

2040 COMPREHENSIVE PLAN UPDATE

CITY OF LONG LAKE, MINNESOTA



SUNRISE AT NELSON LAKESIDE PARK

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APPROVED BY THE CITY COUNCIL
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DEDICATION

This document is a culmination of input by many citizen volunteers, elected officials, appointed committees, staff and our consultants.

Thank you.

CITY COUNCIL

MARTY SCHNEIDER, MAYOR
JAHN DYVIK, COUNCIL MEMBER
TOM SKJARET, COUNCIL MEMBER
MICHELLE JERDE, COUNCIL MEMBER
TIM HULTMANN, COUNCIL MEMBER

PLANNING COMMISSION

ROGER ADAMS, CHAIR
JOHN HUGHES
STEVE KEATING
CHARLIE MINER
VIRGINIA SEE

2040 COMPREHENSIVE PLAN UPDATE TASK FORCE

MARTY SCHNEIDER, MAYOR
MICHELLE JERDE, COUNCIL MEMBER
JANE DAVIDSON, PARK BOARD
STEVE KEATING, PLANNING COMMISSION MEMBER
CHARLIE MINER, PLANNING COMMISSION MEMBER
NATE MATOUSEK, LONG LAKE AREA CHAMBER OF COMMERCE
PATRICIA NORMAN, LONG LAKE RESIDENT

STAFF

SCOTT WESKE, CITY ADMINISTRATOR
JEANETTE MOELLER, CITY CLERK
SEAN DIERCKS, PUBLIC WORKS DIRECTOR

CONSULTANTS

sbp design consulting BARRY PETTIT
WSB, CONSULTING ENGINEER AND PLANNERS

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Chapter I Introduction

A. Purpose of the 2040 Comprehensive Plan

The City of Long Lake is required by the Metropolitan Council to update its Comprehensive Plan every 10 years to guide growth and redevelopment within our City over the next 10 to 20 years. The Long Lake 2040 Comprehensive Plan provides an overview of Long Lake's history, community, population, existing land use, natural resources, roadways, parks, trails, infrastructure and public facilities along with visioning and goals for the future. The City Council appointed the 2040 Comprehensive Plan Update Task Force to oversee preparation of the 2040 Comprehensive Plan. Members of the Task Force included members of the City Council, Park Board, Planning Commission, residents and business community. This plan replaces the City of Long Lake 2030 Comprehensive Plan that was adopted in 2008.

The updated Plan reflects the values and goals that Long Lake residents and other stakeholders view as important in establishing sound direction for future growth and redevelopment while protecting and respecting the natural environment and character of the surrounding area.

B. Community Involvement

A key goal of the 2040 Long Lake Comprehensive Plan was to incorporate public comment and involvement. The community involvement and comment process included:

- The Long Lake Comprehensive Plan Community Input Survey;
- Public input open house meetings;
- Use of the *CityScene* newsletter, the City of Long Lake website, City Listserv email subscriber list, and the Laker Pioneer newspaper for plan updates and notices.

Chapter II Long Lake History, Existing Conditions, Recent Planning Studies & Forecasts

A. History

The City of Long Lake, located in central Hennepin County, was incorporated in 1906.

The first settlers arrived in Long Lake in early spring 1855. This early contact in Long Lake did not result in settlement but rather this group of Nova Scotians came down Watertown Road, walked to the lake, looked across the lake and settled on the north side of the lake in what is now Orono. The first permanent settlement was established in May of 1855 with the arrival of the Flemings and the George Knettles family from Cumberland County, Pennsylvania. This first settlement was called Cumberland Town and consisted of a saw mill, general store and schoolhouse. The platted area Cumberland Addition can trace its roots to this early period. The Knettles house became a favorite stop for travelers between 1855 and 1860 and is the location of the first public religious service in the community. The first post office was established in 1856, which was named Tamarack in recognition of the Tamarack swamps in the western part of the County.

A significant aspect of the early settlement of Long Lake was the relationship between the Dakota, the Chippewa and the settlers. The origin of the Union Cemetery is found in this tripartite relationship. The area where the cemetery is located was called Teepee Hill in these early years. It served as an encampment for the Chippewa in 1859-1860. The Dakota were informed of the location of the Chippewa through two settlers in the area. This information prompted many of the Dakota to be in and around Long Lake. Although there was no fighting and the actual intentions of the Dakota are not clear, their presence in the area forced the Chippewa to vacate Teepee Hill. This area was acquired by Bradford Wakefield, most probably through squatter's rights, and purchased by Union Cemetery Association in 1861. There was concern among the settlers that the Chippewa would return, so by establishing a cemetery (hallowed ground) it was unlikely that any Native American people would choose that site as an encampment, thus assuring the safety of the surrounding area.

During the middle to late 19th century, Long Lake developed like many other towns. A sawmill was erected (1866), the railroad reached Long Lake (1868), a school district was organized (1869), a general store was started (1870), the Freethinkers Hall was organized (1874), a flourmill was established (1875), and a hotel was added (1875). These institutions were all-important elements to early town development in the upper midwest.

The late 1890's - early 1900's became known as the berry years in Long Lake. The Minnesota Fruit Growers Association was established in Long Lake in 1898 to focus on promoting strawberry and raspberry production. These products became a regional specialty with shipments going as far as Fargo and Grand Forks.

As the 19th century turned into the 20th, Long Lake continued to grow and change. A public library was started (1905), a canning factory was established (1906), and Long Lake was incorporated (1906) specifically to prevent the Great Northern Railway from moving the depot west and out of town. The Long Lake Fire Department was officially established in 1915.

During the period from 1916-1919, the first World War consumed Long Lake, like the rest of the country. In the 1920's, Long Lake saw construction of the Buckhorn Cafe which became a well-known community meeting place. It was during this time that the reduction of the role of agriculture in the Long Lake economy was evident by the transition from agriculturally oriented establishments (agriculture production facilities) to more consumer oriented services (Buckhorn Cafe, car repair). In addition, Long Lake was serving as a summer destination for people in Minneapolis and St Paul who wanted to get away from the summer's heat. At that time, the City was accessible. It had a number of lakeside cabins and was a relaxing place to fish or swim.

It was not until the 1950's that Long Lake expanded to its current City limits. Up until the 1950's, the City limits were about the same as in 1898. The catalyst for the expansion of the City limits was a desire by

Long Lake's neighbors to take advantage of the City's decision to install a sewer system. Those areas that wanted to be connected to City sewer were annexed by the City.

In 2000 - 2001 MnDOT began construction of the TH 12 "bypass" which resulted in the loss of about 70 houses and the need to replace and relocate Long Lake's City Hall, Fire Station and Public Works facility. The TH 12 "bypass" project also resulted in the full reconstruction, beginning in 2017, of old Highway 12, now the CSAH 112/ Wayzata Boulevard W corridor going through Long Lake.

Additional detailed information on Long Lake's rich heritage can be found at our Western Hennepin County Pioneer Association Pioneer Museum (www.whcpa-museum.org).

B. Natural Resources

- Beyond the shoreland area of the lake there are few natural resources to impede community development activities.
- The City will rely on the CSAH 112 – Wayzata Boulevard W realignment and Nelson Lakeside Park stormwater ponds to project water quality.
- Outside of developed neighborhoods there are few areas of significant tree stands remaining.

C. Water Resources

The lake Long Lake is our major body of water. It lies within the Minnehaha Creek Watershed District draining to the Mississippi River. The lake lies within the City of Long Lake and neighboring Orono. Other water resources within the City include several National Inventory Wetlands, floodplains, Long Lake Creek and a judicial ditch. The City of Long Lake recognizes the guidelines, policies and authority of the Minnehaha Creek Watershed District and its Watershed Management Plan. The Minnehaha Creek Watershed District's most recent Watershed Management Plan, dated January 11, 2018, is available online at www.minnehahacreek.org/about/watershed-management-plan.

The MnDNR classifies the lake as *recreational development*. These are medium size lakes of varying depths and shapes with a variety of landform soils and groundwater situations. They are characterized by moderate levels of recreational use and development. The lake is the City's major recreational resource for fishing, swimming, waterskiing and boating. The ordinary high water level is 944.3.' Uses within 1000' of the defined lakeshore are regulated by State and City shoreland requirements.

Long Lake Creek is designated as a *tributary stream* by the MnDNR. Land within 300' of the ordinary high water level is regulated by the State and City shoreland requirements.

There are floodplain areas along Long Lake and Long Lake Creek. The City participates in the National Flood Insurance Program. FEMA has determined there is no significant flooding potential, and therefore the City is not required to regulate said floodplain areas.

The Wetland Conservation Act has defined eight types of wetlands; the City has two types.

Type 1 – Seasonally Flooded Basin or Flat

- Soil: usually drains well during much of the growing season
- Hydrology: Covered with water or waterlogged during variable seasonal periods
- Vegetation: Varies greatly according to the season and duration of flooding from bottomland hard woods to herbaceous plants

Type 5 – Shallow Open Water

- Soil: Inundated
- Hydrology: Usually less than ten feet of water: shallow ponds and reservoirs

- Vegetation: Fringe of emergent vegetation
- Common sites: shallow lake basins and may border large open water basins.

A series of regional stormwater ponds completed in conjunction with the CSAH 112 project along with other improvements will accommodate the City’s stormwater treatment needs.

D. Land Use

- Single family residential is the primary land use type.
- A significant area of land is devoted to the CSAH 112 – Wayzata Boulevard W realignment right-of-way.
- There is little vacant land remaining for new development, therefore, redevelopment projects will be expected to provide additional residential units and businesses.
- The western business area is a mixture of industrial, commercial, office and institutional uses.
- Recent redevelopment, within the western business area, improving the appearance of several visually rough sites.
- There are no apparent areas where additional public open space/parks can be added.
- The City has controls and initiatives in place to manage future redevelopment.

E. Recent Studies

- In June 2018, the City of Long Lake adopted the *Long Lake Village Design Guidelines* document.
- In March 2018, the City of Long Lake conducted the *Community Design Input Survey*.
- In May 2018, the City of Long Lake conducted the *Long Lake Comprehensive Plan Community Input Survey*.

F. Population & Metropolitan Council Forecasts for Long Lake's 2040 Comprehensive Plan

Per the 2010 Census, Long Lake has a population of 1,768 and 732 households.

The Metropolitan Council designates The City of Long Lake as Suburban and requires use of the following estimates for future planning purposes.

FORECAST YEAR	POPULATION	HOUSEHOLDS	EMPLOYMENT
2010	1,768	732	1,093
2020	1,810	790	1,190
2030	1,960	870	1,310
2040	1,990	900	1,400

Long Lake's 2021-2030 Affordable Housing Need Allocation (as a % of Area Median Income).

At or Below 30 AMI	15 additional units (54 units currently*)
From 31 to 50 AMI	8 additional units (70 units currently*)
From 51 to 80 AMI	5 additional units (275 units currently*)
Total Units by 2030	28 additional units

*Source: Metropolitan Council, 2016 housing stock estimates

Long Lake's Sewer Allocation Forecasts:

Note - There are no current or forecasted unsewered households in Long Lake.

Forecast Year		Population	Households	Employment
2010	MCES Sewered	1,768	732	1,093
2020	MCES Sewered	1,810	790	1,190
2030	MCES Sewered	1,960	870	1,310
2040	MCES Sewered	1,990	900	1,400

Chapter III Long Lake Community Vision and Goals

The mission of the 2040 Comprehensive Plan Update Task Force has been to build on and refine the 2008 Comprehensive Plan by retaining items that remain relevant and adding issues that have surfaced over the past ten years.

This document provides a description of desired land uses for the ongoing evolution of Long Lake defined by public attitudes about concerns and preferences for future growth. The target horizon for the vision and goals is 2040. Amendments to this Comprehensive Plan may occur as new ideas emerge over the next ten-year Comprehensive Plan cycle.

2018 Community Survey

In May of 2018 the City mailed a survey to approximately 750 businesses and households to further understand patterns and concerns. 193 survey responses were submitted to the City.

ARE YOU A RESIDENT OF LONG LAKE?	YES – 159	NO – 29
DO YOU HAVE CHILDREN IN YOUR HOUSEHOLD?	YES – 45	NO – 104
HOW FAR DO YOU LIVE FROM YOUR WORK?	LESS THAN 5 MILES – 42 5 TO 10 MILES – 33 10 TO 20 MILES – 43 OVER 20 MILES – 18 RETIRED OR NOT WORKING – 37	
WHY DID YOU CHOOSE TO LIVE IN LONG LAKE?	LOCATION – 145 COMMUNITY – 99 SCHOOLS – 89 PARKS/TRAILS – 68 AFFORDABILITY – 63 JOB PROXIMITY – 62 HOUSING OPTIONS – 20	
DO YOU FEEL LONG LAKE IS A WALKABLE COMMUNITY?	YES - 126	NO - 43
ARE THERE AREAS NOT ADEQUATELY SERVED BY PARKS?	YES – 15	NO – 146
WHICH OF THE FOLLOWING ARE IMPORTANT TO ENHANCE THE QUALITY OF LIFE IN LONG LAKE?	THE LAKE – 105 PARKS/TRAILS – 104 COMMERCIAL/RETAIL – 100 CITY SERVICES, ROADS AND INFRASTRUCTURE – 89 PUBLIC SAFETY – 80 SCHOOLS – 69 HOUSING OPTIONS – 42 <i>OTHER COMMENTS: USABLE LAKE, BOUTIQUE, COFFEE HOUSE PHARMACY, GROCERY STORE</i>	
DO YOU FAVOR DEVELOPING MORE DENSITY AND TALLER BUILDING IN VARIOUS PARTS OF TOWN?	YES – 61	NO – 109
	<i>OTHER COMMENTS: NO TALL BUILDINGS, LIMIT TO 3 TO 5 STORIES, 4 STORIES OR LESS, DEPENDING ON THE PROJECT</i>	

DO YOU SUPPORT USING TAX RELATED TOOLS AND INCENTIVES (TIF, OR TAX INCREMENT FINANCING, ETC.) TO ASSIST IN DEVELOPMENT OF SPECIFIC AREAS OF LONG LAKE? YES – 88 NO – 67
OTHER COMMENTS: OLD BP STATION, DEPENDS ON THE PROJECT

DO YOU FAVOR SPENDING TAX DOLLARS ON IMPROVING THE WATER QUALITY IN LONG LAKE (THE ACTUAL LAKE)? YES – 137 NO – 30
OTHER COMMENTS: DRINKING WATER, GREEN SPACE, LIMITED MOSTLY; ORONO, MNDNR OR STATE SHOULD HELP

SHOULD LONG LAKE HELP DEVELOP BETTER TRANSIT/COMMUTER OPTIONS? YES – 75 NO – 75

HOW DO YOU GET INFORMATION OR WOULD LIKE TO GET INFORMATION FROM THE CITY?
 CITY NEWSLETTER – 115
 LOCAL PAPER – 93
 CITY WEBSITE – 77
 CITY LISTSERV – 31
 CITY FACEBOOK – 29
 LMCC CABLE – 10

A. City Strengths and Issues

Along with the community input survey a series of public open house input meetings were held to identify community-wide strengths, challenges, concerns and desires as a prelude to the Comprehensive Plan update.

1 Community Strengths

- a. School district
- b. Community / small town feel
- c. Natural setting; lakes and wetlands
- d. Parks, trails and recreation

2 Community Challenges

- a. Attracting and retaining business restaurants, grocery
- b. Growing but keeping the small town feel
- c. Cleaning up old and empty buildings (industrial area)
- d. Lake quality and lake cleanliness

3 Growth Concerns and Desires

This question dealt with the inevitable fears, concerns and desires brought on by change.

Concerns:

- a. Losing sense of community / small town feel
- b. Increased taxes
- c. Increased crime
- d. Loss of trees, loss of natural areas, lake water quality and cleanliness
- e. Loss of affordable housing

Desires:

- a. Encourage more commerce in the downtown; offices, restaurants, clothing stores, drug store, grocery store, ice cream shop
- b. Focus on mix of lot sizes, housing types and prices
- c. Walkability
- d. Lake quality, protection of natural open/green spaces

- e. Keep small town feel and sense of community

B. The Community Vision

The community has supported 13 primary themes that should define Long Lake looking ahead through 2040:

- a. An appropriate mix of lifecycle housing, employment, service and retail
- b. An environmentally conscious, pedestrian friendly community that maintains its *small town* feel, and incorporates our unique lake amenity in its planning
- c. Vibrant and attractive *old downtown* that serves as the shopping and service center
- d. Desirable place to live in the Twin Cities
- e. Maintain *small town* values
- f. High quality commercial development everywhere
- g. Apply our *Long Lake Village Design Guidelines* to all non R-1, R-1A, R-2, R-3 and R-4 districts
- h. Provide opportunities for a wide range of life-cycle housing types and prices
- i. Maintain parks, trails and public facilities focusing on safe walkability to our downtown and through our neighborhoods
- j. Encourage sustainable environmental practices in all projects
- k. Manage our lake to improve water quality, preserve natural habitats and maintain a healthy lakeshore; including soil stabilization, reducing storm water runoff
- l. Create way-finding links to the lake
- m. Develop cooperative efforts with regulatory agencies to define the appropriate intensity on the lake and the adjacent properties

C. Core Vision Elements

1 Managed Land Use, Development and Growth

- a. Protect the health, safety and welfare of the public
- b. Retain the *small town* feel and character
- c. Protect and respect the environment
- d. Promote public and private development that uses sustainable practices in building construction and site design
- e. Provide diversity in housing
- f. Expand the City's role in economic development
- g. Provide a broad range of employment opportunities
- h. Ensure compatibility between land uses
- i. Support a specific Long Lake identity
- j. Preserve and maintain historically significant sites
- k. Understand limitations in local capacity to deliver transportation needs, public services and environmental controls
- l. Development within sensitive areas must consider traffic, adjoining uses and appropriate buffers

2 Residential

- a. Serve a wide range of incomes and ages
- b. Match housing growth to available public services
- c. Support our defined *Village*, small town character
- d. Support mixed-use developments
- e. Manage the contextual compatibility of all infill project
- f. Encourage maintenance of existing housing as a source of affordable housing
- g. Protect neighborhoods from incompatible and offensive uses
- h. Avoid regulations that create excessive obstacles to developing affordable housing
- i. Requiring buffering between non-compatible uses

3 Downtown Village Area – *The Old Downtown*

- a. Promote a mix of, shopping, service, office and residential uses
- b. Apply the *Village Design Guidelines*
- c. Provide safe pedestrian movement
- d. Signage will be consistent with the *Village Design Guidelines*
- e. Determine if funding sources such as Tax Increment Financing and Community Development Block Grants might be sources of financial assistance

4 Industrial – Business Park

- a. Apply the *Village Design Guidelines*
- b. Provide clear and safe sidewalk connections to the Downtown Village District

5 Village/Urban Design

- a. The *Village Design Guidelines* will define the character of all development in Long Lake excluding the R-1, R-1A, R-2, R-3 and R-4 zoning districts

6 Natural Resources

- b. Protect Long Lake, its' in-flow drainage patterns and shoreland.
- c. Protect all wetlands and natural habitats for birds and other wildlife
- d. Building/people density should be sensitive to delicate environmental areas
- e. Insure actions of the Minnehaha Creek Watershed District serve our interests
- f. Protect solar access when and encourage green space development occurs
- g. Development should strive to protect as much existing vegetation as possible

7 Park and Recreation

- a. Provide active and passive recreation opportunities for all age groups
- b. Design parks with proper and appropriate lighting, shelter and landscaping to ensure safety and promote usage
- c. Encourage land gifts and forfeitures in areas with potential recreational opportunities.
- d. Protect natural resources in the development and modification of all parks
- e. Review potential for storm water storage in Nelson Lakeside Park to accommodate the needs of future development in the downtown
- f. Engage with Orono and all assigned agencies to develop a cooperative plan to improve water quality and manage the use of Long Lake

8 Transportation Systems

- a. Properly maintain City owned roadways according to the Pavement Management Plan
- b. Help residents and businesses consider using bus routes and local park and ride facilities
- c. Support new transit considerations and studies by the Metropolitan Council and by Hennepin County

9 Community Facilities

Municipal Sewer and Water

- a. Provide high quality service with low maintenance and operation costs
- b. Provide funding for ongoing general maintenance and repairs of existing infrastructure

Sewer System Policies

- a. Require all habitable structure to be connected to the City's sanitary system
- b. Monitor sewer system for costly infiltration, follow standards set by the Metropolitan Council
- c. Create design and construction standards for sanitary sewer installation and maintenance

Water System Policies

- a. Over time – and where reasonable – require all habitable structures to be connected to the City's water system
- b. Maintain consistency with water quality standards set by the Clean Water Act
- c. Maintain operations consistent with the City's Water Supply Plan and encourage conservation by system users

Stormwater Management

- a. Use natural and structured drainage systems to prevent flood damage and protect water quality
- b. Maintain the city-wide drainage system
- c. Continue to work within the City's Water Supply Plan
- d. City projects will continue to be consistent with policies of the Minnehaha Creek Watershed District, the Minnesota Pollution Control Agency and the MnDNR
- e. Encourage using sustainable 'green' infiltration techniques in all private and public projects

City Services

- a. Provide appropriate public services for residents and businesses
- b. Promote City-wide crime prevention and safe neighborhoods
- c. Provide efficient and responsive public services
- d. Promote effective communication about City affairs with residents, business owners, educators and volunteer organizations
- e. Maintain appropriate and efficient administrative, maintenance and emergency services as the City grows
- f. Cooperate with other public and private agencies to efficiently and economically use existing public and quasi-public building space within the City

Intergovernmental Cooperation

- a. Monitor the affects of our development on adjacent communities
- b. Determine the impact of public/private development in surrounding communities on Long Lake
- c. Find areas of mutual benefit to the City and other agencies
- d. Provide population growth information to the Orono School District for their long-term planning
- e. Continue to explore potential joint service initiatives with Orono, Wayzata, Hennepin County, the Minnehaha Creek Watershed District and other agencies
- f. Encourage communication with Orono and Wayzata regarding common developments and public improvements
- g. Work with regional agencies and community groups regarding regional system improvements or problems

Chapter IV Land Use

A. Summary

The 2040 Land Use Plan is found in Appendix C, which shows the anticipated and desired evolution of Long Lake development through 2040. Land use categories are included on Appendix C.

B. Overall Land Use Strategy

The City will continue to support a *village-oriented* downtown. Housing densities and types will provide a balance of choice and costs.

Commercial, business and industrial uses will be developed and improved with uses compatible with surrounding properties, providing functional and attractive parking, landscaping, water management and minimizing long-term environmental impacts.

The City used the following core principles in developing its land use strategies:

- a. The City is responsible for defining the strategies to meet future needs of residents and businesses
- b. Development must be consistent with the 2040 Land Use Plan map and all chapters of this Comprehensive Plan
- c. The Comprehensive Plan may evolve to accommodate market forces
- d. In-fill development should complement existing land use and density
- e. Support the pattern and scale of the R-1, R-1A, R-2, R-3 and R-4 residential neighborhoods
- f. Encourage redevelopment where building conditions negatively impact adjacent properties
- g. The *Downtown Village District* shall be the focus of our creative planning efforts
- h. All development/redevelopment should focus on upgrading the appearance of properties

C. Land Use Categories

General Note: Density in all categories is defined in the Zoning Ordinance by 1) allowable uses, 2) lot coverage, 3) setbacks, 4) building heights and 5) parking. All development must accommodate the parking requirements; therefore, it is likely that the allowable height and the building footprint may be restricted in order to meet parking requirements.

1 Residential

The Zoning Ordinance defines the location of all residential types (R Districts). The *Long Lake Village Design Guidelines* do not regulate districts R-1, R-1A, R-2, R-3 and R-4.

2 Downtown Village Mixed Use

- a. The primary objective is to develop the *small town village character* as supported by the March 2018 design survey and the *Village Design Guidelines*
- b. The ideal character promotes a dynamic mix of housing, retail and office uses
- c. This district is encouraged to honor commitments to the Livable Communities Act agreement
- d. Landscaping will focus on sidewalks, screening service/delivery areas, breaking down parking lots into smaller segments, classic boulevard tree plantings and ivy to soften solid exterior surfaces

3 Commercial

This designation includes retail, office and services.

- a. Design will be guided by the *Village Design Guidelines*
- b. Traffic studies will be required for projects that change the current patterns and/or capacities
- c. All vehicular access will be from local streets
- d. Cross easements between parking lots should be provided
- e. Landscaping will focus on; sidewalks, screening service/delivery areas, sectioning parking lots into smaller segments, classic boulevard tree plantings and ivy to soften solid exterior walls

4 Business and Light Industrial

This designation generally includes offices, assembly facilities, warehousing and light manufacturing.

- a. Design will be guided by the *Village Design Guidelines*
- b. Exterior storage yards will be screened from public view by combining landscaping and opaque structured screening
- c. Maneuvering needs for all vehicles will be contained on site. Weekend vehicular trips will be minimal
- d. All vehicular access will be from local streets
- e. Landscaping will focus on; sidewalks, screening service/delivery areas, sectioning parking lots into smaller segments, classic boulevard tree plantings and ivy to soften expansive exterior walls

5 Parks

This applies to all public parks (no additional parks are currently planned).

- a. All funds obtained through the Park Land Dedication provisions and/or other sources will be used to enhance existing parks

6 Institutional

This designation includes municipal facilities (excluding parks), religious uses, the West Hennepin County Pioneer Museum and similar non-profits.

- a. There are no areas where this land use designation will be substantially expanded.

7 Utilities

This applies to storm water ponding areas, the Minnehaha Creek Watershed District, MnDOT, the Metropolitan Council lift station and a cellular tower. These properties are regulated by zoning district provisions and several non Long Lake governmental agencies.

8 Open Space – Private

There are four private open space areas associated with residential developments that were used to off-set density issues. All are maintained by a homeowner’s association.

D. Pedestrian Sidewalk and Trail Linkages

The City will continue to expand the sidewalk network as redevelopment and new development occurs. The objective is to create a sidewalk grid adjacent to all commercial streets. Walking/biking trails will be considered where possible to link neighborhoods to the core retail areas and to the Luce Line Regional trail. See Appendix D for the Streets, Parks and Trails Map.

E. Urban Design

Every redevelopment and new development (excluding districts R-1, R-1A, R-2, R-3, R-4) will be guided by the *Village Design Guidelines*. Applications will require a site plan that addresses; general landscaping design, service/delivery screening, sidewalks, landscape buffering, vehicular access and parking and – if valid – connection to trails. See Appendix N, the *Long Lake Village Design Guidelines* document, page 13 for explanation of submittal requirements.

F. Housing Plan

Long Lake’s housing stock will dramatically transform by 2040. Tear-downs and significant remodeling are anticipated. Market forces will control this evolution. The City remains committed to continue to explore ways to expand affordable housing opportunities as defined by the Livable Communities Program goals.

G. Natural Resource Protection

Historic Preservation

No properties or structures are on the Register of National Historic Places and there are no properties that the Minnesota Historical Society has identified to be on that list. The City is committed to the support of the West Hennepin County Pioneer Museum. The City will work with the State and the County to identify potential historic resources and provide preservation efforts.

Solar Access

The City acknowledges that alternative energy sources are important to improving our environment. Current standards within the Zoning Ordinance are sufficient to prevent interference from adjacent buildings and vegetation to solar collectors.

Aggregate Resources

As per the 2010 Aggregate Resource Inventory, Long Lake has no significant aggregate deposits.

The Lake

Long Lake is a major asset to private land use growth and value, and the economic vitality and wellbeing of the City. Long Lake basin is 320 acres, of which 110 acres are in the City of Long Lake and 210 acres are in Orono. Nelson Lakeside Park in Long Lake includes public access to the lake. The City is committed to the principles of the Minnehaha Creek Watershed District and its Watershed Management Plan (www.minnehahacreek.org/about/watershed-management-plan). The Minnehaha Creek Watershed District's plan identifies three principal issues regarding Long Lake:

- Water quality is impaired by excess nutrients;
- Water quantity has resulted in localized flooding;
- Ecological integrity is experiencing degraded aquatic plant communities and degraded and disconnected wetland and terrestrial corridors.

The City of Long Lake is committed to working with the cities of Orono and Medina, as well as Hennepin County, Minnehaha Creek Watershed District, the Minnesota Pollution Control Agency and the Long Lake Waters Association (a community based 501(c)(3) non-profit organization) to improve the water quality of the wetlands and Long Lake, and within the Long Lake Sub-watershed.

Vegetation

The City views the preservation and protection of significant trees as important in developing plans for future development for:

- Soil stabilization
- Reduction of storm water runoff
- Improvement of air quality
- Reduction of noise pollution
- Protection of property value
- Privacy
- Natural habitat for birds and other wildlife

The City will study whether the adoption of additional zoning ordinances are necessary to accomplish these above goals for the water quality and vegetation.

Other Resources

Policies and programs to protect, enhance and mitigate impacts to our natural resources are documented in the Water Supply Plan, Appendix M to this Comprehensive Plan.

Chapter V Comprehensive Plan Implementation

The City has defined four themes that will guide and monitor the 2040 vision.

A. Zoning Ordinance

This document quantifies the vision for Long Lake by defining 1) how land is used, and 2) how building the massing in each zone will develop as a function of heights, setbacks, parking, etc.

The land use zoning includes: seven residential categories, four business categories, one commercial category, two industrial categories, two PUD categories and five institutional categories.

Within the Zoning Ordinance there are three notable objectives that:

1. Establish an overall residential density
2. Ensure new developments Comprehensively with storm water management, erosion controls and the MCWD Comprehensive Water Resources Management Plan
3. Protect access to appropriate sunlight for solar collectors from adjacent structures and vegetation

B. Housing Program

The core of our housing program is maintaining and encouraging housing types that accommodate the full range of lifecycle housing options.

The specific challenges of affordable housing are best addressed through two ideas: 1) preservation and maintenance of the current housing stock; and 2) encourage densities that may accommodate a percentage of affordable units. The city will promote programs offered by Hennepin County, MHFA and the Metropolitan Council to address the region-wide affordable housing mission.

C. Economic Development

The City has an Economic Development Authority (EDA) comprised of the Mayor, all Council Members and two at-large citizens. While their role is promoting investment and development that echoes the Comprehensive Plan vision they also must closely monitor and resist development that strays from the expectations of the citizens. However, the EDA must also recognize when it is appropriate to support beneficial opportunities that vary from the Comprehensive Plan.

D. Plan Amendment Process

Visioning out to 2040 implies flexibility to accommodate unanticipated changes in the market place. During this ten-year Comprehensive Plan cycle it is likely that amendments will be required.

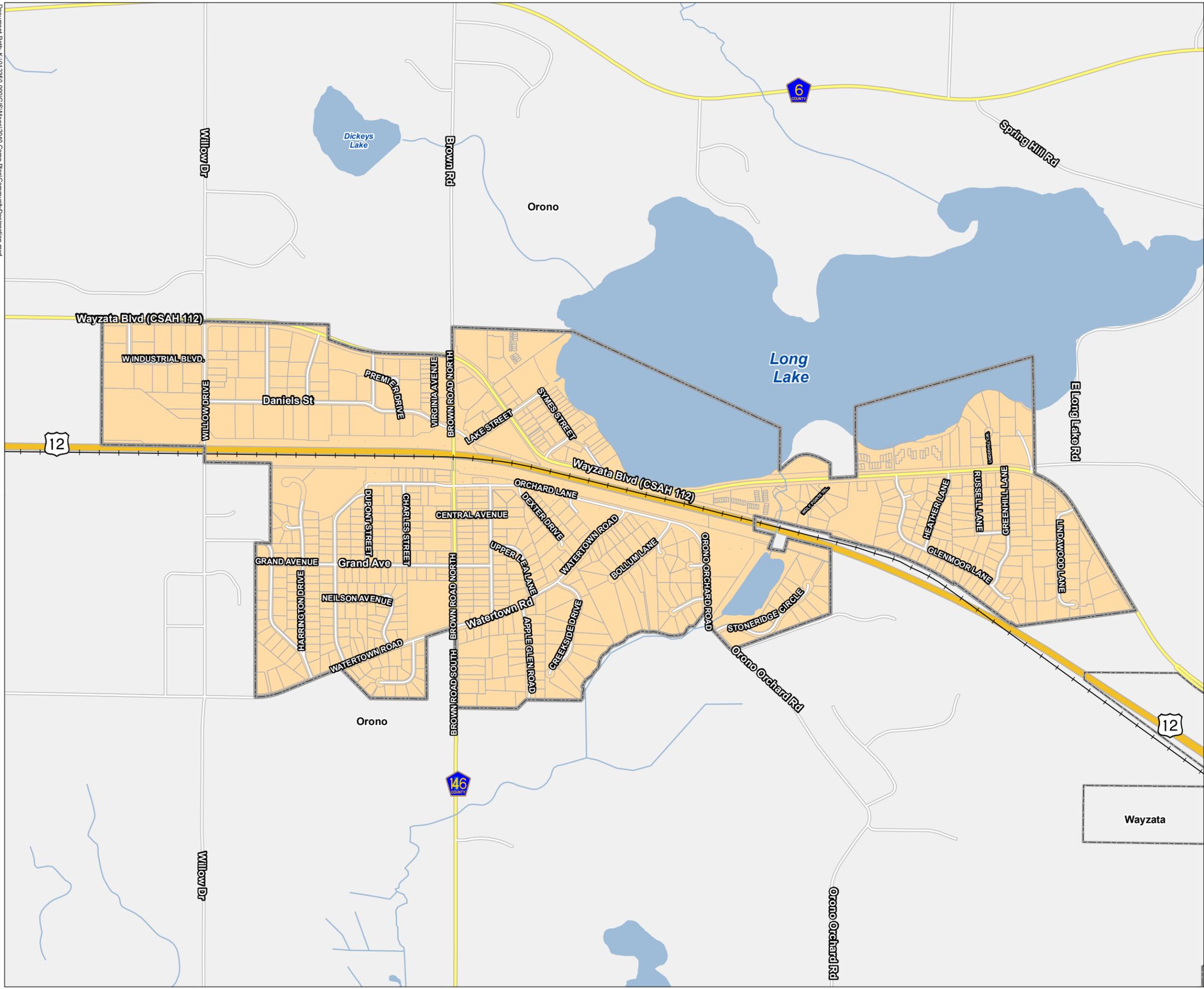
Landowners, developers, organizations, individuals and city agencies may initiate amendments. All such amendments to the Comprehensive Plan require a public hearing and review by the Metropolitan Council, Hennepin County and surrounding communities prior to implementation.

When considering changes the procedures established by state law and the Metropolitan Land Planning Act will be followed. Comprehensive Plan amendments will trigger the following process:

1. Thorough analysis by the Planning Commission
2. A public hearing sponsored by the Planning Commission
3. Planning Commission findings and recommendations submitted to the City Council
4. Final decision by the City Council

APPENDIX A
2040 COMPREHENSIVE PLAN COMMUNITY DESIGNATION MAP

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CITY OF
LONG LAKE

Long Lake, Minnesota 2040 Comprehensive Plan Community Designation Map

-  Long Lake Boundary
-  Parcels
-  Lakes
-  Streams
-  Railroad
- Community Designations**
-  Suburban



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**APPENDIX B
ZONING MAP**



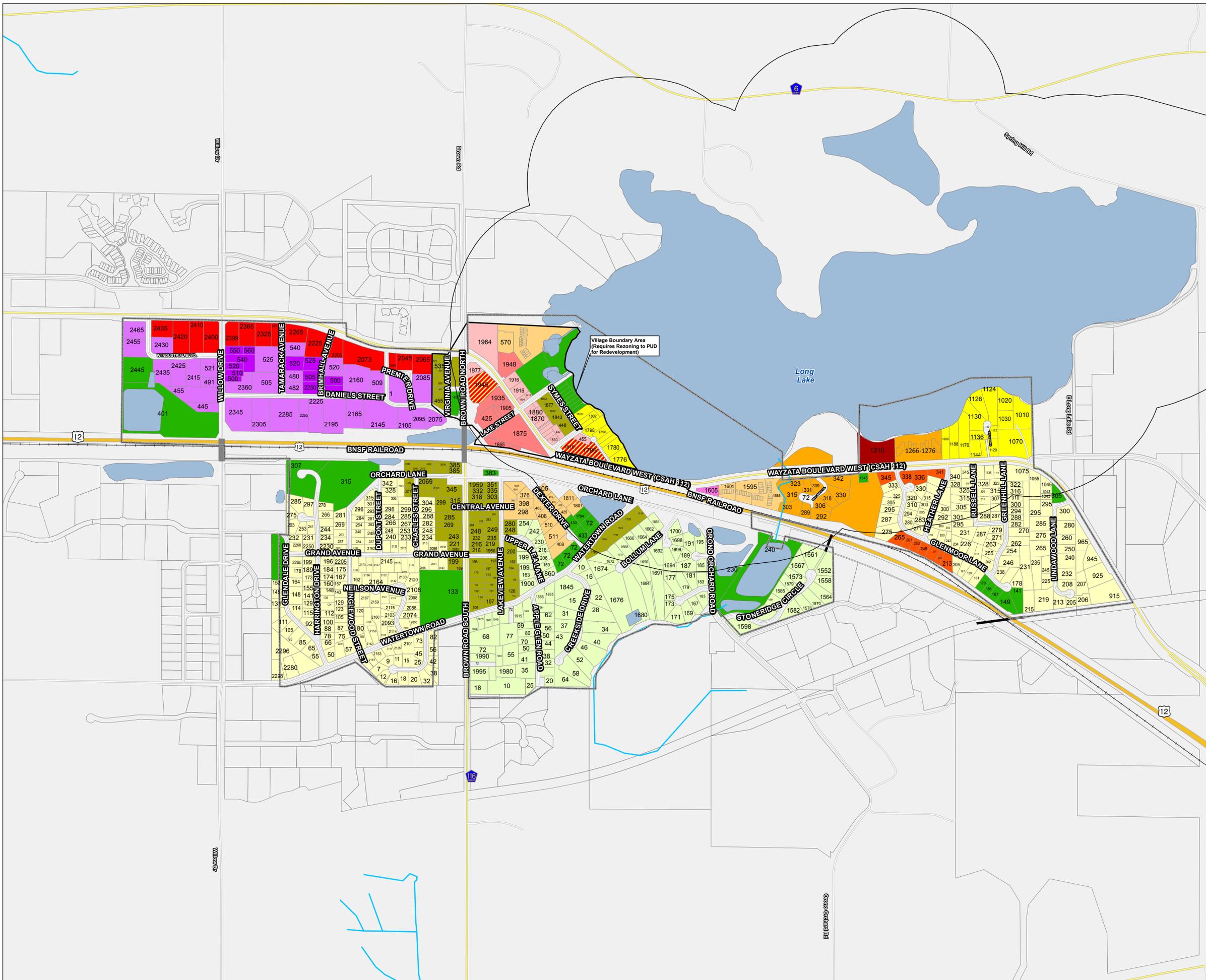
CITY OF
LONG LAKE

Long Lake, Minnesota Zoning Map

- Long Lake Boundary
- Shoreland Area
- Parcels
- Lakes/Ponds
- Pedestrian Bridge
- Vehicle Bridge
- Drainage Ditch
- Zoning**
- R-1A Single Family Residential
- R-1 Single Family Residential
- R-2 Lakeshore Single Family Residential
- R-3 Single Family Residential
- R-4 Single & Two Family Residential
- R-5 Multiple Family Residential
- R-6 Lakeshore Multiple Family Residential
- B-2A Service Business District
- B-1 Limited Business
- B-2 General Business
- B-3 Lakeshore Business
- Village Commercial 1
- I-1 Industrial
- I-2 Industrial
- Institutional
- P.U.D. (Planned Unit Development)



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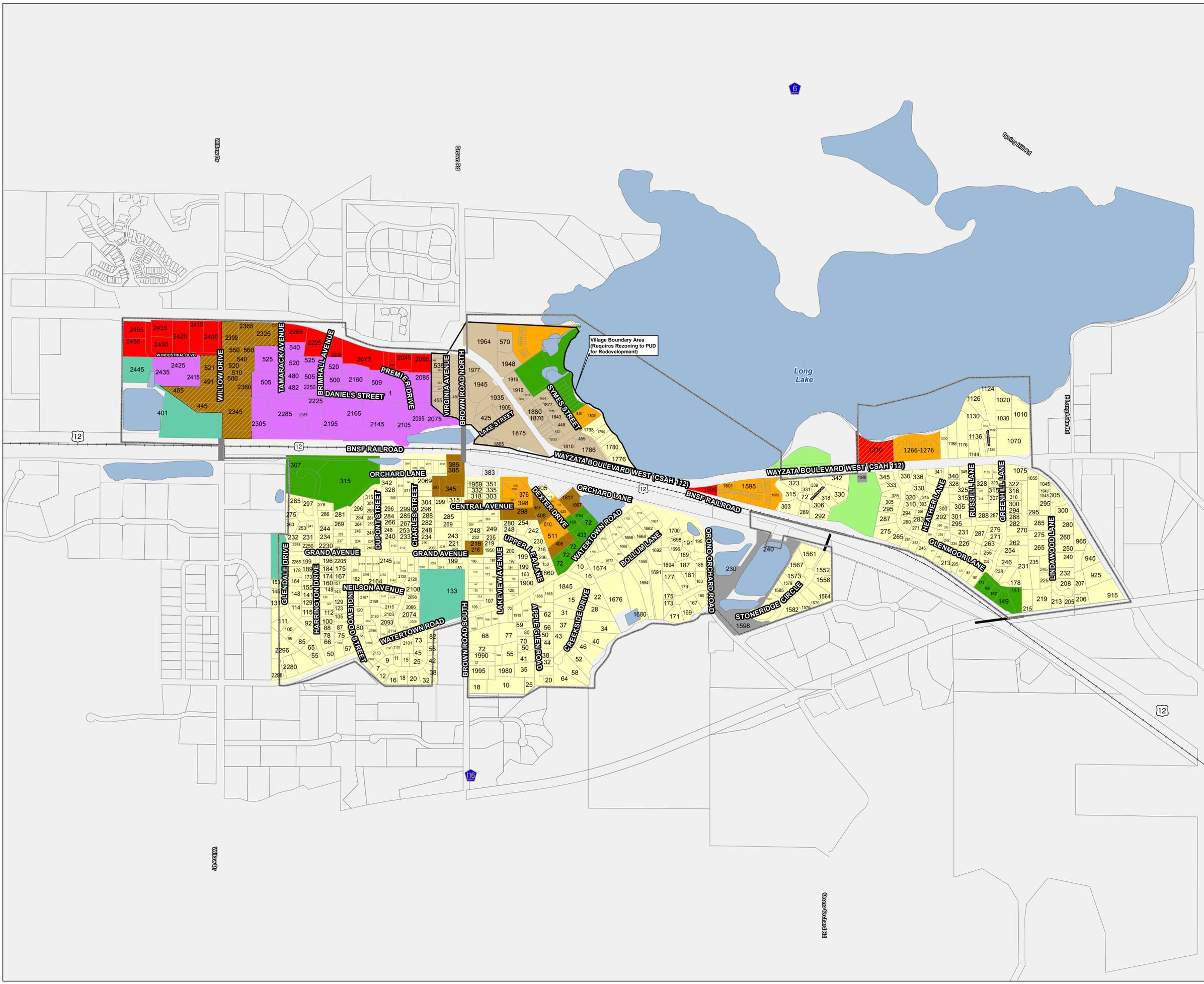
Village Boundary Area
(Requires Rezoning to PUD
for Redevelopment)

