

## **IX. WATER RESOURCES**

### **A. Water Resource Goals and Policies**

**Goal:** Preserve and protect the quantity and quality of surface water and groundwater.

**Objectives:**

- Work cooperatively with all State and Federal agencies to comply with and enforce regulations and standards such as Shoreland Management Regulations, Erosion and Sediment Control Standards, Floodplain Regulations, and Stormwater management.
- Identify sensitive groundwater recharge areas and groundwater dependent natural resources to guide development and land use to minimize potential contamination and incompatible uses.
- Require developers to restore the ability of soils to absorb, retain, and infiltrate water following site development.

**Goal:** Improve stormwater management and land stewardship practices.

**Objectives:**

- Provide educational resources and materials to residents and businesses regarding water quality, stormwater runoff, best management practices, and impaired waters.
- Incorporate low-impact techniques and best management practices on City owned property.

**Goal:** Protect the natural and scenic resources of the St. Croix River Corridor, both within and adjacent to the St. Croix National Scenic Riverway.

**Objectives:**

- Work cooperatively with the National Park Service, Department of Natural Resources, and Carnelian Marine St. Croix Watershed District and adopt their Local Water Management Plans.

**Goal:** Ensure financial and environmental accountability for installation, maintenance, remediation, and management of any permitted private wastewater system.

**Objectives:**

- In cooperation with Washington County, enforce strict conformance with regulations for the design, installation, and maintenance of on-site treatment systems including minimum design, licensing, and installation requirements of the Minnesota Rules Chapter 7080.

### **B. Wastewater**

#### **1. Forecasts**

According the Metropolitan Council population, household, and employment forecasts and City data, the City of Scandia will have the following sewer demands, as detailed in Table IX-A.

Table IX-A – Population, Housing, & Employment Sewer Allocation Forecasts					
	Forecast Component	2010	2020	2030	2040
Population	Unsewered	3,538	3,863	4,232	4,550
	Private Systems	105	105	105	105
	Public Systems	291	292	293	295
	Total	3,934	4,260	4,630	4,950
Households	Unsewered	1,346	1,548	1,758	1,948
	Private Systems	40	40	40	40
	Public Systems	112	112	112	112
	Total	1,498	1,700	1,910	2,100
Employment	Unsewered	484	583	651	690
	Private Systems	0	0	0	0
	Public Systems	35	37	39	40
	Total	519	620	690	730

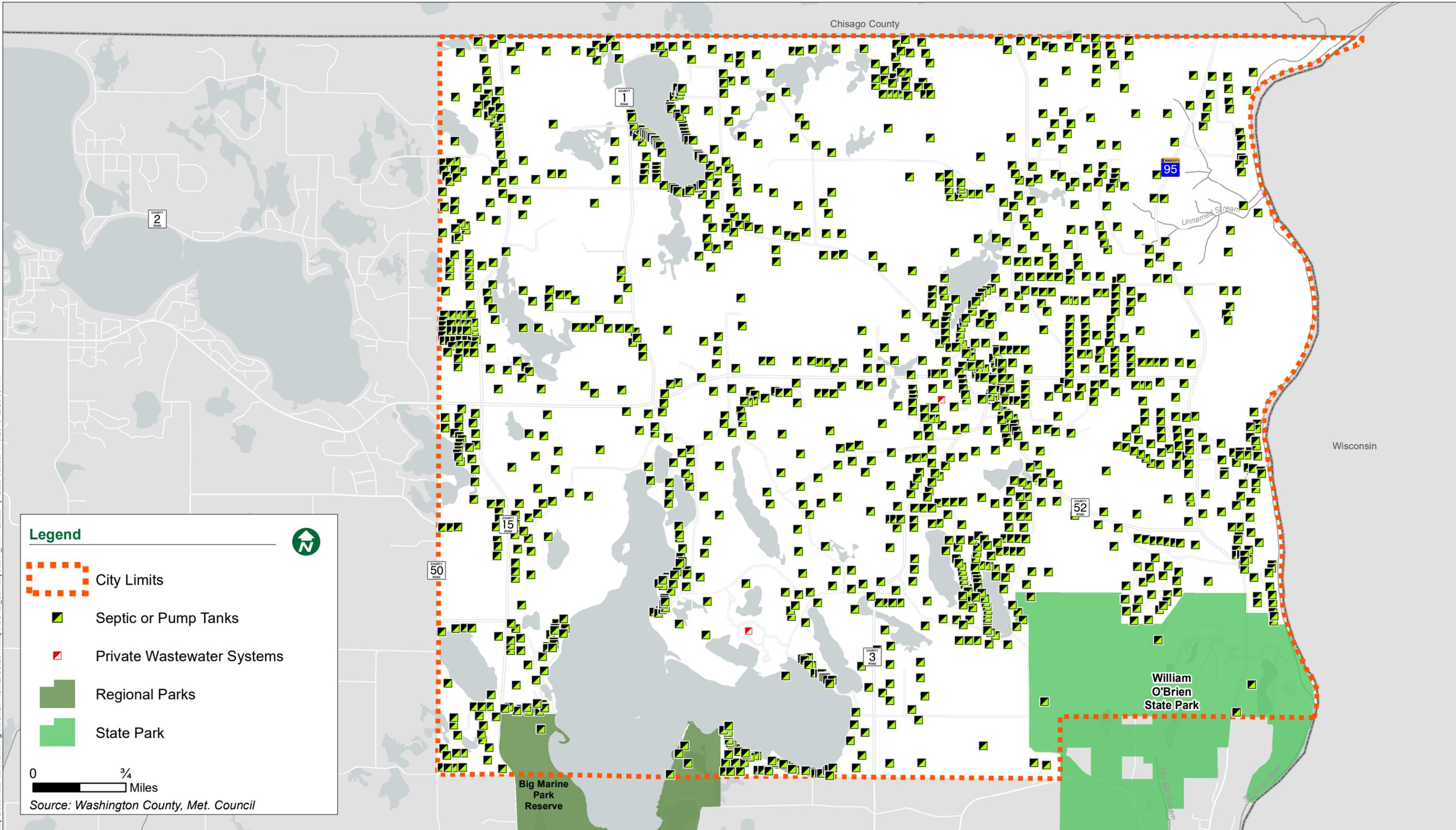
## 2. Existing System

The existing wastewater treatment system is comprised of several on-site septic systems, two private wastewater treatment systems, and three small public wastewater systems.

### a) Private On-Site Septic Systems

Wastewater treatment for residents of Scandia consists primarily of on-site septic systems, shown in Figure IX-A. The city engineer has record of 1,426 on-site septic systems in Scandia, including both households and employment establishments. Responsibility for installation and maintenance of on-site septic systems lies with the property owner. All systems must be installed and maintained to meet the standards of the Washington County Subsurface Sewage Treatment System Ordinance, which is consistent with *Minnesota Rules Chapter 7080*. The County's SSTS Ordinance is codified in the Development Code in Chapter 4, Ordinance #206. This ordinance provides the basis for the County's SSTS program, including requirements for compliance inspections of existing systems, permitting and inspection of new systems, site review, maintenance requirements, and operating permits for advanced treatment systems (Type IV).

The City of Scandia has delegated responsibility for septic inspections to Washington County. Washington County Ordinance 206, Section 22, requires owners of septic systems to have tanks pumped at least once every three years. Washington County also requires inspections at the point of sale for systems older than five years or for systems that do not have a current compliance inspection, and these inspections are recorded with the County. If Washington County becomes aware of non-compliant systems, the County requires replacement of those systems.



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**Legend**

- City Limits
- Septic or Pump Tanks
- Private Wastewater Systems
- Regional Parks
- State Park

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Miles

Source: Washington County, Met. Council

b) *Private Wastewater Systems*

- (1) The Tii Gavo (Permit MN0068217, expires 1/31/2028)

The Tii Gavo on Big Marine Lake WWTP facility is located at 2108 Olinda Trail N, Scandia, Minnesota 55073, Washington County.

The Tii Gavo system on Big Marine Lake development is a 15-residential family home development located in Washington County. The development includes three-bedroom and four-bedroom units. The facility has a total wet weather design flow of 13,065 gallons per day. The facility is designed based on a CBOD<sub>5</sub> loading of 21.1 lbs. per day (0.18 lb. per capita per day), a TSS loading of 23.4 lbs. per day (0.02 lb. per capita per day), a total nitrogen loading of 3.2 lbs. per day (0.027 lbs. per capita per day), and a total phosphorus loading of 0.9 lbs. per day (0.008 lbs. per capita/day).

The facility consists of two 26,250 gallon compartmentalized septic tanks with effluent filters in the last tank, one 8,438-gallon denitrification tank with carbon source addition, one 7,500-gallon recirculation tank, one 3,300 square foot recirculating gravel filter, one 10,000 gallon dosing tank, and six drip dispersal zones totaling 33,120 square feet of infiltrative surface with an additional 11,040 square feet for reserve drainfield area. This is a Class C facility.

There are no designated bypass points in the treatment system. The permit authorizes no discharge to surface waters. The facility is further described in plans and specification on file with the MPCA.

