MUNICIPAL WASTEWATER SERVICE

The City of St. Francis owns and operates a wastewater collection system and treatment facility. The City is currently evaluating the possible expansion of their existing treatment facility as well as considering the construction of a second treatment facility. The collection system continues to be studied and expanded to accommodate the growth of the City. The Comprehensive Sanitary Sewer Plan, completed and adopted by the City of St. Francis in 2005, continues to serve as the guide to evaluate and add collection and treatment system components. Figure 1 identifies the City's existing sanitary sewer system. The 2005 Comprehensive Sanitary Sewer Plan identifies improvements required to provide collection, treatment and disposal for all properties within the City limits.

The following section provides an overview of the Metropolitan Council's role, policy and guidance relative to municipal sanitary sewer service. Subsequent sections of this chapter include summaries of studies that have been completed by the City of St Francis to consider the potential use, location, and costs associated with the construction of sanitary sewer components within the City to accommodate growth.

METROPOLITAN COUNCIL POLICIES AND STRATEGIES

The 2003 Regional Development Framework and the regional system plans comprise the Council's Metropolitan Development Guide, which is the region's plan to ensure orderly, coordinated, and economical development of the region. Local comprehensive plans and plan amendments that have substantial impacts on, or contain substantial departures from, the metropolitan wastewater system plan affect how the Council constructs, operates, and maintains the Metropolitan Disposal System (MDS) and can result in system inefficiencies if the nonconforming plans are permitted to occur.

Substantial impact or departures may result either from over-utilization or under-utilization. Overutilization is local development that will use more regional capacity than currently is available or planned. Underutilization is low-density development that uses less than currently available or planned regional capacity, and is likely to require additional infrastructure elsewhere in the region to accommodate household growth that reasonably would have been expected to occur in the local governmental unit.

As permitted by Minnesota Statutes section 473.175, subdivision 1, the Council may require a local governmental unit to modify any comprehensive plan or part thereof that is inconsistent with the metropolitan system plan if the Council concludes that the local plan is more likely than not to have either a substantial impact on, or to contain a substantial departure from, the Council's adopted policy plans and capital budgets for metropolitan wastewater service. Inconsistencies will provide the Council with grounds for requiring modifications to the local comprehensive plan.

A system impact to the Metropolitan Disposal System (MDS) may occur under various circumstances including, for example:

- When a local governmental unit proposes a land-use change to, and/or expansion of, its local sewer service area that results in projected flows in excess of the capacity within the existing MDS;
- When excessive inflow and infiltration reduces the regional system's capacity to convey and treat wastewater.

A substantial system impact occurs under various scenarios, including when:

- The MDS was not designed to provide wastewater service for the proposed sewer service area; or
- The projected flow from the sewer service area is greater than planned; or
- The timing for the proposed growth is prior to implementation of a planned improvement to the MDS and greater than what can be accommodated by the MDS; or
- The peak wet-weather flows from the local governmental unit exceeds its designed capacity within the MDS, and thus there is inadequate capacity to accommodate the planned growth for the local governmental unit or tributary local governmental units.

A system departure occurs when 1) a local governmental unit proposes forecasts for sewered development densities that are lower than Council forecasts or lower than density standards that are the basis for regional infrastructure planning purposes; or 2) when a local governmental unit proposes densities in rural areas that exceed Council policy (i.e., one unit per ten acres in diversified rural areas and one unit per 40 acres in agricultural areas). This may result in an under-utilization of the available or planned regional wastewater system capacity.

A substantial departure also may occur under different circumstances including when:

- A local governmental unit's sewered household and employment forecasts, within the existing or planned service area of a metropolitan facility, are at least 20 percent lower than the Council's forecasts of growth for the community; or
- A local governmental unit is not achieving the Council's density standards for sewered development; or
- A local governmental unit is planning to allow development that proposes densities in rural areas (i.e., areas not currently served by public sewers) that exceed Council policy, such as development on 2 ½-acre lots that would preclude future economical sewered development.

The Metropolitan Council currently provides wastewater collection and treatment services to 2.5 million people in 103 communities, which represents about 90 percent of the seven-county metropolitan area's population. The Council owns and operates the Metropolitan Disposal System (MDS). The MDS includes eight wastewater treatment

plants: Metropolitan, Empire, Rosemount, Blue Lake, Seneca, Eagles Point, Hastings, and St. Croix Valley; it also includes approximately 600 miles of regional interceptors that connect flow from 5,000 miles of sewers owned by local communities. The system treats up to 300 million gallons per day of wastewater from homes, industries, and commercial businesses. The system is operated through the Council's Environmental Services Division (MCES).