APPENDIX C
2040 COMPREHENSIVE PLAN PROPOSED LAND USE MAP



CITY OF
LONG LAKE

Long Lake, Minnesota 2040 Comprehensive Plan Proposed Land Use Map



- Long Lake Boundary
- Parcels
- Lakes/Ponds
- Pedestrian Bridge
- Vehicle Bridge
- 2040 Land Use Plan**
- Business/Light Industrial
- Commercial
- Downtown Village Mixed Use
- Institutional
- Low Density Residential
- Multiple Family Residential - High Density
- Multiple Family Residential - Medium Density
- Multiple Family Residential - Medium Density/Commercial
- Open Space - Private
- Park
- Planned Commercial Business
- Utility



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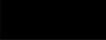
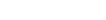


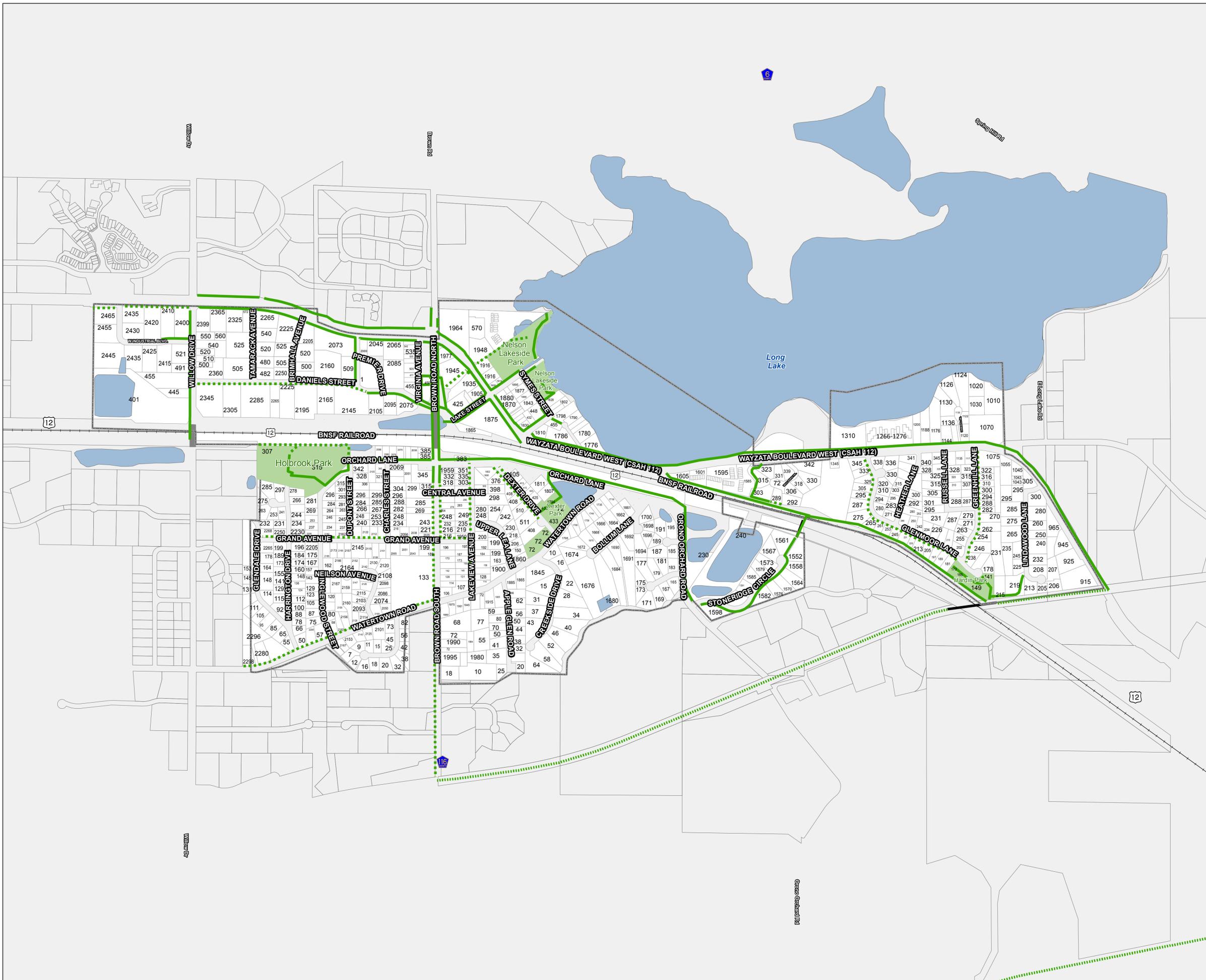
APPENDIX D
STREETS, PARKS, AND TRAILS MAP



CITY OF
LONG LAKE

Long Lake, Minnesota Street, Parks, and Trails Map

-  Long Lake Boundary
-  Parcels
-  Lakes/Ponds
-  Pedestrian Bridge
-  Vehicle Bridge
-  Existing Trails
-  Proposed Trails
-  Regional Trails
-  City Parks



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APPENDIX E
2040 COMPREHENSIVE PLAN REGIONAL PARK SYSTEMS MAP

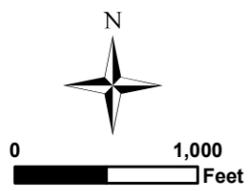
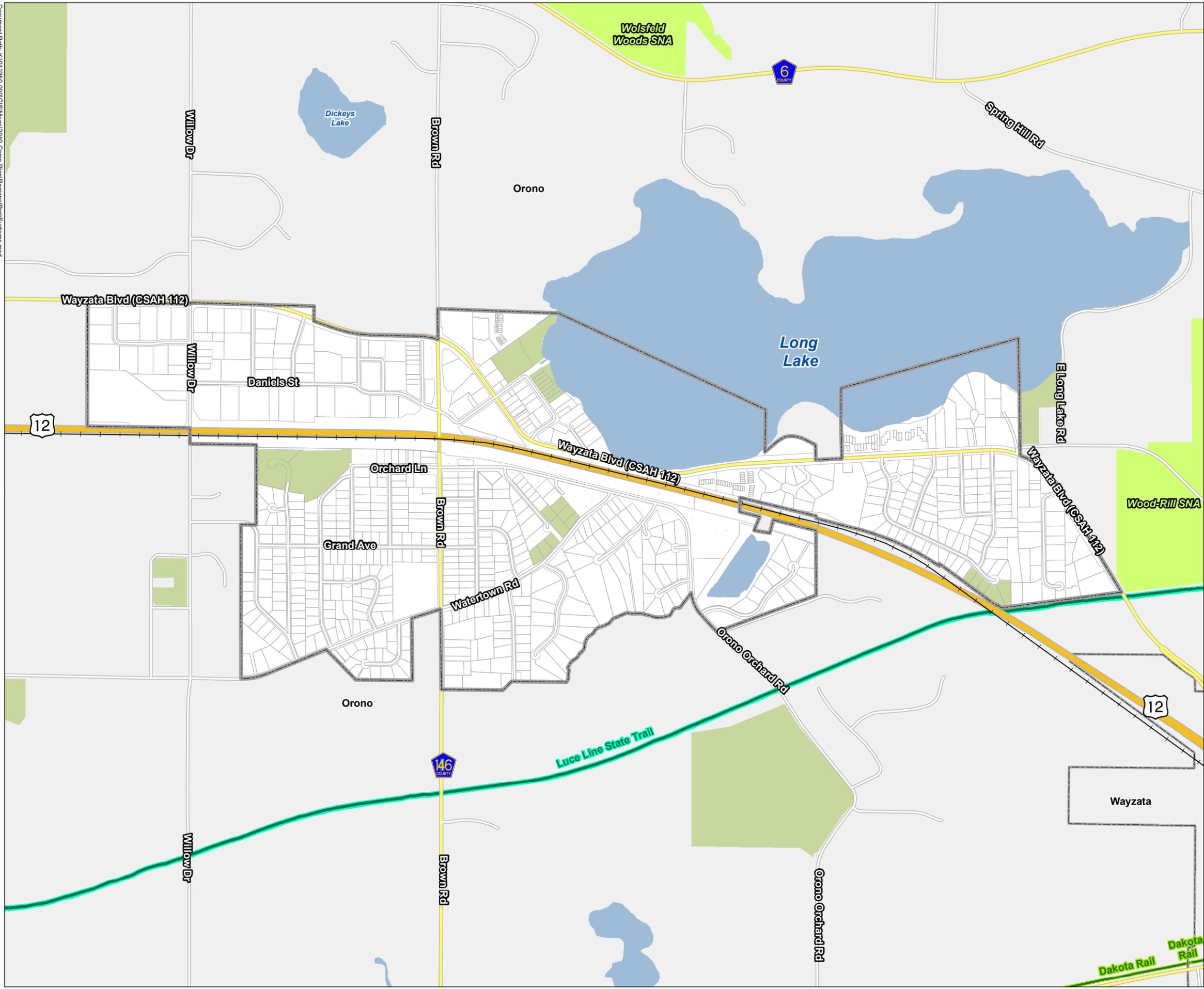
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CITY OF
LONG LAKE

Long Lake, Minnesota 2040 Comprehensive Plan Regional Park Systems Map

- Long Lake Boundary
- Parcels
- Lakes
- Railroad
- Regional Trail Search Corridors
- Regional Trails - 2040 System Additions
- Existing State Trails
- Other Parks
- State Parks
- State Wildlife Management Areas (Publicly Accessible)
- Scientific and Natural Areas (SNA)
- Regional Trails**
 - Existing
 - Planned
- Regional Parks**
 - Regional Park
 - Park Reserve
 - Special Recreation Feature



APPENDIX F
2040 COMPREHENSIVE PLAN REGIONAL BICYCLE TRANSPORTATION NETWORK MAP

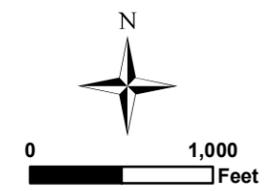
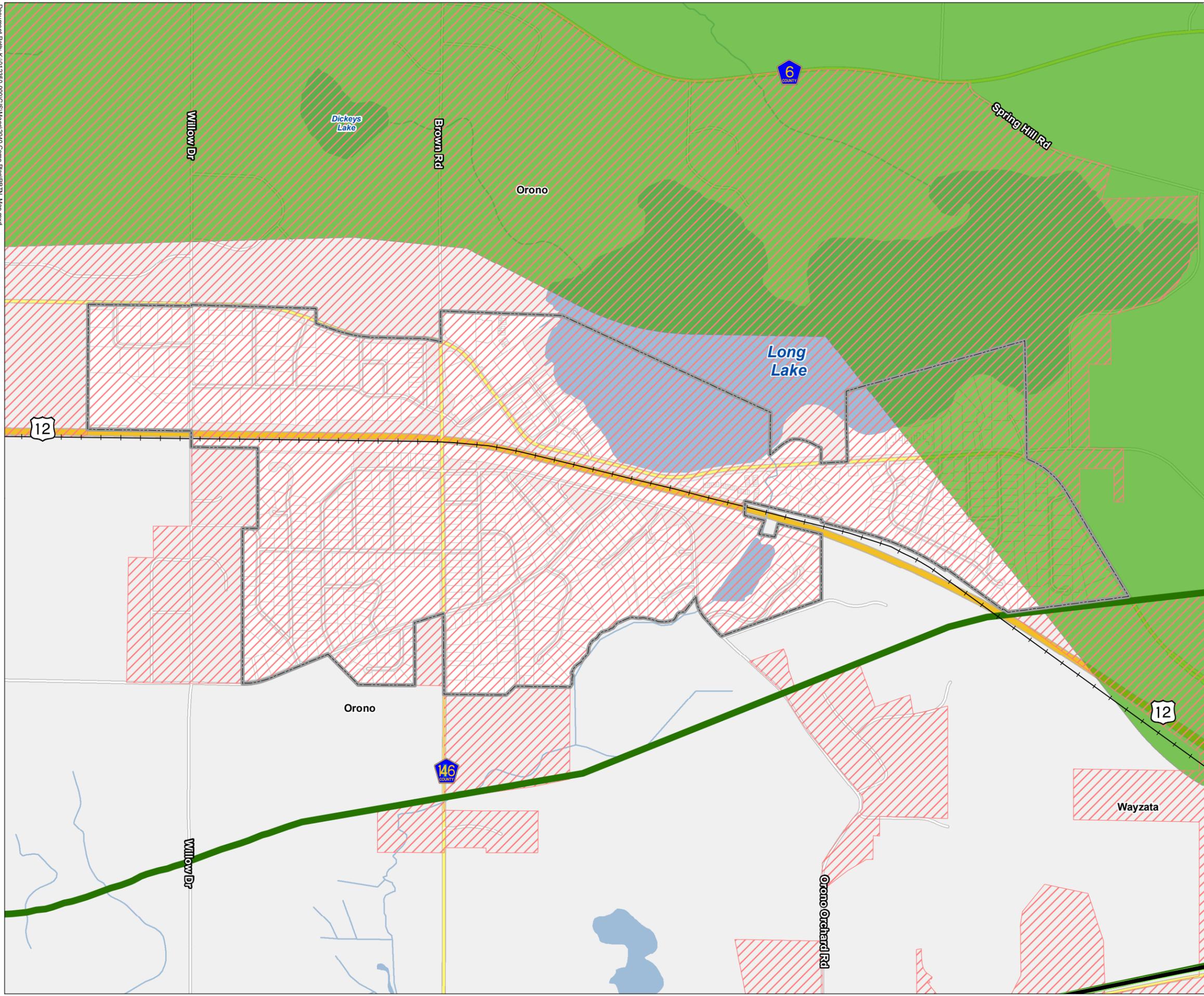
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CITY OF
LONG LAKE

Long Lake, Minnesota 2040 Comprehensive Plan RBTN Map

-  Long Lake Boundary
-  2040 MUSA
-  Lakes
-  Streams
-  Railroad
-  Existing Bikeways
- Regional Trails**
-  Existing
-  Planned
- RBTN Alignments**
-  Tier 1 Alignment
-  Tier 2 Alignment
- RBTN Corridors**
-  Tier 1 Priority Corridor
-  Tier 2 Corridor
-  Parcels



APPENDIX G
2040 COMPREHENSIVE PLAN WATER SYSTEM MAP

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CITY OF
LONG LAKE

Long Lake, Minnesota 2040 Comprehensive Plan Water System Map

Long Lake Boundary

Parcels

Lakes

Water Utility

Water Hydrant

Well

Valves

Water Tower

Water Main Size

1"

2"

4"

6"

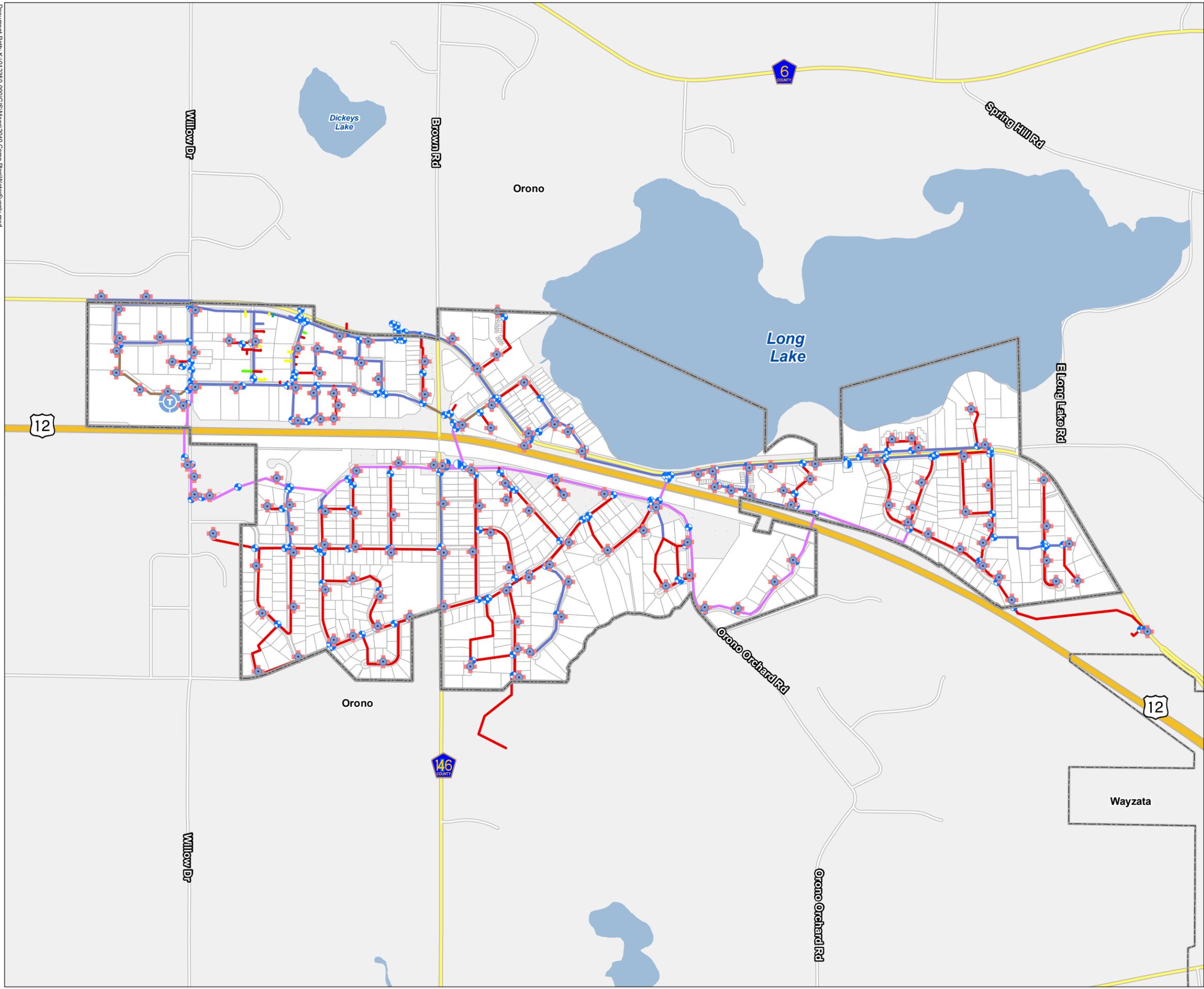
8"

10"

12"



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Feet



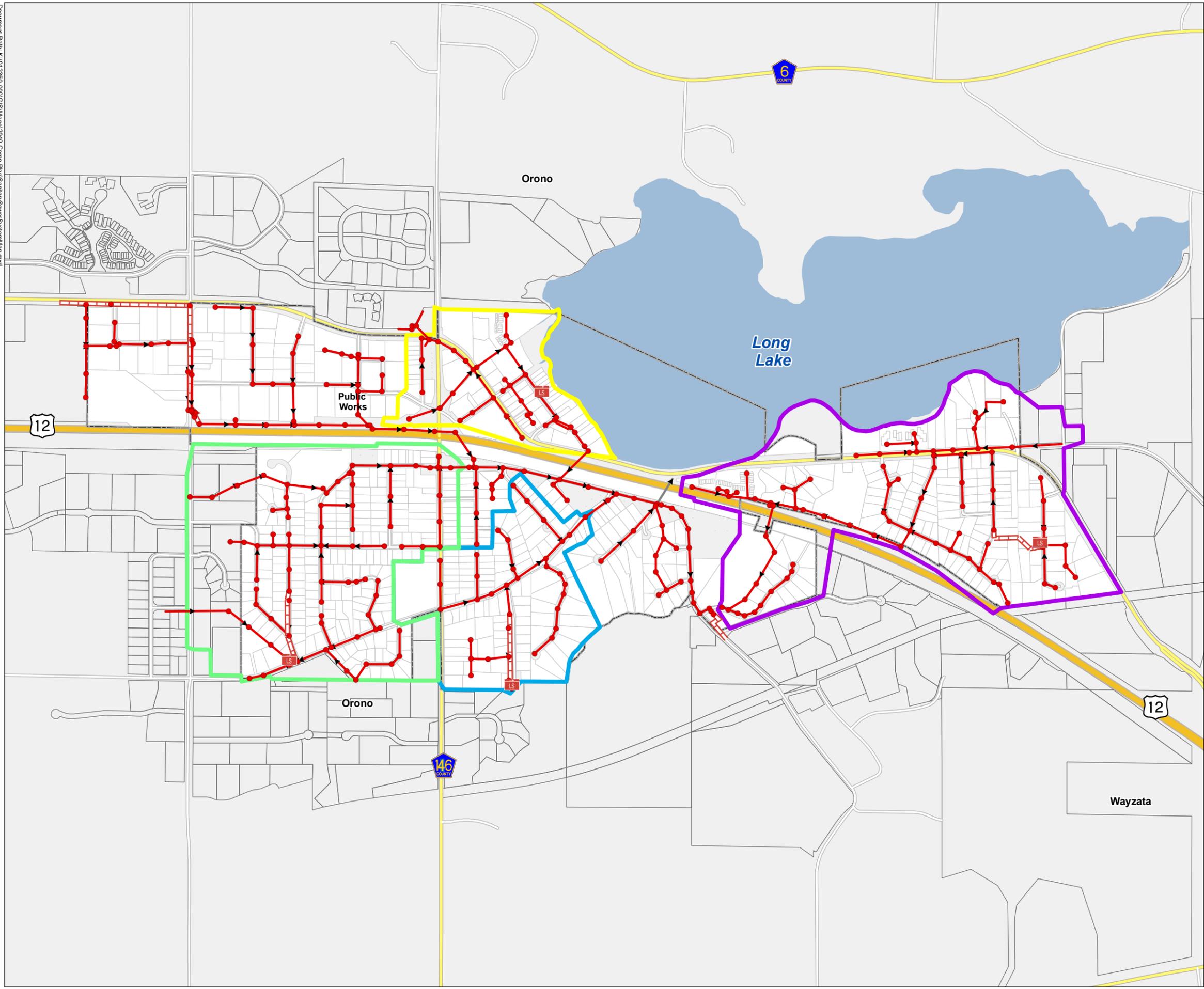
APPENDIX H
2040 COMPREHENSIVE PLAN SANITARY SEWER MAP

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CITY OF
LONG LAKE

Long Lake, Minnesota 2040 Comprehensive Plan Sanitary Sewer Map



Long Lake Boundary

Parcels

Lakes

Sanitary Sewer Utility

Gravity Main

Forcemain

Abandoned Gravity Main

Sanitary Manholes

Lift Stations

Sanitary Sewer Districts

District 1

District 2

District 3

District 4



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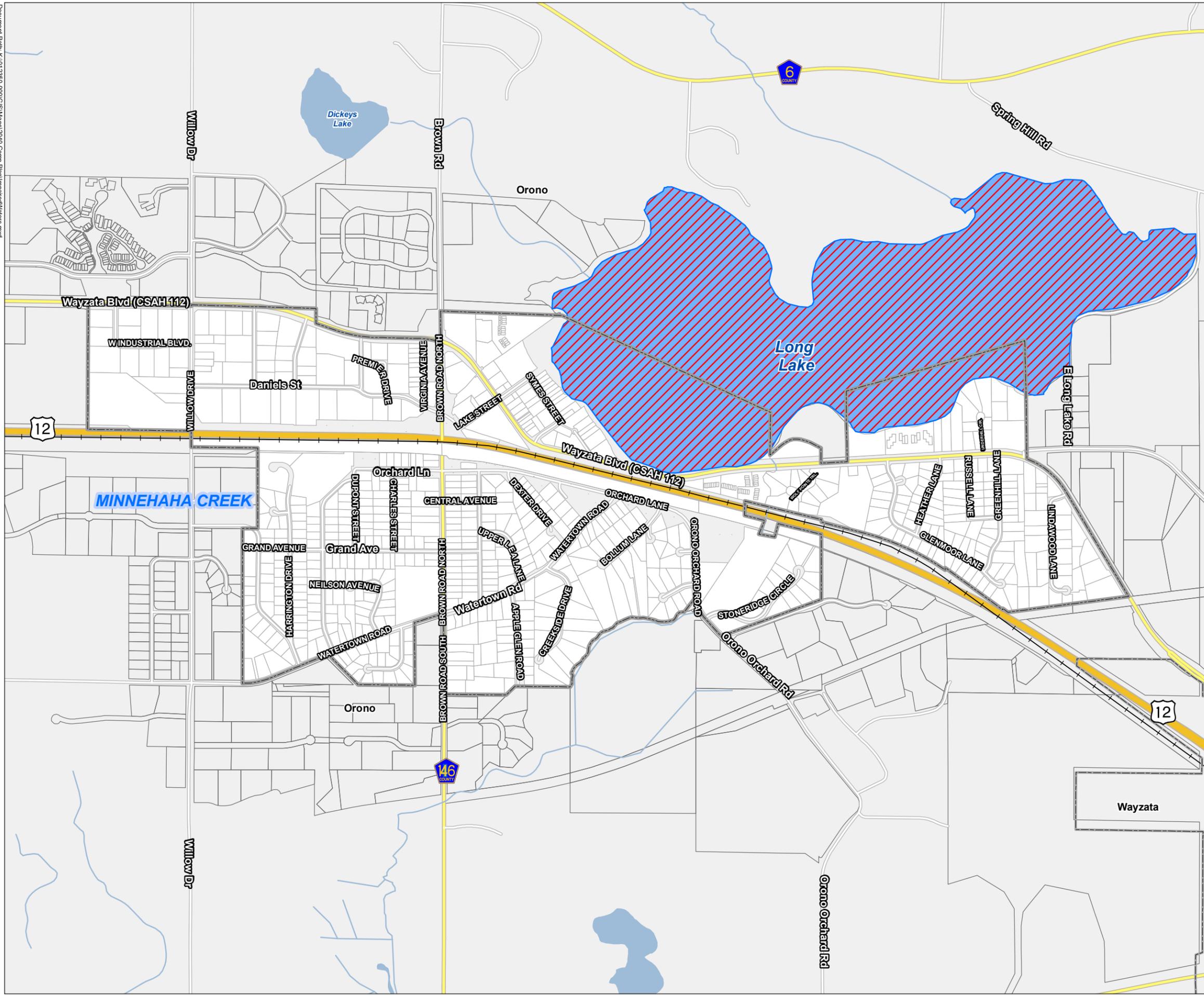


APPENDIX I
2040 COMPREHENSIVE PLAN IMPAIRED WATERS MAP

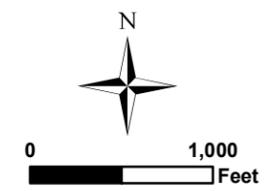


CITY OF
LONG LAKE

Long Lake, Minnesota 2040 Comprehensive Plan Impaired Waters Map



-  Long Lake Boundary
-  Parcels
-  Other Lakes
-  Other Streams
-  Railroad
-  Impaired Lakes
-  Impaired Streams
-  Watershed Management Organizations



APPENDIX J
2040 COMPREHENSIVE PLAN DRAINAGE AREA MAP

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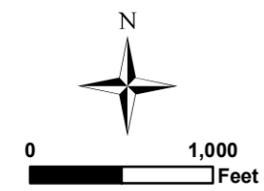


CITY OF
LONG LAKE

Long Lake, Minnesota 2040 Comprehensive Plan Drainage Area Map



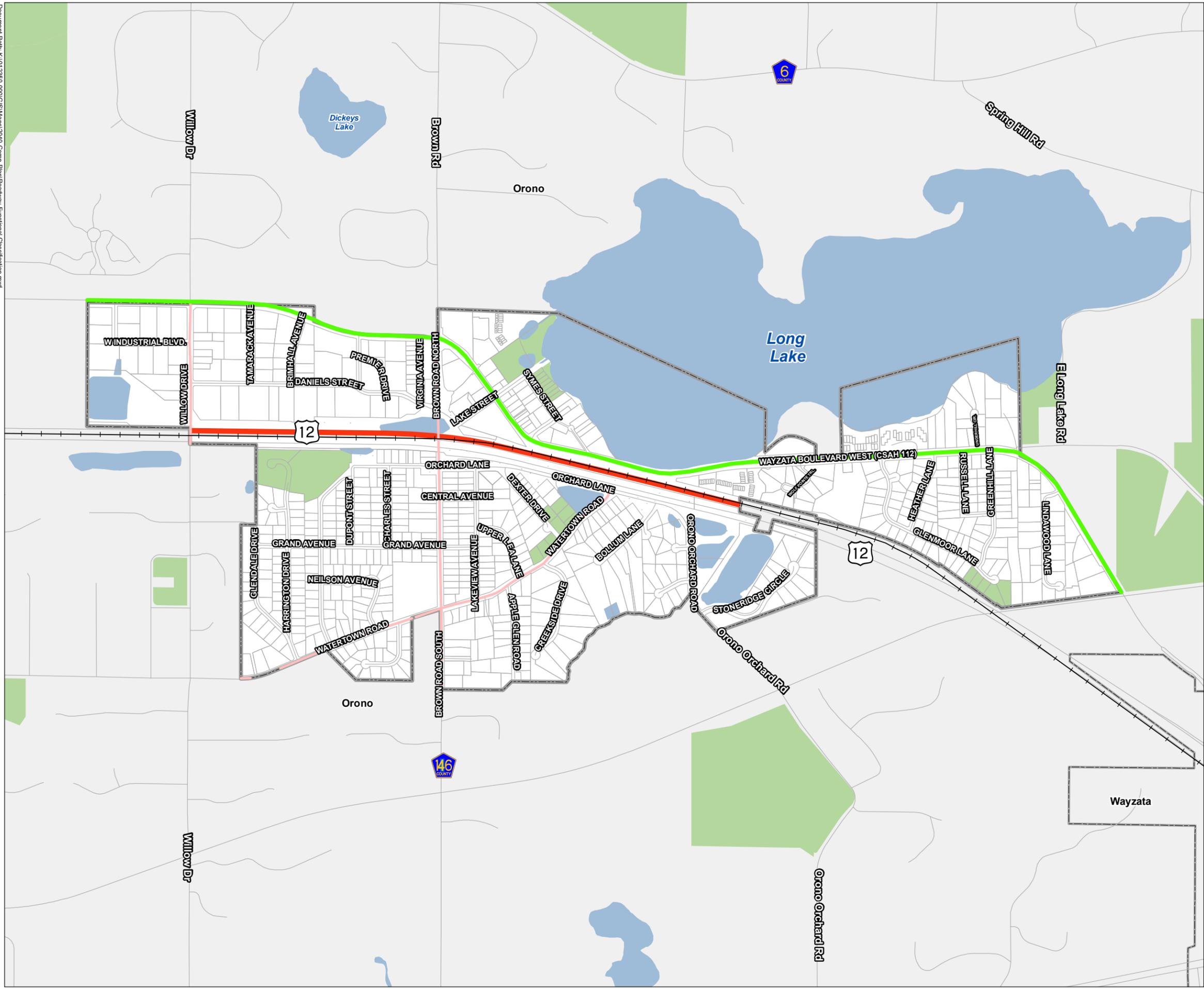
-  Long Lake Boundary
-  Parcels
-  Lakes
-  Railroad
-  Catchment Flow Network (synthetic)
-  Catchment Pour Points
-  Major Drainage Areas
-  Minor Drainage Areas



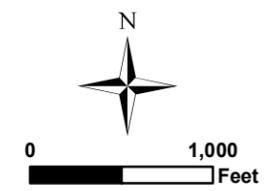
APPENDIX K
2040 COMPREHENSIVE PLAN ROADWAY FUNCTIONAL CLASSIFICATION MAP



Long Lake, Minnesota 2040 Comprehensive Plan Roadway Functional Classification Map



- Long Lake Boundary
- Parcels
- Lakes
- Parks
- Railroad
- Road Class**
- Principal Arterial
- A-Minor Reliever
- Major Collector
- Local Roadway

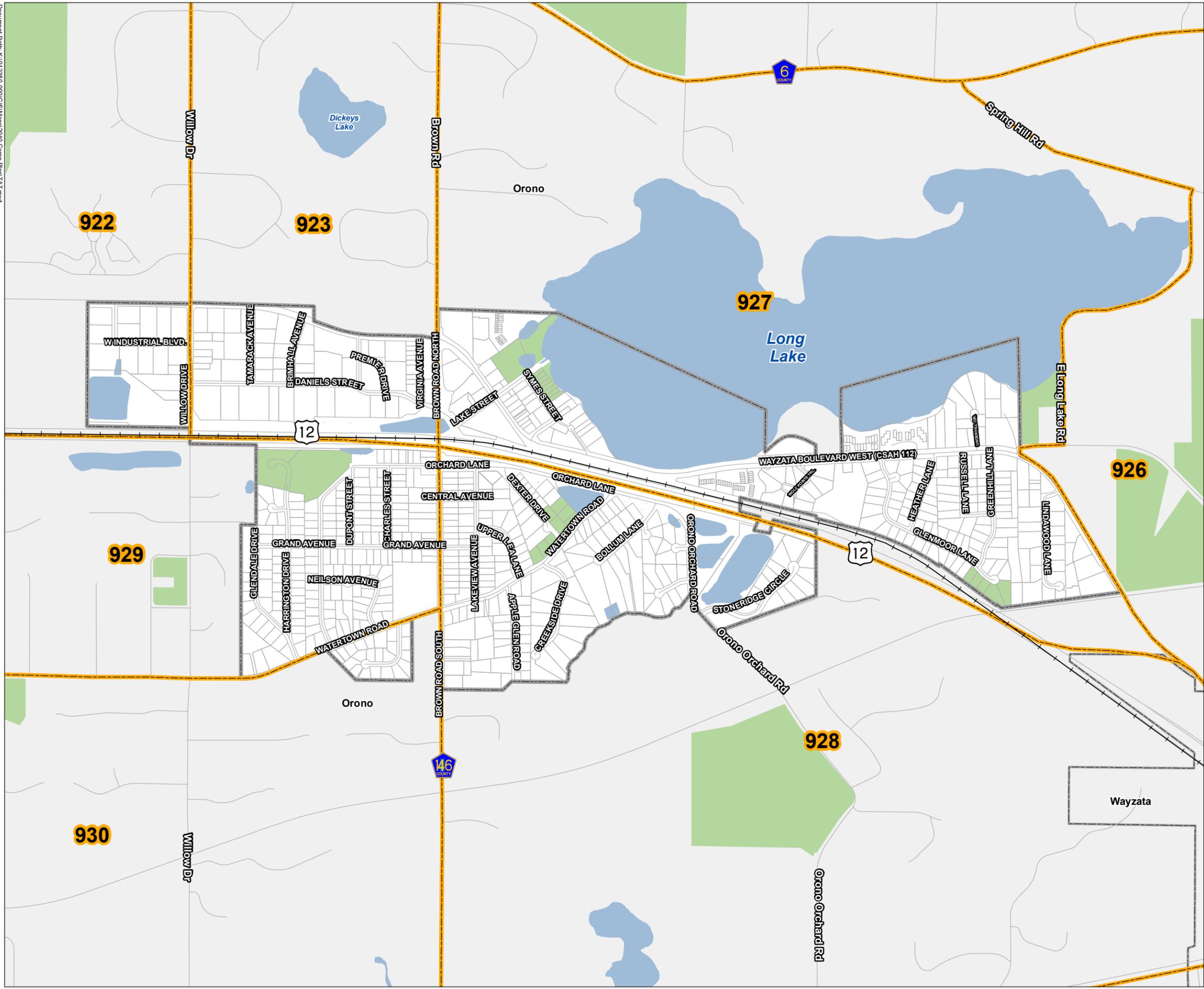


APPENDIX L
2040 COMPREHENSIVE PLAN TRANSPORTATION ANALYSIS ZONE MAP

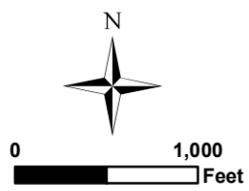
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Long Lake, Minnesota 2040 Comprehensive Plan Transportation Analysis Zone Map



- Long Lake Boundary
- Parcels
- Lakes
- Parks
- Railroad
- Transportation Analysis Zone



APPENDIX M
CITY OF LONG LAKE WATER SUPPLY PLAN 2018

City of Long Lake Water Supply Plan 2018



m DEPARTMENT OF
NATURAL RESOURCES

Cover photo by Molly Shodeen

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DEPARTMENT OF NATURAL RESOURCES – DIVISION OF ECOLOGICAL AND
WATER RESOURCES AND METROPOLITAN COUNCIL

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 (GWMA) to focus groundwater management efforts in specific geographies where there is an added risk of overuse or water quality degradation. A plan directing the DNR's 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 GWMA, communities should be aware of the issues and actions planned if they are within the boundary of one of the GWMA. The three GWMA 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)	1965-0980 1965-0980-1A
Ownership	<input checked="" type="checkbox"/> Public or <input type="checkbox"/> Private
Metropolitan Council Area	<input checked="" type="checkbox"/> Yes or <input type="checkbox"/> No (Hennepin)
Street Address	450 Virginia Ave P.O. Box 606
City, State, Zip	Long Lake, MN. 55356
Contact Person Name	Sean Diercks
Title	Public Works Director
Phone Number	952-476-2855
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:

--

Table 2. Historic water demand (see definitions in the glossary after Part 4 of this template)

Year	Street	Service Connection	Residential Water Demand (MG)	Commercial Water Demand (MG)	Water Available for Use (MG)	Minidistrict Delivery (MG)	Water Demand (MG)	Water Demand (MG)	Water Supplier	Water Unmetered/Unconnected	Water Demand (MG)	Water Demand (MG)	Date of Water Demand	Water Demand (MG)	Water Demand (MG)
2007	1842	740	46,300	30,100	N/A	N/A	76,400	77,170	N/A	1.0%	0.210	0.580	8/27/2007	63.86	129.05
2008	1842	765	43,848	30,578	N/A	N/A	74,426	79,229	N/A	6.1%	0.217	0.966	10/16/2008	65.22	117.84
2009	1842	741	45,629	26,591	N/A	N/A	72,220	78,672	N/A	8.3%	0.216	0.555	6/3/2009	67.87	117.01
2010	1745	741	40,092	24,415	N/A	N/A	64,507	68,009	N/A	5.2%	0.186	0.421	6/17/2010	62.95	106.78
2011	1768	741	40,407	25,143	N/A	N/A	65,550	70,770	N/A	7.4%	0.194	0.484	10/7/2011	62.61	109.67
2012	1760	740	44,895	28,400	N/A	N/A	73,299	73,693	N/A	0.6%	0.202	0.454	7/13/2012	69.89	114.72
2013	1760	741	39,781	25,181	N/A	N/A	64,962	65,688	N/A	1.1%	0.180	0.523	11/16/2013	61.93	102.25
2014	1760	741	36,138	26,195	N/A	N/A	62,273	64,291	N/A	3.1%	0.176	0.520	5/06/2014	56.25	100.08
2015	1760	755	34,906	25,719	N/A	N/A	60,625	65,216	N/A	7.4%	0.179	0.550	10/19/2015	54.34	101.52
2016	1760	756	35,317	25,235	N/A	N/A	60,552	66,230	N/A	8.6%	0.181	0.453	9/16/2016	54.98	103.10
2017	1768	756	34,455	24,191	N/A	N/A	60,281	66,153	N/A	8.9%	0.181	0.426	9/01/2017	53.36	102.51
Avg. 2012-2017	1761	748	37,580	27,480			63,670	66,879		4.9%	0.183	0.488		58.46	104.03

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.

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. TEK PRODUCTS	COMMERCIAL	4,087,000	5.3%	UNKNOWN
2. TOWN CENTER	COMMERCIAL	2,040,000	2.6%	UNKNOWN
3. FOODLINER	COMMERCIAL	1,982,000	2.6%	UNKNOWN
4. SUPERAMERICA	COMMERCIAL	1,532,000	2.0%	UNKNOWN
5. THREE PT DEV.	COMMERCIAL	1,359,000	1.8%	UNKNOWN
6. LAKE ENGINEER	COMMERCIAL	1,239,000	1.6%	UNKNOWN
7. AMERICINN	COMMERCIAL	1,156,000	1.5%	UNKNOWN
8. JEM TECH	COMMERCIAL	916,000	1.2%	UNKNOWN
9. LD FOODS	COMMERCIAL	914,000	1.2%	UNKNOWN
10. RED ROOSTER	COMMERCIAL	772,000	1.0%	UNKNOWN

B. 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?
WELLHOUSE #1 Well 1A	2004	1,728,000 (1200 gpm well)	Chemical addition	Fluoridation, chlorination, Fe/Mn sequestration	N/A	N/A	N/A
WELLHOUSE #2 Well 2	1966	1,008,000 (700 gpm well)	Chemical addition	Fluoridation, chlorination, Fe/Mn sequestration	N/A	N/A	N/A
Total	NA		NA	NA		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.

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)
WATERTOWER	Elevated storage	1983	steel	200,000
Total	NA	NA	NA	200,000

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):

The current treatment and storage capacity exceeds the average daily demand. The projected average daily demand over the next ten years will be equal to or slightly above the storage capacity recommendations.

C. 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)
Groundwater	Prairie du Chien-Jordan	206933	1966	1200	448'/365'	Active	No
Groundwater	Prairie du Chien-Jordan	667910	2004	700	475'/240'	Active	No
Groundwater	Prairie du Chien-Jordan	208849	1948	500	340'/188'	Abandoned/Sealed	No
Orono Inter-connection				500		Emergency Only	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.

The City of Orono will supply water to the city of Long Lake in an emergency via two automatic pressure sensing interconnection valves on the water distribution systems located at the intersections of Wayzata Blvd. and Brimhall Road, and Wayzata Blvd. and Brown Road. In addition; a manual interconnection valve is located at the intersection of Wayzata Blvd. and Willow Drive.