- (2) The Wyldewood Acres (Permit MN 0066567, expired 5/31/2018 but can continue operations until issued a new permit by MPCA)

The Wyldewood Acres Wastewater Treatment Facility is located at SE ¼ of SE ¼ of section 15, Township 32 North, Range 20 West, Scandia, Washington County, Minnesota. This is a Class D facility.

Major components of the Facility include:

- 27 Individual Grinder Pumps
- 1 Septic Tank (7,500 gal)
- 1 Septic Tank (7,500 gal) -compartmentalized
- 1 Constructed Wetland -subsurface flow (9,000 sq. ft.)
- 3 Subsurface Mounds (19,718 sq. ft.)

The facility is designed for 25 three and a half -bedroom homes and four three-bedroom homes in Scandia.

Each house has an individual grinder pump, which pumps the sewage through a two-inch high-density polyethylene low pressure force main, approximately 4,000 feet in length. Wastewater flows through magnetic influent flow meters prior to two septic tanks operated in series. Both are 7,500 gallons; the first is un-compartmentalized and the second has two compartments. The second tank contains effluent filters. Next, wastewater is processed by one 9,000 square foot constructed wetland treatment system. A 5,000 gallon dosing tank doses a 19,718 square foot drainfield system (pressurized infiltration chambers), which consists of three zones with dedicated pumps to alternate usage of the zones.

The Average Wet Weather (AWW) design flow is 8,925 gallons per day (gpd). The influent five-day Biochemical Oxygen Demand concentration is approximately 250 milligrams per liter (mg/L), and the Total Suspended Solids concentration is approximately 250 mg/L.

There are no designated bypass points in the treatment system. The SDS Permit authorizes no discharge to surface waters.

c) *Public Wastewater Treatment Systems*

There are three public wastewater treatment systems in Scandia serving multiple lots and structures, shown in Figure IX-B. The operation, maintenance, and user charges for these public systems are governed by City of Scandia Ordinance No. 189, included in Appendix F of this comprehensive plan.

(1) Bliss Sewage Treatment Facility

The Bliss Sewage Treatment Facility's treatment area is located on the western side of Big Marine Lake, off of Manning Trail North. The facility serves 79 homes along Manning Trail North from the treatment area north to 191<sup>st</sup> Street North to the homes along Langley Avenue North, Layton Avenue North, Lamar Avenue North, and 185<sup>th</sup> Street North. It consists of three septic tanks totaling 7,500 gallons, three 15,000 square foot sand filters that are dosed by a lift station, and three drainfield trench cells (1,200 feet per cell) which are dosed by a second lift station. Based on drawdown tests performed in the spring of 2017, the two pumps in LS #3 (dosing the sand filters) have capacities of approximately 300 and 250 gallons per minute, while the pumps in LS #4 (dosing the trench cells) have capacities of about 110 and 190 gallons per minute. It processes an average of around 7,000 gallons per day during the winter months and 11,000 during the wettest summer months but has a permitted capacity of 19,800 gallons per day. This system has had some issues with high nitrate levels in one of the monitoring wells surrounding the facility. Currently, treatment options are being considered to mitigate this issue. Additional connections to this system will be greatly limited until improvements or upgrades are made to the system, given the nitrate issues. Improvements to this system will need to be made to accommodate new development, as development occurs.

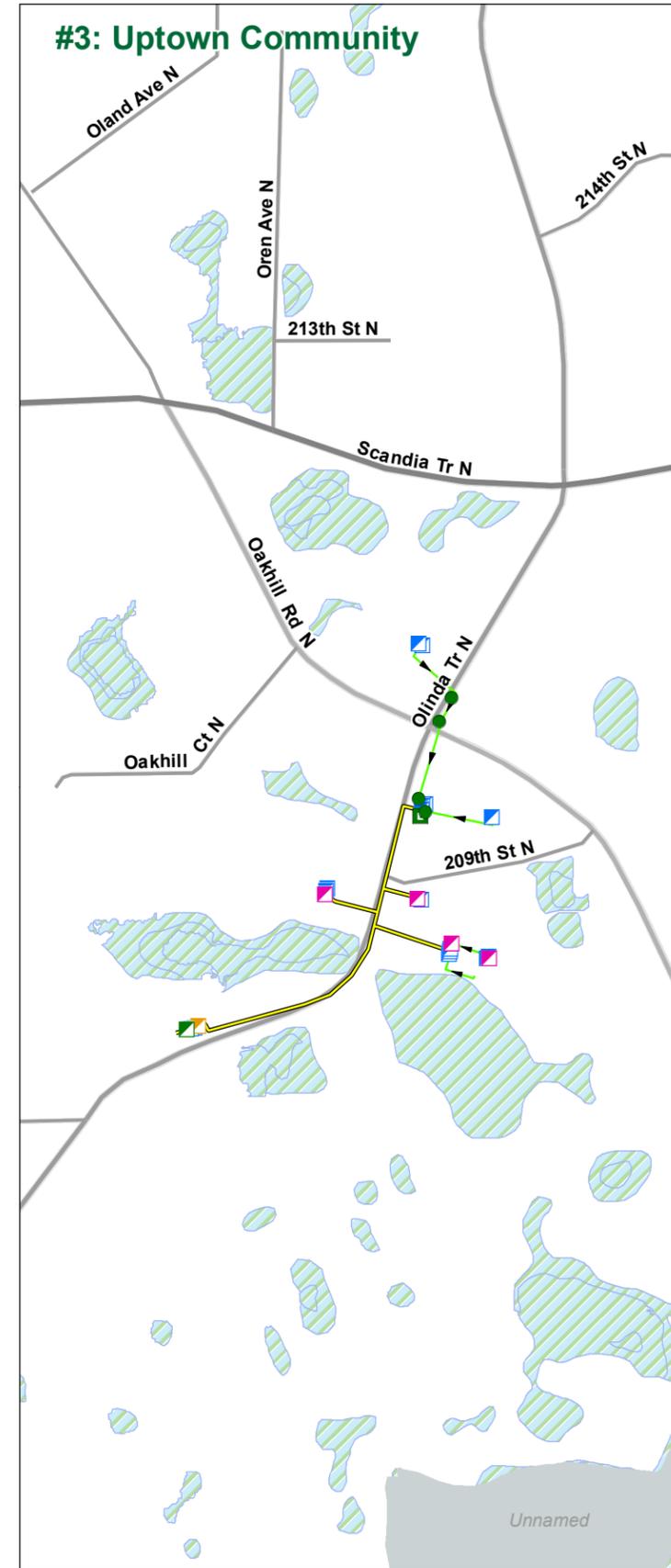
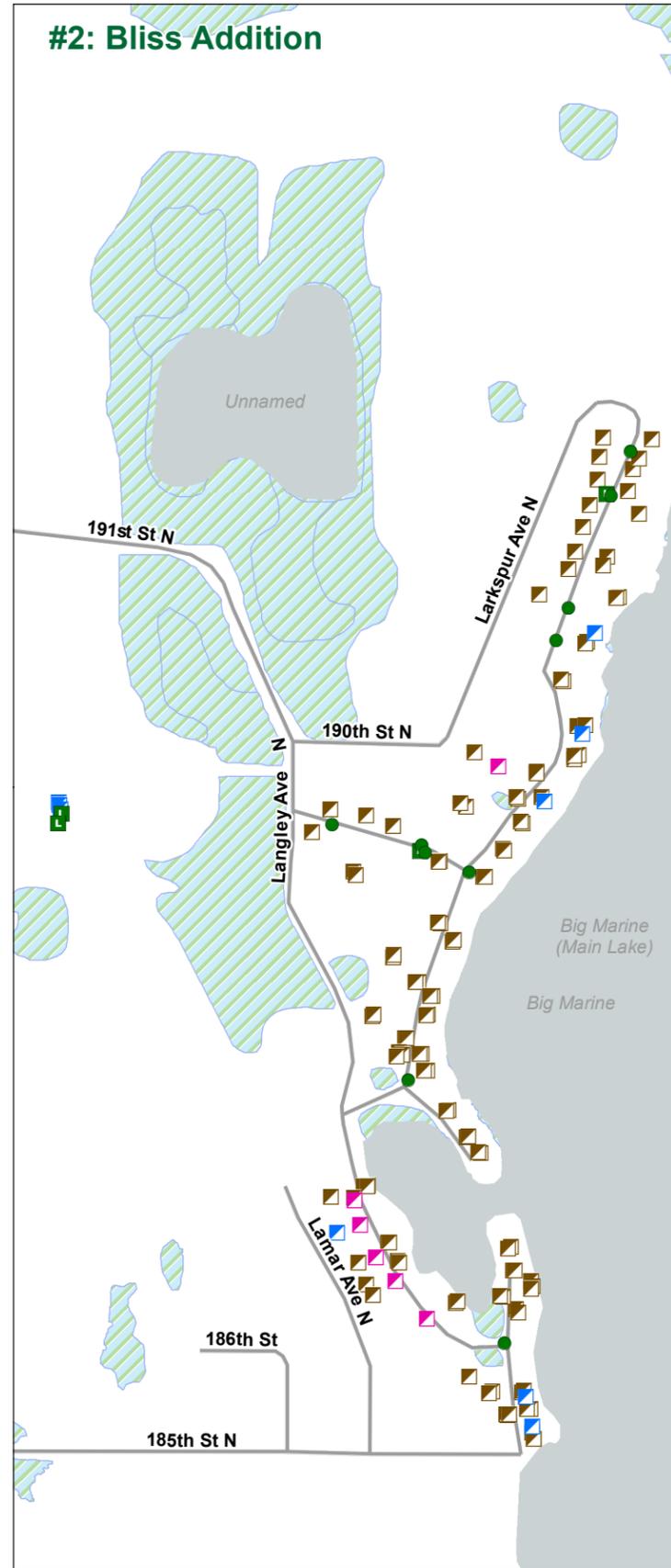
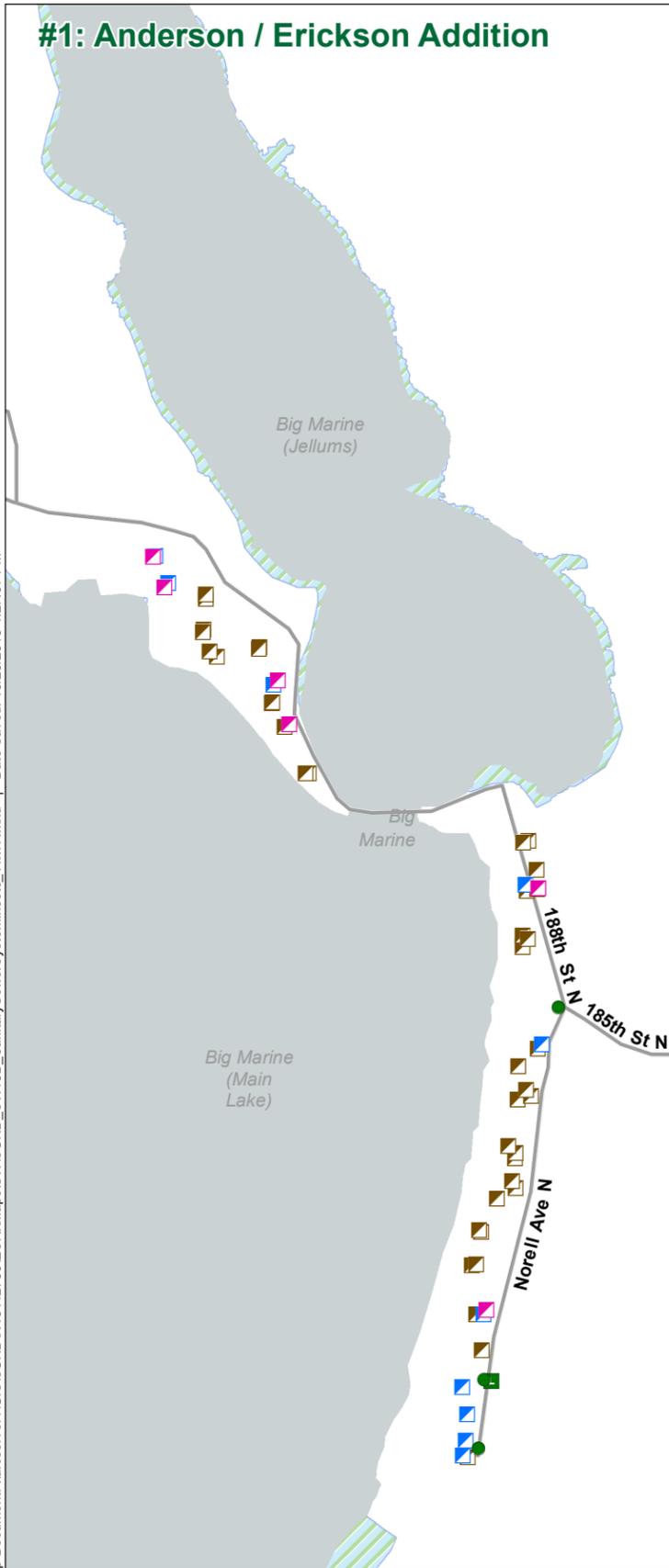
(2) Anderson/Erikson Sewage Treatment Facility