The Council recognizes that some rural centers in the metropolitan area are under extreme pressure to add housing and employment to their communities, and thus expand their municipally owned wastewater treatment plants, while others are not and do not want to take on large quantities of growth. If a rural center is willing to expand to accommodate the increased growth as forecasted by the Council, it may need MCES to become involved in the possible acquisition, operation, and betterment of the wastewater treatment plant located in that community.

ST. FRANCIS WASTEWATER COLLECTION AND TREATMENT

Treatment Facilities

The St. Francis Wastewater Treatment Facility was originally constructed in 1973 and has since been upgraded four times, with the most recent project completed in 2005. The major components of the current facility include: a mechanically cleaned fine screen, one preliminary aerated pond, two primary aerated ponds, a secondary/holding pond, a chemical phosphorus removal system, an effluent pump station, an effluent spray irrigation system, rapid infiltration basins (RIBs), and a surface water outfall.

Treated effluent can be discharged from the facility in several ways. The facility has two surface water discharge outfalls, Rum River and Seelye Brook. The Rum River was designated an Outstanding Resource Value Water (ORVW) on November 5, 1984. In accordance with the Minnesota Pollution Control Agency (MPCA) rules regarding non-degradation of ORVWs, the facility is limited to a minimal discharge flow and loading to the Rum River. Discharging to Seelye Brook is limited to a minimal flow and loading as well due to the confluence of the Seelye Brook into the Rum River a short distance downstream from the discharge location. The majority of treated effluent is discharged through the RIBs and spray irrigation. The secondary/holding pond stores treated effluent while frost prohibits percolation in the RIBs and land application through the spray irrigation system.

The existing treatment facility is rated for a design flow of 0.540 million gallons per day (MGD). The current flows experienced by the facility averaged 0.450 MGD in 2007. The existing facility is at capacity and the City is currently reviewing treatment alternatives to meet future demand. Two alternatives that are under consideration include: 1) expansion of the existing facility and 2) constructing a new facility to provide treatment for the east half of the City while the existing facility would be upgraded to treat flow from the west half of the City. Both alternatives incorporate RIBs and spray irrigation processes for discharging treated effluent due to the limits set forth on surface water discharge.

Projected Flows and Loadings

Projected wastewater flows and loadings are presented in the table below. Projected flows and loadings have been determined from the Metropolitan Population Forecasts as shown in this report and Ten States Standards loading factors. A peaking factor was developed from the City's historical flows to determine projected peak flows.

PROJECTED WASTEWATER FLOWS AND LOADINGS								
Year	**Population**	**Households**	**Average Annual Flow (MGD)**	**Peak Month Flow (MGD)**	**CBOD5 Loading (lbs/day)**	**TSS Loading (lbs/day)**	**TKN Loading (lbs/day)**	**TP Loading (lbs/Day)**
2010	7,700	2,800	0.770	0.988	1,700	1,930	310	65
2020	10,400	4,000	1.040	1.334	2,290	2,600	420	85
2030	12,800	5,000	1.280	1.643	2,820	3,200	520	105

Collection System

The collection system consists of pipes from 4-inches through 15-inches in diameter. The existing collection system is identified in Figure 1. The collection system upgrades completed in the last 3 years have been in compliance with the 2005 Comprehensive Sanitary Sewer Plan adopted by the City. This plan contains several options for ultimate disposal which has a varying amount of impact to the collection system sizing and layout. Figures 2 and 3 identify the location and size of the trunk sewer lines planned within the City as determined by the 2005 Comprehensive Sanitary Sewer Plan. The capacity of the trunk lines shown in Figures 2 and 3 continues to be studied to insure that the most cost effective approach is implemented.