D. 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 residential population and business growth in Long Lake has remained nearly the same the last 10 years. There has been a noticeable reduction in residential per capita demand over the last ten years. The total per capita has remained nearly the same due to a slightly increased commercial/industrial demand. The average daily demand and maximum daily demand has remained very consistent and stable over the past ten years. It is expected that there will be no significant increase in the number of future households or businesses because the city is fully developed. Small changes in water demand will occur incrementally in the future due to redevelopment related activities.

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	Projected Total Per-Capita Water Demand (GPCD)	Projected Average Daily Demand (MGD)	Projected Maximum Daily Demand (MGD)
2016	1760*	1760*	103.10*	0.181*	0.453*
2017	1768*	1768*	102.51*	0.181*	0.426*
2018	1782	1782	104	0.185	0.500
2019	1796	1796	104	0.187	0.504
2020	1810	1810	104	0.188	0.508
2021	1835	1835	104	0.191	0.515
2022	1860	1860	104	0.193	0.522
2023	1885	1885	104	0.196	0.529
2024	1910	1910	104	0.199	0.536
2025	1935	1935	104	0.201	0.543
2030	1960	1960	104	0.204	0.550
2040	1990	1990	104	0.207	0.559

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:

The Metropolitan Council projections were used to determine future population. Average daily demand was based on the population projections and the average total per capita demand 104 (GPCD) over the past 5 years. The maximum day demand was based on average day demand projections and the highest day peaking factor of 2.7 (average of last past 4 years). *Denotes actual data.

E. 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
MN Unique Well # 667910	<input checked="" type="checkbox"/> production well <input type="checkbox"/> observation well <input type="checkbox"/> source water intake <input type="checkbox"/> source water reservoir	<input checked="" type="checkbox"/> routine MDH sampling <input checked="" type="checkbox"/> routine water utility sampling <input type="checkbox"/> other	<input checked="" type="checkbox"/> continuous <input type="checkbox"/> hourly <input type="checkbox"/> daily <input checked="" type="checkbox"/> monthly <input type="checkbox"/> quarterly <input type="checkbox"/> annually	<input checked="" type="checkbox"/> SCADA <input type="checkbox"/> grab sampling <input type="checkbox"/> steel tape <input type="checkbox"/> stream gauge
MN Unique Well # 206933	<input checked="" type="checkbox"/> production well <input type="checkbox"/> observation well <input type="checkbox"/> source water intake <input type="checkbox"/> source water reservoir	<input checked="" type="checkbox"/> routine MDH sampling <input checked="" type="checkbox"/> routine water utility sampling <input type="checkbox"/> other	<input type="checkbox"/> continuous <input type="checkbox"/> hourly <input type="checkbox"/> daily <input checked="" type="checkbox"/> monthly <input type="checkbox"/> quarterly <input type="checkbox"/> annually	<input type="checkbox"/> SCADA <input checked="" type="checkbox"/> grab sampling <input checked="" type="checkbox"/> steel tape <input type="checkbox"/> 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/pump maintenance
MN Unique Well # 667910	Prairie du Chien-Jordan	4.6	<input type="checkbox"/> Falling <input checked="" type="checkbox"/> Stable <input type="checkbox"/> Rising	Continuous/ monthly
MN Unique Well # 206933	Prairie du Chien-Jordan	7.6	<input type="checkbox"/> Falling <input checked="" type="checkbox"/> Stable <input type="checkbox"/> Rising	monthly

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	Risk Assessed Through	Describe Resource Protection Threshold or Goal	Mitigation Measures or Management Plan	Describe How Thresholds or Goals are Monitored
<input type="checkbox"/> River or stream		<input checked="" type="checkbox"/> None anticipated <input type="checkbox"/> Flow/water level decline <input type="checkbox"/> Degrading water quality trends <input type="checkbox"/> Impacts on endangered, threatened, or special concern species habitat <input type="checkbox"/> Other: _____	<input type="checkbox"/> Geologic atlas or other mapping <input type="checkbox"/> Modeling <input type="checkbox"/> Modeling <input type="checkbox"/> Monitoring <input type="checkbox"/> Aquifer testing <input type="checkbox"/> WRAPS or other watershed report <input type="checkbox"/> Proximity (<1.5 miles) <input checked="" type="checkbox"/> Other: _____	<input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> Additional data is needed to establish <input type="checkbox"/> See report: _____ <input type="checkbox"/> No data available <input type="checkbox"/> Other: _____	<input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> Change groundwater pumping <input type="checkbox"/> Increase conservation <input type="checkbox"/> Other: _____	<input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> Newly collected data will be analyzed <input type="checkbox"/> Regular check-in with these partners: _____ <input type="checkbox"/> Other: _____
<input type="checkbox"/> Calcareous fen		<input checked="" type="checkbox"/> None anticipated <input type="checkbox"/> Flow/water level decline <input type="checkbox"/> Degrading water quality trends <input type="checkbox"/> Impacts on endangered, threatened, or special concern species habitat <input type="checkbox"/> Other: _____	<input type="checkbox"/> Geologic atlas or other mapping <input type="checkbox"/> Modeling <input type="checkbox"/> Modeling <input type="checkbox"/> Monitoring <input type="checkbox"/> Aquifer testing <input type="checkbox"/> WRAPS or other watershed Report <input type="checkbox"/> Proximity (<5 miles) <input type="checkbox"/> Other: _____ <input type="checkbox"/> Other: _____	<input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> Additional data is needed to establish <input type="checkbox"/> See report: _____ <input type="checkbox"/> Other: _____	<input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> Change groundwater pumping <input type="checkbox"/> Increase conservation <input type="checkbox"/> Other: _____	<input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> Newly collected data will be analyzed <input type="checkbox"/> Regular check-in with these partners: _____ <input type="checkbox"/> Other: _____

Resource Type	Resource Name	Risk	Risk Assessed Through	Describe Resource Protection Threshold or Goal	Mitigation Measures or Management Plan	Describe How Thresholds or Goals are Monitored
<input checked="" type="checkbox"/> Lake		<input type="checkbox"/> None anticipated <input checked="" type="checkbox"/> Flow/water level decline <input checked="" type="checkbox"/> Degrading water quality trends <input type="checkbox"/> Impacts on endangered, threatened, or special concern species habitat <input type="checkbox"/> Other: _____	<input type="checkbox"/> Geologic atlas or other mapping <input type="checkbox"/> Modeling <input type="checkbox"/> Modeling <input checked="" type="checkbox"/> Monitoring <input type="checkbox"/> Aquifer testing <input type="checkbox"/> WRAPS or other watershed report <input type="checkbox"/> Proximity (<1.5 miles) <input checked="" type="checkbox"/> Other: Met Council Water Supply Profile____ <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input checked="" type="checkbox"/> Additional data is needed to establish <input type="checkbox"/> See report: _____ <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input type="checkbox"/> Change groundwater pumping <input checked="" type="checkbox"/> Increase conservation <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input checked="" type="checkbox"/> Newly collected data will be analyzed <input type="checkbox"/> Regular check-in with these partners: _____ <input checked="" type="checkbox"/> Other: Water use conservation rates _____
<input checked="" type="checkbox"/> Wetland		<input checked="" type="checkbox"/> None anticipated <input checked="" type="checkbox"/> Flow/water level decline <input checked="" type="checkbox"/> Degrading water quality trends <input type="checkbox"/> Impacts on endangered, threatened, or special concern species habitat <input type="checkbox"/> Other: _____	<input type="checkbox"/> Geologic atlas or other mapping <input type="checkbox"/> Modeling <input type="checkbox"/> Modeling <input type="checkbox"/> Monitoring <input type="checkbox"/> Aquifer testing <input type="checkbox"/> WRAPS or other watershed report <input type="checkbox"/> Proximity (<1.5 miles) <input checked="" type="checkbox"/> Other: Met Council Water Supply Profile____ <input type="checkbox"/> Other: _____	<input checked="" type="checkbox"/> Not applicable <input checked="" type="checkbox"/> Additional data is needed to establish <input type="checkbox"/> See report: _____ <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input type="checkbox"/> Change groundwater pumping <input checked="" type="checkbox"/> Increase conservation <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input checked="" type="checkbox"/> Newly collected data will be analyzed <input type="checkbox"/> Regular check-in with these partners: _____ <input checked="" type="checkbox"/> Other: Water use conservation rates _____

Resource Type	Resource Name	RISK	RISK Assessed Through	Describe Resource Protection Threshold or Goal	Mitigation Measures or Management Plan	Describe How Thresholds or Goals are Monitored
<input type="checkbox"/> Trout stream		<input type="checkbox"/> None anticipated <input type="checkbox"/> Flow/water level decline <input type="checkbox"/> Degrading water quality trends <input type="checkbox"/> Impacts on endangered, threatened, or special concern species habitat <input type="checkbox"/> Other: _____	<input type="checkbox"/> Geologic atlas or other mapping <input type="checkbox"/> Modeling <input type="checkbox"/> Monitoring <input type="checkbox"/> Aquifer testing <input type="checkbox"/> WRAPS or other watershed report <input type="checkbox"/> Proximity (< 5 miles) <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input type="checkbox"/> Additional data is needed to establish <input type="checkbox"/> See report: _____ <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input type="checkbox"/> Change groundwater pumping <input type="checkbox"/> Increase conservation <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input type="checkbox"/> Newly collected data will be analyzed <input type="checkbox"/> Regular check-in with these partners: _____ <input type="checkbox"/> Other: _____
<input checked="" type="checkbox"/> Aquifer		<input type="checkbox"/> None anticipated <input checked="" type="checkbox"/> Flow/water level decline <input type="checkbox"/> Degrading water quality trends <input type="checkbox"/> Impacts on endangered, threatened, or special concern species habitat <input type="checkbox"/> Other: _____	<input type="checkbox"/> Geologic atlas or other mapping <input type="checkbox"/> Modeling <input checked="" type="checkbox"/> Monitoring <input type="checkbox"/> Aquifer testing <input type="checkbox"/> Proximity (obwell < 5 miles) <input checked="" type="checkbox"/> Other: Met Council Water Supply Profile _____	<input checked="" type="checkbox"/> Not applicable <input checked="" type="checkbox"/> Additional data is needed to establish <input type="checkbox"/> See report: _____ <input type="checkbox"/> Other: _____	<input checked="" type="checkbox"/> Not applicable <input type="checkbox"/> Change groundwater pumping <input checked="" type="checkbox"/> Increase conservation <input type="checkbox"/> Other: _____	<input type="checkbox"/> Not applicable <input checked="" type="checkbox"/> Newly collected data will be analyzed <input type="checkbox"/> Regular check-in with these partners: _____ <input checked="" type="checkbox"/> Other: Water use conservation rates _____

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	<input type="checkbox"/> In Process <input checked="" type="checkbox"/> Completed <input type="checkbox"/> Not Applicable	September 2004	March 2015
SWP	<input type="checkbox"/> In Process <input checked="" type="checkbox"/> Completed <input type="checkbox"/> Not Applicable	Sept 2006	November 2013

WHP – Wellhead Protection Plan SWP – Source Water Protection Plan

F. 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	<input checked="" type="checkbox"/> No action planned - adequate <input type="checkbox"/> Repair/replacement <input type="checkbox"/> Expansion/addition		
Water Storage Facilities	<input type="checkbox"/> No action planned - adequate <input checked="" type="checkbox"/> Repair/replacement <input type="checkbox"/> Expansion/addition	As Needed	
Water Treatment Facilities	<input checked="" type="checkbox"/> No action planned - adequate <input type="checkbox"/> Repair/replacement <input type="checkbox"/> Expansion/addition		
Distribution Systems (Pipes, valves, etc.)	<input type="checkbox"/> No action planned - adequate <input checked="" type="checkbox"/> Repair/replacement <input type="checkbox"/> Expansion/addition	As Needed	
Pressure Zones	<input checked="" type="checkbox"/> No action planned - adequate <input type="checkbox"/> Repair/replacement <input type="checkbox"/> Expansion/addition		

System Component	Planned action	Anticipated Construction Year	Notes
Other:	<input checked="" type="checkbox"/> No action planned - adequate <input type="checkbox"/> Repair/replacement <input type="checkbox"/> 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	N/A				
Surface Water	N/A				
Interconnection to another supplier	N/A				

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
<input type="checkbox"/> Groundwater	N/A					
<input type="checkbox"/> Surface Water	N/A					
<input type="checkbox"/> Reclaimed stormwater	N/A					
<input type="checkbox"/> Reclaimed wastewater	N/A					
<input type="checkbox"/> 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? 2016

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	WAYZATA POLICE CHIEF	952-404-5340	MRISVOLD@WAYZATA.ORG
Alternate Emergency Response Lead	LONG LAKE FIRE CHIEF	952-473-9701	JVANEYLL@LONGLAKEMN.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 ORONO	500 GPM	N/A	

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
N/A	N/A	N/A	N/A	N/A

If not covered above, describe additional emergency measures for providing water (obtaining bottled water, or steps to obtain National Guard services, etc.)

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 (GPD)	Short-Term Emergency Demand Reduction Potential (GPD)
Residential	1	107,000	180,000
Institutional/Comm/Ind	2	75,000	125,000
TOTAL		182,000	305,000

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
<input checked="" type="checkbox"/> Contamination <input checked="" type="checkbox"/> Loss of production <input checked="" type="checkbox"/> Infrastructure failure <input checked="" type="checkbox"/> Executive order by Governor <input type="checkbox"/> Other: _____	<input type="checkbox"/> Supply augmentation through _____ <input checked="" type="checkbox"/> 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. <input type="checkbox"/> Water allocation through _____ <input checked="" type="checkbox"/> Meet with large water users to discuss their contingency plan.	<input type="checkbox"/> Supply augmentation through _____ <input checked="" type="checkbox"/> 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. <input type="checkbox"/> Water allocation through _____ <input checked="" type="checkbox"/> 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
<input checked="" type="checkbox"/> Short-term demand reduction declared (< 1 year)	<input checked="" type="checkbox"/> Website <input checked="" type="checkbox"/> Email list serve <input checked="" type="checkbox"/> Social media (e.g. Twitter, Facebook) <input type="checkbox"/> Direct customer mailing, <input checked="" type="checkbox"/> Press release (TV, radio, newspaper), <input checked="" type="checkbox"/> Meeting with large water users (> 10% of total city use) <input type="checkbox"/> Other: _____	<input checked="" type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Annually	
<input checked="" type="checkbox"/> Long-term Ongoing demand reduction declared	<input checked="" type="checkbox"/> Website <input checked="" type="checkbox"/> Email list serve <input checked="" type="checkbox"/> Social media (e.g. Twitter, Facebook) <input type="checkbox"/> Direct customer mailing, <input checked="" type="checkbox"/> Press release (TV, radio, newspaper), <input checked="" type="checkbox"/> Meeting with large water users (> 10% of total city use) <input type="checkbox"/> Other: _____	<input checked="" type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Annually	
<input checked="" type="checkbox"/> Governor's critical water deficiency declared	<input checked="" type="checkbox"/> Website <input checked="" type="checkbox"/> Email list serve <input checked="" type="checkbox"/> Social media (e.g. Twitter, Facebook)	<input checked="" type="checkbox"/> Daily <input type="checkbox"/> Weekly <input type="checkbox"/> Monthly <input type="checkbox"/> Annually	

Notification Trigger(s)	Methods (select all that apply)	Update Frequency	Partners
	<input type="checkbox"/> Direct customer mailing, <input type="checkbox"/> Press release (TV, radio, newspaper), <input type="checkbox"/> Meeting with large water users (> 10% of total city use) <input type="checkbox"/> 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

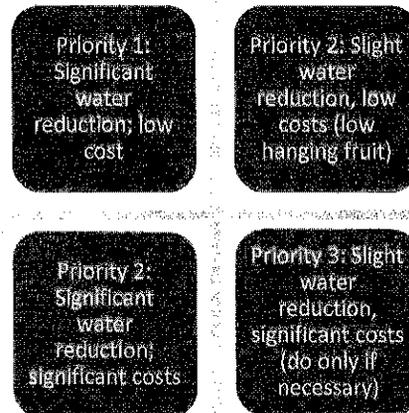
If yes, cite the regulatory authority reference: _____.

If no, who has authority to implement water use restrictions in an emergency?

City Council /Utility Board

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.

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	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Water supply system improvements (e.g. leak repairs, valve replacements, etc.)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Educational efforts	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
New water conservation ordinances	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Rebate or retrofitting Program (e.g. for toilet, faucets, appliances, showerheads, dish washers, washing machines, irrigation systems, rain barrels, water softeners, etc.)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Enforcement	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Describe other	<input type="checkbox"/> Yes <input type="checkbox"/> No

What are the results you have seen from the actions in Table 21 and how were results measured?

Reflection of the table #2 data shows that both the residential per capita demand use, and total per capita demand use is trending downward.

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	<input type="checkbox"/> Low stream flow conditions <input type="checkbox"/> Reports of declining wetland and lake levels <input type="checkbox"/> Other: _____	<input type="checkbox"/> Increase promotion of conservation measures <input type="checkbox"/> Other: _____
Short-term demand reduction (less than 1 year)	<input checked="" type="checkbox"/> Extremely high seasonal water demand (more than double winter demand) <input type="checkbox"/> Loss of treatment capacity <input checked="" type="checkbox"/> Lack of water in storage <input type="checkbox"/> State drought plan <input type="checkbox"/> Well interference <input type="checkbox"/> Other: _____	<input checked="" type="checkbox"/> 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. <input type="checkbox"/> Supply augmentation through _____ <input type="checkbox"/> Water allocation through _____ <input type="checkbox"/> Meet with large water users to discuss user's contingency plan.
Long-term demand reduction (>1 year)	<input checked="" type="checkbox"/> Per capita demand increasing <input checked="" type="checkbox"/> Total demand increase (higher population or more industry). Water level in well(s) below elevation of _____ <input type="checkbox"/> Other: _____	<input checked="" type="checkbox"/> 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. <input checked="" type="checkbox"/> 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. <input checked="" type="checkbox"/> Meet with large water users to discuss user's contingency plan. <input type="checkbox"/> Enhanced monitoring and reporting: audits, meters, billing, etc.
Governor's "Critical Water Deficiency Order" declared	<input checked="" type="checkbox"/> Describe	<input checked="" type="checkbox"/> Describe Stage 1: Restrict lawn watering, vehicle washing, golf course and other non-essential uses. Stage 2: Suspend lawn watering, vehicle washing, golf course and park irrigation and other non-essential uses.

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)

Every 5 years .

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? 2013

Frequency of water audits: yearly other (specify frequency) 5 year

Leak detection and survey: every year every other year periodic as needed

Year last leak detection survey completed: 2013

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

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				As needed	1 /25
Irrigation meters				As needed	1/25
Institutional				As needed	1/25
Commercial				As needed	1/25
Industrial				As needed	1/25
Public facilities				As needed	1/25
Other				As needed	
TOTALS	756	756		NA	NA

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.

Table 24. Water source meters

	Number of Meters	Meter testing schedule (years)	Number of Automated Meter Readers	Average age/meter replacement schedule (years)
Well 1A Wellhouse #1	1		N/A	As needed
Well 2 Wellhouse #2	1		N/A	As needed

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? 61.3 g/person/day

Describe the water use trend over that timeframe:

As indicated in table #2 both the total per capita demand in water use, and the residential per capita demand in water use is trending slightly downward during this reporting period.

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
<input type="checkbox"/> Revise city ordinances/codes to encourage or require water efficient landscaping.	
<input type="checkbox"/> 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	
<input type="checkbox"/> Revise ordinances to limit irrigation. Describe the restricted irrigation plan:	
<input type="checkbox"/> 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.	
<input checked="" type="checkbox"/> Make water system infrastructure improvements	On going
<input type="checkbox"/> Offer free or reduced cost water use audits) for residential customers.	
<input type="checkbox"/> Implement a notification system to inform customers when water availability conditions change.	
<input type="checkbox"/> 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.)	
<input type="checkbox"/> 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.)	
<input type="checkbox"/> Identify supplemental Water Resources	
<input type="checkbox"/> Conduct audience-appropriate water conservation education and outreach.	
<input type="checkbox"/> 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 to completing work
<input checked="" type="checkbox"/> Conduct a facility water use audit for both indoor and outdoor use, including system components	
<input type="checkbox"/> Install enhanced meters capable of automated readings to detect spikes in consumption	
<input type="checkbox"/> 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.)	
<input type="checkbox"/> Install water conservation fixtures and appliances or change processes to conserve water	
<input checked="" type="checkbox"/> Repair leaking system components (e.g., pipes, valves)	On going
<input type="checkbox"/> Investigate the reuse of reclaimed water (e.g., stormwater, wastewater effluent, process wastewater, etc.)	
<input type="checkbox"/> Reduce outdoor water use (e.g., turf replacement/reduction, rain gardens, rain barrels, smart irrigation, outdoor water use meters, etc.)	
<input checked="" type="checkbox"/> Train employees how to conserve water	On going
<input checked="" type="checkbox"/> Implement a notification system to inform non-residential customers when water availability conditions change.	On going
<input type="checkbox"/> 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. <u>Plumbing code 4714.1702, Published October 31, 2016</u>	
<input type="checkbox"/> 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.

The residential per capita water demand shows a downward trend. Watermain replacement efforts, conservation efforts, installation of new residential water meters, and fluctuating economic conditions. The CII customer category demand remains relatively flat showing no significant increase or decrease in water use demand.

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: **2.66**

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: 0 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: 2018 _____

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	<input type="checkbox"/> Monthly billing <input checked="" type="checkbox"/> Increasing block rates (volume tiered rates) <input type="checkbox"/> Seasonal rates <input type="checkbox"/> Time of use rates <input checked="" type="checkbox"/> Water bills reported in gallons <input type="checkbox"/> Individualized goal rates <input checked="" type="checkbox"/> Excess use rates <input type="checkbox"/> Drought surcharge <input type="checkbox"/> Use water bill to provide comparisons <input type="checkbox"/> Service charge not based on water volume <input type="checkbox"/> Other (describe)	<input type="checkbox"/> Uniform <input type="checkbox"/> Odd/even day watering	<input type="checkbox"/> Service charge based on water volume <input type="checkbox"/> Declining block <input type="checkbox"/> Flat <input type="checkbox"/> Other (describe)
Commercial/Industrial/Institutional	<input type="checkbox"/> Monthly billing <input type="checkbox"/> Increasing block rates (volume tiered rates) <input type="checkbox"/> Seasonal rates <input type="checkbox"/> Time of use rates <input checked="" type="checkbox"/> Water bills reported in gallons <input type="checkbox"/> Individualized goal rates <input type="checkbox"/> Excess use rates <input type="checkbox"/> Drought surcharge <input type="checkbox"/> Use water bill to provide comparisons <input type="checkbox"/> Service charge not based on water volume <input type="checkbox"/> Other (describe)	<input type="checkbox"/> Uniform	<input type="checkbox"/> Service charge based on water volume <input type="checkbox"/> Declining block <input type="checkbox"/> Flat <input type="checkbox"/> Other (describe)
<input type="checkbox"/> 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:

The city has an increasing block rate.

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 least two 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

<input type="checkbox"/>	Participate in the GreenStep Cities Program, including implementation of at least one of the 20 "Best Practices" for water
<input checked="" type="checkbox"/>	Prepare a master plan for smart growth (compact urban growth that avoids sprawl)
<input checked="" type="checkbox"/>	Prepare a comprehensive open space plan (areas for parks, green spaces, natural areas)
<input type="checkbox"/>	Adopt a water use restriction ordinance (lawn irrigation, car washing, pools, etc.)
<input type="checkbox"/>	Adopt an outdoor lawn irrigation ordinance
<input type="checkbox"/>	Adopt a private well ordinance (private wells in a city must comply with water restrictions)
<input type="checkbox"/>	Implement a stormwater management program
<input type="checkbox"/>	Adopt non-zoning wetlands ordinance (can further protect wetlands beyond state/federal laws-for vernal pools, buffer areas, restrictions on filling or alterations)
<input type="checkbox"/>	Adopt a water offset program (primarily for new development or expansion)
<input type="checkbox"/>	Implement a water conservation outreach program
<input type="checkbox"/>	Hire a water conservation coordinator (part-time)

<input type="checkbox"/>	Implement a rebate program for water efficient appliances, fixtures, or outdoor water management
<input type="checkbox"/>	Other

Objective 8: Tracking Success: How will you track or measure success through the next ten years?

The city will continue to monitor water use data to see if conservation efforts are working.

Tip: The process to monitor demand reduction and/or a rate structure includes:

- The DNR Hydrologist will call or visit the community the first 1-3 years after the water supply plan is completed.
- 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.
- 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.
- 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.
- 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)?
<input type="checkbox"/> Rainfall sensors required on landscape irrigation systems	<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared Emergencies
<input type="checkbox"/> Water efficient plumbing fixtures required	<input type="checkbox"/> New development <input type="checkbox"/> Replacement <input type="checkbox"/> Rebate Programs
<input type="checkbox"/> Critical/Emergency Water Deficiency ordinance	<input type="checkbox"/> Only during declared Emergencies
<input checked="" type="checkbox"/> Watering restriction requirements (time of day, allowable days, etc.)	<input type="checkbox"/> Odd/even <input type="checkbox"/> 2 days/week <input checked="" type="checkbox"/> Only during declared Emergencies
<input type="checkbox"/> Water waste prohibited (for example, having a fine for irrigators spraying on the street)	<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared Emergencies

Regulations Utilized	When is it applied (in effect)?
<input type="checkbox"/> Limitations on turf areas (requiring lots to have 10% - 25% of the space in natural areas)	<input type="checkbox"/> New development <input type="checkbox"/> Shoreland/zoning <input type="checkbox"/> Other
<input type="checkbox"/> Soil preparation requirements (after construction, requiring topsoil to be applied to promote good root growth)	<input type="checkbox"/> New Development <input type="checkbox"/> Construction Projects <input type="checkbox"/> Other
<input type="checkbox"/> Tree ratios (requiring a certain number of trees per square foot of lawn)	<input type="checkbox"/> New development <input type="checkbox"/> Shoreland/zoning <input type="checkbox"/> Other
<input type="checkbox"/> Permit to fill swimming pool and/or requiring pools to be covered (to prevent evaporation)	<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared Emergencies
<input type="checkbox"/> Ordinances that permit stormwater irrigation, reuse of water, or other alternative water use (Note: be sure to check current plumbing codes for updates)	<input type="checkbox"/> Describe

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
<input checked="" type="checkbox"/> Low flush toilets, <input type="checkbox"/> Toilet leak tablets, <input checked="" type="checkbox"/> Low flow showerheads, <input checked="" type="checkbox"/> Faucet aerators;	<input checked="" type="checkbox"/> Education about <input type="checkbox"/> Free distribution of <input type="checkbox"/> Rebate for <input type="checkbox"/> Other	<input type="checkbox"/> Gas company <input type="checkbox"/> Electric company <input type="checkbox"/> Watershed organization

Water Use Targets	Outreach Methods	Partners
<input type="checkbox"/> Water conserving washing machines, <input type="checkbox"/> Dish washers, <input checked="" type="checkbox"/> Water softeners;	<input checked="" type="checkbox"/> Education about <input type="checkbox"/> Free distribution of <input type="checkbox"/> Rebate for <input type="checkbox"/> Other	<input type="checkbox"/> Gas company <input type="checkbox"/> Electric company <input type="checkbox"/> Watershed organization
<input checked="" type="checkbox"/> Rain gardens, <input type="checkbox"/> Rain barrels, <input type="checkbox"/> Native/drought tolerant landscaping, etc.	<input checked="" type="checkbox"/> Education about <input type="checkbox"/> Free distribution of <input type="checkbox"/> Rebate for <input type="checkbox"/> Other	<input type="checkbox"/> Gas company <input type="checkbox"/> Electric company <input type="checkbox"/> 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.):

The city includes education for water saving measures that can be accomplished in the home.

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 conservation methods	2	<input checked="" type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Consumer Confidence Reports	As required by law	1	<input checked="" type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Press releases to traditional local news outlets (e.g., newspapers, radio and TV)	N/A		<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Social media distribution (e.g., emails, Facebook, Twitter)	N/A		<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies

Education Methods	General summary of topics	#/Year	Frequency
Paid advertisements (e.g., billboards, print media, TV, radio, web sites, etc.)	N/A		<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Presentations to community groups			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Staff training			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Facility tours			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Displays and exhibits			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Marketing rebate programs (e.g., indoor fixtures & appliances and outdoor practices)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Community news letters	Water conservation methods		<input checked="" type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Direct mailings (water audit/retrofit kits, showerheads, brochures)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Information kiosk at utility and public buildings			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Public service announcements			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Cable TV Programs			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Demonstration projects (landscaping or plumbing)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies

Education Methods	General summary of topics	#/Year	Frequency
K-12 education programs (Project Wet, Drinking Water Institute, presentations)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Community events (children's water festivals, environmental fairs)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Community education classes			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Water week promotions			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Website (include address: www.longlakemn.gov)	Water conservation methods		<input checked="" type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Targeted efforts (large volume users, users with large increases)			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Notices of ordinances			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Emergency conservation notices			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies
Other:			<input type="checkbox"/> Ongoing <input type="checkbox"/> Seasonal <input type="checkbox"/> Only during declared emergencies

Briefly discuss what future education and information activities your community is considering in the future:

The city will continue to present educational material regarding to water conservation.

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
<input type="checkbox"/> None at this time		
<input checked="" type="checkbox"/> Comprehensive planning that guides development in vulnerable drinking water supply management areas	2018	City of Orono, City of Wayzata
<input type="checkbox"/> Zoning overlay		
<input type="checkbox"/> 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.

Appendix 1

Well Records and Maintenance Summaries

667910

County Hennepin
 Quad Excelsior
 Quad ID 105A

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
 Minnesota Statutes Chapter 1031

Entry Date 07/15/2002
 Update Date 04/16/2015
 Received Date

Well Name Township Range Dir Section Subsection
 LONG LAKE 1A 118 23 W 34 DBBDC
 Elevation 990 ft. Elev. Method 7.5 minute topographic map (+/- 5 feet)

Address
 Well 380 LONGVIEW AV LONG LAKE MN 55356
 C/W 1964 PARK AV LONG LAKE MN 55356

Stratigraphy Information

Geological Material	From	To (ft.)	Color	Hardness
TOP SOIL	0	5	BLACK	SOFT
CLAY	5	15	YELLOW	SOFT
CLAY	15	60	BLUE	SOFT
CLAY GRAVEL	60	190	GRAY	SOFT
CLAY GRAVEL	190	192	GRAY	SOFT
LIMESTONE	192	343	BRN/RED	HARD
LIMESTONE	343	345	RED/BRN	HARD
SANDSTONE	345	390	YELLOW	SOFT
SANDSTONE	390	395	WHITE	MEDIUM
SANDSTONE	395	400	WHT/RED	MEDIUM
SANDSTONE SHALE	400	410	WHT/GRN	M.SOFT
SANDSTONE	410	420	WHITE	SOFT
SANDSTONE SHALE	420	430	WHT/GRN	MEDIUM
SANDSTONE SHALE	430	440		MEDIUM
SANDSTONE	440	442	PINK	MED-HRD
SANDSTONE SHALE	442	450		MED-HRD
SANDSTONE SHALE	450	470		MED-HRD
80 % SHALE	470	475		MED-HRD

Well Depth Depth Completed Date Well Completed
 475 ft. 475 ft. 01/04/2002
 Drill Method Driven Drill Fluid Bentonite

Use community supply(municipal) Status Active

Well Hydrofractured? Yes No From To

Casing Type Step down Joint Welded
 Drive Shoe? Yes No Above/Below 2 ft.

Casing Diameter	Weight	Hole Diameter
18 in. To 240 ft.	lbs./ft.	24 in. To 19 ft.
19 in. To 24 ft.	lbs./ft.	23. in. To 240 ft.

Open Hole From 240 ft. To 475 ft.

Screen? Type Make

Static Water Level
 86 ft. Land surface Measure 01/04/2002

Pumping Level (below land surface)
 106 ft. 5 hrs. Pumping at 1200 g.p.m.

Wellhead Completion
 Pitless adapter manufacturer Model
 Casing Protection 12 in. above grade
 At-grade (Environmental Wells and Borings ONLY)

Grouting Information Well Grouted? Yes No Not Specified
 Material Amount From To
 Neat Cement 17 Cubic yards 0 ft. 240 ft.

Nearest Known Source of Contamination
 200 feet West Direction Sewer Type
 Well disinfected upon completion? Yes No

Pump Not Installed Date Installed
 Manufacturer's name
 Model Number HP Volt
 Length of drop pipe ft Capacity g.p. Typ

Abandoned
 Does property have any not in use and not sealed well(s)? Yes No

Variance
 Was a variance granted from the MDH for this well? Yes No

Miscellaneous
 First Bedrock Prairie Du Chien Group Aquifer Prairie Du Chien-
 Last Strat St.Lawrence Formation Depth to Bedrock 190 ft
 Located by Minnesota Department of Health
 Locate Method GPS SA Off (averaged)
 System UTM - Mad83, Zone 15, Meters X 454827 Y 4981412
 Unique Number Verification Tag on well Inpute Date 03/18/2003

Angled Drill Hole

Well Contractor
 Traut M.J. Well Co. 71536 TRAUT, T.
 Licensee Business Lic. or Reg. No. Name of Driller

Remarks
 GAMMA LOGGED 7-2-2002. M.G.S. NO. 4177. LOGGED BY JIM TRAEN. TO 422FT.
 VARIANCE #2556.

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD

MINNESOTA UNIQUE WELL NO.

667910

Minnesota Statutes Chapter 103I

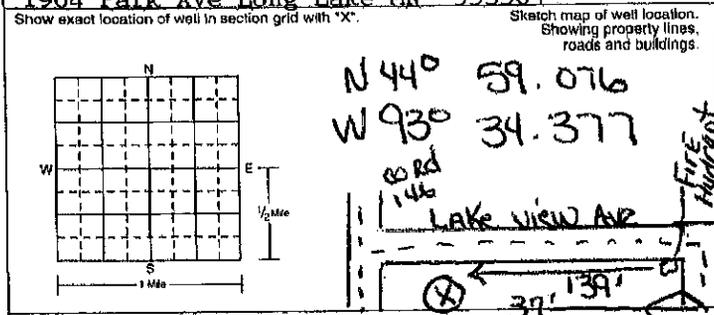
WELL LOCATION
County Name
Hennepin

Township Name: **Orono** Township No.: **118** Range No.: **23W** Section No.: **34** Fraction: **SE 1/4, SE NW 1/4**

WELL DEPTH (completed) **477 Top of Casing** Date Work Completed **1-4-02**

House Number, Street Name, City, and Zip Code of Well Location
1964 Park Ave Long Lake MN 55356

DRILLING METHOD
 Cable Tool Driven Dug
 Auger Rotary Jetted



DRILLING FLUID: **Bentonite** WELL HYDROFRACTURED? YES NO
FROM _____ ft. to _____ ft.

USE
 Domestic Monitoring Heating/Cooling
 Irrigation Community PWS Industry/Commercial
 Environ. Bore Hole Noncommunity PWS Remedial
 Dewatering _____

CASING Drive Shoe? Yes No HOLE DIAM.
 Steel Threaded Welded
 Plastic _____

CASING DIAMETER WEIGHT
24 in. to **19** lbs./ft. **24** in. to **19** lbs./ft.
18 in. to **240** lbs./ft. **23 1/4** in. to **240** lbs./ft.
_____ in. to _____ ft. _____ lbs./ft. _____ in. to _____ ft.

PROPERTY OWNER'S NAME
City of Long Lake

SCREEN OPEN HOLE
Make _____ from **240** ft. to **475** ft.
Type _____ Diam. _____
Slot/Gauze _____ Length _____
Set between _____ ft. and _____ ft. FITTINGS: _____

Property owner's mailing address if different than well location address indicated above.
**1964 Park Ave
Long Lake, MN 55356**

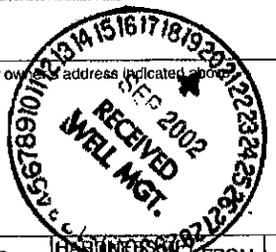
STATIC WATER LEVEL
86 ft. below above land surface Date measured **1-4-02**

WELL OWNER'S NAME
City of Long Lake

PUMPING LEVEL (below land surface)
106' ft. after **5** hrs. pumping **1200** g.p.m.

Well owner's mailing address if different than property owner's address indicated above.
**1964 Park Ave
Long Lake, MN 55356**

WELL HEAD COMPLETION
 P/loss adapter manufacturer _____ Model _____
 Casing Protection _____ 12 in. above grade
 At-grade (Environmental Wells and Borings ONLY)



GEOLOGICAL MATERIALS	COLOR	HARDNESS MATERIAL	FROM	TO
Topsoil	Blk	S	0	5
Clay	Yellow	S	5	15
Clay	Blue	S	15	60
Clay Gravel	Grey	S	60	192
Limestone	Brn Red	H	192	345
Sandstone	Yellow	S	345	390
Sandstone	White	M	390	395
Sandstone	White Red	M	395	400
Sandstone	White Crn	M	400	410

ROUTING INFORMATION
Well grouted? Yes No
Grout Material Neat cement Bentonite Concrete High Solids Bentonite
from **0** to **240** ft. **17** yds. bags
from _____ to _____ ft. _____ yds. bags
from _____ to _____ ft. _____ yds. bags

NEAREST KNOWN SOURCE OF CONTAMINATION
200 feet **West** direction **Sewer Line**
Well disinfected upon completion? Yes No

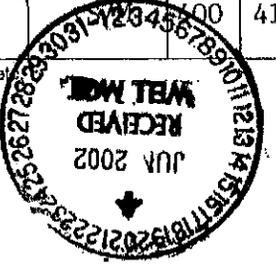
PUMP
 Not installed Date installed _____
Manufacturer's name _____
Model number _____ HP _____ Volts _____
Length of drop pipe _____ ft. Capacity _____ g.p.m.
Type: Submersible L.S. Turbine Reciprocating Jet _____

ABANDONED WELLS
Does property have any not in use and not sealed well(s)? Yes No

VARIANCE
Was a variance granted from the MDH for this well? Yes No TN# **2556**

WELL CONTRACTOR CERTIFICATION
This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

REMARKS, ELEVATION, SOURCE OF DATA, etc.
SEP 20 2002
DATA RECEIVED From **MARK J TRAUT**



Mark J Traut Wells, Inc. 71536
Licensee Business Name Lic. or Reg. No.
Mark J Traut 6/14/02
Authorized Representative Signature Date
Tony Traut 6-14-02
Name of Driller Date

6-17-02
9-20-02

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING RECORD
Minnesota Statutes Chapter 102

MINNESOTA UNIQUE WELL NO.
667910

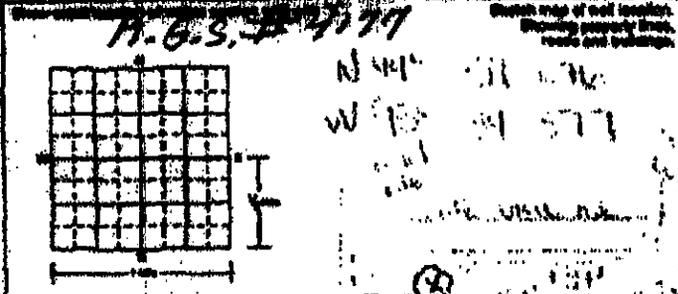
WELL LOCATION
County Name
Stearns

County Name
Stearns
Township No. **118**
Range No. **29N**
Section No. **34**
Position **SE SE NW**

WELL DEPTH (completed)
477 Top of Casing
Date Well Completed
1-4-02

Address Number, Street Name, City, and Zip Code of Well Location
1064 Park Ave Long Lake MN 55306

DRILLING METHOD
 Cable Tool Down Dip
 Auger Rotary Jacked



DRILLING FLUID
Bentonite
WELL HYDROFRACTURED? YES NO

PROPERTY OWNER'S NAME
City of Long Lake #3

USE
 Domestic Irrigation Service, Base Hole
 Monitoring Continuously PWD Nonpotentiometry PWD Sampling
 Neighboring Casing Industry/Commercial Remedial

PROPERTY OWNER'S ADDRESS
1064 Park Ave Long Lake, MN 55306

CASING
 Steel Plastic Drive Shaft Threaded Welded
HOLE DIAM.
_____ in. to _____ in.

ADDITIONAL COMMENTS
118-23-34 11866dc
ELV. 990.5

CASING DIAMETER
18 in. to **24** in. WEIGHT
_____ lb. ft. _____ lb. ft. _____ lb. ft. _____ lb. ft.

WELL OWNER'S NAME
City of Long Lake

SCREEN
Name _____ OPEN HOLE
Type _____ INCH _____ INCH
Material _____ Length _____
Set between _____ and _____ FITTING

RECEIVED
By: _____

STATIC WATER LEVEL
_____ ft. above _____ ft. above land surface Date measured **1-4-02**

REMARKS, REMEDIAL, SOURCE OF DATA, etc.
8 - logged

PERMANENT LEVEL (below land surface)
_____ ft. above _____ ft. above _____ ft. above _____ ft. above

GEOLOGICAL MATERIALS	COLOR	THICKNESS OF MATERIAL	FROM	TO
Gravel	Blk	S	0	5
Clay	Yellow	S	5	15
Clay	Blk	S	15	60
Clay Gravel	Grey	S	60	192
Limestone	Red Sand	H	192	345
Sandstone	Yellow	S	345	390
Sandstone	White	H	390	395
Sandstone	White Sand	H	395	400
Sandstone	White Sand	S/H	400	410

WELL HEAD COMPLETION
 Filter assembly manufacturer _____ Model _____
 Casing Protection _____ (if 12 in. above grade)
 Screen _____

NEAREST KNOWN SOURCE OF CONTAMINATION
200 feet **1000** direction **South East**
Well abandoned upon completion? Yes No

PUMP
 Not installed Date installed _____
Manufacturer's Name _____
Model number _____ HP _____ Volts _____
Length of drop pipe _____ ft. Capacity _____ g.p.m.
Type: Submersible L.A. Turbine Reciprocating J.M. _____

ABANDONED WELLS
Date property have any not in use and not sealed wells? Yes No

VARIANCE
Was a variance granted from the MSH for this well? Yes No THE _____

WELL CONTRACTOR IDENTIFICATION
This well was drilled under my supervision and in accordance with Minnesota Rules, Chapter 4726. The information contained in this report is true to the best of my knowledge.

Mark J Trout Wells, Inc. 71536
Licensed Well Driller License No. _____
Authorized Representative Signature _____
Roy Trout 6-14-02
Name of Driller Title

ADDITIONAL DATA ADDED TO THIS DOCUMENT
JAN 8 2003
DATA RECEIVED From **mg** By: **W**

667910



AUTOMATIC SYSTEMS CO.