The Anderson/Erikson Sewage Treatment Facility's treatment area is located on the eastern side of Big Marine Lake at the southern end of Norell Avenue North. The system serves 33 homes along Norell Avenue North and those along 188<sup>th</sup> Street North to the intersection with Newgate Avenue North. The Anderson/Erikson Lift Station, which doses the drainfields, had pump capacities of roughly 65 and 70 gallons per minute based on the 2017 drawdown tests. The drainfield system itself was originally designed to treat 6,700 gallons per day. Recent flows indicate that the system is treating slightly less than this amount, on average, but regularly exceeds this capacity during peak days and months of the year. Based on this information, the system is at capacity, and any other additions to it would require further examination to assess the system's capacity and potential for expansion.

(3) Uptown Wastewater Community Collector System

The Uptown Wastewater Community Collector System's Treatment area is located on Olinda Trail North, southeast of the village. The system serves Elim Lutheran Church and the parsonage, the Scandia Café, the Scandia Store, the Scandia Veterinary Clinic, the Country Messenger, the bank building, Schmitt Mall, the Community and Senior Center, and the Gammelgarden. These nine businesses currently have approximately 35 employees. The system was expanded in 1999 for the Community Center and again in 2001 for the Gammelgarden. In 2012, an equalization tank and an aerobic treatment tank, complete with blower and air diffuser, were added to the system to treat nitrogen and phosphorus in the wastewater, and to mitigate peak flows which are higher than the system's design capacity. The trench drain laterals comprise 2,250 feet and 6,750 square feet of adsorption area. With the increased treatment provided by the aeration, the design capacity of the system is approximately 4,050 gallons per day. The average flow entering the system is 2,025 gallons per day and the peak flow is about 7,500 gallons per day. Because this system serves venues that frequently have highly-trafficked events that create high flows (e.g., the church and community center), it has been determined that the system is essentially at capacity. While the equalization basin functions to smooth out flow peaks, addition of another institutional or commercial customer to the system could prove too much for it and undermine treatment effectiveness. There is room on the property to double the size of the drainfield. However, if the system is expanded in the near future, then at some possible point further in the future, if the drainfield fails due to solids loading of the ground, an entirely new site may have to be found for construction of a new treatment system. This scenario should be considered before adding additional customers to the Uptown system.

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#### Overview Map

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#### Legend

- City Limits
- Lakes and Ponds
- Rivers and Streams
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0 0.25 Miles

Source: Met. Council, City of Scandia, Washington County, MnDOT, MnDNR

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#### Sanitary Sewer System

Sanitary Bypass Valve	Sanitary Pump Tank
Sanitary Manhole	Sanitary Septic Tank
Sanitary Lift Station	Sanitary Tank
Sanitary Aerobic Tank	Forcemain
Sanitary Equalization Tank	Sanitary Gravity Pipe
	National Wetlands Inventory

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### Figure SW-15B

### 3. Capacity and Maintenance

The Bliss treatment system could still accept some additional flow before it reaches capacity, around 6,000 gallons per day. However, the high nitrate level issues must be addressed, either by expanding the system or adding a focused treatment process to remove nitrate.

The Anderson/Erikson system is essentially at its design capacity, and it should be evaluated before the addition of any more flow is considered. In general, it operates nominally under capacity during average flow but above it during peak flows.

The Uptown Wastewater Community Collector System is also essentially at its capacity of about 4,000 gallons per day. As with the Anderson/Erikson system, during normal flows it operates below capacity, while during peak flows capacity is surpassed. The city's future land use plan expands the Village Center area to accommodate residential and commercial growth. The City of Scandia owns land suitable for mound system expansion, adjacent to the existing Uptown drainfield system. However, before considering adding more properties to the collector system or expanding the drainfield, it should be considered that if the drainfield is expanded, an entirely new location will need to be found for treatment in the future when the current system reaches the end of its life (via solids loading of the soil).

For all systems discussed above, regular maintenance is key. Each of the systems has numerous of inspection pipes, which allow water levels to be monitored and blockages cleared in the drainfields. The tops of many of these inspection pipes have been damaged and/or the caps lost, either by accidental collision while mowing or other causes. This has the potential to allow dirt and debris into the system, causing blockages and issues, and these pipes require maintenance and replacement as needed. Additionally, animal encroachment, specifically gophers, have been noted in the vicinity of the systems. These should be dealt with regularly, as in their burrowing they can do a great deal of damage to this type of treatment system.

In general, new development will need to provide for their own wastewater systems. The reliance on individual systems for future growth and development in the City will influence development densities and lot sizes. Since new development will need to provide their own wastewater, the City will consider allowing private community treatment systems on a case-by-case basis. Installation and management requirements must follow all City and County ordinances. Private community systems may be developed and overseen by the county, provided they meet the conditions of the county's ordinance for midsize sewage treatment systems. Systems larger than 10,000 gallons per day are permitted by the MPCA.