ST. FRANCIS POLICIES

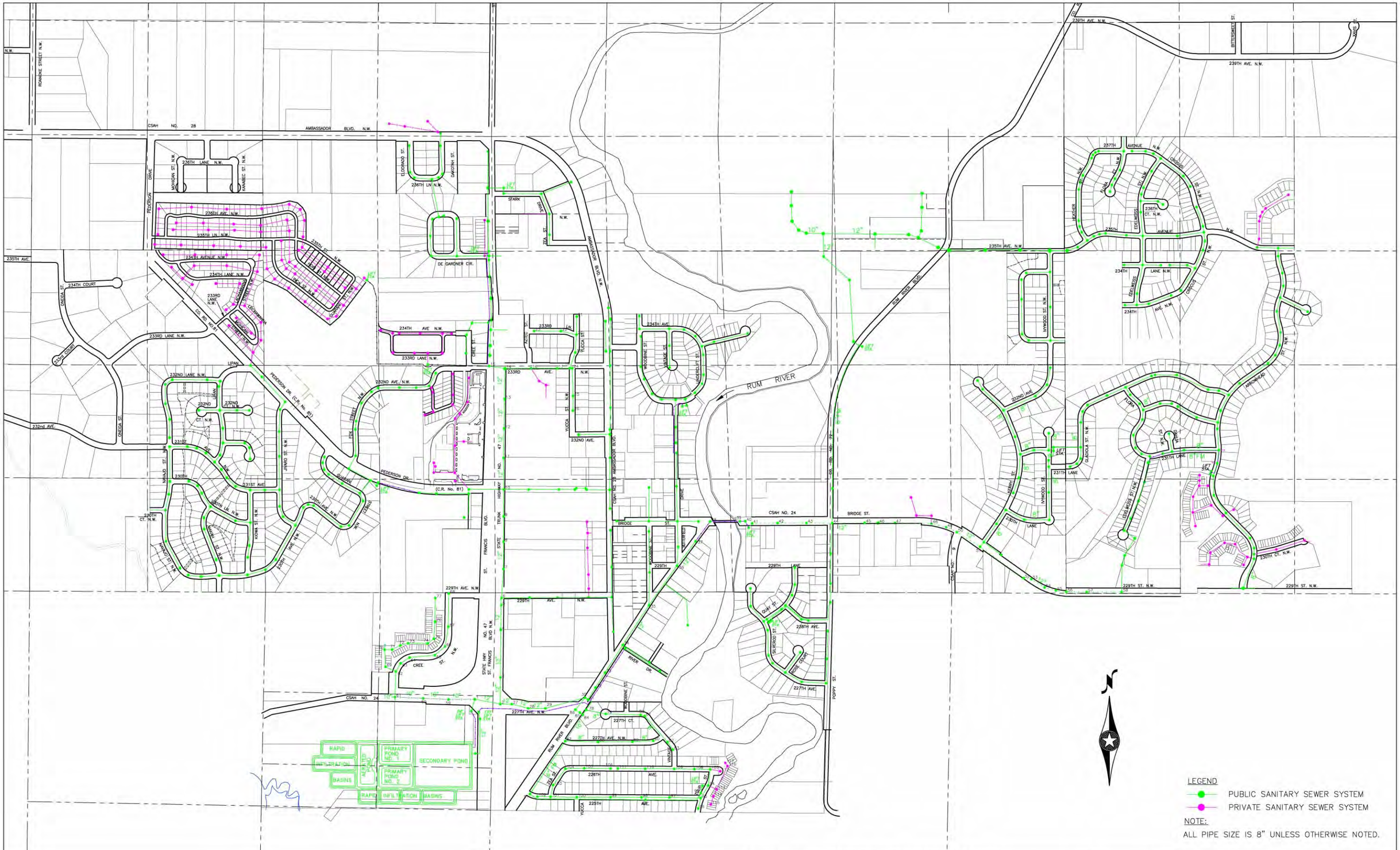
- It is the policy of the City of St. Francis to eliminate infiltration and inflow problems within the sanitary sewer system.
- It is the policy of the City of St. Francis to extend and upgrade its sanitary sewer collection system in a staged manner consistent with the staged growth plan of the City.
- It is the policy of the City of St. Francis to provide a sanitary sewer collection system within the City's boundary consistent with the staged growth plan.
- It is the policy of the City of St. Francis to provide a sanitary sewer collection system for all areas considered for annexation.
- It is the policy of the City of St. Francis to allow for development consistent with providing a public sanitary sewer collection, treatment, and disposal system to serve the areas within the corporate boundary. Cluster wastewater treatment systems will be considered when municipal sanitary sewer collection systems are not readily accessible. The cluster systems will provide sanitary sewer service until municipal service is available. In addition, the cluster systems will provide for easier future connections at a lower overall economic impact. All privately owned wastewater systems will be required to procure all regulating agency approvals.

The City of St. Francis has adopted, by reference and as amended, Individual Sewage Treatment Standards of the Minnesota Pollution Control Agency, cited as Minnesota Rule, C. 7080. This section of the City's Code outlines restrictions and requirements for the evaluation of treatment sites and the installation, construction, and maintenance of individual sewage treatment systems. All individuals performing site evaluation, installation, inspection, and pumping/cleaning of individual sewage treatment systems must maintain certification by the MPCA to perform such work.