March 23, 2011

Mr. Marv Wurzer
City of Long Lake
2145 Daniels Street
Long Lake, MN. 55356

*Ins called
4-2011*

Reference: Alarm Dialer

Dear Marv:

In accordance with your request to our Mr. Terry Moore during his recent service trip we are pleased to offer the following:

- A One (1) **4-Channel Automatic Alarm dialer** as manufactured by Raco.
- B One (1) **Lot of field labor** as required to remove the existing defective alarm dialer and installed the new unit.
- C One (1) Lot of startup, testing and training.

Your net price for Items A through , FOB factory with **freight allowed** to jobsite including one (1) year warranty from date of startup (not to exceed 18 months from date of shipment).....\$2135.00 (plus tax).

Please note, price does not include any sales or use tax.

Thank you very much for the opportunity of providing you with the above proposal, should you wish to proceed with an order please sign on the space provided below and return a copy to this office.

We look forward to hearing from you, should you have any questions please don't hesitate to give Terry or me a call.

<input checked="" type="checkbox"/> MAIN OFFICE:	P.O. BOX 120358	ST. PAUL, MINNESOTA 55112	PHONE 651-631-9005	(FAX) 651-631-0027
<input type="checkbox"/> BRANCH OFFICE:	P.O. BOX 797	AMES, IOWA 60040	PHONE 515-232-4770	(FAX) 515-232-0795

March 23, 2011
Page 2
Long Lake, MN

Sincerely,



Lane Stewart
Automatic Systems Company

Accepted by: <i>Mary Wagon</i> Date: <i>3-23-11</i>

City of Long Lake Public Works Director

Cc: Mr Terry Moore - ASC

PO# 0831-PW



6845 - 20th Avenue South, Ste 140
 Centerville, MN 55038-7761
 Phone 651-773-5422/Fax 651-773-5423

PW Copy

Invoice

DATE	INVOICE #
12/31/2013	12968

BILL TO	SHIP TO
City of Long Lake Accounts Payable 450 Virginia Avenue PO Box 606 Long Lake, MN 55356	City of Long Lake Public Works Dept Marv Wurzer 2145 Daniels Street Long Lake, MN 55356

PAID
 01/24/2014

P.O. NUMBER	TERMS	DUE DATE	REP	SHIP	VIA	OTHER
Verbal Marv	Net 30	1/30/2014	DFS	12/31/2013	SERVICE	

QUANTITY	ITEM CODE	DESCRIPTION	PRICE EACH	AMOUNT
		MN State Sales Tax 6.875%	6.875%	79.11

It's been a pleasure working with you! Thank you for your business.

Total \$1,229.77

To make a credit card payment, please call 651-773-5422 and ask for the finance department.

Web Site	www.cieinc.net	USD	Accredited BBB Member Since 2004	CIE, Inc. Federal Tax ID No. 41-1643709
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On late payments, the contract price shall, without prejudice to Seller's right to immediate payment, be increased by 1 1/2% per month on the unpaid balance, but not to exceed the maximum permitted by law.



Purchase Order Form

PO# 1536 - PW

BILL TO: City of Long Lake
450 Virginia Avenue
PO Box 606
Long Lake, MN 55356
Phone / (952) 473-6961
Fax / (952) 476-9622

SHIP TO: Long Lake City Hall (CH)
450 Virginia Avenue / Long Lake, MN 55356
 Long Lake Public Works Department (PW)
2145 Daniels Street / Long Lake, MN 55356
 Long Lake Fire Department (FD)
340 Willow Drive / Long Lake, MN 55356

INSTRUCTIONS TO STAFF

- 1) A Purchase Order Form must be completed and approved prior to every purchase. Invoices associated with on-going pre-approved contracts for services may not require a Purchase Order, if waived in advance by the City Administrator.
- 2) A Department Head signature is required for all purchases, prior to purchase. Department Head is defined as the City Administrator for City Hall employees; the Public Works Director for the Public Works Department; and the Fire Chief or Assistant Fire Chief for the Fire Department.
- 3) Additionally, City Administrator approval is required on all purchases over \$500, prior to purchase.
- 4) Please print clearly and legibly.

PURCHASE ORDER REQUEST

DATE PREPARED 2-20-14 DATE NEEDED BY _____

VENDOR Connelly Industrial Electronics

VENDOR ADDRESS 6845 - 20th Ave So CITY / STATE / ZIP Canterville, Minn. 55038-7761

VENDOR CONTACT - Dan Swenson VENDOR E-MAIL _____

VENDOR PHONE (651) 773-5432 VENDOR FAX (651) 773-5423

DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL
Continued Control Problems with radio system - Water Level Controls	3.5 hrs	95.00	332.50
	6 1/4 miles	56 hrs	35.84
All Antennas checked again for resistance - changes made.			
(This See represents Labor cost to Connelly Industrial to work with Technician from TCIC see invoice # 17993 which was labor only see TCIC)			
		SHIPPING & HANDLING	
		MN SALES TAX	
		TOTAL	368.34

NEED FOR PURCHASE Repair - investigation of intermittent alarms - daily alarms reduced to 1 or 2 per week - likely water tower antenna lead

APPARATUS / FLEET VEHICLE ID (IF APPLICABLE) _____

EXPENDITURE ACCOUNT CODE 601-49400-4040 EXPLANATION Equip Maint + Repair

SIGNATURES ** ATTENTION VENDORS: PURCHASE ORDER NOT VALID WITHOUT REQUIRED SIGNATURES **

EMPLOYEE NAME Marv Wenzel TITLE Public Works Director

DEPARTMENT HEAD SIGNATURE Marv Wenzel DATE 2-20-14

DEPARTMENT HEAD SIGNATURE REQUIRED ON ALL PURCHASES _____

CITY ADMINISTRATOR SIGNATURE _____ DATE _____

ADMINISTRATOR SIGNATURE REQUIRED ON ALL PURCHASES OVER \$500 _____



Purchase Order Form

PO# 1520 - PW

BILL TO: City of Long Lake
450 Virginia Avenue
PO Box 606
Long Lake, MN 55356
Phone / (952) 473-6961
Fax / (952) 476-9622

SHIP TO: Long Lake City Hall (CH)
450 Virginia Avenue / Long Lake, MN 55356
 Long Lake Public Works Department (PW)
2145 Daniels Street / Long Lake, MN 55356
 Long Lake Fire Department (FD)
340 Willow Drive / Long Lake, MN 55356

INSTRUCTIONS TO STAFF

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- 2) A **Department Head signature is required for all purchases, prior to purchase**. Department Head is defined as the City Administrator for City Hall employees; the Public Works Director for the Public Works Department; and the Fire Chief or Assistant Fire Chief for the Fire Department.
- 3) **Additionally, City Administrator approval is required on all purchases over \$500, prior to purchase.**
- 4) Please print clearly and legibly.

PURCHASE ORDER REQUEST

DATE PREPARED Jan 15th 2014 DATE NEEDED BY /

VENDOR Connelly Industrial Electronics

VENDOR ADDRESS 6845- 20th Ave South CITY / STATE / ZIP Ste 140 Cantonville, Minn 55038-776

VENDOR CONTACT Bob Connelly VENDOR E-MAIL

VENDOR PHONE (651) - 773 - 5422 VENDOR FAX (651) 773 - 5423

DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL
Water System Radio control system	Tech 2.5 hrs	95.00	237.50
intermittent failure. (Numerous Alarms)	70 miles	.565	39.55
Trouble shooting investigation and repairs to date.	Tech 8 hrs	95.00	760.00
	87 miles	.565	49.33
Note: Water Tower antenna cable will need to be repaired - Alarms Reduced Substantially Solving repair.	Tax	6.875	79.11
SHIPPING & HANDLING			
MN SALES TAX			
TOTAL			<u>1779.77</u>

NEED FOR PURCHASE Water System level Control System Repair. Radio / cable / antenna problems

APPARATUS / FLEET VEHICLE ID (IF APPLICABLE)

EXPENDITURE ACCOUNT CODE 601, 49400, 404D EXPLANATION Equip Maint & Repair

SIGNATURES ** ATTENTION VENDORS: PURCHASE ORDER NOT VALID WITHOUT REQUIRED SIGNATURES **

EMPLOYEE NAME Mark Wurzen TITLE Public Works Director

DEPARTMENT HEAD SIGNATURE Mark Wurzen DATE 1-15-2014
DEPARTMENT HEAD SIGNATURE REQUIRED ON ALL PURCHASES

CITY ADMINISTRATOR SIGNATURE _____ DATE _____
ADMINISTRATOR SIGNATURE REQUIRED ON ALL PURCHASES OVER \$500



Purchase Order Form

PO# 1523 - PW

BILL TO: City of Long Lake
450 Virginia Avenue
PO Box 606
Long Lake, MN 55356
Phone / (952) 473-6961
Fax / (952) 476-9622

SHIP TO: Long Lake City Hall (CH)
450 Virginia Avenue / Long Lake, MN 55356
 Long Lake Public Works Department (PW)
2145 Daniels Street / Long Lake, MN 55356
 Long Lake Fire Department (FD)
340 Willow Drive / Long Lake, MN 55356

INSTRUCTIONS TO STAFF

- 1) A Purchase Order Form must be completed and approved prior to every purchase. Invoices associated with on-going pre-approved contracts for services may not require a Purchase Order, if waived in advance by the City Administrator.
- 2) **A Department Head signature is required for all purchases, prior to purchase**. Department Head is defined as the City Administrator for City Hall employees; the Public Works Director for the Public Works Department; and the Fire Chief or Assistant Fire Chief for the Fire Department.
- 3) **Additionally, City Administrator approval is required on all purchases over \$500, prior to purchase.**
- 4) Please print clearly and legibly.

PURCHASE ORDER REQUEST

DATE PREPARED 1-17-14 DATE NEEDED BY _____

VENDOR Connally Industrial Electronics

VENDOR ADDRESS 6845 - 20th Ave South, Ste 140 CITY / STATE / ZIP Centerville, Mn. 55038-7861

VENDOR CONTACT Bob Connally VENDOR E-MAIL _____

VENDOR PHONE (651) 773-5422 VENDOR FAX (651) 773-5423

DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL
<u>Evaluation of radio + antenna system at all 3 water system sites using specialized equipment 1-3-14</u>	<u>1</u>	<u>375.00</u>	<u>375.00</u>
<u>Continuous Alarms for low tank level and power fails - have been reduced but not completely cured. - Need to explore cable at Water Towers.</u>			
		SHIPPING & HANDLING	
		MN SALES TAX	
		TOTAL	<u>375.00</u>

NEED FOR PURCHASE Water System Repair

APPARATUS / FLEET VEHICLE ID (IF APPLICABLE) _____

EXPENDITURE ACCOUNT CODE 601-49400-4040

EXPLANATION Equip Maint + Repair

SIGNATURES ** ATTENTION VENDORS: PURCHASE ORDER NOT VALID WITHOUT REQUIRED SIGNATURES **

EMPLOYEE NAME Marv Wanzor TITLE Public Works Director

DEPARTMENT HEAD SIGNATURE Marv Wanzor DATE 1-17-14
DEPARTMENT HEAD SIGNATURE REQUIRED ON ALL PURCHASES

CITY ADMINISTRATOR SIGNATURE _____ DATE _____
ADMINISTRATOR SIGNATURE REQUIRED ON ALL PURCHASES OVER \$500



Invoice

6845 - 20th Avenue South, Ste 140
 Centerville, MN 55038-7761
 Phone 651-773-5422/Fax 651-773-5423

DATE	INVOICE #
4/24/2014	13159

BILL TO
City of Long Lake Accounts Payable 450 Virginia Avenue PO Box 606 Long Lake, MN 55356

SHIP TO
City of Long Lake Public Works Dept Marv Wurzer 2145 Daniels Street Long Lake, MN 55356

P.O. NUMBER	TERMS	DUE DATE	REP	SHIP	VIA	OTHER
Verbal Marv	Net 30	5/24/2014	NJC	4/24/2014	SERVICE	SCADA

QUANTITY	ITEM CODE	DESCRIPTION	PRICE EACH	AMOUNT
4.25	Tech Labor	Tech Labor Services 4-17-2014 Service Trip: SCADA 1) Service trip to troubleshoot radio issues. a) Cycled Radio power 2) Dialer makes erroneous calls a) Messages for "general" channel 3 are wrong. i. The recorded message when dialer channel 3 is active are the ones for dialer channel 2 b) Dialer makes calls when channel is not active. 3) Need to quote an eight channel dialer (original 4-channel size only provides minimal coverage) with eight hours of labor to Marv 4) Quote prepared and sent via e-mail on 4-18-2014	95.00	403.75
82	Mileage	Mileage	0.56	45.92

*Marv Wurzer 5-17-14
 PO# 1599-PW
 acct. 601-49400-4040*

It's been a pleasure working with you! Thank you for your business.

Total \$449.67

To make a credit card payment, please call 651-773-5422 and ask for the finance department.

Web Site	www.cieinc.net	USD	Accredited BBB Member Since 2004	CIE, Inc. Federal Tax ID No. 41-1643709
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On late payments, the contract price shall, without prejudice to Seller's right to immediate payment, be increased by 1 1/2% per month on the unpaid balance, but not to exceed the maximum permitted by law.

206933

County Hennepin
Quad Excelsior
Quad ID 105AMINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
Minnesota Statutes Chapter 1031

Entry Date 08/24/1991

Update Date 04/22/2015

Received Date

Well Name LONG LAKE 2	Township 118	Range 23	Dir Section W 35	Subsection CABBDD	Well Depth 448 ft.	Depth Completed 448 ft.	Date Well Completed 00/00/1965
Elevation 960 ft.	Elev. Method 7.5 minute topographic map (+/- 5 feet)				Drill Method Cable Tool	Drill Fluid	
Address					Use community supply(municipal)	Status Active	
Contact 1964 PARK AV LONG LAKE MN 55356					Well Hydrofractured? Yes <input type="checkbox"/> No <input type="checkbox"/> From <input type="checkbox"/> To <input type="checkbox"/>		
Well 1345 WAYZATA BL W LONG LAKE MN 55356					Casing Type Step down <input type="checkbox"/> Joint <input type="checkbox"/>		
Stratigraphy Information					Drive Shoe? Yes <input type="checkbox"/> No <input type="checkbox"/> Above/Below <input type="checkbox"/>		
Geological Material	From	To (ft.)	Color	Hardness	Casing Diameter 12 in. To 366 ft. lbs./ft. 20 in. To 184 ft. lbs./ft.		
CLAY	0	22	YELLOW		Open Hole From 366 ft. To 448 ft.		
BLUE CLAY W/SMALL	22	27			Screen? <input type="checkbox"/> Type Make		
BOULDERS	27	30			Static Water Level 72 ft. Land surface Measure 08/31/1988		
COARSE GRAVEL	30	33			Pumping Level (below land surface)		
FINE SAND	33	37			Wellhead Completion Pitless adapter manufacturer <input type="checkbox"/> Model <input type="checkbox"/> <input type="checkbox"/> Casing Protection <input type="checkbox"/> 12 in. above grade <input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
BOULDER CLAY	37	42			Grouting Information Well Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified		
COARSE SAND	42	47			Nearest Known Source of Contamination feet Direction Type Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No		
FINE SAND	47	57			Pump <input checked="" type="checkbox"/> Not Installed Date Installed Manufacturer's name Model Number HP Volt Length of drop pipe ft Capacity g.p. Typ		
GRAVEL	57	67			Abandoned Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No		
MEDIUM SAND	67	121			Variance Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No		
CLAY & SAND	121	132			Miscellaneous First Bedrock St.Peter Sandstone Aquifer Jordan Last Strat St.Lawrence Formation Depth to Bedrock 158 ft Located by Minnesota Department of Health Locate Method GPS SA On (averaged) System UTM - Mad83, Zone 15, Meters X 456081 Y 4981388 Unique Number Verification Information from Input Date 10/12/1999		
FINE SAND	132	142			Angled Drill Hole		
SANDSTONE	142	152			Well Contractor Mueller Well Co. 96460 Licensee Business Lic. or Reg. No. Name of Driller		
SAND & CLAY	152	157					
ST. PETER	157	158					
ST. PETER	158	178					
SHALE	178	182					
SHALE & LIMESTONE	182	202					
SHAKOPEE LIMESTONE	202	292	RED	HARD			
SHAKOPEE LIMESTONE	292	324		SOFT			
JORDAN SANDSTONE	324	345	YELLOW	SOFT			
JORDAN SANDSTONE	345	422		MEDIUM			
JORDAN SANDSTONE	422	429					
JORDAN SANDSTONE	429	431					
JORDAN SANDSTONE	431	448	WHITE	HARD			
Remarks LONG LAKE MUNI #2 MP=1.8 MARV WURZER. GAMMA LOGGED 3-20-1996. ORIG. DEPTH 366 FT DEEP, 184' OF 20" CSG, 366 FT. 12" LINER, FM 1972 MDH SAN RPT							

Alden Pool and Municipal Supply Co.
 268 South Broadway
 Wells MN 56097-1630
 800-253-7235



Invoice

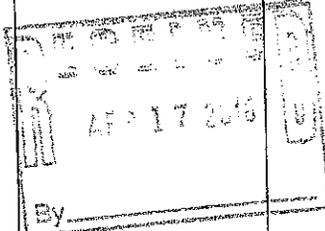
DATE	INVOICE NO
3/12/2018	18085

BILL TO
City of Long Lake Attn Luke 450 Virginia Avenue Long Lake MN 55356

SHIP TO
City of Long Lake Attn Luke 450 Virginia Avenue Long Lake MN 55356

P.O. NO.	TERMS

DESCRIPTION	QTY	RATE	AMOUNT
Gas chlorinator SR 9 Switchover regulator system 2 regulators 1 rate meter 100 ppd and 1 ejector#12 \$2600 complete system with unions	1	2,800.00	2,800.00
SPRING GOOD CUSTOMER DISCOUNT		-200.00	-200.00
Shipping & handling 1-507-383-1063 no charge		0.00	0.00
		Total	\$2,600.00
		Balance Due	\$2,600.00



601-444-05-2210
Wells #2



pw copy

Invoice

6845 - 20th Avenue South, Ste 140
Centerville, MN 55038-7761
Phone 651-773-5422/Fax 651-773-5423

DATE	INVOICE #
1/31/2014	12989

BILL TO
City of Long Lake Accounts Payable 450 Virginia Avenue PO Box 606 Long Lake, MN 55356

SHIP TO
City of Long Lake Public Works Dept Marv Wurzer 2145 Daniels Street Long Lake, MN 55356

P.O. NUMBER	TERMS	DUE DATE	REP	SHIP	VIA	OTHER
Verbal Marv	Net 30	3/2/2014	DFS	1/31/2014	SERVICE	

QUANTITY	ITEM CODE	DESCRIPTION	PRICE EACH	AMOUNT
3.5	Tech Labor	Tech Labor 1-3-2014 Service Trip: 1. Investigate the three antennas 2. Water Tower antennae lead looks to be OK 3. Well 1 antennae looks great (the lead-in and connectors were replaced last week) 4. At the other remotes, it was noticed that Zones 3, 4, 5 had the most errors - so they were disabled 5. Well 2 antennae looks OK except that the three foot jumper cable from radio to the surge arrestor had more loss than to be expected	95.00	332.50
64	Mileage	Mileage	0.56	35.84
		<i>⊕ Fee for CIE Technician Labor working with TCIC Technician, and specialized equipment.</i> <i>*Mow Wurzer 2-20-14</i> <i>PO# 1536 -PW</i> <i>601-49400-4040</i>		
To make a credit card payment, please call 651-773-5422 and ask for the finance department.				

It's been a pleasure working with you! Thank you for your business.			Total	\$368.34
---	--	--	--------------	----------

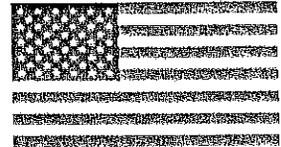
Web Site	www.cieinc.net	USD	Accredited BBB Member Since 2004	CIE, Inc. Federal Tax ID No. 41-1643709
----------	----------------	-----	----------------------------------	---

On late payments, the contract price shall, without prejudice to Seller's right to immediate payment, be increased by 1 1/2% per month on the unpaid balance, but not to exceed the maximum permitted by law.

In Control, Inc.
 10350 Jamestown Street NE
 Blaine, MN 55449



Designed and Built By
 In Control, Inc.



Sold To:

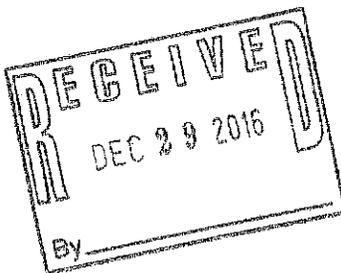
City of Long Lake
 450 Virginia Avenue
 PO Box 606
 Long Lake, MN 55356

Invoice Number: 16035ED01

Invoice Date: Dec 27, 2016

InC Project ID: 16035ED

Customer ID	Purchase Order	Payment Terms	Sales Rep	Page
0594CofLL	Verbal J Goehring	Net 30 Days	JWK-SR	1
Quantity	Item	Description	Unit Price	Extension
5.50		Engineering Services for Mike McCann See Attached Field Service Report Tax Exempt Thanks for your Business!	135.00	742.50

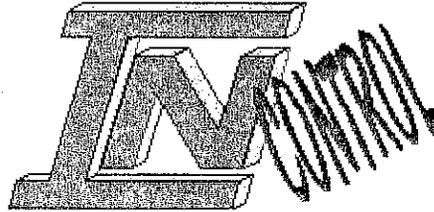


Sales Tax	0.00
Freight	

PAST DUE BALANCES ARE SUBJECT TO 2% (24% APR) PER MONTH SERVICE CHARGE

Total	\$742.50
-------	----------

Phone: (763) 783-9500 If you have a question about this invoice please call
 Fax: (763) 783-9502 Ken Kawiecki at extension 1003



FIELD SERVICE REPORT

Customer Information	Service Information
Work Requested by: Jason Goehring	Date Work Performed: 12/9/16
Customer Name: City of Long Lake	Travel Hours: 1
Customer Address: 450 Virginia Ave, PO Box 606	On Site Hours: 3.5
Customer City: Long Lake	Office Hours: 1
Customer State: MN	Total Hours: 5.5
Customer Zip: 55356	Warranty (y/n): N
Customer Phone: (763) 479-9846	Paid Service (y/n): Y
Date Requested: November 2016	Field Engineer: MJM
Customer P.O. Number: Verbal	Job Number: 16035ED

Description of Work Performed:

Well 2 had been changing to pressure control mode and overflowing the tower. I examined the PLC program and found that there are multiple conditions that will start the well. The logic at well 2 is setup to switch to local control mode whenever communication is lost. In addition the logic was setup to switch to pressure mode whenever the pressure went below the low pressure setpoint regardless of whether the control mode was local or remote. With this logic, the control mode can switch to pressure mode behind the scenes and then lie in wait until the control mode is switched to local. Then the only way to get out of pressure mode is to meet the stop pressure setpoint. In order to help resolve this problem and confusion, I have added some additional logic to prevent switching to pressure mode unless the control mode is set to local.

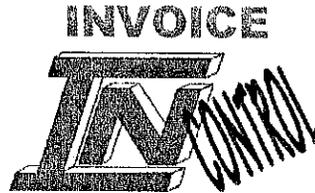
Mike McCann
12/23/2016

IN - Control, inc.

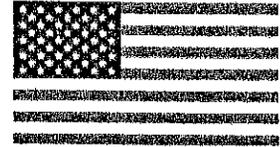
10350 Jamestown Street NE
Blaine, MN 55449

Phone: (763) 783-9500
Fax: (763) 783-9502

In Control, Inc.
 10350 Jamestown Street NE
 Blaine, MN 55449

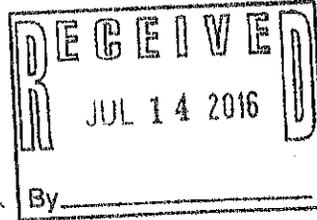


Designed and Built By
 In Control, Inc.



Sold To:

City of Long Lake
 450 Virginia Avenue
 PO Box 606
 Long Lake, MN 55356



Invoice Number: 16035EB01

Invoice Date: Jul 11, 2016

InC Project ID: 16035EB

Customer ID	Purchase Order	Payment Terms	Sales Rep	Page
0594CofLL	Verbal J Goehring	Net 30 Days	JWK-SR	1

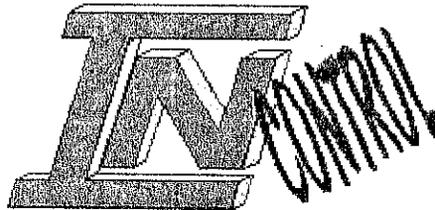
Quantity	Item	Description	Unit Price	Extension
4.00		Engineering Services for Mike McCann See Attached Field Service Report. Tax Exempt Thanks for your Business!	135.00	540.00

Sales Tax	0.00
Freight	

Total **\$540.00**

PAST DUE BALANCES ARE SUBJECT TO 2% (24% APR) PER MONTH SERVICE CHARGE

Phone: (763) 783-9500 If you have a question about this invoice please call
 Fax: (763) 783-9502 Ken Kawiecki at extension 1003

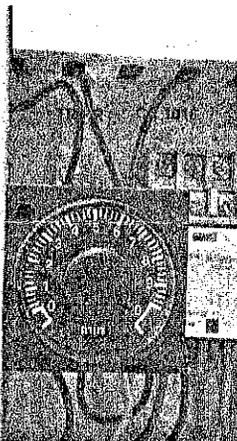


FIELD SERVICE REPORT

Customer Information	Service Information
Work Requested by: Jason Goehring	Date Work Performed: 6/30
Customer Name: City of Long Lake	Travel Hours: 1
Customer Address: 450 Virginia Ave, PO Box 606	On Site Hours: 3
Customer City: Long Lake	Office Hours: 0
Customer State: MN	Total Hours: 4
Customer Zip: 55356	Warranty (y/n): N
Customer Phone: (763) 479-9846	Paid Service (y/n): Y
Date Requested: July 2016	Field Engineer: MJM
Customer P.O. Number: Verbal	Job Number: 16035EB

Description of Work Performed:

Well 2 had shut down and was indicating "High Temperature Alarm" on the operator interface at the well house. After going online with the GE PLC, it was found that the reason why the pump was not running was actually a fail to start alarm. Initially, there appeared to be no specific reason for the fail to start and the alarm was reported as being intermittent. After further investigation, it was found that there was an external prelube timer that was set to just under 2 minutes. The PLC fail to start timer was set to 2 minutes and must wait until the prelube timer to time out before the start command is sent to the well. Since the two timer values are so close together it is possible to get the fail to start alarm if the hardware timer sometimes takes a little longer to time out. In order to resolve this issue, I changed the PLC fail to start timer from 2 minutes to 3 minutes.



Hardware Prelube Timer

Mike McCann
7/10/2016

IN - Control, inc.

10350 Jamestown Street NE
Blaine, MN 55449

Phone: (763) 783-9500
Fax: (763) 783-9502



M-Series® M2000

M2000-to-M2000 Interchangeability Procedure

SCOPE

This document defines the process for updating an M2000 amplifier.

LIMITATIONS

For M2000-to-M2000 replacement, all detector sizes are allowed for exchange.

M2000-TO-M2000 ACCURACY STATEMENT

The M2000 amplifier will be within $\pm 0.10\%$ of Full Scale.

M2000-TO-M2000 UPDATE PROCEDURE

1. Record the amplifier pipe diameter: DN200 / 8
2. Record the amplifier detector factor: 4143.60
3. Record the amplifier detector offset: -0.0034 m/s
4. Record all applicable setup parameters in the tables provided in this document.
5. Disconnect power to the amplifier before removing connections.
- ✓ 6. Remove all wiring connections from the amplifier.
7. Remove amplifier PCB/enclosure and replace with new PCB/enclosure.
8. Reconnect Coil/Electrode connections. Reconnect all other pluggable inputs and outputs.
9. Apply power to the amplifier.
10. Configure Pipe Diameter with original value recorded in step 1.
11. Configure Detector Factor with original value recorded in step 2.
12. Configure Detector Offset with original value recorded in step 3.
13. Configure M2000 to remaining parameters recorded in step 4.

RECORD SETUP PARAMETERS

Main Menu

METER SETUP				
Scale Factor	00.00 %			
Empty Pipe	off			
Power Line Freq	60 HZ			
Excitation Freq	(7.5, 15, 1.0, 3.75)			
Pipe Diameter	8"			
Amplifier Factor				
Detector Factor	4143.60			
Detector Current				
Detector Offset	-0.0034 m/s			
MEASUREMENTS				
Flow Unit	GPM			
Totalizer Unit	US Gallons			
Full Scale Flow	1230.00 gpm	Max = 5975.43 gpm		
Low Flow Cut Off	0.2%			
Flow Direction	Uni-Directional			
Damping Factor	NO DAMPING			
INPUTS/OUTPUTS				
Analog Output	Range 4-20mA Alarm High			
Digital Input	None			
Digital Outputs	#1	#2	#3	#4
Pulses/Unit	0000001.00	0000049.	N/A	N/A
Pulse Width	0	0	N/A	N/A
Full Scale Freq	N/A	N/A		N/A
Preset Amount	0	0		
Set Point Min	0	0		
Set Point Max	100%	100%		
Output Type	Normally open	Normal open		
Select Function				

Forward Pulse →

NOTE: Tables continue on the next page.



Communications Menu

Port A Settings	
Interface	Modbus RTU (DEF) ✓
Modbus RTU (def)	✓
Remote Menu	
Disable Port	
Port Address	(1-247)
Baud Rate	9600 (DEF)
Parity	Even (DEF)
Data Bits	8 bits (DEF)
Stop Bits	1 Stop Bit (DEF)

Advanced Menu

Unit Multiplier	OFF
Backlight Control	Timed OFF 1 min
Analog Output	
Software Filter	
Activation	OFF
Filter Delay	N = 0001
Acceleration	1.0000
Constant Flow	ISO.00000 M3S2
Peak Detect	00.0
Empty Pipe Cal	
Cal Empty Pipe	Volts 3.000
Cal Full Pipe	Volts 0.118
Security	
Set Admin Pin	
Set Service Pin	"
Set User Pin	
Language Select	

Control. Manage. Optimize.

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www.badgermeter.com

The Americas | Badger Meter | 4545 West Brown Deer Rd | PO Box 245036 | Milwaukee, WI 53224-9536 | 800-876-3837 | 414-355-0400
 México | Badger Meter de las Americas, S.A. de C.V. | Pedro Luis Ogazón N°32 | Esq. Angelina N°24 | Colonia Guadalupe Inn | CP 01950 | Mexico, DF | México | +52-55-5662-0882
 Europe, Middle East and Africa | Badger Meter Europa GmbH | Nürtinger Str 76 | 72639 Neuffen | Germany | +49-7025-9208-0
 Europe, Middle East Branch Office | Badger Meter Europe | PO Box 341442 | Dubai Silicon Oasis, Head Quarter Building, Wing C, Office #C209 | Dubai / UAE | +971-4-371 2503
 Czech Republic | Badger Meter Czech Republic s.r.o. | Matfíkova 2082726 | 621 00 Brno, Czech Republic | +420-5-41-626411
 Slovakia | Badger Meter Slovakia s.r.o. | Raciánska 1097B | 831 02 Bratislava, Slovakia | +421-2-44 63 83 01
 Asia Pacific | Badger Meter | 80 Marine Parade Rd | 21-06 Parkway Parade | Singapore 449269 | +65-63464835
 China | Badger Meter | 7-1202 | 99 Hangzhong Road | Minhang District | Shanghai | China 201101 | +86-21-5763 5412

In Control, Inc.
 10350 Jamestown Street NE
 Blaine, MN 55449



Designed and Built By
 In Control, Inc.



Sold To:

City of Long Lake
 450 Virginia Avenue
 PO Box 606
 Long Lake, MN 55356

Invoice Number: **16035EA01**

Invoice Date: Mar 28, 2016

InC Project ID: 16035EA

Customer ID	Purchase Order	Payment Terms	Sales Rep	Page
0594CofLL	Verbal M Wurzer	Net 30 Days	JWK-SR	1

Quantity	Item	Description	Unit Price	Extension
7.00		Engineering Services for Mike McCann See Attached Field Service Report. Please Send a Copy of your Tax Exempt Certificate Thanks for your Business!	135.00	945.00

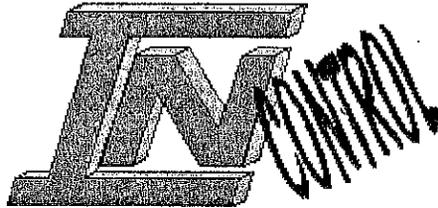
(Handwritten notes in the item description area):
 *
 Manufacture 4-11-16
 PO# 2162-PC
 601-49400-3000
 Professional Services - well control repairs!

Sales Tax	0.00
Freight	

PAST DUE BALANCES ARE SUBJECT TO 2% (24% APR) PER MONTH SERVICE CHARGE

Total **\$945.00**

Phone: (763) 783-9500 If you have a question about this invoice please call
 Fax: (763) 783-9502 Ken Kawiecki at extension 1003



FIELD SERVICE REPORT

Customer Information	Service Information
Work Requested by: Marv Wurzer	Date Work Performed: 2/24 and 3/21
Customer Name: City of Long Lake	Travel Hours: 2
Customer Address: 450 Virginia Ave, PO Box 606	On Site Hours: 5
Customer City: Long Lake	Office Hours: 0
Customer State: MN	Total Hours: 7
Customer Zip: 55356	Warranty (y/n): N
Customer Phone: 612-720-4261	Paid Service (y/n): Y
Date Requested: January 2016	Field Engineer: MJM
Customer P.O. Number: Verbal	Job Number: 16035EA

Description of Work Performed:

February 24th, 2016 - MJM 4 Hours

Well 2 was experiencing radio communication failures on a regular basis. The original signal strength was recorded at -94dB. A signal strength be above -90dB with a TransNET radio will cause intermittent signal loss.

A test antenna and coax cable was used to verify the existing cabling and antenna. Similar results were obtained with the test antenna when it was at the same elevation and direction as the existing antenna. By changing the direction of the existing antenna, the signal strength was improved to -84dB. This was a significant increase in signal strength but something was still not right.

Well 2 talks to the radio at the water tower via an antenna located on top of the tower. Since the tower can be seen from well 2, the signal should have been stronger. It was found that the antenna was located in the center of the top of the tower and the path to well 2 was obscured by one of the cell phone antennas located on the perimeter. The antenna was moved from the center to the perimeter between two of the cell antennas.

March 21st, 2016 - MJM 3 Hours

After changing the direction of the well 2 antenna and relocating the water tower antenna, the signal strength at well 2 was retested and was recorded at -67dB. This is a very strong signal and should provide reliable communication to well 2.

Mike McCann
March 21st, 2016

IN - Control, inc.

10350 Jamestown Street NE
Blaine, MN 55449

Phone: (763) 783-9500
Fax: (763) 783-9502



Purchase Order Form

PO# 2162 - PW

BILL TO: City of Long Lake
 450 Virginia Avenue
 PO Box 606
 Long Lake, MN 55356
 Phone / (952) 473-6961
 Fax / (952) 476-9622

SHIP TO: Long Lake City Hall (CH)
 450 Virginia Avenue / Long Lake, MN 55356
 Long Lake Public Works Department (PW)
 2145 Daniels Street / Long Lake, MN 55356
 Long Lake Fire Department (FD)
 340 Willow Drive / Long Lake, MN 55356

INSTRUCTIONS TO STAFF

- 1) A Purchase Order Form must be completed and approved prior to every purchase. Invoices associated with on-going pre-approved contracts for services may not require a Purchase Order, if waived in advance by the City Administrator.
- 2) A **Department Head signature is required for all purchases, prior to purchase**. Department Head is defined as the City Administrator for City Hall employees; the Public Works Director for the Public Works Department; and the Fire Chief or Assistant Fire Chief for the Fire Department.
- 3) **Additionally, City Administrator approval is required on all purchases over \$500, prior to purchase.**
- 4) Please print clearly and legibly.

PURCHASE ORDER REQUEST

DATE PREPARED 4-11-16 DATE NEEDED BY _____
 VENDOR IN Control, Inc
 VENDOR ADDRESS 10350 Jamestown ST. NE CITY / STATE / ZIP Blaine, MN
 VENDOR CONTACT _____ VENDOR E-MAIL _____
 VENDOR PHONE () _____ VENDOR FAX () _____

DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL
<u>Well Control Issue Investigation - Report attached - Radio signal strength increased by moving water tower antennas (PW) and realigning well #2 antennas (IN-Control)</u>	<u>7 hr</u>	<u>135.00/hr</u>	<u>945.00</u>
SHIPPING & HANDLING			
Invoice # <u>16035EA01 (3-28-16)</u>			
MN SALES TAX			
TOTAL			<u>945.00</u>

NEED FOR PURCHASE Numerous Data + Communication Failure at well #2 + well #1 - well controls unreliable
 APPARATUS / FLEET VEHICLE ID (IF APPLICABLE) _____
 EXPENDITURE ACCOUNT CODE 601-49400-3000 EXPLANATION Professional Services -

SIGNATURES ** ATTENTION VENDORS: PURCHASE ORDER NOT VALID WITHOUT REQUIRED SIGNATURES **

EMPLOYEE NAME Mark Wenzel TITLE Public Works Director
 DEPARTMENT HEAD SIGNATURE Mark Wenzel DATE 4-11-16
 DEPARTMENT HEAD SIGNATURE REQUIRED ON ALL PURCHASES _____
 CITY ADMINISTRATOR SIGNATURE _____ DATE _____
 ADMINISTRATOR SIGNATURE REQUIRED ON ALL PURCHASES OVER \$500 _____



AUTOMATIC SYSTEMS CO.

Long Lake, Mn 11/6/13

File #2 Well

Power Fail Alarm incorrectly indicating at Well 2

- There was some confusion about what Alarm was actually being displayed. The owner was saying that Well 2 was indicating a false Power Fail locally but not showing the Alarm at the Telemetry Master, Well 1.

Actually Well 2 was indicating a Well 1 Power Fail. There is an Alarm screen on Well 2's HMI which appears to indicate many of Well 1's Alarms.

After going online with both Wells PLCs it was unclear how Well 1's Alarms were being sent to Well 2. I was unable to look at the HMIs tag designations, not having the Cutler Hammer PowerMate HMI programming software.

After returning to the office and getting the PowerMate software functional it was determined that the Well 1 Alarms were not present at Well 2 and the entire 'Well 1 Alarm' screen at Well 2 was never functional dating to the original integrator. The indicators on this screen are tied to local unused registers in Well 2's PLC. Apparently the unused register assigned to the Well 1 Power Fail indicator changed values. Not likely to occur on its own but possible during a power cycle.

ASC could make a PLC program change at Well 2 forcing the associated Well 1 Alarm indicator registers to 0. (These would be registers R591- Well 1 Intrusion; R590 - Well 1 Power Fail; R592- Well 1 Fire Alarm; R594-Well 1 Flood; R593-Well 1 Low Temp; R595- Well 1 Sprinkler; R596-Well 1 CL2 Leak)

It was suggested to the owner that the Well 1 Alarm Screen at Well 2 be simply labeled 'Not to be used'. The owner is considering options.

Manufacturer's Representatives * Controls * Mechanical Equipment

* MAIN Office: P.O. Box 120359 St Paul, MN
Branch Office: P.O. Box 787 Ames, Iowa

Phone 651-631-9005 (Fax) 651-631-0027
Phone 515-232-4770 (Fax) 515-232-0795



INVOICE

INVOICE NO

15894

RECEIVED

07 10 2013

BERGERSON-CASWELL, INC.

WELL DRILLING AND PUMPS

5115 Industrial Street
Maple Plain, MN 55359
PH: 763-479-3121
FX: 763-479-2183

BILL TO
City of Long Lake
P.O. Box 606
Long Lake, MN 55356

JOB
31525T-Long Lake Pump-#2
P.O. Box 606
Long Lake, MN 55356

CUSTOMER	PURCHASE ORDER NO.	BILL THRU	TERMS	INVOICE DATE	PAGE
LONG LAK			Net 30	7/9/13	1

ITEM NO	QUANTITY	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
---------	----------	-------------	------------	----------------

Job #31525T

RE: PUMP #2 LOCKED UP

5-13-13 Freed up pump by raising, lowering impellers and back flushing. Started and tested pump. Shut down and restarted under normal conditions. This well pump's approximately 100 ppm at anital startup and drops to less than 2 ppm within a few minutes.

5-17-13 Pump was not locked up this time, there was a problem in the controls of the installation.

*All applicable State and Federal Taxes have been paid on all Installed Materials for this Installation and are included in the Material Prices.

2.5	HR Labor (Eugene & Mike)	5-13-13	200.00	500.00*
2	HR Labor (Tom)	5-17-13	150.00	300.00*

*Warranty 7-10-13
PO# 1379-PW
601-49400-4040
Equip Maint & Repair*

* means item is non-taxable
THANK YOU FOR YOUR BUSINESS!

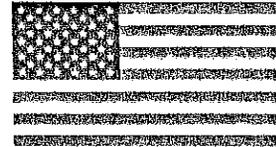
PAST DUE ACCOUNTS SUBJECT TO 1.5% FINANCE
CHARGES PER MONTH PLUS ALL COLLECTION COSTS.

SALE AMOUNT	800.00
TOTAL	\$800.00

In Control, Inc.
 10350 Jamestown Street NE
 Blaine, MN 55449



Designed and Built By
 In Control, Inc.