### 4. Community and Subsurface Treatment Systems

The City of Scandia's Development Code 13.14.2 states,  
*"Where lots cannot be connected with a public sewer system, provision must be made for sanitary sewer facilities consisting of an individual disposal device for each lot. Such provision shall be in accordance with Chapter Four of the Washington County Development Code, Subsurface Sewage Treatment Systems Regulations."*

Installation of individual sewage treatment systems into low swampy areas, drainage swales, floodplains or other areas subject to recurrent flooding is prohibited. Notwithstanding the foregoing, individual sewage treatment systems in existence may

continue in use if they are repaired and maintained in conformity with the requirements of existing City and County Ordinances and maybe replaced if normal repairs and maintenance to the existing system would not reasonably be expected to permit such system to operate in conformity with the requirements of existing ordinances. Individual Sewage Treatments Systems shall not be located within utility or drainage easements nor within dedicated public or private rights-of –way without proper approvals.

The construction of community sewage treatment systems may be provided for all lots within a subdivision, providing they meet applicable MPCA and Washington County Health Department requirements and an entity other than lot owners or the City of Scandia can demonstrate capability of operating and maintaining the system. This may be done as an alternative to either individual sewage treatment systems or a public sewer system.

Subsurface sewage treatment systems in the City of Scandia are also subject to regulations in Chapter Four of Washington County’s Development Code, adopted in 2015.

## **C. Surface Water**

### **1. Background**

The City completed its Local Water Management Plan (LWMP), and it is currently under final review by relevant watershed districts. The plan serves as a comprehensive planning document to guide the City in conserving, protecting and managing its surface water resources. The plan was developed to meet the requirements of Minnesota Statutes 103B and Minnesota Rules 8410, to be consistent with the goals and policies of the Metropolitan Council’s Water Resources Management Policy Plan, and the goals and policies of the three watershed management organizations that have jurisdiction within the City. The plan and its amendments will be adopted by the City as an element of this Comprehensive Plan.

The LWMP includes a detailed description of the City’s natural resources, including water resources, past studies and inventories, and current surface water management. An assessment of the existing and potential water resource and stormwater related concerns within the City and associated corrective actions are provided. The LWMP also includes goals and policies to address the long-term surface water management needs in the City, and outlines the regulations, standards, practices, projects and funding that will be needed to implement the goals and policies.

The lakes and other critical environmental features in Scandia are one of the reasons the City is an attractive place to live. However, residential development on and near these lakes can impact the water quality and wildlife habitat if not properly managed. One of the primary concerns is the impact of impervious surfaces on water quality. In order to protect lakes from the negative impacts of development, federal, state and local authorities have established rules that protect natural resources against the impacts of development. The City of Scandia is generally subject to the following regulatory authority and strategic plans.

- City of Scandia 2040 Comprehensive Plan
- City of Scandia Ordinances
- Carnelian Marine-St. Croix Watershed District, Watershed Management Plan, amended 2015
- Comfort Lake-Forest Lake Watershed District, Watershed Management Plan, 2012-2021
- Rice Creek Watershed District, 2010 Watershed Management Plan, updates in 2020
- City of Scandia Comprehensive Plan Update, 2018

- City of Scandia Development Code, 2011
- City of Scandia, Shoreland Management Regulations, 2007
- Washington County Groundwater Plan, 2014
- Washington County Model Groundwater Rules, 2004
- North and East Metro Groundwater Management Area Plan, 2015
- Minnesota Department of Natural Resources North & East Metro Groundwater, 2015 Management Area Plan

## 2. Watershed Management Organizations

Scandia is located in three watershed districts: Carnelian Marine-St. Croix, Comfort Lake-Forest Lake, and Rice Creek. This section briefly describes the most recent local water management plan for each of the three watershed districts within the City of Scandia, followed by a comparison of the goals, objectives and policies of each plan. Management districts and subwatersheds are also noted. Subwatershed plans provide more geographic and issue specific management within the larger watershed. Figure IX-C shows the watershed management organization boundaries within Scandia.

### **Carnelian Marine-St. Croix Watershed District, Watershed Management Plan, 2015**

About 78% of the City of Scandia falls within the CMSCWD, encompassing the eastern and southern halves of the city. The Carnelian Marine-St. Croix Watershed District's (CMSCWD) most recent watershed management plan was created in 2011 and was amended in 2015 to better address invasive species and groundwater quality. The plan contains the goals, policies and management plans of the CMSCWD and guides the watershed's activities until 2020. CMSCWD also developed individual lake and stream plans for all waterbodies in the District.

The plan includes a Focused Watershed Management process based on three levels of activity:

- *Routine Watershed Management* for the non-impaired water resources of the District—these are the basic, day-to-day programs implemented throughout the District.
- *Impaired Watershed Management* for water resources that are classified as impaired waters—includes completion of TMDL studies for impaired waters and implementation of the recommendations from these studies
- *Focused Watershed Management* for non-impaired waters—includes efforts to protect non-impaired waters so they do not become impaired, by enhancing routine management activities on identified water bodies.

CMSCWD completed a district-wide Wetland Management Plan in July 2010 and amended the plan in September of 2015. An electronic version of the plan is available on the District's website. The plan includes a wetland function and value assessment, wetland management goals, management standards, buffer standards, and identification of Wetland Preservation Areas within the District.

Based on the functions and values assessment, the plan includes a wetland classification system with four categories. The categories include:

- High Quality/Highest Priority
- Stream Corridor and Shoreland Wetlands

- Isolated Wetlands
- Utilized Wetlands

### **Comfort Lake-Forest Lake Watershed District, Watershed Management Plan, 2011**

The northwest quadrant of the city falls within the Comfort Lake-Forest Lake Watershed District (CLFLWD). Drainage from the watershed enters the Sunrise River, a tributary of the St. Croix River. The CLFLWD's most recent watershed management plan was created in 2011 with revisions adopted and approved by the BWSR in August 2015. The plan contains the goals, objectives, and actions of the CLFLWD and guides the watershed's activities until 2021.

The CLFLWD plan has eight core goals areas:

- Floodplains
- Lakes
- Streams
- Wetlands
- Uplands Resources
- Groundwater
- Public Education
- Interagency Coordination

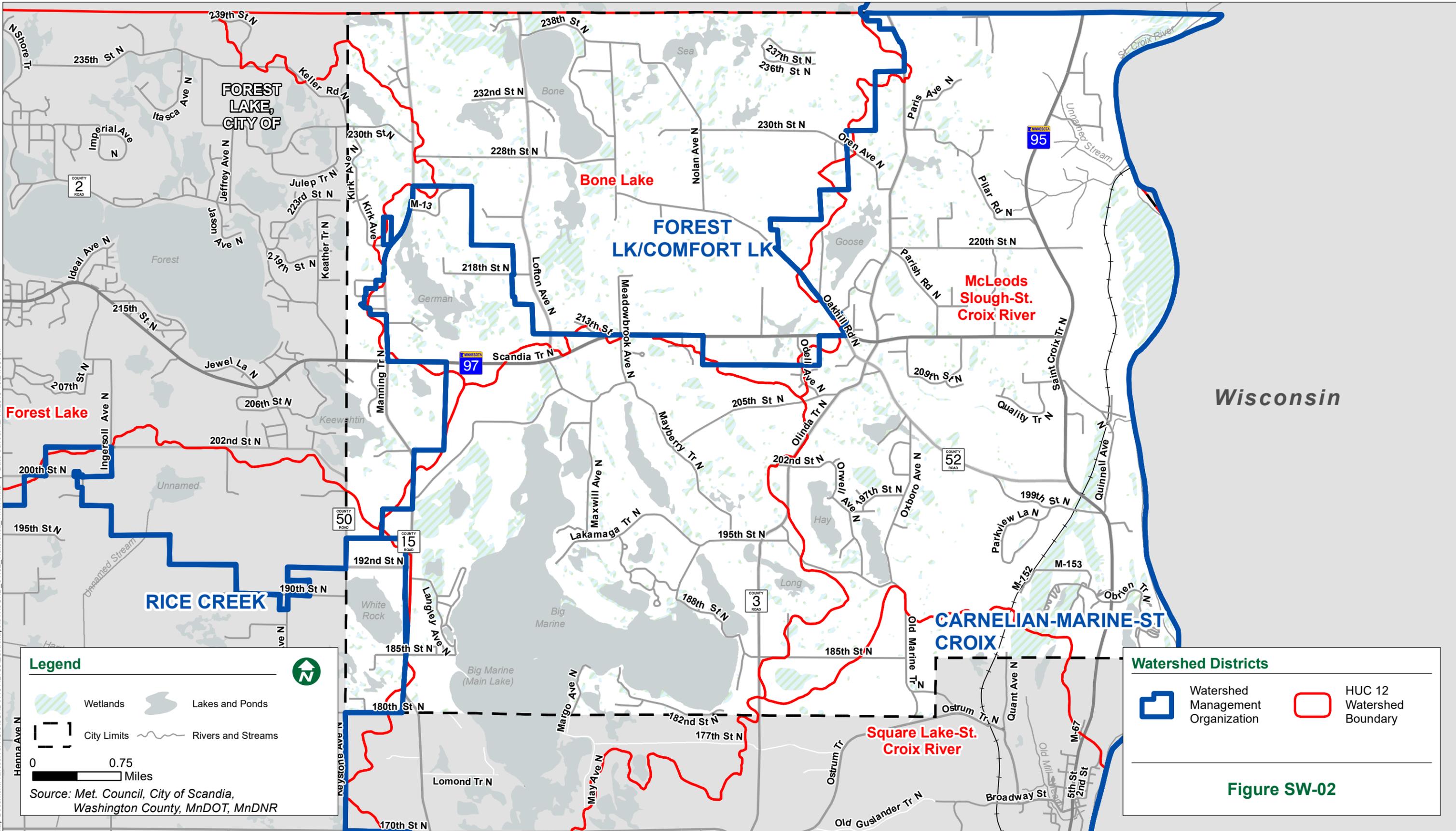
Most of Scandia within the CLFLWD falls within the Bone Lake Management District. A small portion of the city (northwestern most corner) belongs in the Little Comfort Lake Management District. CLFLWD developed a Total Maximum Daily Load (TMDL) plan for Bone Lake, discussed below in the section on Impaired Waters. The District completed a Partially Drained Wetland Assessment in 2014.