The owner of each individual sewage treatment system must submit an inspection report of the system once every three years, indicating that the system meets minimum maintenance standards for individual sewage treatment systems. Property owners are notified of this requirement at time of building permit, via the City's website, and through mailings of official municipal forms to affected parties. System maintenance records are tracked through paper and database files at City Hall, and kept on file with all building and site information by address. If a property owner fails to submit the required report, the City will direct the Building Inspector or other qualified individual to inspect the owner's system on their behalf. The costs of such inspection will be billed to the owner. As of January 2009, approximately 700 individual sewage treatment systems existed within the City.

The City recognizes the importance of groundwater sensitivity and has established environmental protection policies that will enhance protection of groundwater in the City and the region. The City will ensure protection of local groundwater through implementation of its Surface Water Management Plan, its ordinances regulating private on-site sewage treatment systems, and its Urban Storm Water Pollution Control For New Development Ordinance. The City will continue to require compliance with the MPCA Rules Chapter 7080 for the design, installation, maintenance, expansion and repair of private on-site sewage treatment systems.

Sources:
Metropolitan Council Website
2005 City of St. Francis, *Comprehensive Sanitary Sewer Plan*



LEGEND

PUBLIC SANITARY SEWER SYSTEM

PRIVATE SANITARY SEWER SYSTEM

NOTE:

ALL PIPE SIZE IS 8" UNLESS OTHERWISE NOTED.

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City of St. Francis

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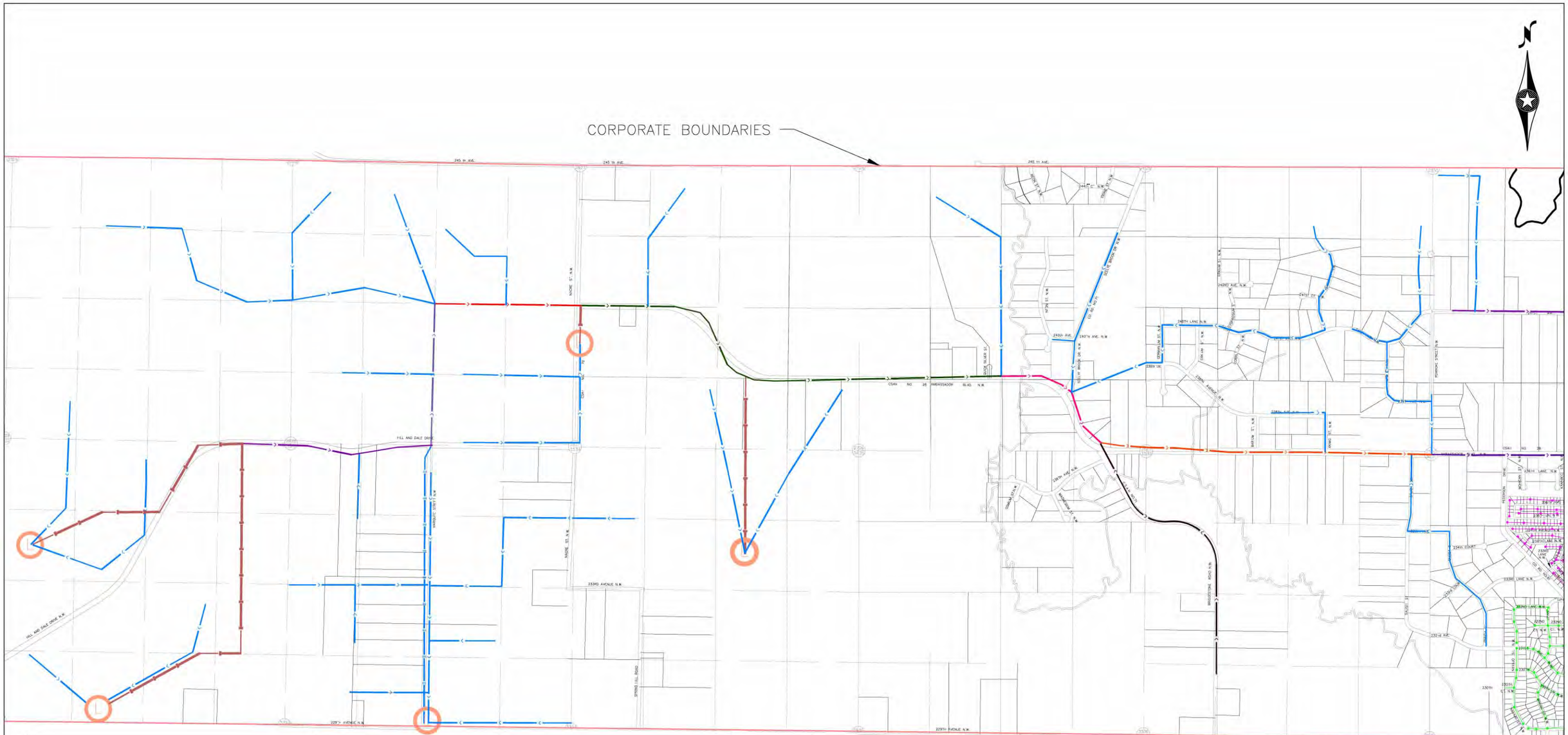
CITY OF ST. FRANCIS, MN
2008 COMPREHENSIVE PLAN
EXISTING WASTEWATER FIGURE