Sold To:

City of Long Lake
 450 Virginia Avenue
 PO Box 606
 Long Lake, MN 55356

Invoice Number: 17054MB01

Invoice Date: Nov 6, 2017

InC Project ID: 17054MB

Customer ID	Purchase Order	Payment Terms	Sales Rep	Page
0594CofLL	Verbal J Goehring	Net 30 Days	JIVER	1

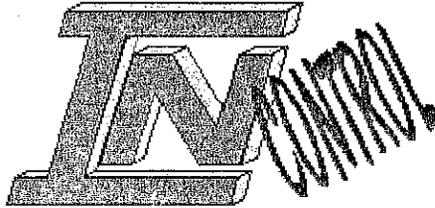
Quantity	Item	Description	Unit Price	Extension
5.50		Engineering Services for Patrick McPeck See Attached Field Service Report	135.00	742.50
66.00	EXP 0200004	Mileage	0.70	46.20
1.00		Equipment RTE-B1AF20 - Idec - Timer 120Vac	65.96	65.96
1.00		Equipment 800T-XA - AB Contact Block 1 NO, 1 NC	36.72	36.72
Tax Exempt				
Thanks for your Business!				
<div data-bbox="527 1228 836 1449" data-label="Image"> </div> <div data-bbox="665 1459 1218 1627" data-label="Text"> <p>601 - 49400-3000 Well #2 Repairs Dan Long 11-20-2017</p> </div>				

Sales Tax	0.00
Freight	

PAST DUE BALANCES ARE SUBJECT TO 2% (24% APR) PER MONTH SERVICE CHARGE

Total	\$891.38
-------	----------

Phone: (763) 783-9500 If you have a question about this invoice please call
 Fax: (763) 783-9502 Ken Kawiecki at extension 1003



FIELD SERVICE REPORT

Customer Information	Service Information
Work Requested by: Luke	Date Work Performed: 11/1/17
Customer Name: City of Long Lake	Travel Hours: 2
Customer Address: 450 Virginia Ave, PO Box 606	On Site Hours: 3
Customer City: Long Lake	Office Hours: 0.5
Customer State: MN	Total Hours: 5.5
Customer Zip: 55356	Warranty (y/n): N
Customer Phone: (612) 720-4263	Paid Service (y/n): Y
Date Requested: October 2017	Field Engineer: Patrick McPeck
Customer P.O. Number: Verbal	Job Number: 17054MB

Description of Work Performed:

The pump at Well 2 had been failing intermittently for approximately 1 week at the time we were contacted. This failure would stop the pump after it had already been running. Reported times of failure ranged between run times of 5 minutes and 30+ minutes. No VFD faults were evident nor were any alarms present on the HMI. These alarms would occur in both auto and hand.

Upon arriving, I started the pump at Well 2 in hand. No failure was immediately apparent and it was moving water at approximately 700 GPM. The led indicator light on the pre-lube mechanical timer was blinking erratically during and after it's time out cycle. It was found that the timer was still sending voltage to the pre lube solenoid even after timing out. Due to this malfunction, it was decided to replace the timer. During my inspection I also found poor grounding to the control panel. The reading from 124 VAC (Line to Neutral) hot was 95 VAC Line to Ground. This would indicate a grounding/bonding problem at the service entrance where neutral and ground should be bonded at equal potential. All wires involved with the starting and operation of the pump were traced and examined for any faults or loose terminals. No problems were apparent with any of the wiring. A potential loose and oxidized contact was found at the Hand/Off/Auto switch on the door, this was replaced.

After a thorough inspection and operation of the pump, I was able to observe one failure. The pre-lube timer's coil (replacement) was briefly de-energized for under a second. This caused the pump to stop and the pre-lube cycle to begin again. All parts of this circuit and timer were again inspected and no apparent issues were found. A possible cause of this intermittent and brief failure would be the UPS in the enclosure briefly shutting down due to the poor ground. To rule out this possibility, the UPS was temporarily bypassed in the enclosure. We continued to start and stop the pump in hand and were unable to observe any failures.

Service actions taken:

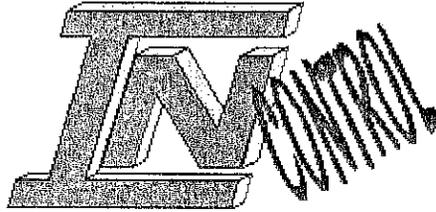
- Malfunctioning Pre—Lube timer replaced
- Oxidized switch contacts replaced
- UPS bypassed in the event that the poor ground is causing problems with its controls and power delivery system.

Future service suggestions:

IN - Control, inc.

10350 Jamestown Street NE
Blaine, MN 55449

Phone: (763) 783-9500
Fax: (763) 783-9502



Due to the poor readings to ground, I would suggest you have an electrician check the bonding at the panel entrance and elsewhere in the building's electrical system. If bypassing the UPS fixes the problem, further investigation of the grounding is assuredly warranted as well as potentially replacing the UPS in the enclosure.

-PHM 11/1/17

IN - Control, inc.

10350 Jamestown Street NE
Blaine, MN 55449

Phone: (763) 783-9500
Fax: (763) 783-9502



**REQUEST FOR ACTION
LONG LAKE CITY COUNCIL**

Meeting Date: September 7, 2010

Agenda Item: No. 7

Subject: Accept Test Pumping Quote from Bergerson – Caswell, Inc. for 2010 Well and Well House No. 2 Rehabilitation Project

Prepared By: Terrance R. Post, City Administrator

Staff Initials:

Recommended City Council Action

Staff recommends the following motion:

Motion to accept the quote from Bergerson - Caswell Inc. in an amount not to exceed \$6,100 to test pump Well No. 2 and to authorize the City Administrator to notify the contractor of the award.

Overview / Background

At the August 17, 2010 regular meeting, the Long lake City Council approved the proposal from SEH for engineering services in support of the 2010 Well and Well House No. 2 Rehabilitation Project. One of the objectives of this project is to upgrade the pumping capacity of the well from the current 500 gallons per minute (gpm) to 1,000 gpm for fire service water capacity needs supporting future downtown Long Lake economic redevelopment activities. However, a necessary first step is to perform a test pump to determine the capability of pumping 1,000 gpm or if necessary well development is necessary to accomplish the increased pumping capacity objective.

Quotes were obtained from two well drilling firms – Bergerson-Caswell from Maple Plain and Traut Wells from Waite Park. The Bergerson quote ranged from a low of \$5,500 to \$6,100 if generator power was required. The Traut quote was a fixed amount of \$8,280.

The recommendation of SEH Project Engineer Chris Larson and staff is to accept the quote from Bergerson – Caswell, Inc. based upon the lower quote amount.

Engineer Larson has also provided a proposed project activity schedule and timeline for Council's general information. Council should note that the last two activities scheduled to be started in 2011 (building painting and driveway overlay/retaining wall replacement) will be dependent upon actual inception-to-date project costs incurred to that point and remaining funds availability in TIF District 2 Fund No. 382.

Supporting Information

- Chris Larson August 31, 2010 recommendation memo to Terry Post
- Bergerson-Caswell 08/30/10 written quote
- Traut Wells 08/31/10 written quote
- 2010 Well No. 2 Rehabilitation proposed project schedule

Financial Impact: \$5,500 to \$6,100 Budgeted (Y / N) Y Source: TIF District 2 Fund No. 382

Notes:



1/2

Bergerson - Caswell Inc.
5115 Industrial Street
Maple Plain, MN 55359
(763) 479-3121 Fax: (763) 479-2183

August 30, 2010

CITY OF LONG LAKE

Attn: Mr. Marv Wurzer
PO Box 606
Long Lake, MN 55356

SEH ENGINEERS

Attn: Mr. Chris Larsen

RE: QUOTE TO UPGRADE WELL PUMP #2

Dear Mr. Wurzer;

Bergerson-Caswell Inc. appreciates the opportunity to assist you with your well and pump maintenance. We are familiar with this well in that we have redeveloped this well twice, and it has been performing since the last redevelopment.

Originally this well was designed to produce 540Gpm @ 324'TDH, and it has done that for an extended period of time. To increase the installation to a 1,000 Gpm could be possible, but in my opinion should be tested for higher capacities before the project is completely designed. There are other installations in this area with similar wells that do support 700-800Gpm and therefore this well should do that by changing and upgrading the equipment size and Hp of the electrical, but to obtain the mentioned 1,000Gpm, I recommend flow testing the well and determine the maximum flow that should be obtained from this well. It may be possible to obtain the 1,000 Gpm if additional development and a larger cavern is created to minimize sand pumping when the well is pump, and we can determine this by performing the recommended flow testing. Below I have provided a cost breakdown as requested for the equipment required to perform the desired upgrade, along with a cost to perform the flow testing

PROJECT COST to perform the Flow testing to the well:

Labor and equipment to mobilize to site remove well pump and install test pump	\$ 1,850.00
Test Pump well 8-12 hours @ \$200.00/hr (generator power)	\$ 2,400.00
Using City power for test pumping: deduct \$50.00/hr	{ \$ 600.00 }
Labor and equipment to remove test pump and reinstall owners pump or temp pump	\$ 1,850.00
TOTAL TO FLOW TEST WELL	\$ 5,500.00 or \$6,100.00

Materials for upgrading installation: 850 Gpm @ 350'TDH

100 hp VLT premium efficient US motor	\$ 8,400.00
Pump Bowl assembly Goulds 11CHC-6 (850 Gpm @ 352'TDH)	\$ 7,150.00
8"x 119.25" T&C pipe: 13 each ea. @ \$ 405.00/ea	\$ 5,265.00
8"x 59.25" T&C pipe: 2 each ea. @ \$ 275.00/ea	\$ 550.00
8"x 10' tail pipe	\$ 400.00
8" spider bearing assemblies, 14 each @ \$85.00/ea.	\$ 1,190.00
8"x 8"x 16.5" high profile discharge head w/ 1.5" packing assembly	\$ 1,650.00
140' of 1.5" SS line shafting T&C @ \$35.00/ft.	\$ 4,900.00
Head shaft assembly	\$ 650.00
140'x 1" poly for draw down testing @ \$1.00/ft	\$ 140.00
Misc. installation items	\$ 200.00
Labor to heat straighten shafting, and prepare the installation	\$ 1,000.00
Labor to remove & reinstall well pump, start up and test	\$ 3,150.00

TOTAL PROJECT COST AS LISTED

\$ 34,645.00

Traut Wells

141 28th Ave South
 Waite Park, MN 56387
 320-251-5090
 Email joetraut@trautwells.com
 www.trautwells.com

Quote - City of Long Lake well 2 - Test pumping

DATE: 8/31/2010 _____

PHONE # _____

NAME: City of Long Lake - well 2 _____

FAX # _____

ADDRESS _____

ATTN: Chris Larson _____

JOB # 30-0000 _____

RE: If generator is needed for test pumping - 125.00/HR

Description	Unit	Unit Price	QTY	Totals
MOB/DEMOB	LS	1,950.00	1	\$ 1,950.00
Remove existing pump	HR.	175.00	5	\$ 875.00
Set test pump	HR.	175.00	4	\$ 700.00
Run test pump (power from city)	HR.	95.00	24	\$ 2,280.00
Pull test pump	HR.	175.00	4	\$ 700.00
Reinstall permanent pump	HR.	175.00	5	\$ 875.00
PER.DIEM & ROAD EXP.	PR.DAY	225.00	4	\$ 900.00

TOTAL MATERIALS	
TOTAL LABOR	\$ -
INCOMING FREIGHT	
TOTAL	\$ 8,280.00

212

**Long Lake Well No. 2 Rehabilitation
Proposed Project Schedule**

<u>Driveway Overlay/Retaining Wall Replacement</u>	<u>Start Date</u>	<u>Completion Date</u>
Solicit Quotes	10/18/10	11/5/10
Council Approval	11/16/10	11/16/10
Overlay Driveway	Spring 2011	
Replace Retaining Wall	Spring 2011	



**REQUEST FOR ACTION
LONG LAKE CITY COUNCIL**

Meeting Date: August 17, 2010

Agenda Item: No. 7

Subject: Approve Scope and Fee Proposal for City Engineer SEH for 2010 Well and Well House No. 2 Rehabilitation Project and Authorize Solicitation of Construction Quotes

Prepared By: Terrance R. Post, City Administrator

Staff Initials:

Recommended City Council Action

Staff recommends the following motion:

Motion to approve the Short Elliott Hendrickson (SEH) scope and fee proposal, estimated to be \$30,000, for engineering services in support of the 2010 Well and Well House No. 2 Rehabilitation Project and to authorize it's execution by the City Administrator; as well as authorizing the solicitation of quotes for the various project scope construction packages.

Overview / Background

Earlier in the year, Council gave direction to staff to focus expending remaining funds in TIF District No. 2 on infrastructure projects that would support future economic development activity in the city. The projects selected were the replacement of the Willow Drive Water Main currently underway and the rehabilitation of Well and Well House No. 2. Staff has estimated that there will be approximately \$200,000 available to the well rehabilitation project.

Public Works Director Wurzer and City Engineer Boxrud have each been advised on the funding limitation for the well rehabilitation project. Together, they have identified project elements that accomplish the primary goal and stay within the project funding parameter. It should be noted that this project was earlier identified in the City's long range CIP as being in the \$450k to \$500k range. The primary scope reductions have included not rebuilding the well house, not cutting in a new access driveway, and not grading the site because of severe slope issues.

This project is also somewhat time sensitive in that Well No. 2 will not be in service during this construction activity. The ideal construction month would be October, although the purchase of such a large pump and motor require months of lead time from the manufacturers.

City Engineer Boxrud will be in attendance at the meeting to more fully describe the project details, timing, and any questions council may have regarding the proposal.

Staff recommends the acceptance of the SEH engineering services contract proposal in support of the 2010 Well and Well House No. 2 Rehabilitation Project and also authorize the solicitation of quotes for the various project element construction packages.

Supporting Information

- Dan Boxrud August 11, 2010 contract proposal letter to Terry Post

Financial Impact: \$200,000	Budgeted (Y / N) N	Source: TIF District 2 Fund No. 382
Notes:		



RECEIVED

AUG 12 2010

August 11, 2010

RE: City of Long Lake, MN
Well and Well House No 2
Rehabilitation
SEH No. LONGL 107914

Mr. Terry Post
City of Long Lake, MN
450 Virginia Avenue
Long Lake, MN 55356

Dear Mr. Post:

The rehabilitation of Well and Well House No 2 has been planned for over 5 years. It has been planned to increase the capacity to 1,000 gallons per minute (gpm). This would achieve the firm pumping capacity needed to provide adequate design fire protection (driven mostly by the commercial and industrial areas) to the City of Long Lake. Although prior rehabilitation proposals and budgets anticipated correction of the steep driveway and general inaccessibility of the site, the project is now scaled back to meet a proposed budget of \$200,000. The scope of the improvements is detailed in the attached Memorandum from Chris Larson dated August 10, 2010.

We anticipate working closely with Marv Wurzer, Public Works Director, to jointly determine the most cost effective way to package quotations, and coordinate our efforts with those of public works to avoid redundancy. Our services will consist of conducting studies, investigations, and designs to the extent necessary to solicit quotations from the various types of contractors needed to complete this rehabilitation. We will also assist in getting quotations, provide shop drawing review, conduct construction site visits as necessary, and assistance during the start-up.

We will also furnish such Additional Services as you may request or as required.

It is important to not take the well out of service until the end of the peak summer usage period, late September to early October, and to have the well back in service as soon as possible. Therefore, the first quotations should be ready for solicitation by early September to beat winter weather. Interior work can be done into the winter months. Accordingly, we will start our services promptly after receipt of authorization on August 17. We anticipate most engineering and construction work being underway this fall with the project fully functional before spring.

This letter and the Agreement for Professional Services between the City of Long Lake and SEH along with Exhibits A, B, C-1, and D represent the entire understanding between you and us in respect of the project and may only be modified in writing signed by both of us.

You will pay us a fee for our services, currently estimated to be \$30,000, in accordance with Exhibit C-1, Rate Table method.



MEMORANDUM

TO: Dan Boxrud/SEH

FROM: Chris Larson/SEH

DATE: August 10, 2010

RE: Long Lake Wellhouse No. 2 Rehab
SEH No. 107914

The well and wellhouse were constructed in 1965. Well No. 2 is drawing water from the Jordan aquifer and is currently capable of pumping 500 gallons per minute (gpm). Our prior review of the well log and development data indicates that the well can possibly be redeveloped to a capacity of 1,000 gpm. This will require that the pump and motor be replaced to pull that much water from the well. The City has an overall budget of \$200,000.

The pump for Well No. 2 was last pulled and serviced in 1996. Approximately 70 cubic yards of sand was removed from Well No. 2 in 1996 (routine maintenance for sandstone wells). Given that the pump was last serviced in 1996, it is time for the pump to be pulled and serviced even if a rehabilitation project is not pursued.

To upgrade Well No. 2 to be capable of pumping 1,000 gpm, the following improvements need to be made:

- Pull existing pump and motor, test pump well, redevelop well (remove sand)
- Provide new pump and column capable of producing 1,000 gpm (or whatever the well will provide sand free)
- Upsize motor from 60 hp to 100 hp (estimated)
- New pump discharge head
- New electrical motor starter, controls, and communications

In addition to upgrading the well pump and motor, the wellhouse is also in need of repairs. Some of the improvements are required to bring the wellhouse into compliance with Minnesota Department of Health regulations. The following wellhouse improvements are recommended:

- New insulated roof, explore insulating block walls
- New exhaust fans and heater
- Process piping improvements (piping, check valve, air release valve)
- New flow meter
- Electrical transfer switch and generator receptacle
- Interior and exterior painting
- New chlorine chemical feed equipment (booster pump, ejector, scales etc.)
- New fluoride and polyphosphate chemical feed equipment
- Secondary containment for the polyphosphate and fluoride chemical tanks
- Retaining wall replacement and driveway overlay



MEMORANDUM

TO: Terry Post
Marv Wurzer

FROM: Christopher Larson, P.E.

DATE: December 6, 2010

RE: Wellhouse No. 2 Rehabilitation– Mechanical and Electrical Quotes
SEH No. 113888

The following table summarizes the status of the Wellhouse No. 2 projects and costs that have currently been incurred:

<u>Project</u>	<u>Status</u>	<u>Cost</u>
Test Pumping	Completed	\$6,100
New Pump & Motor	Completed	\$31,000
New Roof	Construction to start week of Dec. 6	\$8,500
Chemical Fill Station	Construction underway	\$16,600
Total Construction Cost:		\$62,200
Engineering		\$30,000
Total Cost to date:		\$92,200

Mechanical Quotes

We solicited quotes for the process piping, chemical feed systems, demolition, windows, doors, plumbing, and HVAC from Gridor Construction, Inc., Rice Lake Construction Group, and Magney Construction. The quotes are as follows:

Gridor Construction Inc.	\$72,090
Rice Lake Construction Group	\$86,800
Magney Construction	\$94,700

The quotes (attached) are broken down by task and portions of the work can be eliminated from the project if desired. We have had a positive experience working with Gridor in the past.

Electrical Quotes

We solicited quotes for the electrical work including a new electrical service, new motor starter, modifications to the existing PLC, radios, and necessary SCADA modifications from Killmer Electric, Industrial Electric Company, and Electrical Installation and Maintenance. The quotes are as follows:

Killmer Electric	\$64,067
Industrial Electric Company	\$66,370
Electrical Installation & Maintenance	\$67,812

The electrical quotes (attached) are broken down by task and include various adds/deducts. The above prices include all of the proposed work (i.e. radios, SCADA upgrades). We have had a positive experience working with Killmer in the past.

Wellhouse No. 2 Rehabilitation
December 6, 2010
Page 2

Recommendation of Award

The original project budget for the Wellhouse No. 2 rehabilitation was \$200,000; however, another \$47,000 was reportedly available due to a watermain project being completed under budget.

If the entire mechanical and electrical quotes are awarded, it will bring the overall project budget to \$228,357. It should be noted that this includes work not originally envisioned as part of this project (radios, SCADA upgrades, windows, doors, etc.). However, we believe that this work is worthwhile and should be done as part of the overall project.

If the additional \$47,000 is available for this project bringing the total available budget to \$247,000, we recommend awarding the entire mechanical and electrical projects to Gridor Construction and Killmer Electric.

Please call me at (651) 765-2961 with any questions or concerns.

Attachments: Mechanical Quotes
 Electrical Quotes

cc: Dan Boxrud, SEH



GRIDOR CONSTR., INC.

3990 27th Street SE
Buffalo, MN 55313

(763) 559-3734
(Fax) 559-3736

Improving America's Water Quality since 1970

12/1/10

Mr. Chris Larson
Short Elliot Hendrickson
3535 Vadnais Center Drive
St. Paul, MN 55110-5196

Subject: Well House No 2 Rehabilitation for the City of Long Lake, MN

Dear Mr. Larson,

As requested Gridor Construction, Inc is pleased to provide the following for your consideration:

Provide all labor and equipment for the following scopes of work:

Demolition -	\$ 2,684.82
Concrete Work -	\$ 1,418.10
Masonry - (Glass Block)	\$ 3,456.80
Doors and Hardware -	\$ 4,479.79
Chemical Feed Systems -	\$ 19,827.88
Flow meter/Pressure Transmitter -	\$ 6,185.38
Process Piping/Valves -	\$ 11,016.35
Gauges -	\$ 531.86
Mechanical Insulation -	\$ 1,263.24
Plumbing -	\$ 9,480.39
HVAC -	<u>\$ 11,745.00</u>
Total	\$ 72,089.61

Not included in the above price:

Electrical/Integration work - By others
Painting - By others

Please feel free to contact me with any questions or concerns in regards to this quote or any other work you'd be interested in us quoting.

Best Regards,

Peter Nordang
Project Manager
Gridor Construction Inc.

P. 763.746.9082
F. 763.559.3736
peter@gridor.com



December 1st, 2010

PROPOSAL

Long Lake Wellhouse #2 Rehabilitation
City of Long Lake, MN

TO: Christopher T. Larson, P.E.
SEH, Inc.
3535 Vadnais Center Drive
St. Paul, MN 55110-5196

<u>Price Breakdown</u>	<u>Price</u>
Mobilization	\$ 1,500.00
Demolition	\$ 1,850.00
Concrete	\$ 2,250.00
Masonry	\$ 5,250.00
Steel Doors and Frames	\$ 4,250.00
Chemical Feed Equipment	\$ 21,500.00
Magnetic Flow Meter	\$ 5,350.00
Process Piping, Valves and Fittings	\$ 17,600.00
Plumbing	\$ 12,350.00
Heating, Venting and Air Conditioning	\$ 14,900.00
Total Price	\$ 86,800.00

Rice Lake Construction Group

Steve Perpich
Project Manager

MAIN OFFICE

22360 County Road 12
PO Box 517
Deerwood, MN 56444
PH 218-546-5519
FX 218-546-7016

ATWATER OFFICE

200 Atlantic Avenue W.
PO Box 689
Atwater, MN 56209
PH 320-974-8821
FX 320-974-8500

MAGNEY CONSTRUCTION

COMMERCIAL & INDUSTRIAL CONTRACTORS
 1401 PARK ROAD CHANHASSEN MN 55317
 952.474.1674 OFFICE 952.474.1679 FAX
 www.magneyconstruction.com

Proposal

SEND TO Company name S.E.H.		From Kevin Vranicar
Attention Mr. Chris Larson, PE		Date 12/1/2010
Fax (651) 490-2150	Phone (651) 765-2961	Proposal # 01 - Wellhouse No. 2 Rehabilitation - Long Lake, MN

Urgent
 Please comment
 Please review
 For your information

Total pages, including cover: 1

COMMENTS

Re: Wellhouse No. 2 Rehabilitation - Long Lake, MN

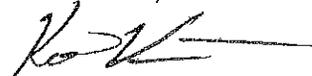
Chris,

Magney Construction, Inc. is pleased to present the following proposal to furnish the necessary material, equipment and labor to complete the rehabilitation project as per drawings 01R1, 01P1, DP1, 01M1, dated 11/16/10 and the specifications dated November, 2010. Our proposal also accounts for the clarifications that were e-mailed on 11/19/10. Below is a summary of the costs associated with this proposal:

Building Permit Allowance	\$	500.00
Mobilization, Insurance & General Conditions	\$	12,300.00
Demolition	\$	6,900.00
Cast-In-Place Concrete	\$	1,550.00
Unit Masonry - Glass Block Windows	\$	1,650.00
Steel Doors, Frames & Hardware	\$	3,900.00
Chemical Feed Equipment	\$	22,600.00
Magnetic Flow Meter	\$	3,500.00
Process Piping, Fittings, Valves & Gauges	\$	15,400.00
Plumbing	\$	10,400.00
HVAC	\$	14,500.00
Pressure Transmitter	\$	1,500.00
Lump Sum Total	\$	94,700.00

Please review this proposal and feel free to contact me with any questions, comments, or concerns. We look forward to working with you on this project and we sincerely appreciate the opportunity to bid.

Thank You,



Kevin Vranicar
Project Manager

Accepted By	Date

Industrial
Commercial
Underground



5141 Lakeland Avenue North
Crystal, Minnesota 55429
Telephone: (763) 425-2525
Fax: (763) 424-1258

December 2nd, 2010

Mr. Christopher Larson, PE
Short Elliot Hendrickson
3535 Vanais Center Drive
St. Paul, MN 55110

Re: Well No. 2 Rehabilitation
Long Lake, MN
Dear Chris,

Killmer Electric Company proposes to provide electrical construction services for the subject project. This proposal is prepared in accordance with plans prepared by SHE dated 11-16-10, and site visit.

Misc. Included

- New Electrical Service.
- Coordination with Xcel Energy. Cost to be covered by others.
- New PVC conduit utilized.
- New 125HP VFD w/full bypass. (*Deduct \$2,000.00 to remove bypass*)
- Use of existing conduits if available.
- PLC mods required for new motor VFD control.

Excluded

- Payment and performance bonds.
- Drawdown level sensor.
- Radio Upgrade. See alternate add.
- New Magnetic Flow Meter.

Total Base Bid: \$55,634.00

Alternate Add – Radio/SCADA Upgrade Add: \$8,433.00

Provide PLC and radios as describe on electrical sheet

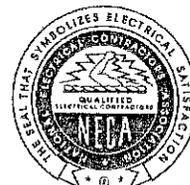
Thank you for the opportunity to provide a proposal on this project.
Please call with any questions or comments.

Regards,

A handwritten signature in black ink that reads "Matthew Pettit".

Matthew Pettit
Project Manager

An Equal Opportunity Employer



Electrical Installation & Maintenance Co.

1480 County Road 90
Maple Plain, MN 55359
763-479-3744 phone
763-479-3745 fax

PROPOSAL

DATE	ESTIMATE NO.
12/3/2010	6502

NAME / ADDRESS
SEH ATTN: CHRIS LARSON RE: LONG LAKE WELL #2 REMODEL

DESCRIPTION	TOTAL
1. BASE PRICE FOR ELECTRICAL ON REMODEL ON WELLHOUSE #2	47,750.00
2. WELL #1 & #2 & WATERTOWER SCADA MODIFICATIONS	15,582.00
3. LABOR ONLY WELL #2	1,080.00
4. LABOR ONLY WELL #1 & WATERTOWER	3,400.00
(DEDUCT IF RADIO EQUIPMENT IS NOT UTILIZED AND THE EXISTING MODEMS REMAIN - \$6,306.00)	
THIS PRICE IS IF YOU USE TELEMETRY PROCESS CONTROL	
WE LOOK FORWARD TO DOING BUSINESS WITH YOU	TOTAL \$67,812.00



MEMORANDUM

TO: Terry Post
FROM: Christopher Larson, P.E.
DATE: October 11, 2010
RE: Wellhouse No. 2 – New Roof Quotes
SEH No. 113888

Attached are quotes from Sela Roofing, Berwald Roofing, and Dalbec Roofing to provide a new roof for Wellhouse No. 2. The existing roof was installed in the 1960s and is need of replacement.

The following is a summary of the quotes:

Sela Roofing	\$8,500
Berwald Roofing	\$9,873
Dalbec Roofing	\$16,965

We recommend awarding the project to Sela Roofing because their price is low and they are a reputable company.

Please call me at (651) 765-2961 with any questions or concerns.

Attachments Sela Roofing Quote
 Berwald Roofing Quote
 Dalbec Roofing Quote

cc: Marv Wurzer, City of Long Lake
 Dan Boxrud, SEH



CITY OF LONG LAKE
450 VIRGINIA AVENUE
P.O. BOX 606
LONG LAKE, MN 55346

ACCEPTANCE COPY
OCTOBER 11, 2010
651-765-2961

We propose to tear off and re-roof the well house #2 roof at the above address and install a GAF NDL roofing system by:

- Tear off the existing roofing down to the concrete Clean up and haul away all debris from the premises.
- Install tapered panels of Isocyanurate roof insulation tapering from 2.5" to 4.5" over the entire roof surface for an average R-22.
- Mop one layer of 1/2" wood fiber board roof insulation over the entire roof surface.
- Install 4 layers of type IV fiberglass felt, running all felts up into the base flashings. Each layer of felt will be mopped in solid with hot asphalt at a rate of no less than 25 lbs. per sq. ft.
- Flash all walls with an additional layer of modified bitumen 160 mil flashing material, fasten and secure.
- Install new galvanized sheet metal chimney stack base flashings in place of existing.
- Install new pre-finished sheet metal scupper where existing is now.
- Install proper ice water shield to encapsulate all wood blocking.
- Flood coat the entire roof surface with a final layer of hot asphalt at a rate of 60 lbs. per 100 sq. ft. and embed washed roofing gravel in asphalt while still hot at a rate of 500 lbs. per 100 sq. ft.
- Install new pre-finished cant edge metal around the outside perimeter.
- Install new pre-finished sheet metal counter flashing at all roof curbs, roof to wall locations and secure.
- Install new pre-finished open faced downspouts in place of existing.

CONTINUED ON PAGE 2.....

CITY OF LONG LAKE
450 VIRGINIA AVENUE
P.O. BOX 606
LONG LAKE, MN 55346

ACCEPTANCE COPY
OCTOBER 11, 2010
651-765-2961

CONTINUED FROM PAGE 1.....

- Remove all roofing equipment and materials from job site when completed and clean up and haul away all debris from the premises.

COST FOR THE ABOVE-DESCRIBED WORK IS: \$ 8,500.00

- NOTE: The cost of one 3'x3' aluminum hatch is included in price.
- GUARANTEE: This Contract comes with a Ten (10) year conditional guarantee on workmanship and materials.
- PAYMENT: A payment of 1/3rd of the Contract amount is due upon the set-up of the roofing project and monthly progress payments will be invoiced and due upon receipt. Interest on unpaid balances after completion accrues at the rate of 1 1/2% (1.5%) per month (18% per annum).
- NOTE: This proposal may be withdrawn by SELA if not accepted within Thirty (30) days, and price is subject to Manager's approval for Seven (7) days after customer's signature as acceptance. In the event customer attempts to and/or does cancel or breach this agreement, the parties agree that SELA's resulting damages will be difficult to ascertain and that SELA shall be entitled to liquidated damages in a sum equal to twenty percent (20%) of the total Contract price or \$500.00, whichever is greater. The parties agree that this is not a penalty, is not an amount greatly disproportionate to SELA's estimated actual damages, and is an accurate approximation of SELA's lost profit due to customer's cancellation and/or breach of this agreement.

Acceptance of the Proposal: The above prices, specifications and conditions, including those set forth in the "Additional Contract Terms" attached hereto, are satisfactory and are hereby accepted. Sela is authorized to do the work as specified. Payment will be made as outlined.

THANK YOU!!!

DAN SCHEEL, SERVICE MANAGER
SELA COMMERCIAL DIVISION

THE ATTACHED "ADDITIONAL CONTRACT TERMS" ARE INCORPORATED HEREIN BY REFERENCE AND ARE PART OF THIS CONTRACT

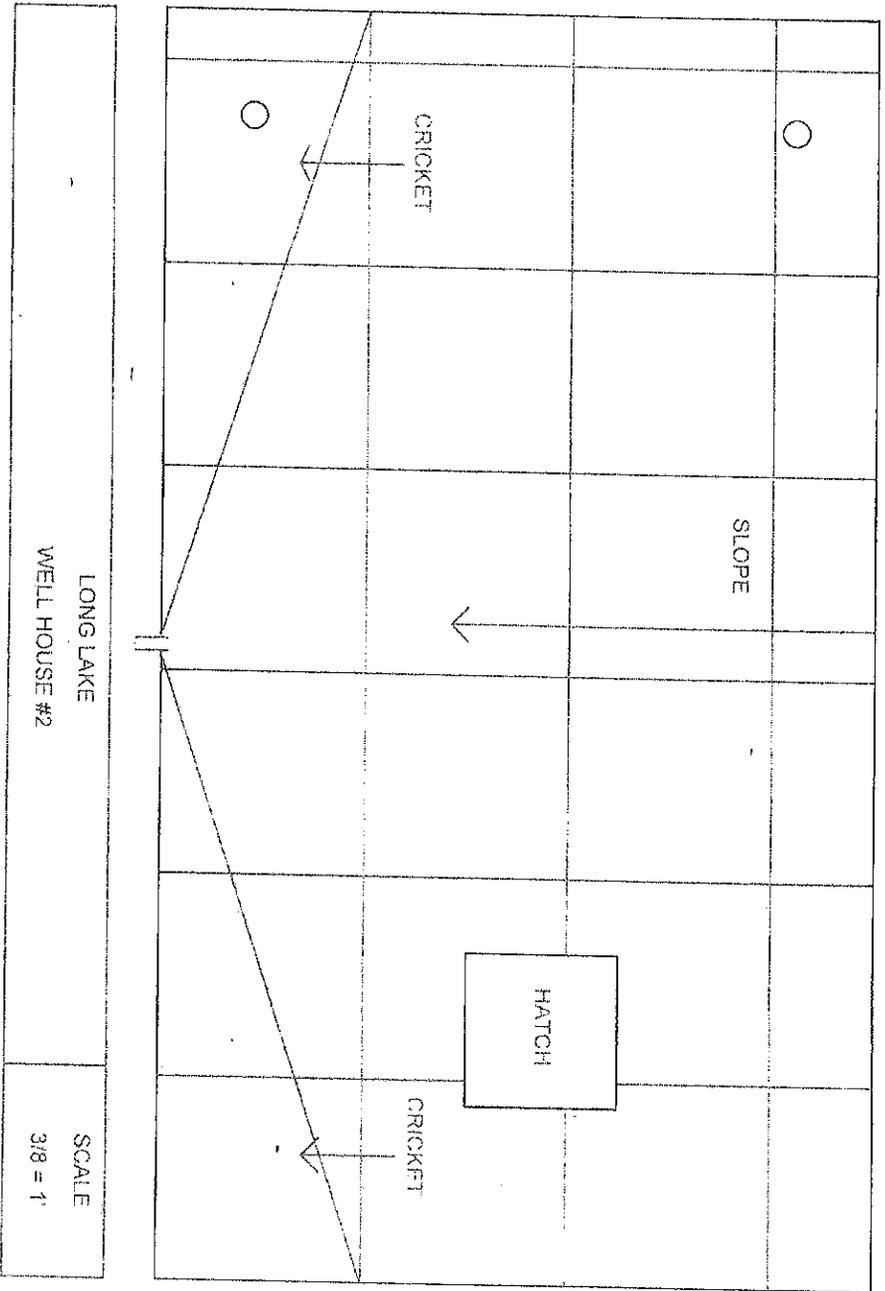
SELA ROOFING AND REMODELING INC.: CUSTOMER:

BY: Dan Scheel

BY: _____

DATED: 10.11.10

DATED: _____



LONG LAKE
WELL HOUSE #2

SCALE
3/8" = 1'



Berwald Roofing Company, Inc.
ROOFING AND SHEET METAL

2440 North Charles Street
North St. Paul, MN 55109

651-777-7411
fax: 651-777-1871
www.berwaldroofing.com

PROPOSAL

October 11, 2010

Faxed _____
Mailed _____

SUBMITTED TO: SEH
3535 Vadnais Center Drive
St. Paul, MN 55110-5196

ATTENTION: Christopher T. Larson
PHONE: 651-765-2961

CELL: 651-955-1428

JOB NAME: Well House #2
JOB LOCATION: Long Lake, MN

WE PROPOSE TO FURNISH ALL LABOR MATERIAL, EQUIPMENT, AND INSURANCE TO COMPLETE SHEET METAL AND ROOFING ACCORDING TO PLANS AND SPECIFICATIONS.

- Area: 327 sq ft.
- Tear off existing built-up roof.
- Tapered insulation (isocyanurate) and 1/2" rigid insulation top layer mopped in place with hot asphalt R value 22.22.
- 4-ply asphalt roof with Type IV fiberglass felt.
- Modified bitumen base flashing, wood cant, plate, 40-mil peel & stick at perimeter.
- Prefinished sheet metal flashing (75')
- Prefinished scupper (1)
- 3'0" x 3'0" aluminum roof hatch.

We propose to furnish material and labor -- complete in accordance with above specifications, for the sum of **Nine thousand eight hundred seventy-three and no/100 dollars \$9,873.00.**

NOTE: Terms of payment: Net 30 days. This proposal is valid for 30 days. It may be withdrawn or modified if not accepted during this time. All material is guaranteed to be as specified. All work to be completed in a workmanlike manner according to standard practices. Any alteration or deviation from above specifications involving extra costs will be executed only upon written orders, and will become an extra charge over and above the estimate. All agreements are contingent upon strikes, accidents or delays beyond our control. Owner is to carry fire, tornado and other necessary insurance. Our workers are fully covered by Workman's Compensation Insurance.

Authorized Signature: _____
Ron Kloempken Cell # 612-803-7357

Acceptance of Proposal - The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Date of Acceptance: _____ Signature: _____

EEO/AA
Industrial - Commercial - Residential
Since 1936



DALBEC ROOFING

October 7, 2010

Marv Wurzer
City of Long Lake
450 Virginia Ave
Long Lake, MN 55356

**Proposal for Re-Roofing at:
Pumphouse #2
1345 West Wayzata Blvd.
Long Lake, MN 55356**

We propose to furnish the necessary labor, material and equipment required to perform the roof replacement on the above named project as follows:

DEMOLITION

1. Remove existing built up roof, to roof decking.
2. Remove the existing metal flashing and rotted wood blocking.
3. Properly haul away all debris from the project site and dispose of item in the appropriate landfill.

INSULATION

1. Install wood blocking at perimeter to accommodate the new insulation.
2. Install a base layer of 3.2" isocyanurate roof insulation in hot asphalt to the concrete deck. Install additional tapered insulation sumps at 2 scuppers. (Locations to be determined)
3. Install a top layer of 1/2" fiberboard insulation embedded in hot asphalt. The roof will have an average "R" value of 22.2, which meets state code.

ROOFING

1. Four (4)-plies of type IV fiberglass roofing felt set in solid moppings of type III asphalt.
2. Flood coat roof with type III asphalt (60# per square) and embed No 7 roofing gravel (500# per square).
3. Install one (1) ply of reinforced modified base flashing at vertical surfaces.
4. Flash into roof all vent stacks, scuppers, and (1) new 4' x4' clear opening roof hatch at existing access opening.
5. Install Ice and Water Shield over the top of the roof edge perimeter.

SHEET METAL

1. 24- gauge prefinished coping with galvanized keeper strip at perimeter walls.
2. 24- gauge prefinished counter flashing at roof hatch.
3. 24-gauge scuppers and downspouts.

All of the above for the sum of: SIXTEEN THOUSAND NINE HUNDRED SIXTY FIVE AND 00/100
--- \$16,965.00

NOTES

1. Manufacturers 10- year warranty included.
2. Manufactures 20-year sheet metal warranty is included.
3. Quote includes required permits and standard Contractors Liability Insurance
4. We did not figure handling or disposal of hazardous material if present.
5. Quote includes the price of an asbestos test on the existing roof material.
6. This Proposal may be withdrawn by us if not accepted within 30 days. There will be a labor increase for all work performed after May 1st, 2011.
7. Winter conditions are not figured. If snow and ice removal are needed, this will be done on a time and material basis.
8. To reuse existing access cover in lieu of a replacement hatch: **Deduct \$1,900.00**

We appreciate the opportunity to provide you with this estimate. If you have any questions, or if I can be of further assistance, please call me.