### **Rice Creek Watershed District, Watershed Management Plan, 2010 (amended 2016)**

The Rice Creek Watershed District's (RCWD) most recent watershed management plan was created in 2010. The plan contains the objectives, policies, and management strategies of the RCWD and guides the watershed's activities until 2020. Only 0.2% of the City of Scandia falls within the RCWD. This area encompasses all of White Rock Lake and is part of the Hardwood Creek Planning Region. The primary issues within the Hardwood Creek Planning Region are related to water levels within Rice Lake, the lack of a well-defined regulatory floodplain along the Hardwood Creek, and appropriate management methods for Hardwood Creek and its riparian corridor.

The RCWD's 2010 Watershed Management Plan has eight objectives:

- Increase knowledge, awareness, and capacity for decision-making among District constituents
- Manage water systems for their ecological and community value
- Recognize the origin and interconnectedness of water systems while planning for current and future needs
- Improve diversity and ecological integrity of wetlands
- Minimize damage to infrastructure and property caused by flooding and excessive runoff
- Capitalize on open space opportunities to enhance water quality, reduce runoff volume, and enhance ecological resources
- Incorporate groundwater into the decision-making process
- Manage District property and resources responsibly



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### **3. Physical Environment and Land Use**

Public waters are all water basins and watercourses that meet the criteria set forth in Minnesota Statutes, § 103.005, subd. 15. Of the many wetlands and water bodies within the city's boundaries, 40 of them have been classified as public waters in accordance with the guidelines of the Minnesota Department of Natural Resources.

Public waters within Scandia range in size from 2 acres to nearly 2,000 acres of water surface and include several water bodies of regional significance. Table IX-B provides information on all public waters and their acreage. The St. Croix River, a federally designated National Scenic Riverway, forms the eastern border of the city. Big Marine Lake, in the southwestern portion of the city, is the second largest lake in Washington County. Existing and future development in areas surrounding public waters should be carefully managed and planned to prevent adverse impact on water resources.

**Table IX-B – Waterbodies within Scandia**

<b>Water Body Name</b>	<b>Public Water Inventory ID</b>	<b>Shoreland Management Classification</b>	<b>Acres</b>
Alice	82-287 P	Natural Environment	26.03
Big Marine	82-052 P	Recreational Development	1902.59
Bone	82-054 P	Recreational Development	218.47
Clear	82-078 W	Natural Environment	35.28
Elwell	82-079 W	Natural Environment	18.86
Falls Creek (Section 1.6.7.12)		Wild and Scenic	-
Fish	82-064 P	Natural Environment	64.99
German	82-056 P	Natural Environment	151.20
Goose	82-059 P	Natural Environment	84.04
Hay	82-065 P	Natural Environment	59.32
Keewahtin	82-080 P	Recreational Development	108.25
Long	82-068 P	Natural Environment	46.12
Nielson	82-055 W	Natural Environment	49.65
Pitzl Pond	82-282 W	Natural Environment	36.19
Rasmussen Pond	82-070 W	Natural Environment	18.24
Sand	82-067 P	Natural Environment	47.41
Sea	82-053 W	Natural Environment	51.67
St. Croix River	82-001 P	Wild and Scenic River	-
Washington	82-169 W	Natural Environment	22.34
White Rock	82-072 P	Natural Environment	80.88
Wojtowicz Pond	82-058 W	Natural Environment	16.8
Unnamed	82-057 W	Natural Environment	27.52
Unnamed	82-060 W	Natural Environment	26.26
Unnamed	82-061 W	Natural Environment	14.37
Unnamed	82-062 W	Natural Environment	17.44
Unnamed	82-066 W	Natural Environment	33.75
Unnamed	82-081 W	Natural Environment	41.29
Unnamed	82-171 W	Natural Environment	14.54
Unnamed	82-172 W	Natural Environment	26.95
Unnamed	82-173 W	Natural Environment	10.49
Unnamed	82-174 W	Natural Environment	26.49
Unnamed	82-210 W	Natural Environment	25.12
Unnamed	82-211 W	Natural Environment	10.84
Unnamed	82-212 W	Natural Environment	17.46
Unnamed	82-213 W	Natural Environment	10.88
Unnamed	82-280 W	Natural Environment	19.48
Unnamed	82-281 W	Natural Environment	7.46
Unnamed	82-283 P	Natural Environment	8.46
Unnamed	82-284 P	Natural Environment	2.08
Unnamed	82-285 P	Natural Environment	14.73
Unnamed	82-286 P	Natural Environment	5.17

a) *National Wetland Inventory*

The National Wetlands Inventory (NWI) is a national program sponsored by the US Fish and Wildlife Service (USFWS). Based on the NWI data, the City of Scandia has approximately 2,900 acres of wetlands based on the NWI data. Additional wetland information is summarized in the City's Local Water Management Plan and the CMSCWD Wetland Management Plan (2015).

- b) *Existing and Future Land Use:* While Scandia allows for a variety of land uses, development densities are low to maintain the rural character of the community and to be compatible with agricultural uses. Residential development densities range from 0.1 to 0.4 units per acre. Commercial, retail, and industrial land uses are guided to be near existing infrastructure, including water and wastewater services. Likewise, the city anticipates a majority of residential growth to occur in and around the Village Neighborhood Zoning District, which is primarily centered around the historical city center. The Village Neighborhood Zoning District encompasses Goose Lake and borders the western shore of Big Marine Lake. The expansion of the Village Neighborhood Zoning District will reduce the amount of land zoned for agriculture or rural densities (4 units/40 acres). Low densities will be maintained to accommodate agriculture. Comprehensive land use descriptions can be found in the Land Use section of the Comprehensive Plan.

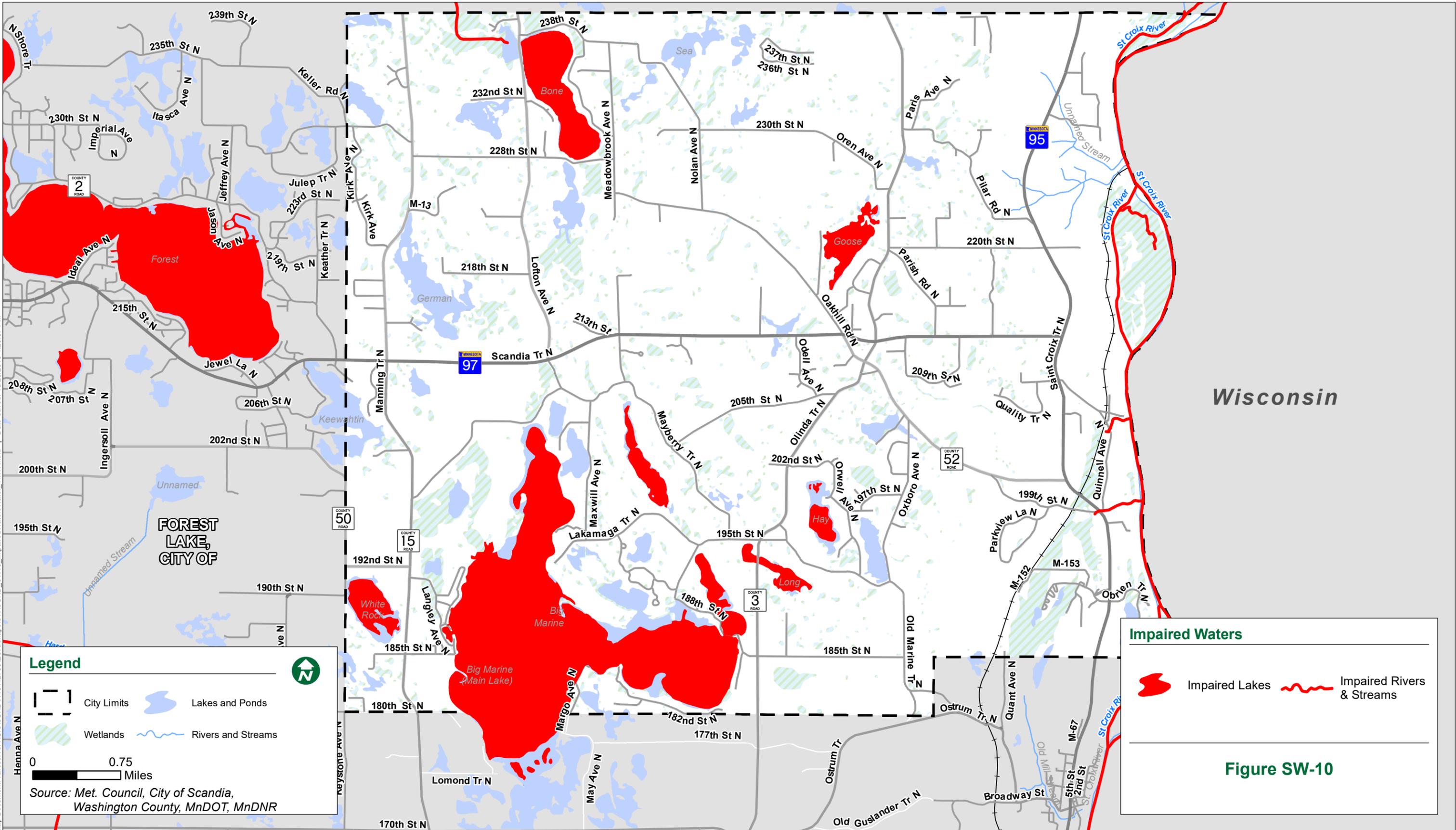
#### **4. Existing and Potential Water Resource Related Problems**