FIGURE 1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MADE ST. N.W.
233RD AVENUE N.W.
SPRING HILL ROAD
229TH AVENUE N.W.
229TH AVENUE N.W.
CSAH NO. 26 AMBASSADOR BLVD. N.W.
DARK SILVER ST.
CSAH NO. 22
GOLF BROOK DR. N.W.
244TH C N.W.
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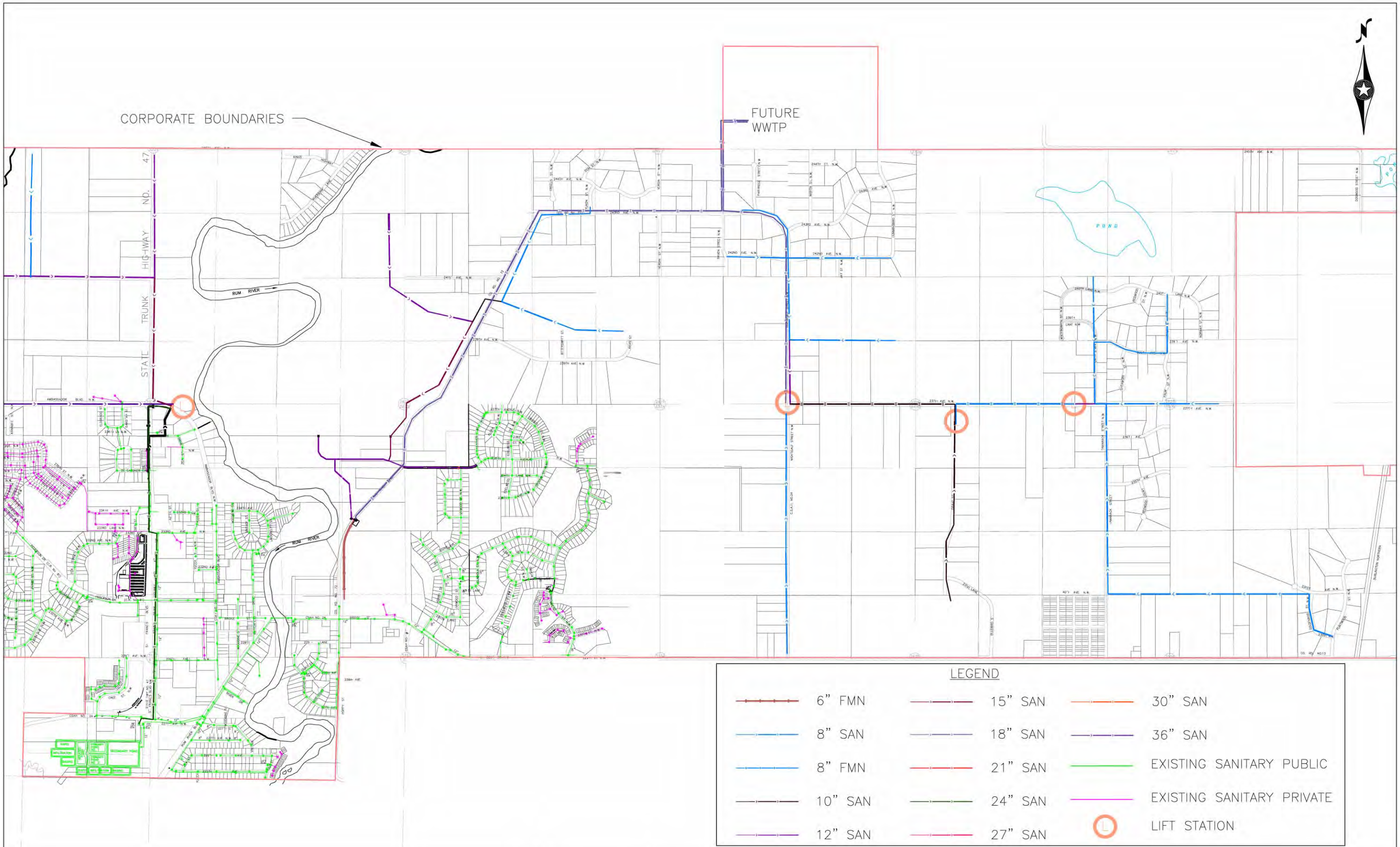