Tony Rozeske

ACCEPTED _____

PRINT NAME _____

DATE _____

208849

County Hennepin
 Quad Excelsior
 Quad ID 105A

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING REPORT
 Minnesota Statutes Chapter 1031

Entry Date 08/24/1991
 Update Date 02/05/2016
 Received Date

Well Name LONG LAKE 1	Township 118	Range 23	Dir Section W 34	Subsection DBBBBC	Well Depth 340 ft.	Depth Completed 340 ft.	Date Well Completed 00/00/1952
Elevation 990 ft. Elev. Method 7.5 minute topographic map (+/- 5 feet)					Drill Method Cable Tool	Drill Fluid	
Address					Use abandoned	Status Sealed	
Contact 1964 PARK AV LONG LAKE MN 55356					Well Hydrofractured? Yes <input type="checkbox"/> No <input type="checkbox"/> From To		
Well 1964 PARK AV LONG LAKE MN 55356					Casing Type Single casing Joint		
Stratigraphy Information					Drive Shoe? Yes <input type="checkbox"/> No <input type="checkbox"/> Above/Below		
Geological Material	From	To (ft.)	Color	Hardness	Casing Diameter	Weight	Hole Diameter
DRIFT	0	188			12 in. To	198 ft. lbs./ft.	12 in. To 340 ft.
SHAKOPEE-ONEOTA	188	290					
JORDAN SANDSTONE	290	340					
					Open Hole From 198 ft. To 340 ft.		
					Screen? <input type="checkbox"/> Type Make		
					Static Water Level 86.3 ft. Land surface Measure 07/26/1988		
					Pumping Level (below land surface) 94 ft. 6 hrs. Pumping at 350 g.p.m.		
					Wellhead Completion Pitless adapter manufacturer Model <input type="checkbox"/> Casing Protection <input checked="" type="checkbox"/> 12 in. above grade <input type="checkbox"/> At-grade (Environmental Wells and Borings ONLY)		
					Grouting Information Well Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Specified		
					Nearest Known Source of Contamination feet Direction Type Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No		
					Pump <input checked="" type="checkbox"/> Not Installed Date Installed Manufacturer's name Model Number HP Volt Length of drop pipe ft Capacity g.p. Typ		
					Abandoned Does property have any not in use and not sealed well(s)? <input type="checkbox"/> Yes <input type="checkbox"/> No		
					Variance Was a variance granted from the MDH for this well? <input type="checkbox"/> Yes <input type="checkbox"/> No		
					Miscellaneous First Bedrock Prairie Du Chien Group Aquifer Prairie Du Chien Last Strat Prairie Du Chien Group Depth to Bedrock 188 ft Located by Minnesota Department of Health Locate Method GPS SA On (averaged) System UTM - Mad83, Zone 15, Meters X 454782 Y 4981444 Unique Number Verification Information from Inpute Date 10/12/1999		
Remarks LONG LAKE #1 MUNI WELL MP=3.6 MARV WURZER. ORIG. DRILLED 1946, DEPTH 369 FT. SEALED 4/30/2004 BY 27058; PREVIOUS USE: PC 1945 WELL NO. 1 WAS "OVER 400 FT. DEEP". MAY BE ANOTHER WELL.					Angled Drill Hole		
					Well Contractor Bergerson-Caswell 27058 Licensee Business Lic. or Reg. No. Name of Driller		

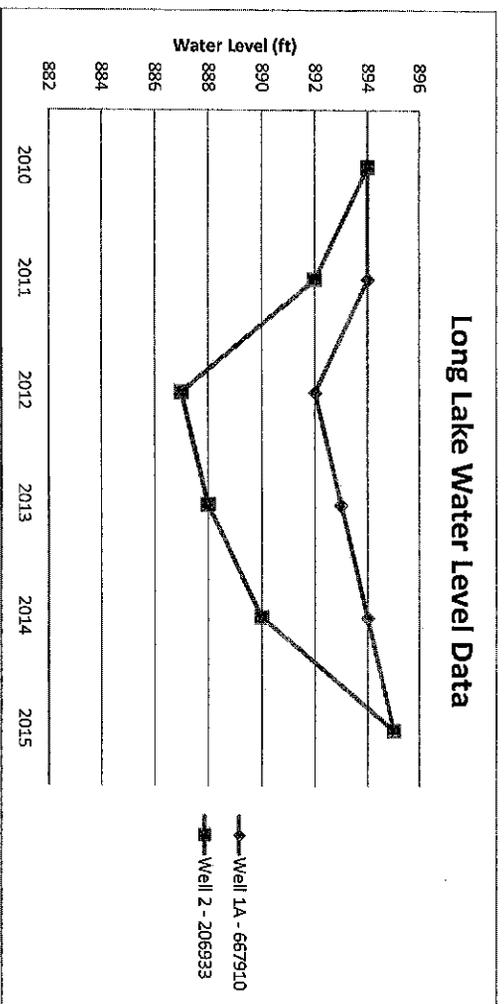
Appendix 2
Water Level Monitoring Plan

Location	Monitoring Method	Frequency
Well 1 – 667910	SCADA	Daily
Well 2 – 206933	Steel Tape	Weekly

Appendix 3

Water Level Graphs for each Water Supply Well

Elevation (ft)	Well 1		Well 2	
	Drawdown (ft)	Water level (ft)	Drawdown (ft)	Water level (ft)
990	96	894	66	894
	96	894	68	892
	98	892	73	887
	97	893	72	888
	96	894	70	890
	95	895	65	895
Static Water Level	86		72	



Appendix 4
Capital Improvement Plan

Unit Number	Description	Year of Purchase	Cost	Replace Yes or No	Estimate Life (years)	Estimated Replacement Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
#1	Ford Single Axle Dump Truck and equipment, plow, sander, etc	1994	Yes	20	\$ 60,000	2016	\$ 7,000	\$ 140,000	\$ 7,000	\$ 7,000	\$ 7,000	\$ 7,000	\$ 7,000	\$ 7,000	\$ 7,000	\$ 7,000	\$ 7,000	\$ 7,000	\$ 7,000	\$ 7,000
#2	Ford 1 Ton Dump Truck and jaw	1996	Yes	20	\$ 45,000	2018	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250
#3	Handheld 800 mt Blades (3)	2004	Yes	5	\$ 9,600	2019	\$ 1,800	\$ 1,800	\$ 1,800	\$ 1,800	\$ 1,800	\$ 1,800	\$ 1,800	\$ 1,800	\$ 1,800	\$ 1,800	\$ 1,800	\$ 1,800	\$ 1,800	\$ 1,800
#4	Ford 950 Utility Tractor with attachments	1990	Yes	20	\$ 25,000	2020	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250	\$ 1,250
#5	Navigator 2 color Mini Camera and Network Locator	2000	Yes	5	\$ 7,000	2020	\$ 1,400	\$ 1,400	\$ 1,400	\$ 1,400	\$ 1,400	\$ 1,400	\$ 1,400	\$ 1,400	\$ 1,400	\$ 1,400	\$ 1,400	\$ 1,400	\$ 1,400	\$ 1,400
#6	Bulleting P-50 1 Ton Roller on horsehoe trailer (replaces with a 2 Ton Avington Roller	1980	Yes	10	\$ 12,000	2020	\$ 1,200	\$ 1,200	\$ 1,200	\$ 1,200	\$ 1,200	\$ 1,200	\$ 1,200	\$ 1,200	\$ 1,200	\$ 1,200	\$ 1,200	\$ 1,200	\$ 1,200	\$ 1,200
#7	2001 Dodge 1/2 Ton Pickup	2001	Yes	10	\$ 35,000	2021	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
#8	2002 Ford 1/2 Ton Pickup	2002	Yes	10	\$ 35,000	2022	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500	\$ 3,500
#9	Factory Car Floor Sweeper Model # 24	2003	Yes	20	\$ 4,000	2023	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200
#10	New Holland M-C-25 front blower with power, blower, and boom	2008	Yes	15	\$ 40,000	2023	\$ 2,667	\$ 2,667	\$ 2,667	\$ 2,667	\$ 2,667	\$ 2,667	\$ 2,667	\$ 2,667	\$ 2,667	\$ 2,667	\$ 2,667	\$ 2,667	\$ 2,667	\$ 2,667
#11	Land Power Wash Bay unit	2005	Yes	20	\$ 6,000	2025	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300
#12	Dynapack L-62 Jumping Jack Compactor	2000	Yes	25	\$ 2,800	2025	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100	\$ 100
#13	Hommel/Bach Generator/Electric Jack Hammer	1970	Yes	20	\$ 3,000	2025	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150
#14	1985 Orion 10 KW Generator, trailer mounted (3) Military surplus	1985	Yes	20	\$ 20,000	2025	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000	\$ 1,000
#15	Public Works Emergency Power Shop Generator 1800 KW Military surplus 50 KW	1985	Yes	20	\$ 30,000	2025	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500	\$ 1,500
#16	International 50 KW CNV Multi-Use Station Emergency Generator, trailer mounted (same availability) Replacement cost	1985	Yes	20	\$ 40,000	2026	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,000
#17	Car powered 300KW Generator, trailer mounted	1976	Yes	20	\$ 38,000	2026	\$ 1,900	\$ 1,900	\$ 1,900	\$ 1,900	\$ 1,900	\$ 1,900	\$ 1,900	\$ 1,900	\$ 1,900	\$ 1,900	\$ 1,900	\$ 1,900	\$ 1,900	\$ 1,900
#18	Ford / New Holland T18	1999	Yes	20	\$ 120,000	2026	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000
#19	Veon - 3 point Mounted, 12 foot wide Boom Type Spreader	1990	Yes	20	\$ 3,000	2030	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150
#20	Utility Trailer, 7000 lb capacity, 16 feet by 51 inches wide	1980	Yes	20	\$ 3,000	2030	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150	\$ 150
#21	Bobcat 630 Skid Steer with attachments	2012	Yes	20	\$ 45,000	2032	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250	\$ 2,250
#22	Steering Single Axle Dump Truck and equipment, plow, sander, etc	2004	Yes	20	\$ 440,000	2034	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000	\$ 22,000
#23	Skid Loader Trailer, 12,000 pound capacity	2004	Yes	20	\$ 6,000	2034	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300	\$ 300

Purchase Price
Depreciation Per Year

\$ 33,817 \$ 140,000 \$ 33,817 \$ 33,817 \$ 45,000 \$ 9,000 \$ 44,000 \$ 35,000 \$ 36,000 \$ 44,000
 \$ 33,817 \$ 173,517 \$ 33,817 \$ 33,817 \$ 78,817 \$ 42,817 \$ 77,817 \$ 68,817 \$ 88,817 \$ 77,817

Appendix 5
Emergency Telephone List

City of Long Lake
Emergency Telephone List
6/15/18

Emergency Response Team	Name	Work Telephone	Alternate Telephone
Emergency Response Lead	Orono Police Chief	952-249-4700	952-258-5321
Alternate Emergency Response Lead	Long Lake Fire Chief (James Van Eyll)	952-473-9701	952-471-9777
Water Operator	Sean Diercks	952-476-2855	
Alternate Water Operator	Don (Luke) Laakkonen	952-476-2855	
Public Communications	Scott Weske	952-473-6961 ext.2	

State and Local Emergency Response Contacts	Name	Work Telephone	Alternate Telephone
State Incident Duty Officer	Minnesota Duty Officer	800-422-0798 Out State	651-649-5451 Metro
County Emergency Director	Daniel Bovitz	612-596-0249	
National Guard	Minnesota Duty Officer	800-422-0798 Out State	651-649-5451 Metro
Mayor/Board Chair	Marty Schneider	612-237-3843	
Fire Chief	James Van Eyll	952-473-9701	952-471-9777
Sheriff	Richard Stanek (Hennepin Co.)	612-348-3744	
Police Chief	Mike Risvold (Wayzata)	952-404-5343	
Ambulance	N/A	911	
Hospital	Regency Minneapolis	763-588-2750	
Doctor or Medical Facility	Park Nicollet – Wayzata	952-993-8250	

State and Local Agencies	Name	Work Telephone	Alternate Telephone
MDH District Engineer	Isaac Bradlich	651-201-3971	
MDH	Drinking Water Protection	651-201-4700	
State Testing Laboratory	Minnesota Duty Officer	800-422-0798 Out State	651-649-5451 Metro
MPCA	St. Paul Office	651-296-6300	800-657-3864
DNR Area Hydrologist	Kate Drewry	651-259-5753	
County Water Planner	Joe Settles	612-348-6157	

Utilities	Name	Work Telephone	Alternate Telephone
Electric Company	Xcel Energy	800-895-4999	
Gas Company	CenterPoint Energy	612-374-4727	800-245-2377
Telephone Company	CenturyLink	800-475-7526	
Gopher State One Call	GSOC	800-252-1166 or 811	651-454-0002
Highway Department	James Grube (Hennepin Co.)	612-596-0300	

Mutual Aid Agreements	Name	Work Telephone	Alternate Telephone
Neighboring Water Systems	Scott Oberaigner (Orono)	952-249-4680	
Emergency Water Connection	Orono Police Chief	952-249-4700	
Materials			

Preferred Contractors	Name	Work Telephone	Alternate Telephone
Water Contractors	Valley Rich	952-448-3002	
	Widmer Construction	952-955-5062	
Sewer Contractors	Kothrade Sewer, Water and Excavating	763-498-8702	
	Drain King	763-786-3000	888-391-6241
	Roto Rooter	612-872-2929	612-788-9029

Communications	Name	Work Telephone	Alternate Telephone
News Paper	The Pioneer	952-442-4414	
Radio Station	CBS Radio	612-370-0611	
School Superintendent	Karen Orcutt (Orono)	952-449-8305	
Property & Casualty Insurance			
Television Network	WCCO	612-339-4444	

Appendix 6

Cooperative Agreements for Emergency Services

AGREEMENT
BETWEEN THE CITY OF LONG LAKE
AND THE CITY OF ORONO PROVIDING
RECIPROCAL EMERGENCY WATER SUPPLY

THIS AGREEMENT, made and entered into this 11th day of April, 1994, by and between the City of Long Lake hereinafter referred to as "Long Lake," a municipal corporation, organized and existing as a city under the laws of the State of Minnesota, and the City of Orono, hereinafter referred to as "Orono," a municipal corporation, organized and existing as a city under the laws of the State of Minnesota.

WHEREAS, it will be beneficial to both cities to make arrangements for interconnections of the contiguous water service mains in both cities for use as a mutual emergency reservoir by the parties hereto; and

WHEREAS, it is necessary that there be permanent arrangements for the use, maintenance and repairs;

NOW, THEREFORE, it is agreed by and between the parties hereto that:

1. The Orono water main is connected to the existing water distribution system at Long Lake as shown on the plans as prepared by the City Engineer of Orono and approved by the City Engineer of Long Lake. Said plans are dated and shall be incorporated by reference to this agreement.
2. Long Lake and Orono shall pay each other for water consumed by either of the parties during emergencies or maintenance at the average rate prevailing at the time of usage. The average shall be determined by adding the two city rates and dividing by two.
3. The exchange and sale of water is to be limited to cases of emergencies or water system maintenance, cleaning and repair work. Emergencies shall be defined as follows:
 - (a) Interruption of normal water supply due to mechanical failure and for up to five (5) days for repair. However, if the mechanical failure causing service interruption shall, of necessity, require additional time, the parties hereto may agree, upon mutual consent, to extend the time.
 - (b) Fire emergencies which cannot adequately be taken care of by the use of one system.
4. The two-way valve shall remain closed at all times under normal conditions. Opening or closing of the valve for water system maintenance, cleaning and repair shall be done

only after two weeks notification of the City Clerk of either city which notification may be given only by the City Clerks, the water department superintendents or the fire chiefs of each city. The valve may be opened under emergency conditions without prior notice, but the City Clerk shall be notified as soon as possible thereafter and in no event later than 24 hours after the occurrence.

5. Repair and maintenance costs shall be borne by Long Lake for any portion of the pipe within its city limits and by Orono for that portion within the city limits of Orono.

6. Long Lake agrees that Orono shall not be responsible or liable in any manner for any claim, demand, action or cause of action of any kind arising out of the negligent performance or failure to perform any of the work provided herein by Orono. The above provision shall apply also to any failure by Orono for any reason to supply water service to Long Lake. Long Lake agrees to indemnify Orono, its officers and employees and to save and keep them harmless from all losses and expenses including attorney fees, expenses and court costs incurred as a result of any claim, demand, action or cause of action arising out of the construction, operation, maintenance or presence of the water line or the failure to provide water service at any time to Long Lake.

Orono agrees that Long Lake shall not be responsible or liable in any manner for any claim, demand or cause of action arising out of the negligent performance or failure to perform any of the work provided herein by Long Lake. The above provision shall apply to any failure by Long Lake for any reason to supply water service to Orono. Orono agrees to indemnify Long Lake, its officers and employees and to save and keep them harmless from all losses or expenses including attorney fees, expenses and court costs incurred as a result of any claim, demand, action or cause of action arising out of the construction, operation, maintenance or presence of the water line or the failure by Long Lake for any reason to supply water service to Orono.

7. Long Lake acknowledges that Orono is under no duty to provide a supply of water to Long Lake and Orono also acknowledges that Long Lake is under no duty to supply water to Orono.

8. Upon termination of this agreement by either party Long Lake shall take those steps necessary to install a shutoff valve at Long Lake's sole expense in Long Lake to prevent the passage of any water and Orono shall install a similar valve in Orono to prevent water passage between the two cities.

9. In the event both Long Lake and Orono shall have an emergency simultaneously, then each city shall operate on its own system and neither shall be responsible to the other to provide any water. Orono does not guarantee that any amount of water will be available at any given time and neither shall Long Lake.

10. This agreement shall be perpetual, but shall be subject to cancellation by either party upon the following conditions:

(a) Either party may cancel this agreement upon a 90-day written notice without cause.

(b) In the event one system introduces impure water into the other system and corrective action is not immediately taken upon notification, the party receiving impure water may cancel this agreement immediately.

Executed by the parties as of the day and year first above written.

WITNESS:

Harvey M. Hallen

CITY OF ORONO

By Edward J. Callahan
Its Mayor

And Ronald E. Moore
Its City Administrator

WITNESS:

Jane Gargenson

CITY OF LONG LAKE

By Tod Olson
Its Mayor

And Lutene Jensen
Its City Clerk

WATER SYSTEM INTERCONNECTION AGREEMENT

THIS AGREEMENT is entered into as of this ____ day of April, 2003, by and between the City of Long Lake (Long Lake), a municipal corporation, and the City of Orono (Orono), a municipal corporation.

RECITALS

WHEREAS, Long Lake and Orono are interested in sharing public services that will promote the public health, safety, and welfare of its citizens; and

WHEREAS, Long Lake and Orono have a water system interconnection located between the south side and north side of Wayzata Boulevard within the right-of-way of Willow Road (Willow Interconnection). It has a water system interconnection that can be operated manually; and

WHEREAS, Long Lake and Orono believe that additional water system interconnections will benefit both communities by allowing water to flow from one community to another during emergency or major maintenance of a community water system; and

WHEREAS, Long Lake and Orono desire to enter into an agreement to provide for the design, construction, and maintenance of water system interconnections for the mutual benefit; and

WHEREAS, Long Lake and Orono have already agreed to split the costs of the design and construction for two additional water system interconnections between the two communities; and to share the cost of maintenance of all these systems.

NOW, THEREFORE, for and in consideration of the mutual covenants contained herein and other good and valuable consideration, Long Lake and Orono agree as follows:

1. Long Lake and Orono confirm that they will share the costs equally for the design of two additional water system interconnections in accordance with the design prepared by Short, Elliot and Henderson (SEH). The location of the two new water system interconnections is set forth in the attached schematic, marked Exhibit A and are located as follows:

- a. The south side of Wayzata Boulevard to the north side of Wayzata Boulevard near Brimhall Avenue at a location to be determined (Brimhall Interconnection); and
- b. The Long Lake water main located on the north side of Wayzata Boulevard west of Virginia Avenue, to the Orono Avenue water main located on the north side of Wayzata Boulevard west of Virginia Avenue at a location to be determined (Virginia Interconnection).

2. The Brimhall and Virginia Interconnections will be automatic systems. The parties acknowledge that the existing Willow Interconnection will continue to be operated manually.

Upon receipt of the SEH invoice for the design of the Brimhall and Virginia Interconnections, Long Lake shall forward a copy to Orono. Long Lake and Orono will split those costs equally and pay the invoice on a timely basis.

3. Long Lake and Orono agree to split the costs equally of the construction of the Brimhall and Virginia Interconnections. The construction work will be added to an existing Long Lake City utility contract by change order. Upon receipt of the invoice, Long Lake will forward the invoice related to the Brimhall and Virginia Interconnections to Orono to be split equally between the two cities.

4. Long Lake and Orono agree that they will split the costs equally of the ongoing maintenance expense of the operation of the three water system interconnections, i.e. Willow, Brimhall, and Virginia.

Dated: 4-15-03

Dated: 7-14-03

CITY OF LONG LAKE

CITY OF ORONO

By: [Signature]

By: [Signature]

Its Mayor

Its Mayor

By: [Signature]

By: [Signature]

Its City Administrator

Its City Administrator

849535.1

Attachment to the Orono/ Long Lake Water Interconnection Agreement

There are two new separate water system interconnections referenced in this interconnection agreement. The agreement states that the operation and maintenance costs for these two interconnections will be shared equally between the two Cities. The two interconnections are similar in design with the same type of valves and a sump pump in each interconnection enclosure. In order to simplify the administration of this agreement, each City will be responsible for the operation, maintenance, and repair of one interconnect. Electric service will be required for sump pump operation in both interconnects, and each City will be responsible for payment of the costs for electric service for their interconnect.

The City of Orono will be responsible for the maintenance and operation of the interconnection located north of Highway 12 across from Virginia Avenue.

The City of Long Lake will be responsible for the maintenance and operation of the interconnection located south of Highway 12 near Brimhall Avenue.

Appendix 7

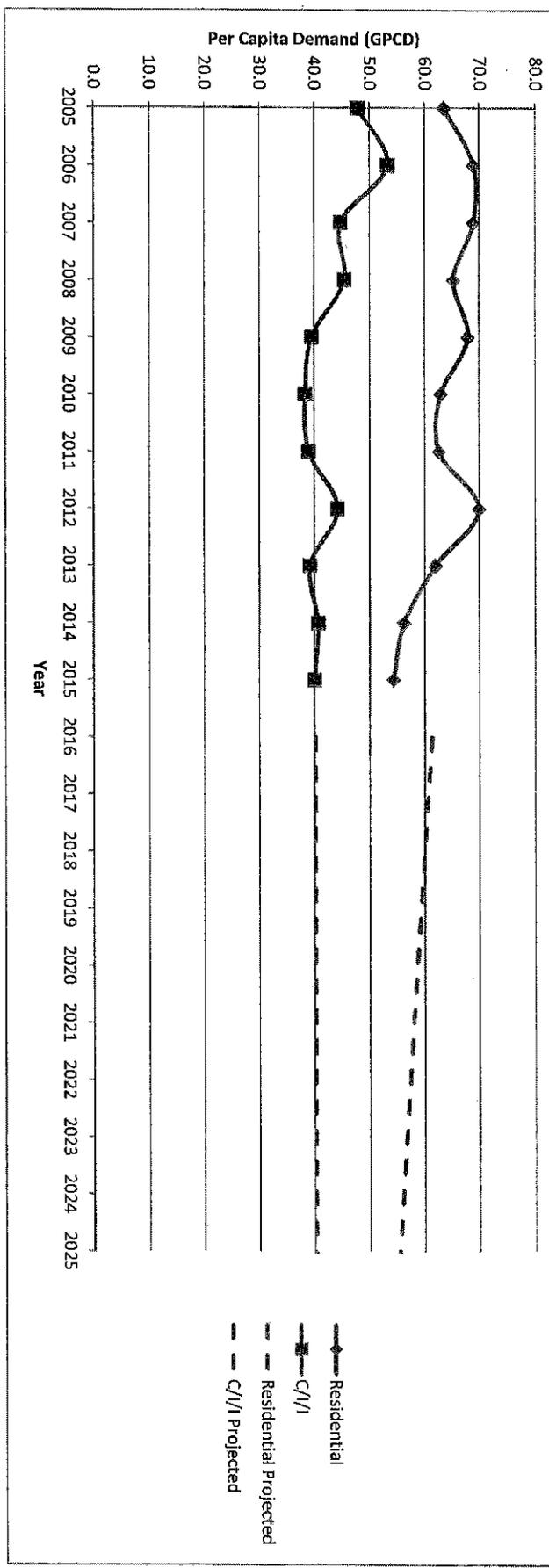
Municipal Critical Water Deficiency Ordinance

The City does not have a Critical Water Deficiency Ordinance in place.

Appendix 8

Graph showing annual per capita water demand
for each customer category during the last ten years

Historical and Projected Water Use by Customer Category



Appendix 9
Water Rate Structure



**City of Long Lake
2018 Rates**

WATER USAGE CHARGES		REFERENCES
Residential and commercial minimum fixed charge (applies to all properties)	\$4.05 / qtr	CH 36, ART II, DIV 4, SEC 36-102
RESIDENTIAL Tier 1 = 0 - 10,000 gallons used per quarter	\$2.67 / 1,000 gal	CH 36, ART II, DIV 4, SEC 36-102
RESIDENTIAL Tier 2 = Over 10,000 gallons used per quarter	\$4.01 / 1,000 gal	CH 36, ART II, DIV 4, SEC 36-102
COMMERCIAL Tier 1 = 0 - 40,000 gallons used per quarter	\$2.67 / 1,000 gal	CH 36, ART II, DIV 4, SEC 36-102
COMMERCIAL Tier 2 = Over 40,000 gallons used per quarter	\$4.01 / 1,000 gal	CH 36, ART II, DIV 4, SEC 36-102
LARGE INDUSTRIAL Tier 1 = 0 - 340,000 gallons used per quarter	\$2.67 / 1,000 gal	
LARGE INDUSTRIAL Tier 2 = Over 340,000 gallons used per quarter	\$4.01 / 1,000 gal	CH 36, ART II, DIV 4, SEC 36-102
Hydrant hook up fee per day	\$50.00 / day	CH 36, ART II, DIV 4, SEC 36-102
Minnesota Department of Health water connection fee	\$1.59 / qtr	CH 36, ART II, DIV 4, SEC 36-102

Appendix 10

Adopted or proposed regulations
to reduce demand or improve water efficiency

The following zoning ordinances contain regulations for short-term demand reductions and/or long-term improvements in water efficiencies

Section 21 – Off-Street Parking Requirements

Subdivision 4

Perimeter Tree Planting Requirements

The perimeter of parking areas for all commercial, industrial, institutional, and multiple family properties shall be planted with deciduous shade trees at least 3" in diameter at a number equal to 1 tree per 4 parking spaces, and spaced to provide maximum shading of the parking area.

Appendix 11

Implementation Checklist:

Summary of all the actions that a community is doing or proposes to do,
including estimated implementation dates

Appendix 11:

Implementation Check List

1. Data Collection of static and pumping levels of municipal wells: The public works department will continue to conduct routine collection of groundwater levels at the municipal well sites. This activity will provide data for the evaluation of groundwater elevations trends over time. On-going.
2. Educate the public on water conservation efforts: The city will provide information to the public to encourage users to voluntarily incorporate water saving habits and tools into their lifestyles via website, newsletters, links to the MDH, Met Council, and Hennepin County. On-going.
3. Incorporate information water supply plan to City's Comprehensive Plan: The city will use this water supply plan as a resource when updating it's Comprehensive Plan. Planned update of Comp. Plan 2018
4. Improve the existing water system's operation and maintenance programs: The city will continue to conduct water loss audits, and water conservation testing. The city will also continue to incorporate, capital replacement projects of aging water infrastructure into the capital improvement plan to ensure the water distribution system remains efficient and to keep water loss to a minimum. On-going.

Appendix 12
Sources of Information for Table 10

Long Lake Water Supply Profile

Overview of water system and use in the community

The community owns and operates their own water supply system.

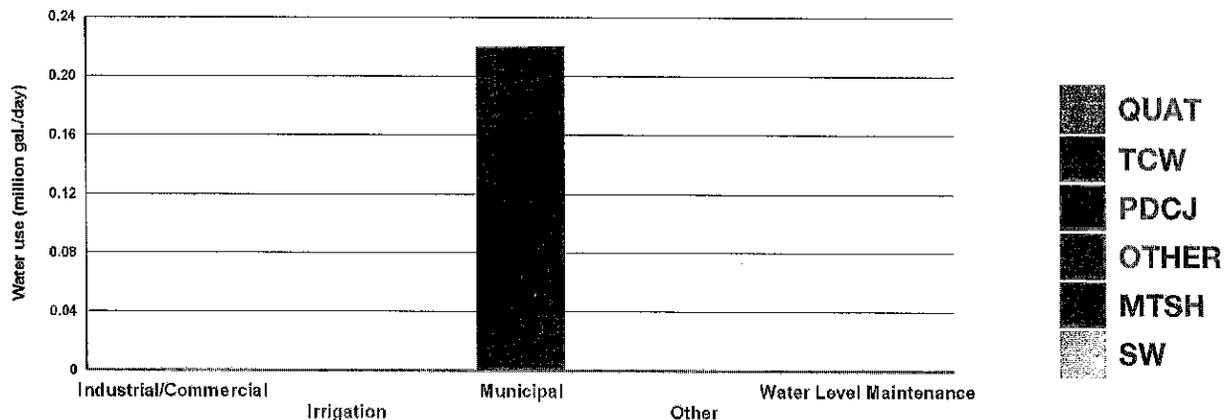
Available approaches to meet current and future demand

1. Conservation
2. Groundwater sources
3. Stormwater reuse
4. Reclaimed wastewater
5. Enhanced recharge
6. Surface water sources

Number of active public and private DNR-permitted wells and surface water intakes that provide water to residents and businesses in the community

Source	Municipal Wells or intakes in the community	Non-Municipal Wells or intakes in the community	Municipal Wells or intakes outside the community
Mt. Simon-Hinckley (MTSH)	0	0	0
Prairie du Chien-Jordan (PDCJ)	1	0	0
Quaternary (QUAT)	0	0	0
Tunnel City-Wonewoc (TCW)	0	0	0
Multi-aquifer (MULTI)	0	0	0
Surface Water (SW)	0	0	0

Amount of water used, on average, by water appropriation permit holders in key water use categories (chart will be blank if no DNR-permitted wells or intakes provide water in the community)



Municipal Water Use

Municipal water treatment: Fluoride , Disinfection, Iron/Manganese Sequestration

Rate structure: Unknown

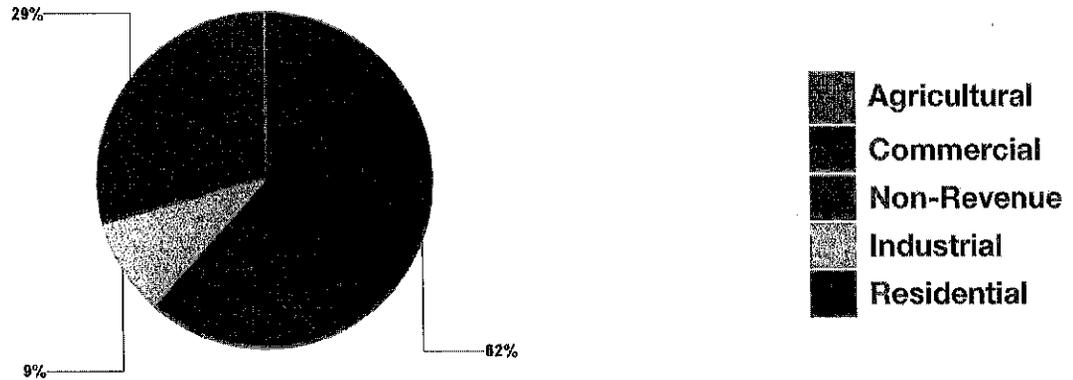
Permitted amount in 2012: 178 (million gallons/year)

Reported use in 2012: 74 (million gallons/year) 0.20 (million gallons/day)

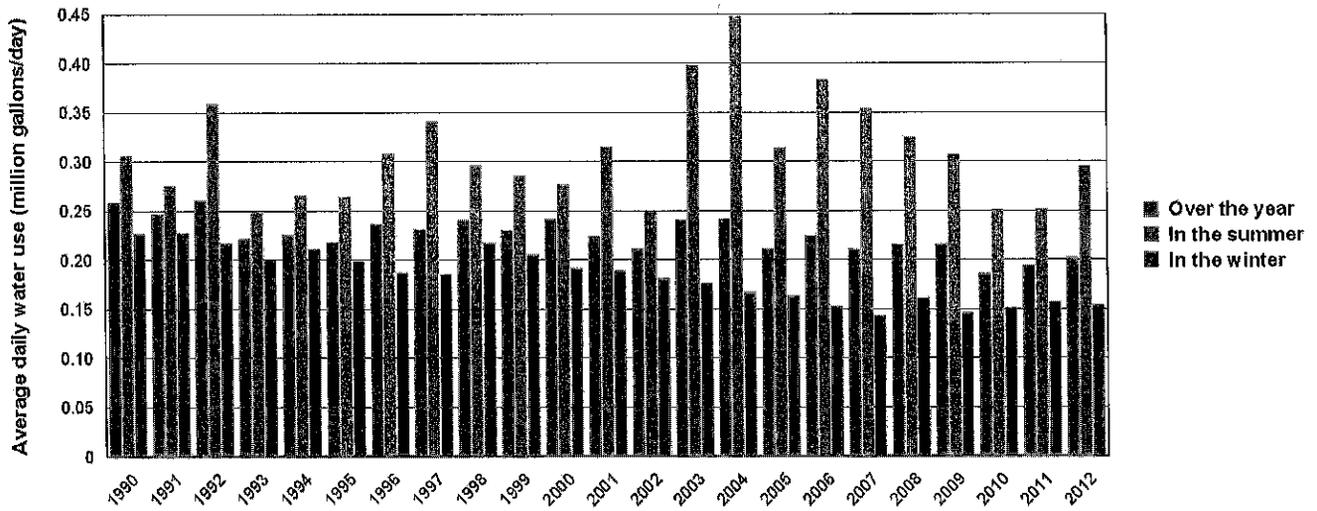
Note: *this may be higher than permitted amount if, for example, water is purchased from a neighbor*

Residential water use per person in 2012: 68 gallons per person per day

Water use by major categories in 2012



Historical municipal water use in the community



Projected municipal water use

	2020	2030	2040
Population Served	1,810	1,960	1,990
Total Population	1,810	1,960	1,990
Projected Average Daily Water Use (Million Gal./Day), Plus or Minus 20%	0.22	0.23	0.24
Total Per Capita Water Use (Gal./Person/Day)	119	119	119
What per capita water use would be, if population grew without changing total water use:	112	103	101

Water resource plans and permits that address the following issues support more sustainable water supplies

- State and federal requirements, such as Safe Drinking Water Act standards, conditions identified on water appropriation permits issued by the DNR, water quality permits issued by the MPCA and others
- Potential for water use conflicts and well interference
 - Due to the pervasiveness of private wells in the metro area, there exists a potential water use conflict and well interference of all appropriators
- Potential for significant decline in aquifer water levels
 - A nearby DNR observation well documents a declining trend in aquifer water levels
- Potential for impacts of groundwater pumping on surface water features and ecosystems
 - Surface waters in this area may be directly connected to regional groundwater system
- Significant vulnerability to contamination
 - Travel time from land surface to bedrock aquifers is estimated to be less than 50 years
- Significant uncertainty about aquifer productivity and extent
 - Part of the area may not be well-represented by a Minnesota Department of Health aquifer test
 - The county geologic atlas is more than twenty years old
 - Part of the area may not be represented by a Minnesota Department of Natural Resources or community observation well

Note: *Local studies may be underway or completed to provide more information about these issues.*

The Metropolitan Council's Local Planning Handbook contains interactive maps of all of these issues, and they are also summarized in Chapter 5 of this Master Water Supply Plan.

As appropriate, incorporate the following actions into plans and programs, consistent with your organization's roles and responsibilities

- Acknowledge the issues above and support partnerships to address them in local water supply plans and water appropriation permit applications.
- Explore and support water demand (water conservation) programs such as incentives, ordinances, education and outreach, rates and other approaches. The Metropolitan Council Water Conservation Toolbox can support these efforts.
- Promote the evaluation of water conflict and well interface as part of the water appropriation permit request and review process. Before requesting water appropriations, water users in this areas should evaluate the need to address water conflict and well interference including a) an inventory of all active domestic

and public water supply wells near proposed well locations and b) an analysis of existing water level/water withdrawal data to identify where future drawdowns could affect domestic wells.

- Support collaborative efforts to evaluate the likelihood of significant declines in aquifer water levels before water appropriation permits are requested. The analysis may be determined in consultation with DNR and can vary from a graphical comparison of water levels to local groundwater flow modeling. If this analysis suggests future declines are likely to be unacceptable, a management plan should be developed and include additional water level and pumping rate monitoring, triggers and actions to protect aquifer levels, a schedule for periodic analysis of data to identify the need for action to mitigate impacts, and a schedule for periodic and timely reporting to DNR.
- Work with partners to evaluate relationships between aquifer withdrawals and surface water features. If a connection is likely, management plans should include aquifer testing, monitoring water levels and pumping rates and surface water flow, triggers and actions to protect aquifer levels, a schedule for periodic analysis of data to identify the need for action to mitigate impacts, and a schedule for periodic and timely reporting to DNR.
- Collaborate with partners, including MDH, to support local actions that prevent the spread of contamination. This may include implementation of source-water protection plan measures to mitigate public health risks. Where significant contamination exists, MDH will continue enhanced monitoring, and public water suppliers in the area may need to implement treatment processes to meet Safe Drinking Water Act requirements and manage pumping to better control the extent and magnitude of contaminant plumes.
- Work with partners to identify opportunities for sharing information, reducing duplicate work, and partnering on projects that improve understanding about aquifer productivity and extent.
- Support collaborative efforts to periodically review local water supply risks and potential alternatives to mitigate those risks. Technical advances, regulatory adjustments and sub-regional developments can present new opportunities for local water suppliers to enhance the resiliency, sustainability, and affordability of their water supplies.
- Continue to work with local, state and federal agencies, as required.

Note: The actions listed above may be underway or completed, and information may be available from local public water suppliers, planners, or water resource managers.

Additional information and guidance is provided in the Local Planning Handbook. Metropolitan Council staff can also provide technical and planning assistance.

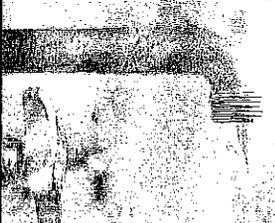
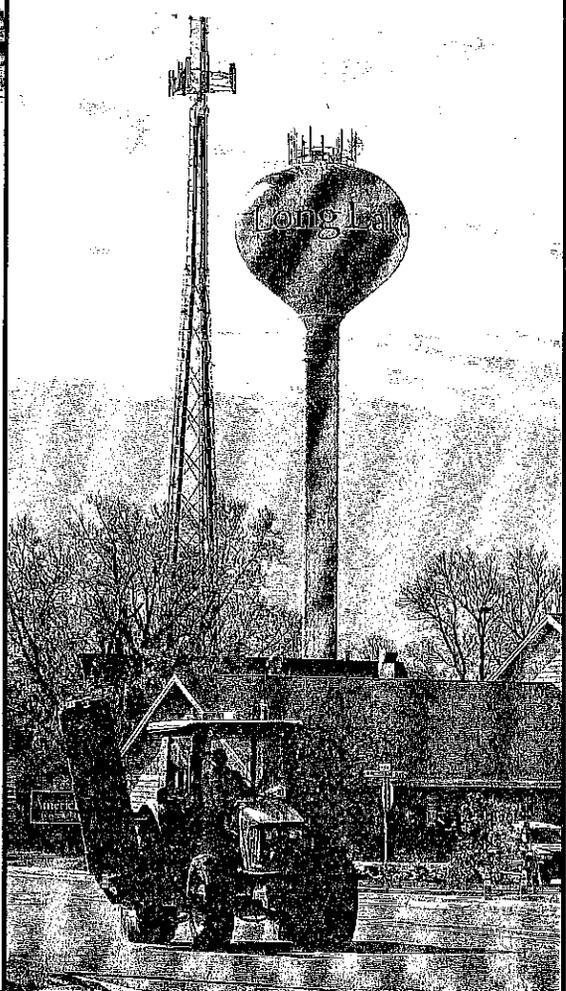
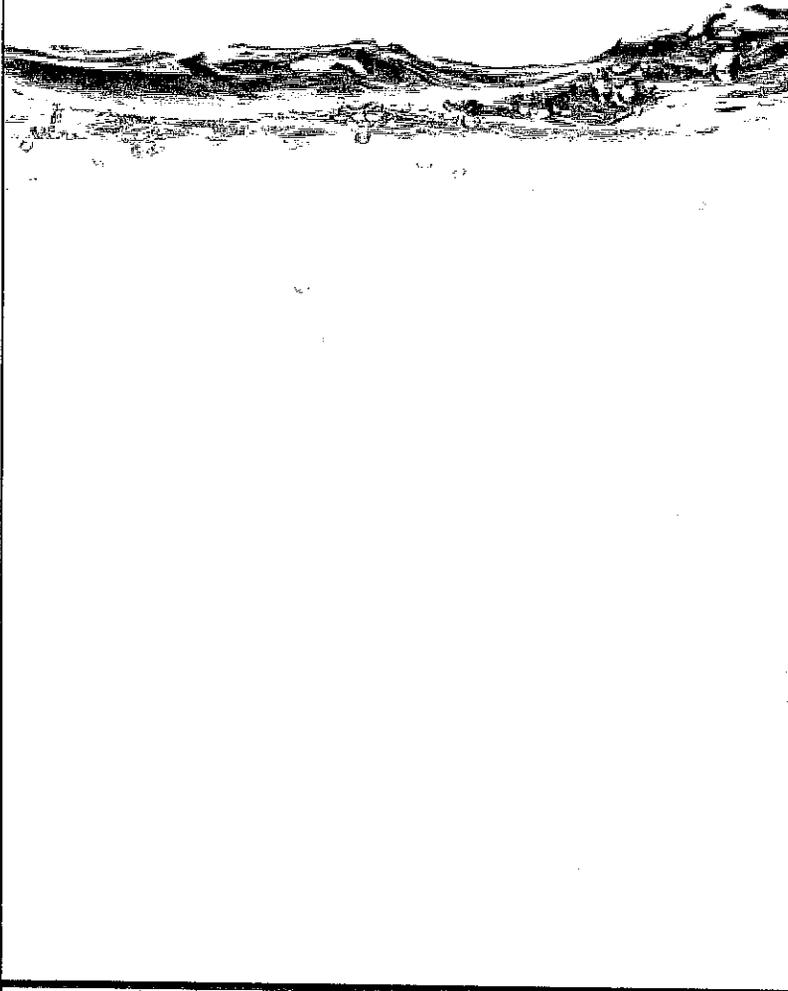


City of Long Lake
450 Virginia Avenue, PO Box 606 • Long Lake, MN 55356

March 2015

WELLHEAD Protection Plan Part 2

WSB Project No. 2151-01



701 Xenia Avenue South, Suite 300
Minneapolis, MN 55416
Tel: (763) 541-4800 • Fax: (763) 541-1700
wsbeng.com

Wellhead Protection Plan
Part 2
City of Long Lake, Minnesota

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PUBLIC WATER SUPPLY PROFILE

PUBLIC WATER SUPPLY

City of Long Lake
450 Virginia Avenue
Long Lake, Minnesota 55356
Phone: (952) 473-6961

WELLHEAD PROTECTION MANAGER

Marv Wurver, Public Works Director
450 Virginia Avenue
Long Lake, Minnesota
Phone: (952) 476-2855
E-Mail: mwurver@ci.long-lake.mn.us

CONSULTANT/TECHNICAL ASSISTANCE

Leslee Storlie, EIT
WSB & Associates, Inc.
701 Xenia Ave. S, Suite 300
Minneapolis, Minnesota 55416
Phone: (763) 231-4874
E-Mail: lstorlie@wsbeng.com

Breanne Rothstein, Planner
WSB & Associates, Inc.
701 Xenia Ave. S, Suite 300
Minneapolis, Minnesota 55416
Phone: (763) 231-4863
E-Mail: brothstein@wsbeng.com

GENERAL INFORMATION

Unique Well Number(s): 00667910, 00206933, 00509097
Size of Population Served: 1,803 (2012)
County: Hennepin

PUBLIC WATER SUPPLY WELLS

Local Well Name	Unique Number	Aquifer	Casing Depth (ft)	Well Depth (ft)	Date Constructed
Long Lake 1A	00667910	Prairie du Chien/Jordan	240 feet	475 feet	01/04/2002
Long Lake 2	00206933	Jordan	366 feet	448 feet	1965
Orono 3	00509097	Prairie du Chien/Jordan	312 feet	381 feet	11/12/1990

DOCUMENTATION LIST

<u>Step</u>	<u>Date Performed</u>
Part I Approval Notice Received from MDH	February 2013
Scoping 2 Meeting Held (4720.5349, subp. 1)	September 19, 2013
Second Scoping Decision Notice Received (4720.5340, subp. 2)	October 10, 2013
Part II submitted to Local Units of Government (LGUs) (4720.5350, subp. 1 & 2)	July 18, 2014
Review Considered (4720.5350, subp. 3)	July and August 2014
Public Hearing Conducted (4720.5350, subp. 4)	October 7, 2014
Part II of WHP Plan Submitted (4720.5360, subp. 1)	October 9, 2014
Approved Review Notice Received	TBD

EXECUTIVE SUMMARY

The Wellhead Protection Plan (the Plan) for the City of Long Lake (City) addresses municipal water supply wells used by Long Lake (2 municipal wells) and Orono (1 municipal well) and the associated source water aquifers (the Prairie du Chien Jordan and Jordan– the aquifers from which the municipal wells pump water).