In 2015, 12 lakes in or partially located in Scandia were monitored as part of the Metropolitan Council's Citizen-Assisted Monitoring Program (CAMP). In this program, lakes are sampled every two weeks from mid-April through mid-October. During each sampling, temperature, dissolved oxygen, and Secchi depth transparency were measured and recorded. A surface water sample was also collected and analyzed for total phosphorus, total Kjeldahl nitrogen, and chlorophyll-a. Total phosphorus is a key measure of lake nutrients, chlorophyll-a is a measure of algae abundance, and Secchi depth transparency is a measure of water clarity.

The Metropolitan Council uses the monitoring data to assign each lake a water quality grade using an A through F grading system. The grading system uses percentile ranges for three water quality indicators-summertime average values for total phosphorous, chlorophyll-a, and Secchi depth transparency. An overall grade is calculated as the average grade for the three individual grades. The individual grades given to the lakes can be seen in Table IX-C. Five of the monitored lakes yielded insufficient information, five were given a "C" grade, none were given a "B" grade, and two lakes received an "A".

<b>Table IX-C – CAMP Ratings for Lakes Within Scandia</b>	
<b>Lake</b>	<b>Rating</b>
Alice	Insufficient Data
Big Marine	A
Bone	C
Fish	Insufficient Data
German	Insufficient Data
Goose	C
Hay	Insufficient Data
Jellum’s Bay	C
Long	B
Sand	C
Keewahtin	A
White Rock	C

Under the federal Clean Water Act (33 U.S.C.) the Minnesota Pollution Control Agency (MPCA) is required to set standards and assess Minnesota waters for impairments. The standards are set on a wide range of pollutants, including bacteria, nutrients, turbidity, and mercury. A water body is listed as impaired by the MPCA if it fails to meet one or more water quality standards. If a water body is listed as impaired, a Total Maximum Daily Load (TMDL) must be established for the pollutant, and plans must be created to reduce TMDLs. Scandia will be required to participate in TMDL plans for impaired water bodies within its borders. Figure IX-D shows the locations of impaired water bodies in Scandia while Tables IX-D and IX-E provide detail on specific impairments.



**Impaired Waters**

Impaired Lakes
 Impaired Rivers & Streams

**Figure SW-10**

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Table IX-D – Impaired Water Bodies in Scandia				
Water Body	Nutrients	Invasive Species	PCBs	Mercury
Big Marine Lake	X	Eurasian watermilfoil		X
Bone Lake	X	Eurasian watermilfoil; Curly-leaf pondweed		
Fish Lake	X			
Goose Lake	X			
Hay Lake	X			
Long Lake	X			
Sea Lake		Eurasian watermilfoil; Curly-leaf pondweed		
St. Croix River			X	X
White Rock Lake	X			

Table IX-E – Water Bodies Listed on Minnesota’s 303 List				
Water Body	Concerns			Other Considerations
	Total Phosphorus	Chlorophyll-a	Secchi Transparency	
Fish Lake	X	X	X	Walleye Rearing
Goose Lake	X	X		Bluegill; northern pike
Hay Lake	X	X		
Jellum’s Bay (Bay in Big Marine Lake)	X	X		Walleye Rearing
Long Lake	X	X	X	Walleye Rearing

Source: Carnelian-Marine Watershed District TMDL Plan, 2011

## 5. Local Implementation Plan/Program

Implementation of the Scandia Local Water Management Plan will require cooperation with local Watershed Districts to implement projects within the City that are identified in the District Plans. The City supports the projects identified in the District Plans and Capital Improvement Plans that are within Scandia, including the projects listed in Table IX-F.

The CMSCWD plan describes three categories of activities that are included in the District’s Implementation Program: routine watershed management, focused watershed management, and impaired watershed management. Most of the activities included in these efforts are implemented by the District. Some are implemented in cooperation with local landowners and volunteers. The Cost-share Program identifies several existing or potential water quality and environmental issues that will be addressed by the program. The District has ranked the proposed projects on a watershed basis. Many of the projects will be carried out in cooperation with private landowners.

The CLFLWD’s Management Plan includes three categories of implementation activities: Administration, Programs and Projects. Administration activities are carried out by the CLFLWD. Programs include development of District rules and permitting activities, education and outreach. As noted above, the City concurs with and adopts the District’s Water Management Plan, standards and rules. The CLFLWD Districts will continue to enforce surface water regulations and permitting within the City, within its geographic area.

A small portion of Scandia is included within the Rice Creek Watershed District—the area around White Rock Lake. The District’s Plan includes no implementation projects for the White Rock Lake area. The City supports the District’s efforts to study this lake and identify potential issues related to water quality and lake management.

<b>Table IX-F – Future Surface Water Improvement Projects</b>			
<b>Watershed District</b>	<b>Project</b>	<b>Improvement Cost Estimate<sup>1</sup></b>	
		<b>Low</b>	<b>High</b>
<b>CMSCWD</b>	205th Street – St. Croix River Bluff Erosion Control and Stormwater Quality Project	\$15,000	\$25,000
	Neighborhood Small Lot Stormwater Management Incentive Program in Downtown Scandia and Lake Neighborhoods	\$30,000	\$50,000
	TMDL Study Implementation Projects	TBD – As Constructed	
	Ravine Reconstruction	\$60,000	\$85,000
	Non-Specific Project in its Focused Watersheds, including Sand Lake	\$40,000/Year for 10 Years	
<b>CLFLWD</b>	Bone Lake TMDL Implementation Plan – Numerous Projects	TBD – As Constructed	
	Water Quality Studies and Develop Management Plans for Sea Lake, Nielsen Lake and Clear Lake	TBD – As Constructed	
	Stream Assessment of the Bone-Birch-School-Little Comfort Lake Tributary	TBD – As Constructed	
<b>RCWD</b>	White Rock Lake (RCWD)	No Projects Planned	

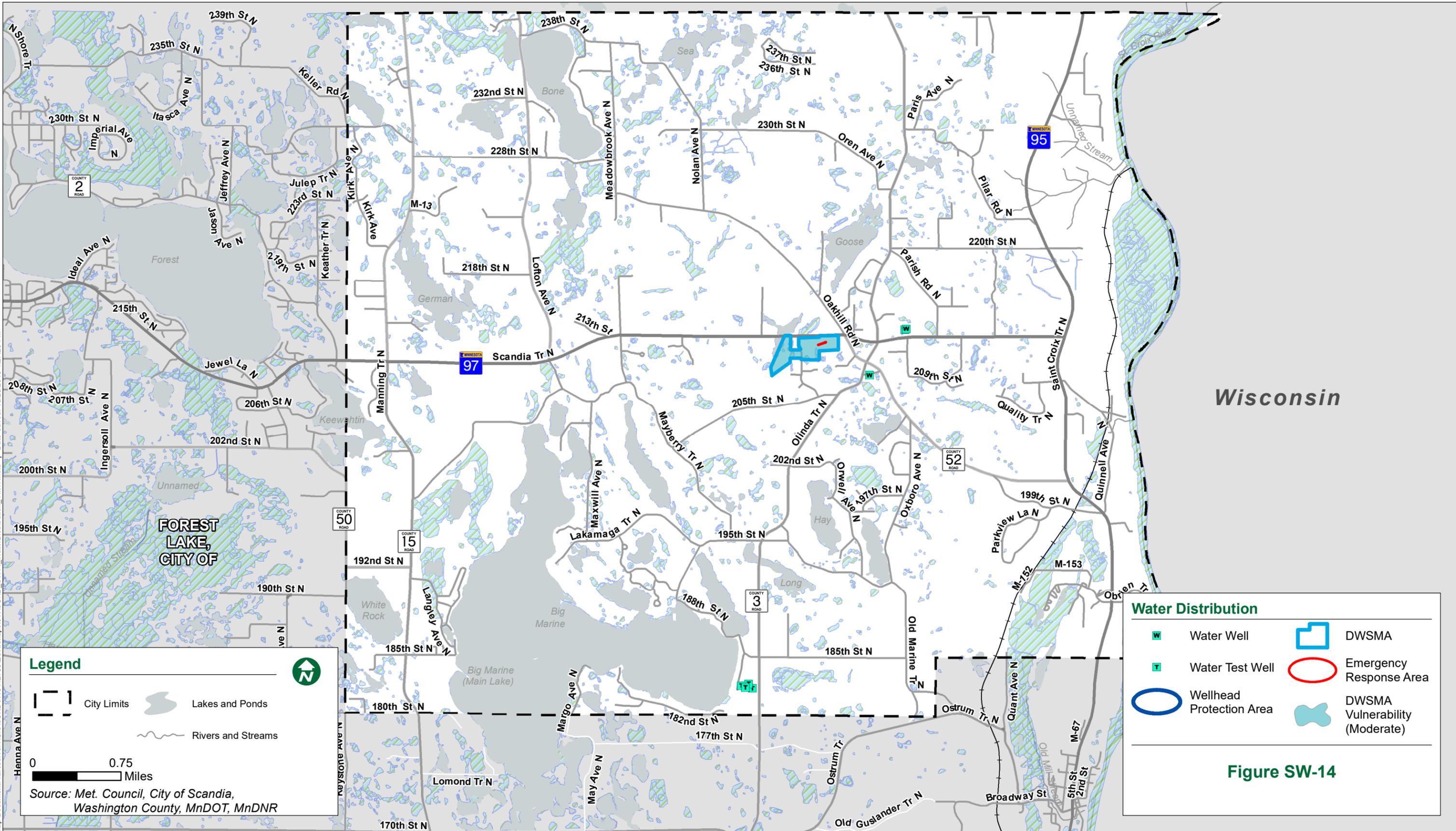
<sup>1</sup> Cost estimates include only stormwater related improvements.