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City of St. Francis

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CITY OF ST. FRANCIS, MN
2008 COMPREHENSIVE PLAN
EASTERN CITY LIMITS

FIGURE 3

SURFACE WATER MANAGEMENT

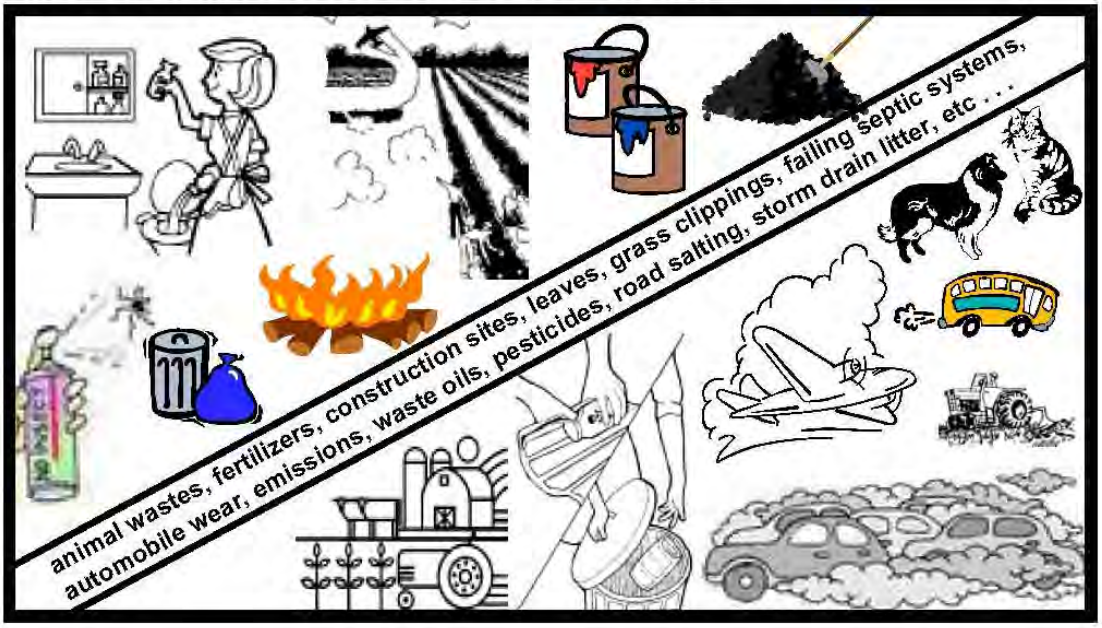
The City of St. Francis is located in the northwestern area of Anoka County and entirely within the borders of the Upper Rum River Watershed Management Organization. Bordering communities include Burns Township and the City of Oak Grove on the south, Athens Township and Stanford Township on the north, the Cities of East Bethel and Bethel on the east and Elk River on the west. The east and south border communities are within the Upper Rum River Watershed. The north and west borders of St. Francis correspond with the borders of the seven county metropolitan area.

The City of St. Francis has been a freestanding community for many years with several schools, churches and a commercial district. The urban area is expanding as additional residential developments and properties expand to agricultural areas of the City. The current trends indicate urbanization and commercial growth will continue.