Part 1 of the Plan was completed and approved by the Minnesota Department of Health (MDH) on February 2013. The Wellhead Protection Plan (Part 1) presented the delineation of the Wellhead Protection Area (WHPA), the drinking water supply management area (DWSMA), and the vulnerability assessments for the system's wells and aquifers within the DWSMA. The boundaries of the DWSMA are shown in **Figure 2**. The DWSMA is mostly in Long Lake, but also partly in Orono. Water supply wells covered by this delineation and this Part 2 Plan are listed on **page 4**.

The *vulnerability assessment* for the aquifers within the DWSMA was performed using available information and indicates that the vulnerability of the aquifers used by the system is classified as **low**. The results of the aquifer vulnerability assessment determine *what types of potential contamination sources* must be managed within the DWSMA:

- Low vulnerability areas – wells
- Moderate vulnerability areas – wells and tanks
- High vulnerability areas – all land uses and potential contaminant sources

This document includes the following information:

- A review of data elements identified by the MDH as applicable to the DWSMA, as outlined in the Second Scoping Decision Notice, dated October 10, 2013.
- Results of an inventory of potential contaminant sources within the DWSMA.
- Review of changes, issues, problems, and opportunities related to the public water supply and the identified potential contaminant sources.
- A discussion of potential contaminant source management strategies and the goals, objectives, and action plans associated with these management strategies.
- A review of the wellhead and source water protection evaluation program and Long Lake's alternative water supply contingency strategy.

The goals and objectives of this Plan focus on managing potential contaminant sources within the DWSMA, reducing the potential contaminant pathways to the source water aquifer that may be provided by private wells, and educating property owners and water supply users.

The City of Long Lake's Wellhead Protection (WHP) team has identified the following goals for implementation of this Plan:

Goal 1: The City will maintain or improve the current level of water quality so that the municipal water supply will continue to meet or exceed all applicable state and federal water quality standards.

Goal 2: The City will continue to supply sufficient water quantity for system users and emergency needs.

Goal 3: The City will provide and promote activities that protect the source water aquifer that provides water to the municipal system.

Goal 4: The City will continue to collect data to support future wellhead and source water protection efforts.

Implementation of these goals will be achieved through direct management efforts to the following areas to prevent future contamination of the aquifer and increase awareness of groundwater protection:

- A. Well Management
- B. Public Education
- C. Data Collection
- D. Water Conservation
- E. Land Use Planning and Zoning
- F. Implementation
- G. Evaluation

The success of the Plan must be evaluated in order to determine whether or not the Plan is accomplishing what the City intended to do. Monitoring and evaluation of the Plan and associated activities will be conducted every two years that the Plan is in effect.

CHAPTER ONE: DATA ELEMENTS AND ASSESSMENT (4720.5200)

Long Lake currently uses the following wells to provide the City's drinking water:

- Well 1A - 667910
- Well 2 - 206933

Additionally, the City of Orono has a public well located in the DWSMA for Long Lake, which is Well 3 for Orono, unique number 00509097.

The DWSMA delineated in the Long Lake Wellhead Protection Plan area delineation study is found in Township 118, Range 23, Sections 34 and 35, as outlined in **Figure 1**. **Figure 3** indicates the location of known public and private wells found within the DWSMA.

I. REQUIRED DATA ELEMENTS AND ANALYSIS

In accordance with Minnesota Rules Chapter 4720.5200 and the Second Scoping Decision Notice dated October 10, 2013, the data elements and their assessments required to be included in the Plan for the City are presented in this Section. Data elements discussed in this Section include geology, land use, and groundwater quantity and quality.

1. GEOLOGY

The geology under Long Lake is a complex series of glacial sediment strata (drift) over faulted Paleozoic sedimentary bedrock. The drift beneath Long Lake is sediment from at least two glacial episodes, some of it deposited in and around meltwater lakes. Most of the glacial sediment in the Long Lake area is clay-rich and loamy till which does not generally conduct water efficiently. The thickness of the unconsolidated sediment varies greatly but can be generalized to approximately 200 feet thick. There are some sand and gravel layers within the glacial sediment that yield moderate volumes of water, but the exact location, depth, and extent, and sustainability of these layers is not known. Wells constructed in the drift can be expected to produce 100-500 gallons per minute (gpm) at relatively low construction cost, but carry the risk of drying up during periods of drought or interfering with other nearby wells. In some areas, the drift aquifers may yield higher volumes and/or have more than one aquifer available.

The Paleozoic sedimentary rocks around the Twin Cities Metro area have three primary aquifers: the Prairie du Chien-Jordan, the Franconia-Ironton-Galesville (FIG), and the Mt. Simon-Hinckley. Each of these is separated by a confining layer that essentially separates the aquifers. There is a documented fault in the bedrock just to the west of Long Lake which may not affect water production from the available bedrock aquifers. The fault probably fractured bedrock in the area, which means that vertical flow through confining layers is more likely in the Long Lake area, especially near the west end of the DWSMA near the fault. The possibility of vertical flow through fractures must be considered within the DWSMA for contaminants that manage to get into the generally low-conductivity drift. **Figure 4** shows the existing bedrock geology in the area near the DWSMA.

2. LAND USE

Current and historic land use in the vicinity of the DWSMA is discussed in this section, as well as information on political and parcel boundaries. This information for the City of Long Lake was used to delineate the DWSMA.

It is important to understand land use in order to determine key areas for concern in managing a wellhead protection area. For example, knowledge about the location of future development or areas of redevelopment within the DWSMA may reveal a need to closely manage the activity within more sensitive areas. Additionally, any land uses that currently pose a potential threat to the City's water supply would need to be highlighted to increase awareness of any concerns.

Figure 5 shows the DWSMA superimposed over the existing land use maps and parcel boundaries for the City of Long Lake. Land uses found within the DWSMA include single-family residential uses, commercial businesses, parks, institutional and industrial uses. The DWSMA is located in the primary downtown area of the City, where many of the historical buildings and auto-oriented services are located. Orono is also partially located in the DWSMA.

Potential threats to the water supply were determined by analyzing data relevant to the public water supply wells, the quality of water being drawn into the wells, or land and groundwater uses around the wells. Furthermore, a site investigation was completed to identify any additional possible Class V injection wells or wells within the DWSMA of any depth not found in the public water supply databases. No Class V injection wells were discovered through a site visit or the database search. The following potential contaminant sources were found to be within the DWSMA:

- Public and Private Wells. **Figure 3** shows a map that includes the public and private wells that are known to be located in the DWSMA. There are 16 known wells in the DWSMA, 3 of them for public supply (including one located in Orono). **Figure 11** shows detailed information about these wells.

Based on the geology of the area, the DWSMA associated with the Long Lake municipal wells has been determined to be a low susceptibility for contamination. Despite its relatively low vulnerability, best management practices should be developed for municipal and private wells. Specific non-point source land use acreage was not determined for this report, but the zoning and land use maps (see **Figures 6 and 7**) provide a tool for understanding the scope of land uses in the DWSMA.

3. GROUNDWATER QUANTITY

The City of Long Lake currently operates three active water supply wells, as shown on **Figure 3**. As outlined in the Part 1 of the WHPP (**Appendix D**) and depicted on the DNR State Water Use Database System. **Figure 8** illustrates the annual withdrawal from 2006 to 2010. **Figure 9** shows the projected water use to 2016.

Well No. 2 pumps water from the Jordan aquifer. Well No. 1A pumps water from the Prairie du Chien and Jordan aquifer(s). A five percent increase in water use is expected in the next five years.

Additional information about Long Lake's water supply system in general is presented in various City reports and may be requested for further information. In addition, well construction details, well logs, and past and projected pumping rates are included in the Wellhead Protection Plan Part 1 located in **Appendix D**.

4. GROUNDWATER QUALITY

The City of Long Lake produces an annual report on the quality of its groundwater called the Consumer Confidence Report. **Appendix B** is the 2013 Consumer Confidence Report, which outlines the results of quality monitoring done on the City's drinking water. Figure 11 shows that the City is in compliance with maximum contaminant levels set by the State and Federal Safe Drinking Water Rules for the contaminants analyzed. Water supplied by Well Nos. 1 and 2 meet all Maximum Contaminant Level (MCL) National Primary Drinking Water Regulations.

Water samples have been regularly obtained from the City wells and tested for regulated contaminants. As mentioned in Part 1, data summaries were obtained from the MDH, and it was determined based on this data that tritium was not detected in wells located within the DWSMA. Tritium is not a health hazard, but is an indicator of vertical migration travel time and aquifer vulnerability. The absence of tritium indicates that the travel time from the surface to the aquifers is extensive and supports the geologic sensitivity rating of low to very-low for the City wells. In addition, the thick confining bedrock units and glacial clay between the surface and the aquifer aid in protection the City's groundwater supply.

Non-municipal owned wells, particularly those that are completed in or penetrate the Jordan Aquifer, will continue to be considered when developing the management strategies for the Long Lake DWSMA. Unmaintained, damaged, poorly constructed, or unused/abandoned wells could provide a direct route for contaminants to enter the aquifers utilized by the City of Long Lake as their drinking water supply.

Management strategies are discussed in Chapter Five, which focus on activities that have the most potential to impact the aquifer system the City of Long Lake is using for its drinking water supply.

WELLHEAD PROTECTION AREA DELINEATION CRITERIA

Part 1 of the Wellhead Protection Plan provides documentation regarding how the following delineation criteria were applied to determining the boundaries of the WHPA:

- 1. Time of Travel** – 10 years
- 2. Aquifer Transmissivity** – porous media aquifer delineations, pumping tests conducted at former Long Lake Well 1 (02088490), MPCA Metro Model
- 3. Daily Volume of Water Pumped** – historical volumes and projected future volumes, which ever was greater.

4. **Hydrologic Boundaries** - Surface water features, geological boundaries, high capacity wells, and overland drainage.
5. **Groundwater Flow Field** - MODFLOW

The Inner Well Management Zone information is located in **Appendix C** of this report.

CHAPTER TWO: IMPACT OF CHANGES ON PUBLIC WATER SUPPLY WELLS (4720.5220)

In accordance with Minnesota Rules 4720.5220 a wellhead protection plan must identify and describe expected changes that may occur during the next ten years to:

1. The physical environment
2. Land use
3. Groundwater

1. PHYSICAL ENVIRONMENT

The City of Long Lake is not expected to grow significantly over the next 10 years. Long Lake is primarily built-out, and any changes to the physical environment would be a function of re-development. Therefore, there are not many anticipated changes in the physical environment that would impact the public water supply in a substantial way.

2. LAND USE

According to the Comprehensive Plan, the City of Long Lake is planning some re-development of their downtown area. A master plan completed for downtown indicates a mix of commercial and residential uses. Also, the city is planning for an expansion of their industrial park on the west side of the city, where current commercial properties re-located. The industrial park is the location of aging, heavier industrial uses, and is the primary location of the potential contaminant sources. The City of Orono has primarily commercial properties located in the DWSMA, which are anticipated to stay in commercial use, as well as a new, medium density townhome development north of Old Highway 12. An existing land use map for the year 2008 and a future land use map for the year 2030 are shown on **Figures 8 and 10, respectively.**

3. GROUNDWATER

The City does not anticipate significant growth in population or water usage over time. As stated in Part 1 of the Plan (**Appendix D**), the City projected a five percent increase in water usage over the next five years. However, with an increased focus on water conservation, it is the hope of the City that water quantity drawn from well pumping would stay the same or decrease over time. With regard to quality, Long Lake's groundwater has historically been of good quality.

A. INFLUENCE OF EXISTING WATER AND LAND GOVERNMENT PROGRAMS AND REGULATIONS

There are a number of existing rules and regulations at the County and Local levels requiring regulations related to managing wells within the system's DWSMA.

City of Long Lake and Orono Regulations

The cities of Long Lake and Orono both have regulations that make efforts to protect the interconnection of groundwater systems and stormwater systems with sanitary sewer systems. While Orono allows new wells, they require an analysis of the availability of public water systems before drilling.

Minnehaha Creek Watershed District Regulations

The Minnehaha Creek Watershed District has several goals in their Comprehensive Water Resources Management Plan, and several rules related to surface water quality, which also serve to impact groundwater quality. Through the regulation of filling and impacting wetlands, groundwater quality and quantity is enhanced. Through the wetland buffer rule and their stormwater rule which requires pre-treatment, the MCWD further enhances the groundwater recharge and quality. The MCWD focuses their stormwater management regulations on infiltration with the expressed purpose of maintaining groundwater recharge and protecting the hydrology of high value groundwater resources. Overall, the MCWD is one of the most active watershed districts in requiring the protection of groundwater resources.

B. ADMINISTRATIVE, TECHNICAL, AND FINANCIAL CONSIDERATIONS

The City of Long Lake has a small staff in the public works department. The Public Works Director will work in conjunction with their consultant City Engineer to protect the city's wells and water sources and implement the policies listed herein.

Funds to support ongoing wellhead and source water protection efforts will come from the City's water utility fund, but grants from the Department of Health could also be used to cover the costs of implementing this plan. Wellhead and source water protection activities will be evaluated on an annual basis, and any changes in the focus of the tasks will also be evaluated to determine if additional funding will be necessary to accommodate the changes.

CHAPTER THREE: ISSUES, PROBLEMS, AND OPPORTUNITIES (4720.5230)

Part 1 and Part 2 of Long Lake's Wellhead Protection Plan have utilized current local and regional information available for compiling and assessing data elements. At a minimum, this Plan will be revised or updated every 10 years as required by the Wellhead Protection Rules and the most recent and accurate data will be utilized at that time. To support on-going wellhead protection efforts, the City will collect data on wells, water quality and land use within its DWSMA. Due to limited resources to independently collect the full range of data and recreate the necessary databases, the City will continue to mainly rely on databases maintained by the State and County agencies to obtain and verify data, as needed.

I. ISSUES, PROBLEMS, AND OPPORTUNITIES IDENTIFIED BY THE CITY OF LONG LAKE THROUGH THIS REPORT

The City of Long Lake currently does not identify issues or problems and hopes to continue their wellhead protection effort similarly to how it was conducted in the past.

II. ISSUES, PROBLEMS, AND OPPORTUNITIES DISCLOSED AT PUBLIC MEETINGS AND IN WRITTEN COMMENTS

At the beginning of the wellhead protection amendment process, the City of Long Lake sent a notification to other local units of government of its intention to amend their wellhead and source water protection efforts. After approval by the MDH, Long Lake sent copies of the Part 1 report to the local units of government.

The City was not informed of any issues, problems, or opportunities by the local units of government during that time.

III. ISSUES, PROBLEMS, AND OPPORTUNITIES RELATED TO STATUS & ADEQUACY OF OFFICIAL CONTROLS, PLANS, AND OTHER LOCAL, STATE, AND FEDERAL PROGRAMS

Numerous controls, plans and programs exist that may be used to achieve the wellhead protection goals identified in this Plan. State and local units of government currently enforce land use ordinances, zoning laws, sewer ordinances, well permits, and groundwater use appropriation permits. The City will continue to work with neighboring communities to ensure proper management of the portion of the DWSMA that extends into the City of Orono. It is anticipated that most local issues may be adequately addressed through these existing processes and adopting of best management practices.

Given the low vulnerability of the DWSMA to potential contamination, the wellhead protection team does not recommend any additional regulations be imposed at this time. However, the team does recommend that overall regional coordination of wellhead protection efforts be initiated.

CHAPTER FOUR: WELLHEAD PROTECTION GOALS (4720.5240)

In accordance with Minnesota Rules 4720.5240 this section must address goals for present and future water use and land use to provide a framework for determining plan objectives and related actions.

Goals outlined in this part were selected based on the information gathered and compiled from the data elements, delineations of the WHPAs and DWSMA, results of the vulnerability assessments, results of the potential contaminant source inventory, expected changes in land and water uses, identified issues, problems, and opportunities, and evaluation of this information.

The public water supply is considered to have low vulnerability to contamination. The goals and objectives of this Plan will focus on managing potential contaminant sources within the DWSMA, reducing the potential contaminant pathways to the source water aquifer that may be provided by private wells, educating property owners and water supply users, and working with the neighboring communities to ensure proper management of the portion of the DWSMA in their respective community.

The City of Long Lake's WHP team has identified the following goals for implementation of this Plan:

Goal 1: The City will maintain or improve the current level of water quality so that the municipal water supply will continue to meet or exceed all applicable state and federal water quality standards.

Goal 2: The City will continue to supply sufficient water quantity for system users and emergency needs.

Goal 3: The City will provide and promote activities that protect the source water aquifer that provides water to the municipal system.

Goal 4: The City will continue to collect data to support future wellhead and source water protection efforts.

CHAPTER FIVE: OBJECTIVES AND PLANS OF ACTION (4720.5250)

Given the issues, problems, and opportunities discussed in Chapter Three and the goals stated in Chapter Four, the Wellhead Protection Plan delegates direct management efforts to the following areas to prevent future contamination of the aquifer and increase awareness of groundwater protection:

- A. Well Management*
- B. Public Education*
- C. Data Collection*
- D. Water Conservation*
- E. Land Use Planning and Zoning*
- F. Implementation*
- G. Evaluation*

In 2004, the City of Long Lake completed a Part II Wellhead Protection Plan. Many of the objectives and plans of action listed in the 2004 report are still valid and applicable today. The goals that are identified in that report are shown as **asterisked** in the Plan of Action.

PLAN OF ACTION

A. WELL MANAGEMENT

Objective A1: Take measures to promote proper sealing of abandoned, unused, unmaintained, or damaged wells*

Action A1: Make property owners aware of potential technical and financial resources that are available to assist them in securing grant funding for properly sealing wells.

Who:	City of Long Lake public works department and administration
Cooperators:	MDH, Hennepin County
Time Frame:	On-going
Estimated Cost:	\$500 annually in staff time
How:	Use the City's website, newsletters, or direct mailings to make well owners aware of well sealing cost-share programs. Assist realtors when appropriate to pass along information to property owners preparing to sell.

Objective A2: Educate the public about proper well management.*

Action A2: Provide links to MDH and County well management web sites on the City's website, include information in the City's newsletter or other direct mailings.

Who:	City of Long Lake administration
Cooperators:	MDH
Time Frame:	Ongoing
Estimated Cost:	\$250 in staff time
How:	Use the City's website, newsletters, or direct mailings. Use local newspaper, public access or social media sites.

Objective A3: Incorporate Wellhead Protection Initiatives into City Plans*

Action A3: The City will use this Wellhead Protection Plan as a resource when updating its Comprehensive Plan, Local Water Management Plan, Water Supply Plan, and other relevant plans.

Who:	City of Long Lake planning and engineering consultants
Cooperators:	City staff, consultants
Time Frame:	3 to 5 years

Estimated Cost:	\$5,000 to include in all other updates to planning documents
How:	Wellhead Protection initiatives will be addressed and incorporated into the City's various plan updates.

Objective A4: Continue to monitor the water quality from City's wells (existing and new) to ensure high quality*

Action A4: Maintain water quality sampling requirements mandated by MDH and analyze trends in water chemistry, looking for any possible degradation of quality or changes in aquifer hydraulics, including publishing the Drinking Water Consumer Confidence Report.

Who:	City of Long Lake public works
Cooperators:	Minnesota Department of Health
Time Frame:	annually
Estimated Cost:	No additional cost
How:	Staff will review annual water quality reports and assist MDH in the completion of the annual CCR.

Objective A5: Develop a contingency plan in the case of groundwater or source water contamination*

Action A5: Coordinate with local emergency management and response officials to develop a water supply contingency plan and alternative water supply plan.

Who:	City of Long Lake administration
Cooperators:	City Engineering consultant
Time Frame:	3 to 5 years, coordinated with next Emergency Management Plan update
Estimated Cost:	\$5,000
How:	Working with adjacent communities and emergency management officials to update the reciprocal water agreement.

Objective A6: Management of Class V Injection Wells

Action A6: If any Class V injection wells are identified in the future, add those wells to the well inventory and work with the MDH to provide information to the property owner on management and/or permitting options.

Who:	City of Long Lake public works department
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Cooperators:	Engineering consultant
Time Frame:	ongoing
Estimated Cost:	no additional cost
How:	Add any new Class V injection wells to the PCSI inventory.

B. PUBLIC EDUCATION

Objective B1: Develop a public support and understanding for the wellhead protection planning through the use of web sites, newsletters, and handouts.

Action B1.1: Include information about wellhead protection and groundwater protection in the City newsletter.

Who:	City of Long Lake administration
Cooperators:	City of Long Lake public works and building departments
Time Frame:	Ongoing
Estimated Cost:	\$500 in staff time
How:	Identify and obtain existing educational materials available from MDH and other sources. Write articles describing wellhead protection and include contact information and website addresses for existing educational resources.

C. DATA COLLECTION

Objective C1: Continue to collect and maintain local geologic and hydrogeologic data in order to improve and augment current information and to provide additional data for future revisions to this Plan.

Action C1.1: Monitor static and pumping levels in municipal wells.

Who:	City of Long Lake public works department
Cooperators:	None
Time Frame:	Ongoing
Estimated Cost:	No additional cost
How:	Conduct routine collection of groundwater levels in the municipal wells, which will provide data for the evaluation of groundwater elevation trends over time. A decreasing trend in static water levels in the municipal wells may be cause for the City to pursue more restricted water use measures and /or more effective methods to control public

	water supply use. This data can also be used to verify the groundwater flow field in the source water aquifer.
--	--

Action C1.2: Cooperate and support future data collection efforts by other agencies.

Who:	City of Long Lake public works department
Cooperators:	Various agencies
Time Frame:	Ongoing
Estimated Cost:	\$500
How:	Provide assistance to agencies as requested.

D. WATER CONSERVATION**Objective D1: Implement a community-wide water conservation program.****Action D1: Implement conservation measures included in the Water Supply Plan.**

Who:	City of Long Lake public works department and City Council
Cooperators:	Engineering consultants
Time Frame:	1 to 2 years
Estimated Cost:	\$5,000
How:	Educate the public to encourage users to voluntarily incorporate water saving habits and tools into their lifestyles, consider options to improve the exiting water system's operation and maintenance procedures and incorporate costs associated with water conservation programs, analyze benefits of adjusting water rate structure and consider meter replacement or calibration.

E. LAND USE PLANNING AND ZONING**Objective E1: Eliminate or reduce the potential pollution risks to the source water aquifer and minimize the risk of altering the WHPA and DWSMA area.****Action E1: Include a review of this Plan as part of the Comprehensive Plan update when evaluating appropriate sites for future development**

Who:	City of Long Lake building department
Cooperators:	City of Long Lake public works department

Time Frame:	Next Comp Plan update
Estimated Cost:	\$1,500
How:	Copies of this Plan will be distributed to city staff and consultants for review and incorporate it as part of their comprehensive plan update.

F. IMPLEMENTATION

Objective F1: Track and report Wellhead Protection activities to aid in implementing Wellhead Protection Objectives.

Action F1: Complete an internal annual report on completed WHP activities.

Who:	City of Long Lake public works department
Cooperators:	Engineering consultants
Time Frame:	annually
Estimated Cost:	\$500 in staff time
How:	Report will be prepared and provided to the City.

G. EVALUATION

Objective G1: Evaluate Plan.

Action G1: Complete an evaluation report every 2 years.

Who:	City of Long Lake public works department, building official, administration, and City Council
Cooperators:	Engineering consultants
Time Frame:	annually
Estimated Cost:	\$2,500 per review
How:	Prepare a written report using the MDH Wellhead Protection Program Evaluation form or a format selected by the City. Provide report to the City Council and MDH Source Water Protection Unit.

CHAPTER SIX: EVALUATION PROGRAM (4720.5270)

The success of the Wellhead Protection Plan must be evaluated in order to determine whether or not the Plan is accomplishing what the City of Long Lake intended to do. Monitoring and evaluation of the Plan and associated activities will be conducted every two years that the Plan is in effect. The evaluation activities will include the following items:

- Track the implementation of the goals, objectives, and plans of action discussed in Chapter Five of this Plan;
- Analyze the effectiveness of specific plans of action regarding the protection of Long Lake's municipal water supply;
- Identify possible changes to the plans of action which may improve their effectiveness; and
- Determine the adequacy of financial resources and staff availability to carry out the management strategies planned for the each year.

The City of Long Lake will continue to coordinate with the MDH in the annual monitoring of the City's municipal water supply to determine if the management strategies presented in this Plan are having a positive impact on water quality and to identify what water quality problems may still be occurring and how they need to be addressed.

At the end of each evaluation period (every two years) City staff or the City's consultant will make a written report regarding progress in implementing the Plan, as well as an evaluation of the costs and benefits of the Plan activities. This report may be completed using the MDH Wellhead Protection Program Evaluation form. A copy of the evaluation report will be sent to the MDH Source Water Protection Unit in St. Paul. The City will also keep a copy of the evaluation report in its records. The intent of the evaluation is to compile a complete and comprehensive study of the implementation strategies for use when the City updates or revises this Plan. As required by the Wellhead Protection Rules, this Plan will be updated every 10 years at a minimum.

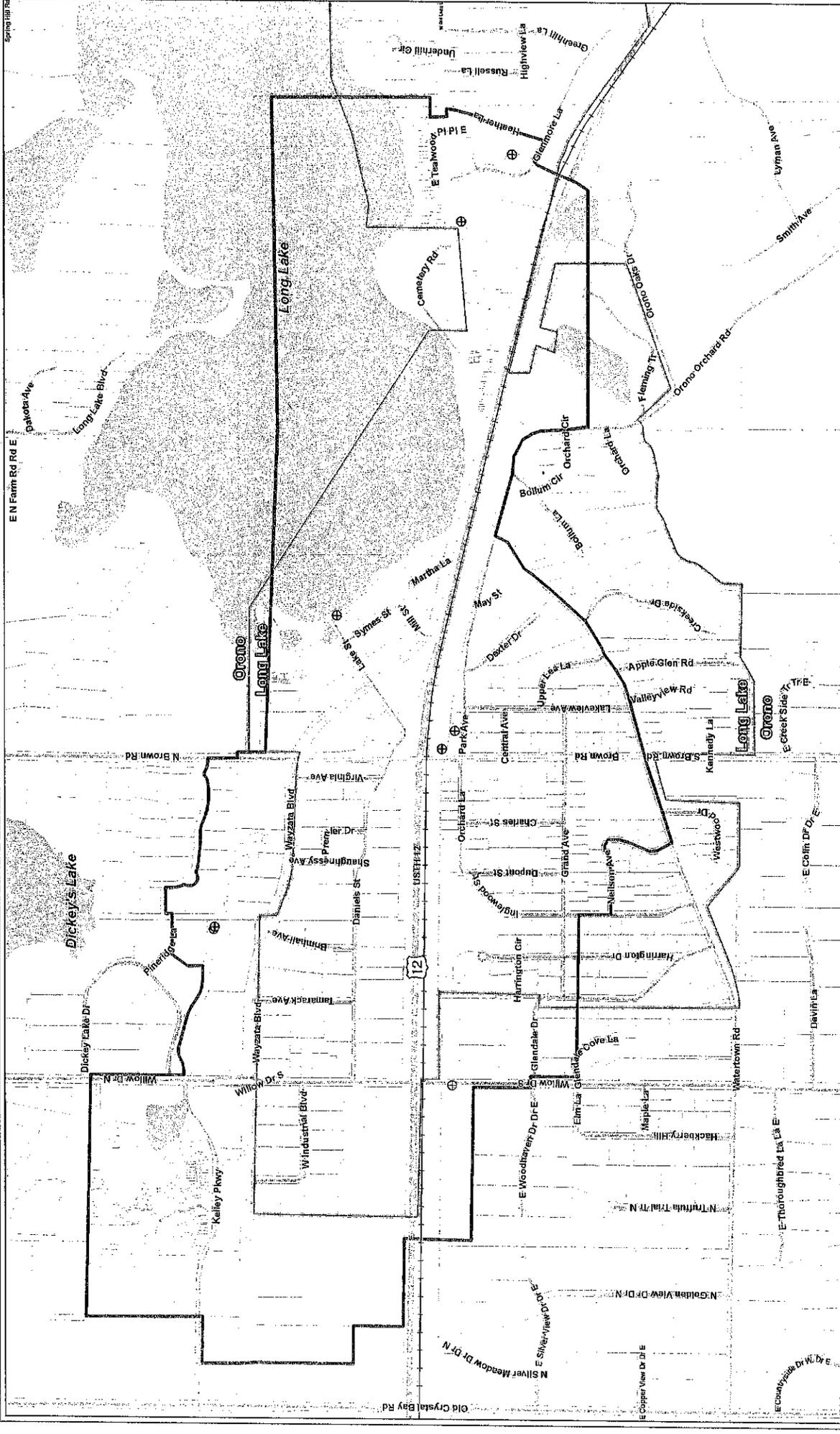
CHAPTER SEVEN: ALTERNATIVE WATER SUPPLY CONTINGENCY STRATEGY (4720.5280)

A contingency plan is put into effect to establish, provide, and keep updated certain emergency response procedures and information for the public water supply, which may become vital in the event of a partial or total loss of public water supply services as a result of a natural disaster, chemical contamination, civil disorder, or human-caused disruption. Currently, the City of Long Lake has a reciprocal water agreement with the City of Orono as their contingency strategy. The written agreement is provided in the DNR approved Water Supply Plan available upon request at City Hall.

Appendix A: Figures



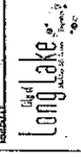
1 inch = 700 feet



Legend

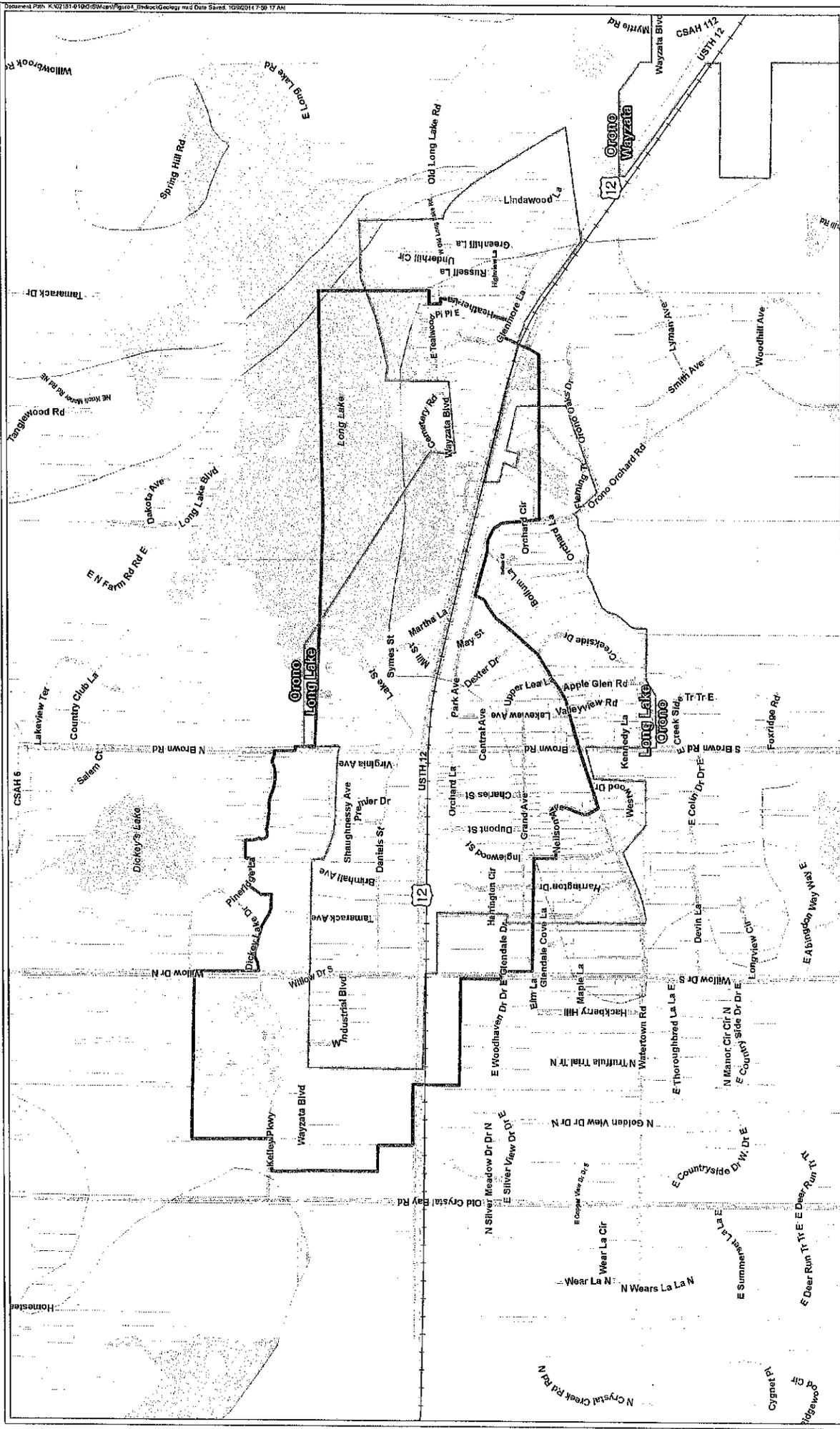
- ⊕ Wells Deeper than 30'
- ▭ DWSMA Area

Figure 3
 Location of Wells
 in DWSMA
 Long Lake, MN





1 inch = 1,000 feet



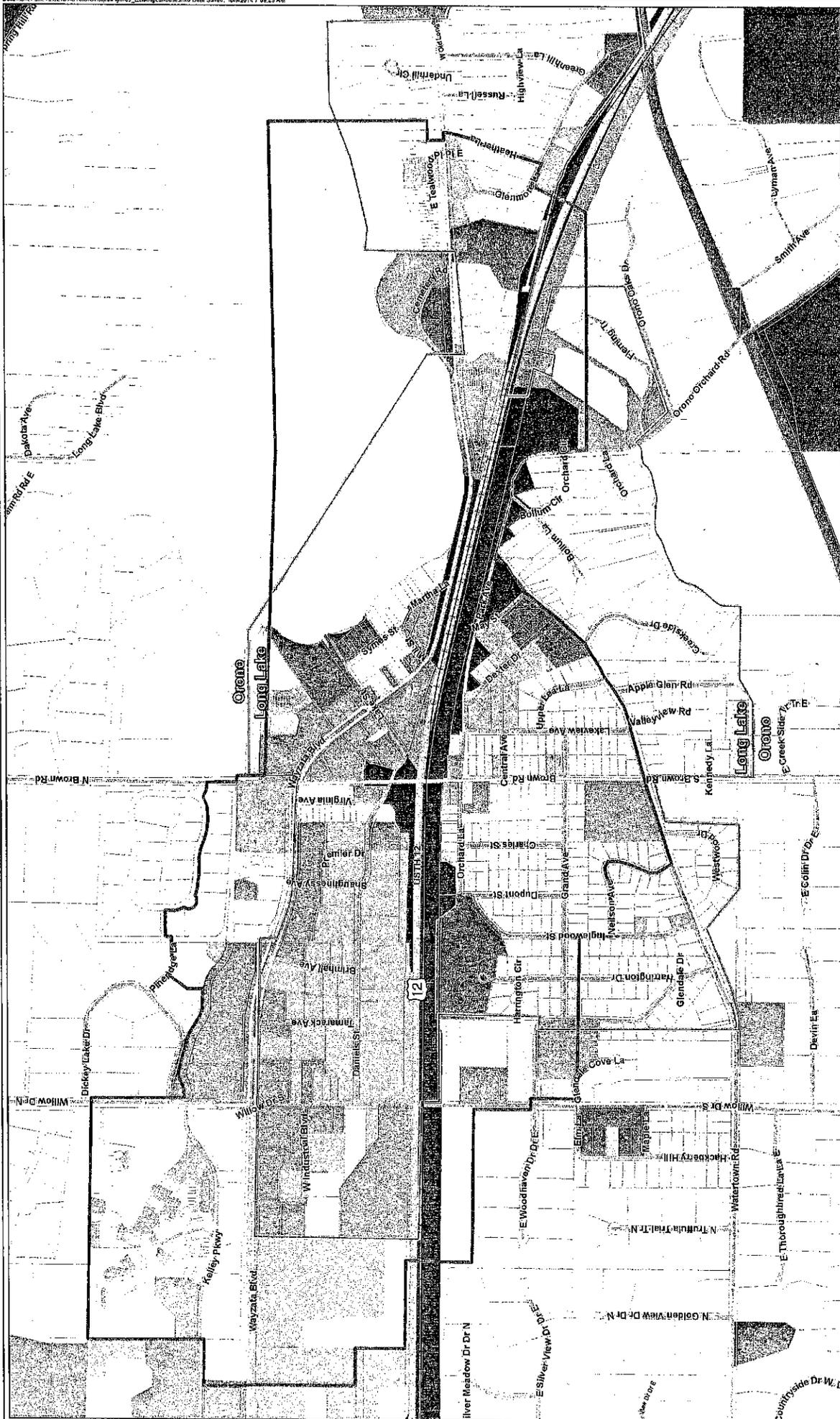
Legend

- St. Peter Sandstone
- Jordan Sandstone
- Prairie du Chien Group

Bedrock Geology

Figure 4
Long Lake, MN







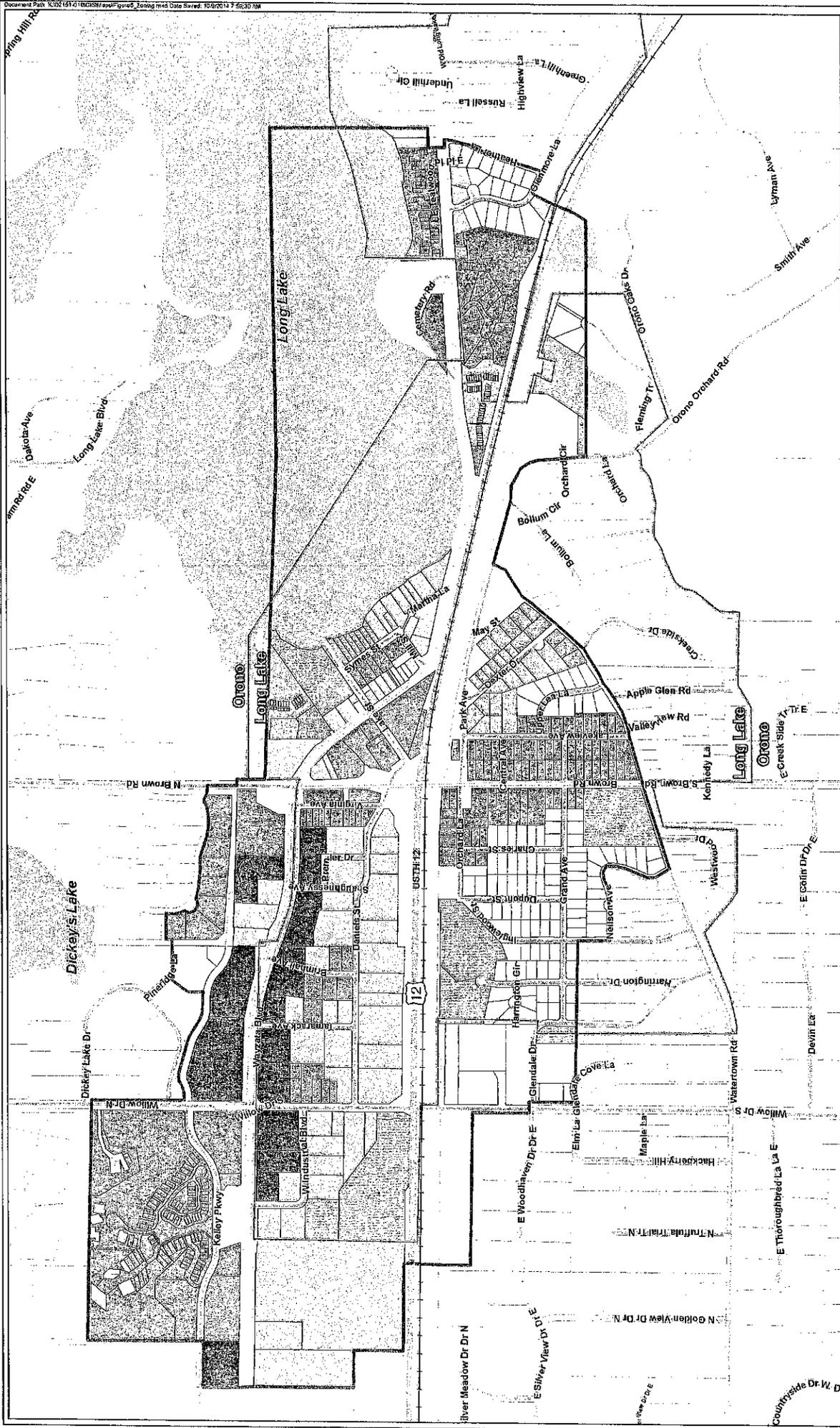
 1 inch = 700 feet

City of Long Lake
 Long Lake, MN Existing Land Use Map



 WSB
 LAND SURVEYING, INC.

Single Family Detached
 Single Family Attached
 Multifamily
 Retail and Other Commercial
 Office
 Mixed Use
 Industrial and Utility
 Industrial
 Institutional
 Park, Recreational or Preserve
 Golf Course
 Water
 DWSMA Area



Long Lake
City of Long Lake, MN

WSB
Watershed Solutions, Inc.