## **D. Water Supply**

### **1. Local Water Supply Plan**

As with wastewater treatment, most residences and businesses in Scandia are served by on-site drinking water wells installed and maintained by the landowner. There are three community drinking water wells in the Village Center serving multiple residences and businesses. In addition, there is a public well serving the Fire Department and Public Works building. The public well locations are show on Figure IX-E.

Minnesota Rules Chapter 4720 requires the development of Wellhead Protection Plans (WHPP). Scandia Elementary has worked with the Minnesota Department of Health and completed Phase I of the WHPP. The City of Scandia may be required to complete WHPPs for all public water supply systems if required by the Minnesota Department of Health.



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a) *Hilltop Water Company*

The Hilltop Water Company is a private water system that serves 25 homes and businesses in the Village Center. The company's service area extends along Olinda Trail North from Highway 97 to Oakhill Road and along Oakhill Road. The well was drilled in 1980, and approximately 275 feet deep. The well pump is assumed to have a design capacity of approximately 50 gpm and two 82-gallon pressure tanks provide water storage. Ground elevations in the Hilltop water system are approximately 40 feet above the City of Scandia facilities. The water system is set to maintain water pressures between 40-60 psi.

b) *Scandia Water Company*

The Scandia Water Company is a private water system serving 19 properties along Olinda Trail North to the North of Highway 97.

c) *Uptown Well/Scandia Community Center Well*

The Uptown Well is located at the Scandia Senior/Community Center, 14727 209<sup>th</sup> Street North. It serves the Senior/Community Center/City Hall and a number of properties within the village including Elim Church and parsonage, the Gammelgarden, and the ice rink-warming house. The well was completed in June 1996 and is 463 feet deep with 70 gallons per minute (gpm) well pump. Four 119-gallon tanks provide pressure to the water system when the well is off and provide water storage. The water system provides water system pressures of approximately 45-70 pounds per square inch (psi) to the water system as measured at the warming house mechanical room.

In 2011, the City completed a study on a water system connection between the Uptown Well and Hilltop Water Company system. The recommendation emergency interconnection between the City and Hilltop water systems includes an approximately 4-inch water main directly between the two wells. This would provide sufficient backup water supply for both water systems and the interconnection would meet the MDH recommendation for backup water supply for the Hilltop Water Company and would not change existing systems requirements of either water system.

d) *New Scandia Fire Hall Well*

The New Scandia Fire Hall Well is located to the north of Highway 97 at the intersection of Ozark Avenue North. The well was completed in May 2000 and is 790 feet deep. The well serves the Fire Department and Public Works, which are both located in the Fire Hall.

e) *Wyldeewood Acres*

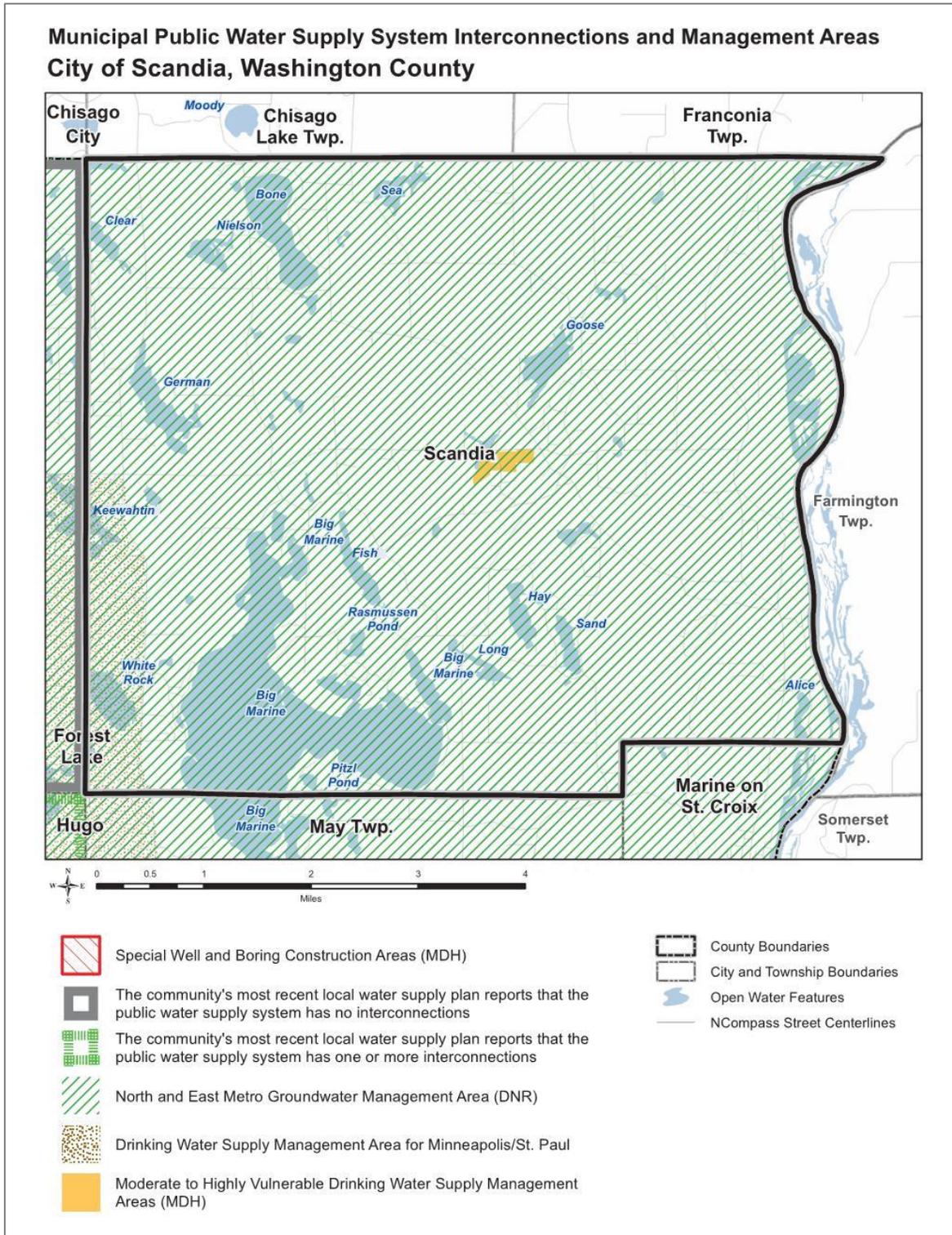
Wyldeewood Acres is a private water system designed to serve 23 three-and-a-half bedroom homes and four three-bedroom homes. The system is owned and operated by the Wyldeewood Acres HOA

## 2. **Assessing and Protecting the Water Source**

Scandia is part of the DNR's North and East Metro Groundwater Management Area, shown in Figure IX-F. A small segment of the city located south of Highway 97 and west of Manning Ave is also in the Drinking Water Supply Management Area for Minneapolis/St. Paul. The Minnesota Department of Health has identified a portion of the city for a

Moderate to Highly Vulnerable Drinking Water Supply Management Plan; this area is located south of Highway 97, west of Olinda Trail, and east of Meadowbrook Avenue N. The city will work with the DNR, Department of Health, and other relevant agencies as necessary to ensure groundwater within these management areas is protected.