METROPOLITAN COUNCIL POLICIES AND STRATEGIES

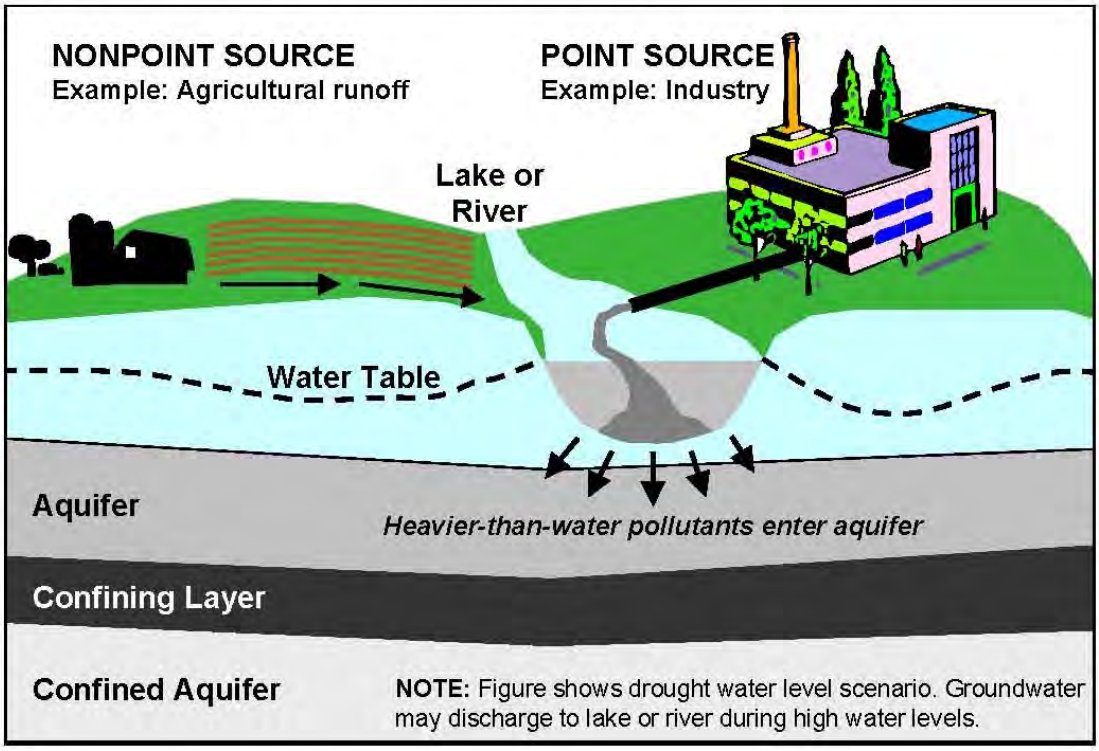
Metropolitan Council surface water management programs deal with broad land runoff ("nonpoint" source) and specific wastewater ("point" source) pollution. Point source pollution includes the discharge of treated wastewater effluent through a pipe. Nonpoint sources of pollution result from many of the everyday activities and actions of people (Figure 7). These include applying fertilizer to lawns in an amount that exceeds what the grass can use, plowing an agricultural field such that erosion results, blowing grass clippings into the street, or driving a car that exhausts improperly burned hydrocarbons or leaks oil. All these add up to major nonpoint source pollution loading of our receiving waters.

Figure 7: Examples of Nonpoint Source Pollution



Nonpoint source pollution begins with the alteration of the landscape caused by agricultural production and urban development (Figure 8). The natural vegetative and drainage systems provide a low-impact course for water to follow. Alteration of these systems increases both the volume and rate of water runoff, and introduces polluting materials that can be transported by the runoff into receiving water bodies. This makes it harder to clearly identify the pollution source and effectively manage it.

Figure 8: Point vs. Nonpoint Source Pollution



Protecting the quality of the region's water resources cannot be achieved in a cost effective manner without addressing point *and* nonpoint sources of pollution. The region has spent several decades and made great strides in improving water quality by reducing point sources of pollution. The region has begun to make progress in improving water quality by reducing nonpoint sources of pollution as well, but it is apparent that nonpoint sources of pollution far exceed point sources of pollution to the region's and state's water resources.

Local governmental units also have a role. They need to address the impacts from increased stormwater runoff as a result of increased imperviousness related to additional growth. Without local actions, projects and permits for future wastewater treatment plant expansions may be required to meet higher standards, making them more expensive.

The Council will provide technical assistance and resource assessment information to assist others in their efforts to implement practices that will protect water resources (wetlands, lakes, streams, rivers, and natural drainage courses). Best management practices help to maintain and improve water quality, control runoff rates and volumes to reduce stream bank erosion and flooding, and preserve designated beneficial uses.

The Council will review local comprehensive plans, watershed management plans, local surface water management plans, local stormwater ordinances, environmental permits and other environmental documents to ensure that the local units of government are fulfilling their nonpoint source reduction requirements and therefore not impacting the metropolitan disposal system.