North Arrow

1 inch = 700 feet

Zoning within Long Lake, MN the DWSMA

[Pattern]	R-1A SINGLE FAMILY RESIDENTIAL
[Pattern]	R-1 SINGLE FAMILY RESIDENTIAL
[Pattern]	R-2 LAKESHORE SINGLE FAMILY RESIDENTIAL
[Pattern]	R-3 SINGLE FAMILY RESIDENTIAL
[Pattern]	R-4 SINGLE & TWO FAMILY RESIDENTIAL
[Pattern]	R-5 MULTIPLE FAMILY RESIDENTIAL
[Pattern]	R-8 LAKESHORE MULTIPLE FAMILY RESIDENTIAL
[Pattern]	B-1 LIMITED BUSINESS
[Pattern]	B-2 GENERAL BUSINESS
[Pattern]	VILLAGE COMMERCIAL 1
[Pattern]	H-1 INDUSTRIAL
[Pattern]	I-2 INDUSTRIAL
[Pattern]	INSTITUTIONAL
[Pattern]	P.U.D. (PLANNED UNIT DEVELOPMENT)
[Pattern]	DWSMA Area

Figure 6
Long Lake, MN

Figure 8: Annual Water Withdrawal (gals/year)

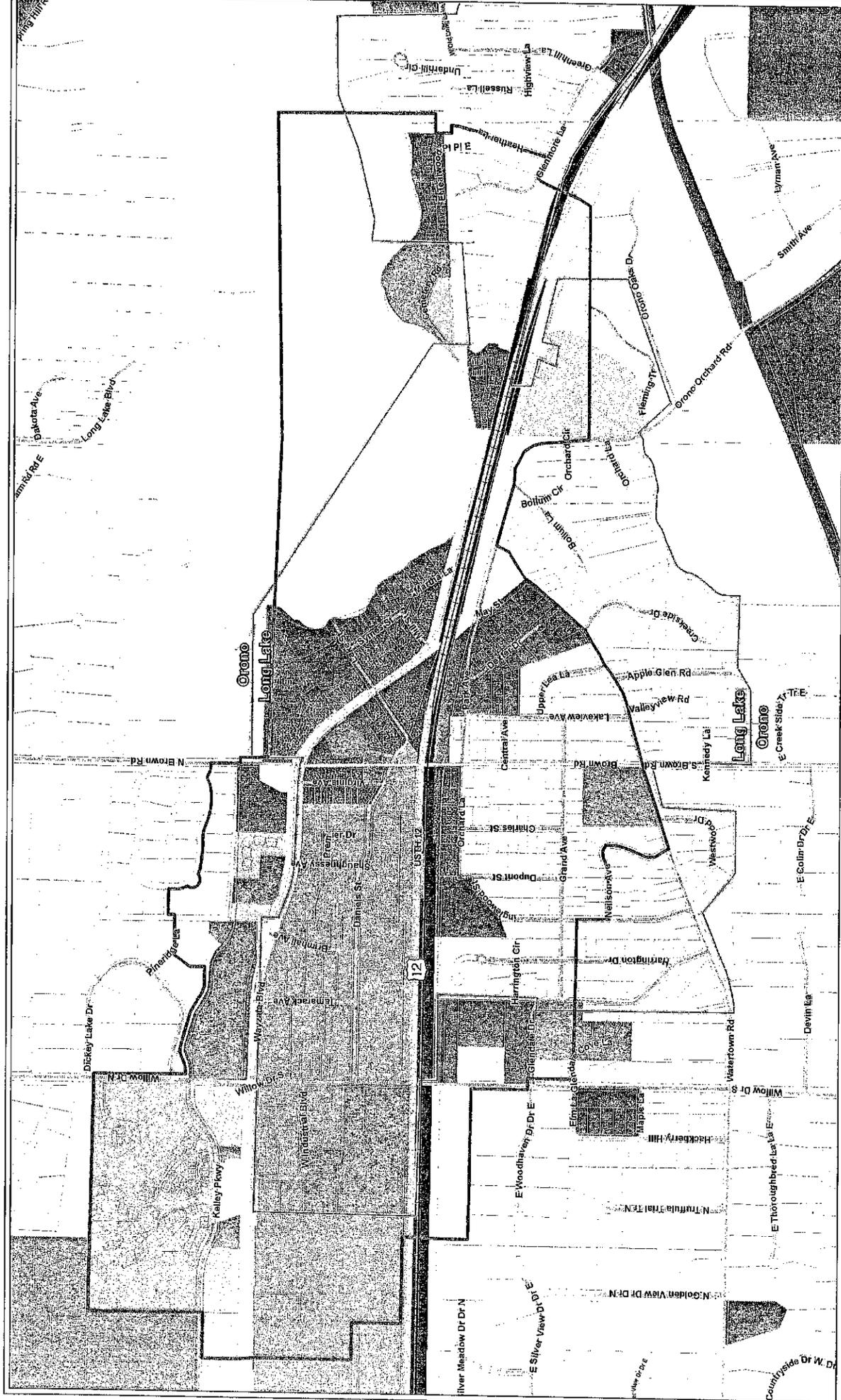
Unique Number	Well Name	2007	2008	2009	2010	2011
206933	2	32,200,000	31,500,000	36,700,000	21,200,000	19,400,000
667910	1A	44,900,000	47,000,000	41,900,000	46,800,000	51,300,000
	Totals	77,100,000	78,500,000	78,600,000	68,000,000	70,700,000

Source: DNR State Water Use Database Permit No. 1965-0980
City of Long Lake

Figure 9: Projected Water Use (to 2016)

Unique Number	Well Name	Maximum Withdrawal 2007-2011 (gal/yr)	Projected 2016 Withdrawal (gal/yr) 5 percent increase
206933	2	36,700,000	31,253,408
667910	1A	51,328,000	51,352,087
	Totals	88,028,000	82,605,495

Source: City of Long Lake Wellhead Protection Plan Part 1 (Appendix B)



Long Lake, MN

Figure 10 2030 Future Land Use Map

1 inch = 700 feet

WSB CONSULTING

North Arrow

Rural and Large-Lot Residential and Other
 Single Family Residential
 Medium Density Residential
 High Density Residential
 Office
 Commercial
 Industrial
 Institutional
 Multiple Use - Multiple Units
 Park and Recreation
 Open Space or Restrictive Use
 Rights-of-Way (i.e., Roads)
 Railway (inc. LRT)
 Open Water
 DWSMA Area

Figure 11: Potential Contaminant Source Inventory (Wells)

PID_NO	PCS_CODE	UNIQUE_NO	WELLNAME	CASE DIA	CASE DEPTH	UTM E	UTM N	FACILITY CODE	Notes
351182331	WEL	00206933	LONG LAKE 2	12	366	456080	4981389	4000	Located here
341182342	WEL	00667910	LONG LAKE 1A	18	240	454826	4981413	4000	
351182331	WEL	00164574	OSGOOD, LARRY	4	216	453952	4981424	1100	Not here
341182322	WEL	00158431	NICK MAZANYI	4	195	456247	4981262	1100	Not located
341182322	WEL	00509074	ORONO TW	4	307	454337	4982018	4000	
341182341	WEL	00206926	LONG LAKE NO.1	24	183	455110	4981705	5000	Water fountain in park, didn't see well
341182322	WEL	00208849	LONG LAKE 1	12	198	454781	4981445	4000	
341182322	WEL	00509097	ORONO 3	16	312	454343	4982016	4000	

APPENDIX N
LONG LAKE VILLAGE DESIGN GUIDELINES



Long Lake, Minnesota

Village Design Guidelines



*The Village: Design based on restraint and variations based on harmony.
(Photo of Long Lake Streetscape - Early 1900's)*

Adopted June 19, 2018

DEDICATION: CREATING THE VILLAGE

This document is a culmination of input by citizen volunteers, elected officials, appointed committees, staff and our consultants. We believe it is appropriate to acknowledge the individuals who contributed to this effort, and to convey appreciation for their time and participation.

CITY COUNCIL

MARTY SCHNEIDER, MAYOR
JAHN DYVIK, COUNCIL MEMBER
TOM SKJARET, COUNCIL MEMBER
MICHELLE JERDE, COUNCIL MEMBER
TIM HULTMANN, COUNCIL MEMBER

PLANNING COMMISSION

ROGER ADAMS, CHAIR
JOHN HUGHES, COMMISSIONER
STEVE KEATING, COMMISSIONER
CHARLIE MINER, COMMISSIONER
VIRGINIA SEE, COMMISSIONER

ECONOMIC DEVELOPMENT AUTHORITY

JAHN DYVIK, CHAIR AND COUNCIL MEMBER
MARTY SCHNEIDER, MAYOR
TIM HULTMANN, COUNCIL MEMBER
MICHELLE JERDE, COUNCIL MEMBER
TOM SKJARET, COUNCIL MEMBER
CARRIE CLEMENS, LONG LAKE RESIDENT
LORI GOODSSELL, LONG LAKE RESIDENT

CITY STAFF

SCOTT WESKE, CITY ADMINISTRATOR
JEANETTE MOELLER, CITY CLERK

CONSULTANTS

sbp design consulting BARRY PETIT
WSB & ASSOCIATES, CONSULTING ENGINEER AND PLANNERS



(Photo of Long Lake Business - Early 1900's)

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NOTES:

1. THE CURRENT ZONING ORDINANCE WILL SUPERSEDE ANY CONFLICTS BETWEEN THIS DOCUMENT AND THE ZONING ORDINANCE.
2. THIS DOCUMENT WILL BE UPDATED BY THE PLANNING COMMISSION REGULARLY. IT IS ESSENTIAL, THEREFORE, THAT AN APPLICANT MAKES CERTAIN THEY HAVE THE MOST CURRENT EDITION.

THE SCRAPBOOK

THE SCRAPBOOK IS A PICTURE-BASED DOCUMENT INTENDED TO BE UPDATED BY THE PLANNING COMMISSION. COMMISSION MEMBERS WILL BE ADDING EXAMPLES OF BUILDING DESIGNS THEY DEEM APPROPRIATE FOR THE VILLAGE DESIGN CHARACTER OF LONG LAKE. THE CITY WILL PROVIDE A COPY UPON REQUEST. IT IS NOT PART OF THE VILLAGE DESIGN GUIDE DOCUMENT.

Long Lake Village Design Policies

This document is born from the expectations defined by the citizens of Long Lake. In many ways it represents the next iteration of the 2001 Downtown Master Plan and Design Guidelines.

This document will be regularly reviewed by the Planning Commission for refinements and clarity. The Planning Commission has also been challenged to keep their collective eyes open for ideas and images from any part of the world that may help make this document better.

PART I INTRODUCTION

The Story

The City was challenged with these questions: “Who defines the character of Long Lake; developers or its citizens, and should development be random or guided?”. Overwhelmingly, when invited to share input on development design elements and the character of their community, citizens had a strong voice and desire to control the process. While thinking about an appropriate visual character, two ideas emerged - defining Long Lake as a *village*, and then finding an appropriate design character. The *village* is about harmony where design differences between buildings are based on nuance and not whimsy, random or corporate branding. Character is about an appropriate local imagery based on history, borrowed design clues and appropriate regional interpretations.

The community has endorsed the vision that Long Lake will develop a village-like character as defined in this Village Design Guide policy document. It’s important to understand our vision of *village* and character revolves around the idea of harmony - the *blended effect* of every element within our built environments, with no one element visually standing apart.

Note to Applicants: *Our vision is based on design restraint and neutral architecture. All applications will support our design objectives.*



It's a question of who defines the character of Long Lake - an applicant or the citizens. Long Lake has a longstanding tradition of being an engaged community, and we believe our design character must be reflective of the community's input which continues to favor concepts of "village" and restraint.



The *village* and its character are borne from common themes based on local materials, weather and construction talent. It is not about random difference for the sake of difference. Village design is harmonious with differences being nuance-based.



The randomness in design of this example shown at left is exactly what Long Lake wants to avoid through implementing this Village Design Guideline document.

Community Design Survey

In order to engage Long Lake property owners and residents and in an effort to learn more about the citizenry's design preferences, a community-wide survey project was undertaken taken in March of 2018. Approximately 750 surveys were mailed, with 178 completed surveys returned. The survey received nearly a 25% response rate, which would be considered a very large sample.

The survey contained eight questions about design supported by 61 images. Once tabulation of survey responses was complete, we grouped all the highest rated images and lowest rated images. Complexity versus a desire for simplicity jumped off the page. When delving deeper into the survey's results with a focus on the number of materials and colors on each design example depicted in the survey, we came to the defensible conclusion that good building design for Long Lake would be about restraint: - fewer materials and fewer colors. This revelation of restraint forms the core of the Long Lake's *village* character. The survey proved good design for a community can be quantifiable, converting emotional response into data.

For the purposes of brevity, the following examples are the highest and lowest rated images from just four of the questions.

Favorable Imagery



The eight images are taken from the community-wide design survey. The left images received favorable ratings over 75%. The images on the right were under 20%.

Through a comparison of the number of materials, colors and the complexity of the designs in each column, it became immediately obvious that restraint and simplicity marked the profound differences.

While there are those who would assert response to design is subjective, it becomes apparent it is not. The survey proved that the average person's struggle to verbally engage in a conversation about design does not make design subjective, it only means not all individuals not have the verbal tools to describe their feelings with regard to design.

The survey demonstrated that the design direction for Long Lake's *village* will be based on applying restraint in use of materials and colors, because designs focusing on restraint have been defined by the community's citizens as representing good design.

Imagery Not Supported by Survey Respondents



PART II THE FOUR DESIGN THEMES

Consistent with the results of the community design survey the Long Lake *village character* will be based on restraint. To that end, we have generated four design themes – SIMPLICITY, COLOR, HIERARCHY and COMPOSITION to help each applicant understand our mission and their design responsibility.

Note to Applicants: Applicants in any discussion about design with staff, Planning Commission, City Council, etc. will be expected to explain two things: 1) How their design addresses and supports each of the Four Design Themes; and 2) How their design supports the village character. The Long Lake Village Design Guide will supersede all corporate design standards.

Theme 1 SIMPLICITY

Good design is inherently visually simpler than poor design. Bad design is burdened with *stuff* - faux balconies and/or false second-story windows, multiple materials, banding, poorly detailed parapets, unnecessarily large signage, too many colors, odd combinations of piers, arches and colonnades and the ever-present tower - architecture as wedding cake.

Our position on SIMPLICITY is validated not only by our community design survey, but also by studying universally acknowledged great architecture. Each of the iconic buildings on this page embodies SIMPLICITY. Each is born from clear and powerful ideas that form the basis of every design decision. Competent design is rooted in clarity, not in whimsy and applied decoration.

It's important to understand that Long Lake's SIMPLICITY is not promoting elementary, dull or boring design. Also, it does not mean that only primitive geometries are acceptable forms. Rather, SIMPLICITY is about a reductive process where ideas are distilled to a few strong points. The architecture gains strength from peeling away unnecessary elements that dilute the concept. Good design is about the confidence and talent to resist decoration without meaning or purpose. SIMPLICITY avoids application of unnecessary and expensive *stuff* on facades in the name of design. SIMPLICITY actually saves money.

Power of light



Emotion of music



History of the river



Agrarian elegance



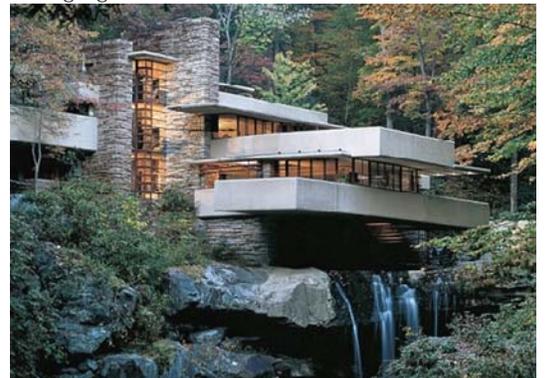
Power of few details



Calming through minimalism



Emerging from nature



Theme 1 SIMPLICITY (continued)

Dissecting Chaos The comparative examples included below further drive home our design mission based upon restraint. The functions of the examples are identical - the top two examples are corner one-story retail, and the lower examples are corner two-story retail and office buildings.

The overly substantial number of materials and colors applied to design on the two left-hand images sap the energy from marketing the retail tenants. These frenetic-feeling designs are so focused with drawing attention to themselves that the primary ideas of finding the door and featuring the street-level displays become secondary.

On the right, our two highly rated buildings from the community design survey would appear designed to understand their mission to be a recessive enclosure that supports the tenants. Our definition of good design emerges from modesty while poor design turns up the visual volume. Good design is comfortable with blending.

The two buildings on the right are representative of Long Lake’s village character.

The numbers represent the number of colors on each facade. Often the colors are associated with specific material variations as well.



one story



1 2 3 4 5 6 7 8 9 10 11

1 2 3



two stories



1 2 3 4 5 6 7 8 9 10 11

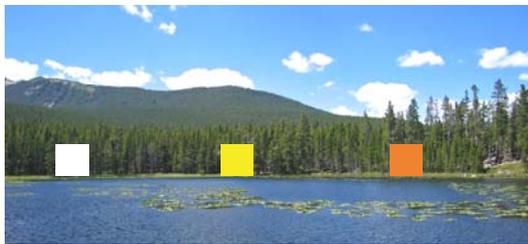
1 2

Theme 2 COLOR

Color is guided by physics: *dark colors absorb light* and *brighter colors reflect light*. Materials will visually dominate or recede, by accident or design, based solely on color.

Often the commercial/retail world uses color to compete for customers. Each business wants to be seen first. This competition creates a collective visual overstimulation where nothing dominates. As an example, *when everyone screams, no individual is heard*.

This single-color neutral building shifts the emphasis to the surface elements - awnings, flowers, business sign, the address and the windows.



Colors in landscape: bright colors dominate while darker colors recede.



Impact of light and darker buildings within the landscape.



The eye is drawn to the odd and bold combination of trim and awning colors.



Using color to differentiate materials is critical. The left image makes little distinction between the expensive brick and the cheaper stucco-like surfaces. The right image darkened the stucco in order to create a contrast and visually cap the building. Also interesting to note that the darker stucco drives more attention to the sidewalk level shops.



This is a simple exercise in recessive design achieved through color. The original maintenance building on the left was changed to the darker green in order to make this very utilitarian building recede.



Theme 3 HIERARCHY

HIERARCHY argues that every built element - signs, buildings, streetscapes - is a calculated mix of dominant and recessive features. This two-category division (dominant and recessive) deals with differentiating materials, surfaces, details, etc. by assigning their level of importance: what do you want me to see? The whole building will not scream for attention. HIERARCHY is an essential part of design restraint.

The assignment of recessive or dominant elements should yield a longer list of recessive features in order to ensure the important things like signs, doors, addresses, display windows dominate.

It should be apparent that HIERARCHY and COLOR are closely related. For example, an architect might create a visual path - HIERARCHY - using dominant and recessive colors. When you're trying to understand HIERARCHY, simply ask how the designer is using color to emphasize or disguise certain features. Visually aggressive design will be rejected.



The complications of the top two buildings ignore the mission to find the front door. While the building below may be overly simplistic, the design solution is completely subordinate to the tenant's doors and display windows.



A simple solution where the entire objective is to see the display window and the front door.



HIERARCHY of the message: this understands that a sign's objective is to see a store's name. The sample sign on the left adds distracting features, while the redesigned sign example on the right focuses everything to the shop name. SIMPLICITY and COLOR create the HIERARCHY.

HIERARCHY also deals with organizing a facade by distinguishing and contrasting materials. In the upper image example, nothing dominates and the eye wanders over the surface of unresolved details. The image below that simplifies the surfaces and assigns color to separate materials and emphasize a BASE, MIDDLE, TOP organization.



Competent design will emphasize the front door. This example fails to do so, causing a need to install additional bold signs to direct customers to their entry.



Theme 4A COMPOSITION FORM-BASED

Now we get a bit more complicated. Our COMPOSITION theme deals with how an architect organizes the exterior facades. We are promoting two dominant contemporary schools of thought, 1) BASE-MIDDLE-TOP and 2) FORM-BASED.

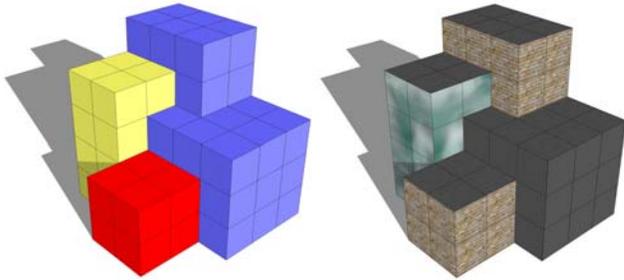
FORM-BASED

In very elementary terms, FORM-BASED design uses contrasting materials and colors to distinguish the ‘pieces’, almost like stacking the colored wooden blocks we all played with as children. These abstractions evolved from the 1930’s modern architectural movement that aggressively rejected neoclassic (or very formal) architecture.

For our purposes, the key characteristics are: 1) **contrast**, i.e. dark versus light, steel versus masonry, texture versus smooth, solid surfaces versus glazing, etc; 2) **weight**, i.e. stone versus glass, metal versus brick, dark colors versus light colors, etc.; and 3) **stacking**, i.e. organizing facades around linking distinct pieces.

It is a very legitimate design solution and although it appears at odds with our village character objective, it’s not because it still requires *restraint* by applying our themes of SIMPLICITY, HIERARCHY and COLOR.

The colored blocks become a perfect analogy for FORM-BASED design.



Extreme FORM-BASE composition. Essentially the entry is defined by carving out the corner of the black box. It’s a very powerful image - almost mysterious, but completely based on restraint.



FORM-BASED composition where the pieces are clearly defined by color and/or materials.



Examples of the two composition patterns. The top images represent the BASE-MIDDLE-TOP approach and the lower images are FORM-BASED design.



Theme 4B COMPOSITION BASE-MIDDLE-TOP

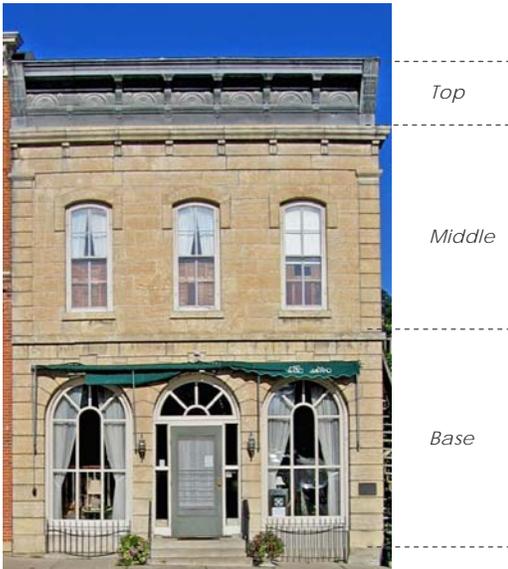
BASE-MIDDLE-TOP is borrowed from the classic Roman and Greek architecture that basically assigned horizontal layers to buildings.

Today this classic breakdown - mostly accidental - is found in nearly every contemporary commercial and retail design. Our objective is to ensure those designs using this three-part organization consciously understand the composition in order to provide a clear definition between the layers.

BASE: For our purposes the base zone has two roles: transparency in order to visually market the services or goods being sold; and structural, which attaches the building to the ground and supports the floors above. Consider the term *transparent strength*.

MIDDLE: The middle/neutral zone is simple, restrained and repetitive in number of floors, color and materials.

TOP: Historically, the top was an ornately detailed celebration of completion, and often included elements to honor a civilization's religious or mythological figures. The top could be the upper floor or, most often, the cornice, parapet or pediment.



Excellent example of a classic three-part composition: elaborate cornice detailing celebrates the top. The middle zone is simple and calm. The base zone changes texture, becomes transparent and emphasizes the door.



Contemporary building with three horizontal zones.

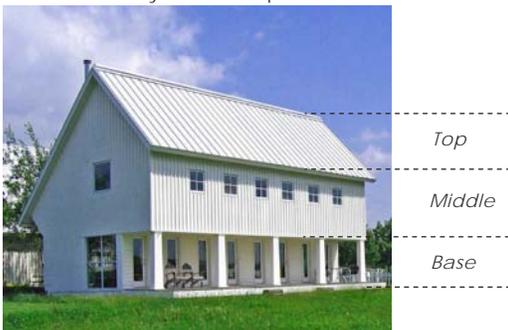
Interesting example of the three-part expression: dominant BASE made of stone, the transparent MIDDLE, capped by a substantial roof, or TOP.



The design of this large condominium project is clearly defined by the division of BASE-MIDDLE-TOP.



The ground level is distinguished by the columns that create shadow and depth, supporting the simple second story with its small square windows capped by the most elementary roof form possible.



This example is a direct function of failing to establish an organizational strategy. BASE-MIDDLE-TOP would have added an order eliminating the visual confusion of materials that fail to emphasize anything. The eye wanders in struggling to find a logic for why materials start and stop and how colors are assigned.



PART III DETAILS & MATERIALS

Note to Applicants: The intention of these rules is to impose a higher level of construction quality and to reinforce our village vision.

Definitions:

- 1 Stone refers to quarried stone and all types of cast stone-like products.
- 2 Stucco refers to real stucco assemblies, all stucco appearing products and all exterior insulation finishing systems (EIFS).
- 3 Wood refers to real wood and all simulated products fabricated to look and perform like wood.

Materials Not Allowed:

- 1 Exterior vinyl paneling of any type.

Restricted Design Elements:

- 1 No towers. Towers are for castles.
- 2 All sidewalks will be broom-finished concrete with saw-cut joints.
- 3 Repetitive ‘banding’ will be subtle similar to the banding created by shadow lines in recessed brick.
- 4 Awnings will be canvas.

Color and Material Limitations:

Buildings will have a limit of four materials and three colors.

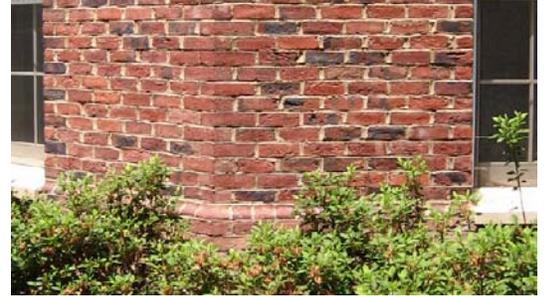
Materials differences are defined by actual materials: aluminum versus brick, and material variations. For example, Hardie Board lapsiding and Hardie Board shingles are the same cementitious product, but are considered two materials. Another example: a design with three exterior metal assemblies, i.e. standing seam prefinished steel, prefinished corrugated steel and steel lintels uses three of the four materials. If each material is the same color then only one color has been used. Stone is an exception with respect to color and materials. A facade with rough cut, flame finish and polished granite will represent three of the four allowed materials and the three color limit because each surface will produce a different, shade, tone and/or tint. Window and doors frames may be a separate fourth color, but all frames will be the same color.

Stone: Buildings using stone will have only one type of stone. Each finish will be considered a separate color and material. Sills for all window openings in stone will be stone. Lintels for all openings in stone walls will be steel or stone - no metal flashing.

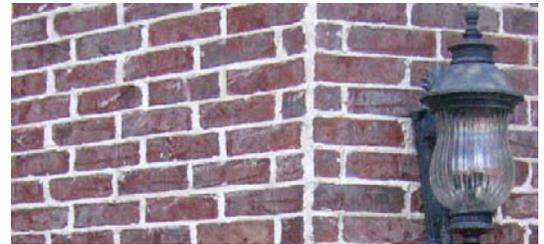
Columns and Piers: Materials used for first floor piers and columns will continue to the grade or to a continuous perimeter plinth.

Spandrel Panels: Street-level windows where glazing does not extend to the grade or plinth will have infill panels flush with the window frame system, not matching the pier or column material.

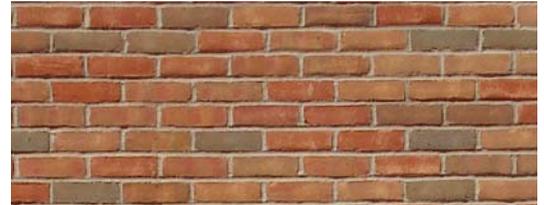
Tower elements would not be permitted.



All corner angles will be full brick. The construction below is not permitted.



The mortar color will be darker emphasizing the brick. The mortar above is not permitted.



Above is an example of a very subtle brick blend actually made from three brick colors and a recessive mortar.



Stone pier continues to grade. Spandrel panel below glazing to grade.



Not acceptable because the stone pier does not continue to grade and the surface below the glazing repeats the brick.

Canvas awning designs



Mitered corners



Severe oil canning



Shade range of acceptable precast panels



10" and 4" recess in stucco facades



Brick: Facades using brick will have only one dominant brick color or blend. The color range within a blend will be subtle. One very subtle and very limited accent brick color is permitted. Bricks will be modular dimension only. All mortar joints will be darker gray, concaved, tooled. Sills for all openings in the brick will be brick or stone. Lintels for all openings in brick will be steel, brick or stone - no metal flashing. All corners are full bricks - no partial or continuous mitered joints. All window, louver and door frames will be recessed at least 2.75" from the face of the brick.

Wood: All horizontal paneling or shingles will have mitered outside corners with a maximum exposure of 6". All window and door trim will be counted as a single material. No trim will be wider than 7.25" actual.

Standing Seam Metals: Narrow seams - no batten seams.

Oil Canning: Appropriate assembly is required to minimize oil canning of metal surfaces.

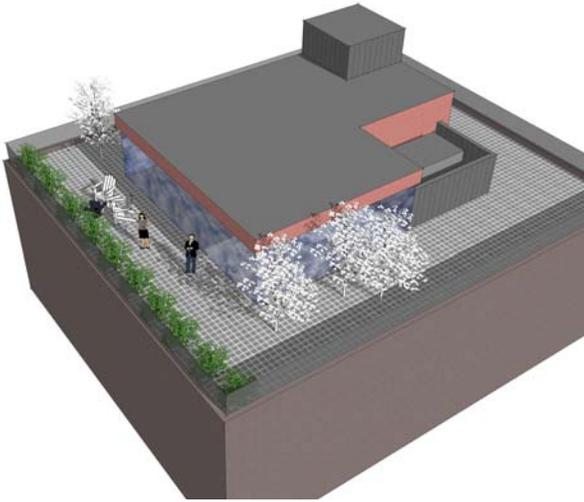
Stucco / EIFS: 40% of the total opaque exterior surfaces may be stucco. Colors will be limited to white and the following approximate pantone colors: pale cream (PMS 1205, 155), green (PMS323), gray (cool gray 8, 9, 10, 11, PMS 443, 444, 445) and rust red (PMS 478). Window and door frames in the street level facade will be recessed at least 10" from the finished surface and a minimum of a 4" recess on all other floors.

Precast Concrete Panels: These panels will be acceptable for large warehouse and manufacturer-like spaces. All panels will be integrally colored dark gray and perimeter-planted with ivy. The panel finish will be smooth-as-cast. Precast is not allowed for office, retail and residential designs. Exceptions, at the discretion of the City Council, may be considered for custom textures, patterns and colors.

Equipment: Rooftop equipment will be concealed by standing-seam metal panels. The panels are not included in the four material, three color limit; but the colors are limited to real copper or dark gray, dark brown, dark green or black prefinished metal. Service panels, transformers, etc. will be dark gray, dark brown or black. Panels will not be visible from primary streets.

Parapets: Parapet flashing is not included in the four material, three color limit; but flashing will be real copper or dark gray, dark green, dark brown or black prefinished metal. Stone coping, however, will count as one of the four materials and one of the three colors.

Sloped Roofing: All sloped roofing materials except for valley flashing are included in the four material, three color limit. If the roofing is standing seam metal, valley flashing will match the standing seam color otherwise valley flashing will be real copper, galvanized metal or dark gray, dark brown or black prefinished metal.



The Rooftop Garden Floor: This option effectively allows an additional floor but with more restrictive setbacks and encourages a more organic and/or transparent design.

The enclosed space, including the elevator shaft and stairs, must set back at least 12' from every facade of the floor below. The maximum height, excluding the elevator over-run, is 20'-8" above the finished floor of the level below. A light framed, open trellis may extend to within 2' of every facade of the floor below.

Although too tall, the design below is an example of the imagery being promoted for the Rooftop Garden Floor.



PART IV FIXING A DESIGN

Study Example: This is a critique of a small, retail/office building that would be inconsistent with Long Lake’s village design character objective. We dissected the problems and - respecting the budget - show a solution based on the material/color limits and the four themes. It’s important to understand that while the revisions in the example elevate the design, the design could still be improved upon.

The design below attempts to create a three storefront expression by dividing the facade vertically with changes in color, parapet heights and roofing forms (flat versus hip).

The facade has no depth - recessing windows or pulling the piers forward - making the facade shallow.

The stone columns abruptly end and are capped by embellished capitals supporting faux arches. The two arches communicate no sense of structural support. They are solely decorations with small applied keystones.

The bright colors emphasize the flat blank surfaces above the arched windows. There appears to be significant height between the second floor windows and the top of the building, resulting in odd proportions.

The composition and coloring do little to emphasize the tenants’ retail window displays.

The composition is based on BASE-MIDDLE-TOP.

Darkening the upper floor shifts the emphasis to the retail windows. The building height is reduced by three feet.

The TOP zone of the facade has a corrugated cornice around the full perimeter.

The upper floor is vertical Hardie Board-like paneling and painted slightly lighter than the corrugated cornice.

Subtle shadow bands have been added by recessing the existing brick.

Awnings are used to add color and to draw attention to the display windows.

Redesign time; 93 minutes - the facade has three materials and three colors.



PART V THE REVIEW PROCESS

Reviewing and approving building designs will be the responsibility of the Planning Commission. The VILLAGE WORKSHEET is required for the design review and approval. The document is available from the city staff.

Applicants will follow the normal land use application and/or public hearing process. Their submittal material will focus on 1) the required design information; and 2) variances from this design guide, if any. All planning, engineering and civil requirements will be met before permits are issued. Any misinterpretations will delay issuing a building permit until conflicts are resolved.

Applicants are encouraged to request a staff review of their design before the scheduled Planning Commission public hearing.

The design submittal will follow the four points below:

- 1 A brief summary explaining how the proposed design supports each of the four themes.
- 2 Completing the **MATERIALS AND COLORS** matrix.
- 3 Providing an elevation similar to the example below verifying the materials and color scheme proposed.
- 4 The following presentation material is required (all presentation material will be computer generated):
 - Site Design Plan - The Site Design Plan should be reasonably accurate. The plan needs to indicate approximate landscaping ideas (no Latin names required), buffering concepts, approximate grading, parking access, service and delivery conditions, and sidewalk plans. The focus is on design and not on catch basin locations, utility lines or holding pond calculations. However, the final civil engineering drawings submitted for permitting will provide all the necessary details and adhere to all building codes and all ordinances. Errors, accidental or not, will delay permitting.
 - Elevations
 - 3D images from several vantage points, with context

THE FOUR THEMES

Applicants are required to provide a brief description of how their design supports each of these four themes.

- 1 Simplicity:** Eliminating faux .
- 2 Colors:** Explaining color choices to define appropriate recessive and dominant elements and surfaces.
- 3 Hierarchy:** Order of importance - name, address, display, door, etc.
- 4 Facade Composition:** Explain the facade logic via Base Middle Top and/or Form-Based.

MATERIALS AND COLORS MATRIX

Parapet Flashing:

- Real Copper Dark Brown
- Dark Gray Black Dark Green

Surface Materials: Maximum of four.

- 1 _____ 2 _____
- 3 _____ 4 _____

Surface Colors: Maximum of three - brick and stone are considered colors.

- 1 _____ 2 _____
- 3 _____

Window and Door Frames: One color and one material.

- Color _____ Material _____

Doors: One material and one color.

- Color _____ Material _____

MATERIALS AND COLORS ELEVATION

- Parapet Flashing** Dark Bronze
- Surface Material 1** Stone
- Surface Color 1** Stone
- Surface Material 2** Brick blend with accent brick
- Surface Color 2** Brick blend
- Wdw and Dr Frames** Wood
- Color** Maroon
- Surface Material 3** Steel lintels and canopy
- Surface Color 3** Dark gray
- Doors Material** Wood
- Color** Natural



PART VI DESIGN CRITIQUES

The following four pages include notes on a wide range of building images in order to emphasize appropriate and inappropriate design for Long Lake. Please note that some of the comments may be received as being aggressive or opinionated; however, the commentary is of a more specific, forthright nature in order to help an applicant understand and infer what Long Lake would consider to be good design in keeping with the City’s village design character.

Dark recessive colors used to disguise a building banal in appearance.



Sense of strength by recessing doors into the brick facade to create depth.



Sophisticated FORM-BASE composition assigning materials and colors to specific forms.



A tower highlighted by faux windows, and excessive use of banding.



Two dimensional cartoon facade; no depth. The windows look painted on.



Traditional brick solution for non right angles.



Well done; subtle brick accent, real steel lintels, stone plinth supporting the facade.



This would not be permitted in Long Lake.



Elegant simplicity of the two shops above compared with the visual faux-heavy design in the image below.



Elegant brick cornice detailing.



BASE-MIDDLE-TOP with two colors.



Mansard roofs are acceptable only if they enclose habitable space.



Three types of steel equals three materials: steel roofing, corrugated panels and steel columns.



Emphasis on display windows and the shop doors with building as background.



Extruded flat facade treats brick like glass. No base, middle or top. Design repeats itself unfortunately in height.



Example of clear signage due to the simple and recessive facade colors.



Two color facade assigning full attention on the display windows and the door.



Assigning colors to specific layers - gray top, neutral brick, black bay windows.



Excessive use of colors, forms and materials.



Interesting design - simple and raw. The window color is an ideal accent.



Simple combination of colors and materials on a big box retailer.



Custom pattern in precast panels.



Failed hierarchy. Attention is focused on the faux window, the light stucco colors and the odd flag element.



Simple design, two colors. Well detailed BASE-MIDDLE-TOP composition.



Simple FORM-BASED composition dividing the facade into solid and transparent pieces.



FORM-BASED composition assigning different materials and colors to the three parts.



Contrasting materials to emphasize specific layers and geometries.



Not certain about the BASE, but the neutral MIDDLE and TOP zones are well done.



Some franchises are doing good design.



Building designed to appear as a large sign will not be permitted in Long Lake.



The exaggerated cornice and the 'stuff' above the windows are overly excessive.



Elegance of the simple box.



Nice store front, but the light stone trim unnecessarily complicates the facade.



This is nearly an appropriate building, but the light accent banding and window lintels are out of scale and overly dominant.

Restraint is a problem - this design is too busy.



Excellent example of all four themes: SIMPLICITY, COLOR, HIERARCHY, COMPOSITION.



Southwest style is inconsistent with Minnesota's history and environment.



Recessive brick facade supports the display windows. Purposeful red and green accents.



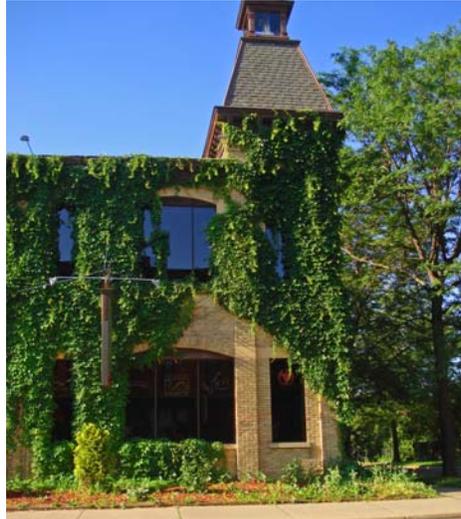
Simple form and color emphasizing the display windows.



The ultimate organic rooftop garden floor.



Vines are an ideal way to add age and disguise large blank surfaces.



Appropriate recessive canopy design created by using a dark green color.



Simple wood structure emphasizing door, signage and display windows.



Example of rooftop garden room that is invisible to the street level so it virtually adds no height to the building.



Well done FORM-BASED design that defines each piece by a specific material and color.



Acceptable subtle banding.



Sign lacking any restraint, more appropriate for Las Vegas.



Recessed windows and doors required with EIFS or stucco.



NOTE ABOUT SCALE:

While our village imagery is promoting simple and recessive design, we understand - and support - that 'brighter' pallets can be very appropriate for smaller buildings, although new construction can rarely afford to build these 'quaint' shops. It is important to note, however, other than being color-aggressive, each of these examples complies with our material and color limits, and they are simple.



NOTE ABOUT SIGNAGE:

Signs should also be designed around our SIMPLICITY, HIERARCHY and COLOR themes. The core idea is 'seeing the message.' A competent sign designer will understand how the background - the field - will support the message, and that clutter dilutes clarity.



Simple clarity of the message.



Simple and powerful sign example.



Retail development applicants must submit a signage package. The above is not allowed.



Two examples of ideal clarity. Buildings as simple backdrops for their signs.

We welcome this sign type, but they can be difficult to read from a moving car.



Understanding how to find the front door from a giant parking lot.



CITY OF LONG LAKE

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THE VILLAGE DESIGN WORKSHEET PAGE 1 OF 2

Approving your building design will be the responsibility of the Planning Commission.

Applicants will follow the normal land use application and/or public hearing process.

Applicants are encouraged to request a staff design review before the scheduled Planning Commission hearing.

The design submittal will follow the four points below:

- 1 A brief summary explaining how the proposed design supports each of the four themes.
- 2 Complete the MATERIALS AND COLORS matrix.
- 3 Provide sufficient elevations to explain and verify all the materials and colors.
- 4 The following presentation material is required (all presentation graphics will be computer generated):
 - Site design plan.
The site design plan should be reasonably accurate. The plan needs to indicate approximate landscaping ideas (no Latin names required), buffering solutions, approximate grading, parking access, service and delivery conditions/screening and sidewalk plans. The focus of the site design plan is on design, not catch basin locations, utility lines or holding pond calculations. However, civil engineering drawings submitted for land use applications and permitting will graphically provide all the necessary details and adhere to all building codes and all ordinances. Errors or omitted information, accidental or not, will delay application processing and/or permitting.
 - Elevations of all facades.
 - 3D images—including adjacent buildings—from multiple vantage points.

1 SUMMARY SUPPORTING THE FOUR THEMES

Applicants are required to provide a succinct description of how their design support each of these four themes.

- 1 **Simplicity:** *The design focuses on developing the composition of a very simple 'street front' facade. There are no fake windows, balconies or towers.*
- 2 **Colors:** *The basic pallet is quite neutral. Color—albeit subtle—was used to emphasize the front doors.*
- 3 **Hierarchy:**
 - 1) *The signage is placed on the neutral brick surface.*
 - 2) *The front doors have received a 'splash' of color.*
 - 3) *The canopy helps to announce the shop doors.*
 - 4) *The facade is recessive to focus attention on the street level display windows.*
- 4 **Facade Composition:** *The facade composition is based on the Base, Middle, Top Theme.*

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THE VILLAGE DESIGN WORKSHEET PAGE 2 OF 2

2 MATERIALS AND COLORS MATRIX

Parapet Flashing:

___ Real Copper Dark Bronze
 ___ Dark Gray ___ Black ___ Dark Green

Surface Materials: Max four

1 Brick blend w/accnt 2 Steel lintels and canopy
 3 Real stone 4 _____

Surface Colors: Max three - brick and stone are colors

1 Stone 2 Brick 3 Dark gray

Window and Door Frames: One color and one material

Color Maroon Material Wood

Doors: One material and one color.

Color Natural stain Material Wood

FYI... photo of the completed building



3 MATERIALS AND COLORS ELEVATION

Parapet Flashing Dark Bronze
 Surface Material 1 Stone
 Surface Color 1 Stone
 Surface Material 2 Brick blend & accent brick
 Surface Color 2 Brick blend
 Wdw and Dr Frames Color Wood Maroon
 Surface Material 3 Steel Lintels and canopy
 Surface Color 3 Dark gray
 Doors Material Wood
 Color Natural