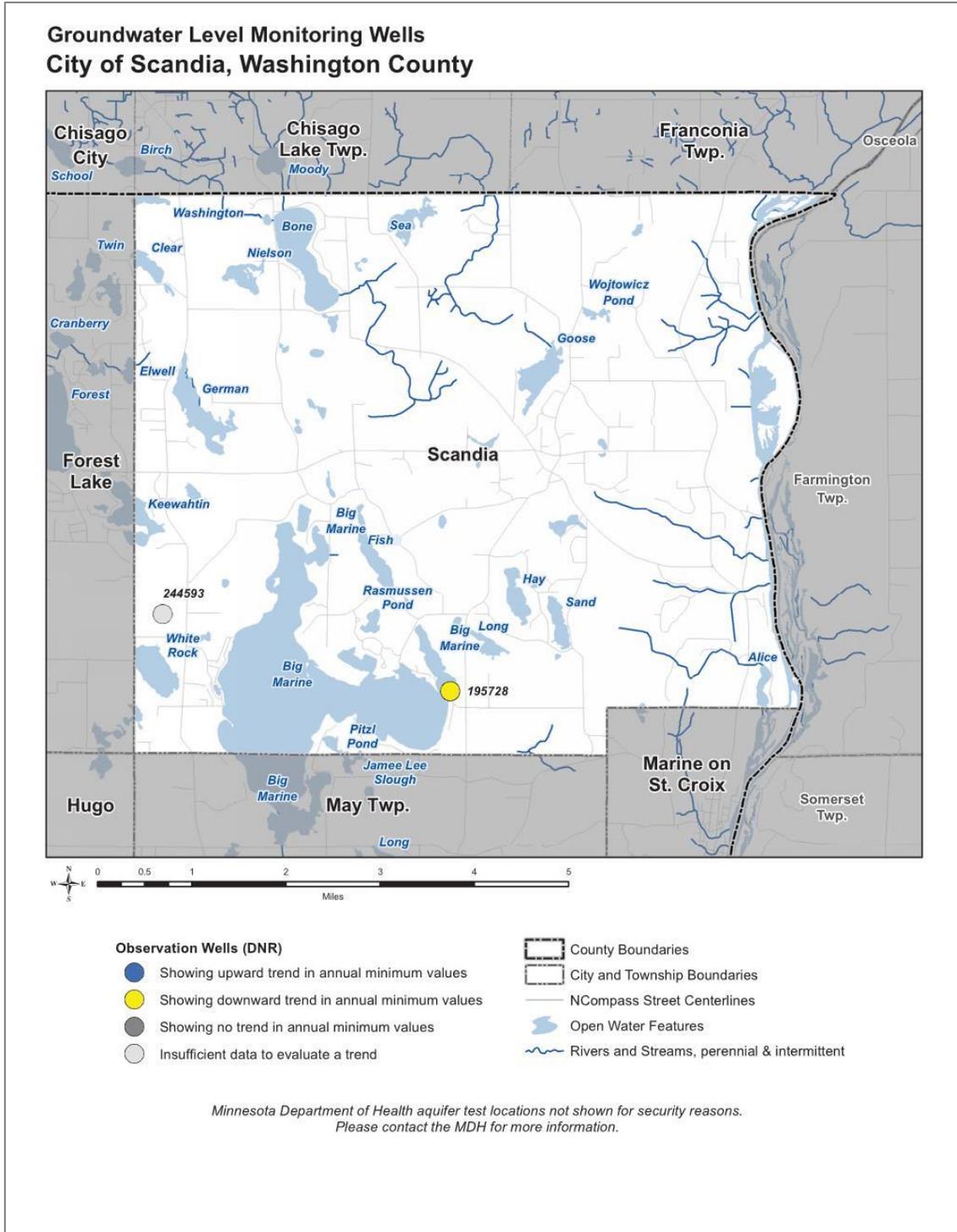
Figure IX-F - Water Supply System Interconnections and Management Areas



There are two DNR observation wells located in Scandia, shown in Figure IX-G. Well 195728 is located near the eastern side of Big Marine Lake. This well is showing a

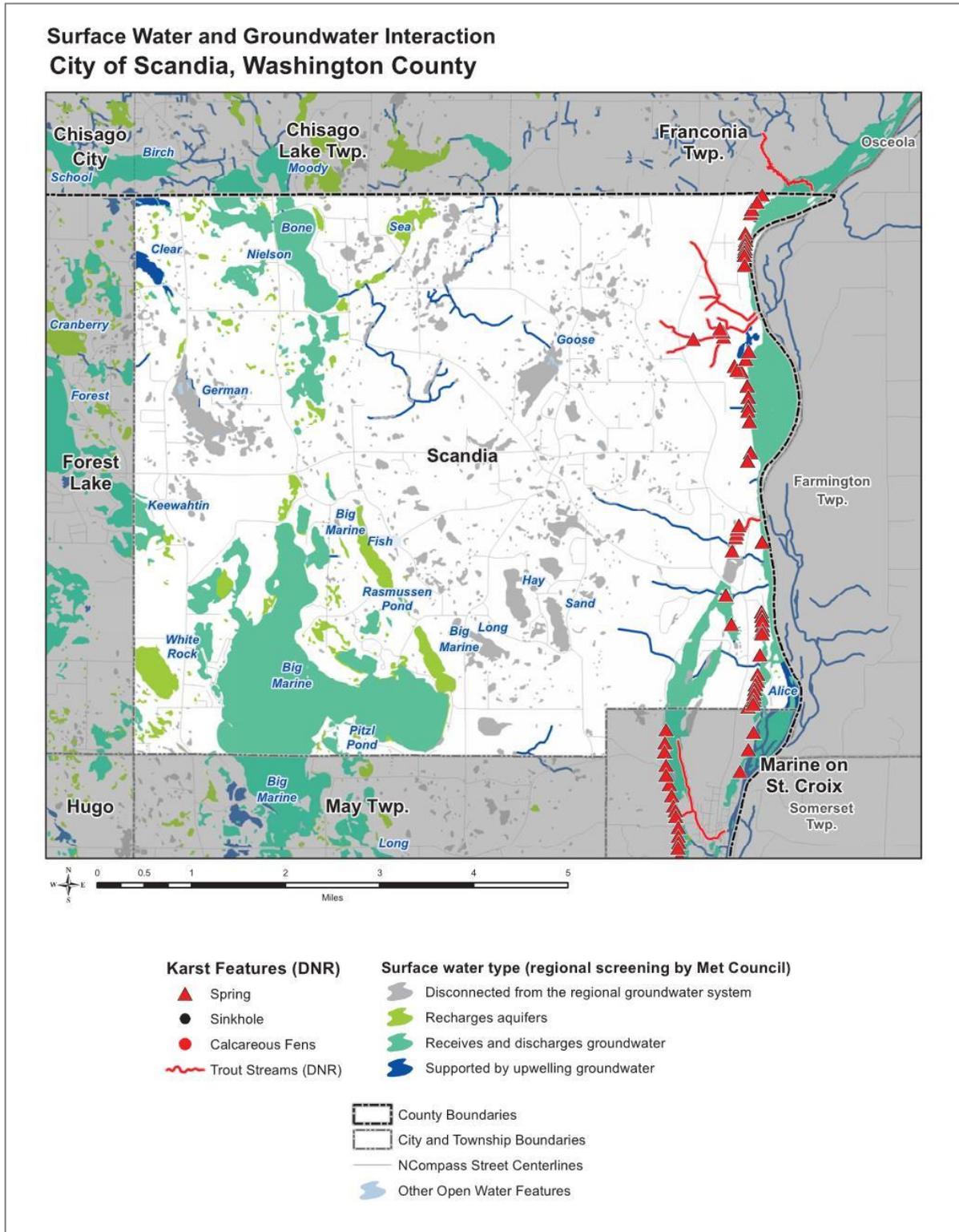
downward trend in annual minimum values, meaning water is being used faster than it is being replenished. Well 244593 is located north of White Rock Lake. There is insufficient data at this well to determine a trend in annual minimum values.

Figure IX-G – Ground Level Monitoring Wells



The city will also take special consideration of wetlands that receive and discharge groundwater or recharge aquifers to prevent potential contamination of groundwater drinking sources, shown in Figure IX-H.

**Figure IX-H – Surface Water and Groundwater Interaction**



### **Sub-Regional Collaboration**

The Washington County Groundwater Plan provides a countywide framework for the protection and conservation of groundwater resources. The current plan was approved in 2014 and guides the protection of groundwater resources in the county until 2024.

The overall goal of the Washington County Groundwater Plan is to protect the economic and environmental values groundwater provides through coordinated, intergovernmental efforts in research and assessment, policies, political influence, regulation, education, and consultation, and technical assistance. The plan has six main goals:

- Concisely outline the physical nature of groundwater resources, discuss the issues that threaten groundwater, and provide direction and strategies on how to protect groundwater for future generations
- Provide context and organization for stakeholders and residents to better understand the complex water governance structure
- Serve as a framework to develop annual work plans for the county and its stakeholders that give specific implementation actions to address the groundwater issues in this plan
- Compliment and coordinate with other state, regional, county, and local planning efforts
- Guide collaboration on groundwater initiatives with state, regional, and local partners more efficiently and effectively
- Be a resource for stakeholders and residents regarding groundwater information pertinent to the county.