatting edits to some of the graphics and charts to make them easier to understand (by Commissioner Henderson). Some of the colors used are too close to easily discern and staff will make adjustments to use colors that will better distinguish between categories.

No one from the public spoke for or against the application.

The Commission voted unanimously (5-0) to recommend approval of the final draft 2040 Comprehensive Plan subject to the conditions identified in the recommendation section of this report.

ISSUES:

There are no issues.

RECOMMENDATION

The Planning Commission recommends to the City Council approval of the final draft 2040 Comprehensive Plan Update for submittal to the Metropolitan Council subject to the following conditions:

1. Incorporation of the Future Land Use Plan changes associated with the Northland Real Estate Group LLC, Roush General Contracting LLC and HR Burnsville Limited Partnership amendments to the 2030 Comprehensive Plan Future Land Use Guide Plan Map upon approval of the Metropolitan Council.

CONSENT AGENDA (continued)

4J. Approve the Final Draft 2040 Comprehensive Plan Update for Submittal to Metropolitan Council; Adopt Resolution

Approve the final draft of the 2040 Comprehensive Plan Update as recommended by the Planning Commission and adopt the following Resolution that will become part of the official records:

RESOLUTION NO. 18-6599

RESOLUTION APPROVING THE FINAL
DRAFT 2040 COMPREHENSIVE PLAN UPDATE

ITEM(S) REMOVED FROM CONSENT AGENDA

4C. Resolution Awarding the Sale of G.O. Tax Abatement, Improvement and Utility Bonds, Series 2018A

Motion by Coughlin, seconded by Kealey, to adopt the following Resolution that will become part of the official records:

RESOLUTION NO. 18-6600

RESOLUTION AWARDING THE SALE OF $8,105,000 GENERAL OBLIGATION
TAX ABATEMENT, IMPROVEMENT AND UTILITY BONDS, SERIES 2018A
FIXING THEIR FORM AND SPECIFICATIONS; DIRECTING THEIR
EXECUTION AND DELIVERY; AND PROVIDING FOR THEIR PAYMENT

Poll of Votes: Ayes – Coughlin, Gustafson, Kautz, Kealey, Schulz. Nays – None. Motion carried.

REGULAR AGENDA

5. Appointment of Melanie Mesko Lee as City Manager and Approve Employment Agreement

Motion by Coughlin, seconded by Schulz, to appoint Melanie Mesko Lee as City Manager effective January 14, 2019 and approve the Employment Agreement for 2019-2020. Ayes – Coughlin, Gustafson, Kautz, Kealey, Schulz. Nays – None. Motion carried.

ADJOURNMENT

Motion by Coughlin, seconded by Kealey, to adjourn the meeting at 5:51 p.m. Ayes – Coughlin, Gustafson, Kautz, Kealey, Schulz. Nays – None. Motion carried.

_____
Macheal Collins, City Clerk

Approved by the City Council of the City of Burnsville this 4th day of December, 2018.

_____
Elizabeth B. Kautz, Mayor

Appendix T – Metropolitan Council Review and City Response

[FUTURE APPENDIX]