ST. FRANCIS LOCAL WATER MANAGEMENT PLAN

The City of St. Francis last updated their Local Surface Water Management Plan (LSWMP) in March of 2001. The Upper Rum River Watershed Management Organization (URRWMO) had their Watershed Management Plan approved by BWSR on April 25, 2007. The URRWMO's Watershed Management Plan requires the City of St. Francis update their Local Surface Water Management Plan prior to April 25, 2009. The URRWMO's Watershed Management Plan requires member communities to adopt and implement the Plan's requirements. The City is currently working toward updating their Local Surface Water Management Plan.

The City's LSWMP includes inventory information such as public waters, wetlands, major, and subwatersheds. The LSWMP also includes policy related to nondegredation and standards consistent with the NPDES Construction General Permit requirements as well as requirements of the URRWMO. A wetland management plan has been incorporated into the LSWMP and includes function and value assessments according to MnRAM and procedures to address impacts. Policies to control peak runoff, encourage infiltration, and reduce TSS and TP as well as standards to ensure the protection of outstanding resource value waters such as the Rum River have been included in the LSWMP. As part f the LSWMP, a capital improvement plan has been developed which assesses current problems and their associated corrective actions, defines funding sources and outlines maintenance schedules for the City's various best management practices.

Upon approval of the City's LSWMP by the Metropolitan Council and URRWMO, the approved LSWMP will be incorporated into the City's Comprehensive Plan by reference.

The St. Francis Local Water Management Plan also includes elements required by the Upper Rum River Watershed Plan. The Minnesota Statute 103B, and the resulting Minnesota Rules Chapter 8410, guided the requirements of the Watershed Plan. The Plan includes procedures to protect, preserve, and use natural surface and groundwater storage and retention systems while minimizing public capital expenditures needed to correct flooding and water quality problems. The Plan identifies means to effectively protect and improve surface and groundwater quality in St. Francis. It also establishes

more uniform local policies and official controls for surface and groundwater management. Procedures are included to prevent erosion of soils into surface water systems, promote groundwater recharge, protect and enhance fish and wildlife habitat and water related recreational facilities, and to secure other benefits associated with the proper management of surface and groundwater.

ST. FRANCIS OBJECTIVES AND POLICIES

The objectives and policies of the City of St. Francis as listed in this update are those that were adopted as part of the 2001 Local Surface Water Management Plan

General

The objectives for local Water Management Plans are required elements in the State Statutes. Recommended policies were determined to help develop the St. Francis Water Management Plan.

The objectives and policies were compiled from various sources, including the Upper Rum River Watershed Management Plan and the published policies of other communities in the general area of St. Francis.

THE GOAL OF ST. FRANCIS

The City of St. Francis has maintained the natural drainage patterns throughout most of its development. The City's goal is to foster continued optimum use of that natural drainage system while enhancing the overall water quality. The intent is to prevent flooding while using identified best management practices to enhance surface water quality with minimal capital expenditures by the City.

The Upper Rum River Watershed is the official repository for water quality data for the watershed. All water quality data acquired by the City of St. Francis will be forwarded to the Watershed.

Erosion control will be addressed by City Ordinance and Development Standards. The City of St. Francis will use the Erosion Control Handbook prepared by the Board of Water and Soil Resources as well as the Minnesota Stormwater Manual as a guide in the preparation of erosion and sediment control plans and ordinances.

St. Francis's goals in stormwater management include objectives and policies within the categories of Water Quantity and Quality, Groundwater Augmentation, Recreation, Fish and Wildlife, and Regulations. Objectives and policies for those objectives follow below:

WATER QUANTITY AND QUALITY

Objective 1: Protect, preserve and use natural surface and groundwater storage and retention systems.

Policy 1.1: Establish 100-year flood levels based on critical storm events.

Policy 1.2: Prohibit encroachment that will reduce the capacity of floodplain and allow only uses permitted within the floodplain district to the extent that they are not prohibited by any other ordinance and provided they do not require structures, fill or storage of materials or equipment.

Policy 1.3: Preserve the retention capacities of the present drainage systems.

Policy 1.4: Alterations of wetlands are discouraged. Alteration may only be allowed on an individual basis if the alteration can be accomplished within the regulations of all federal, state, and local agencies that have jurisdiction over the particular wetland.

Objective 2: Minimize public capital expenditures needed to correct flooding and water quality problems.

Policy 2.1: All developments shall be required to show the impact they have on the hydrology of their sub-basin and shall construct, or participate in a regional solution, to offset any adverse impact the development creates.

Policy 2.2: Major storm water facilities shall be designed for the 100-year critical rainfall event.

Policy 2.3: All minor drainage system analysis and design shall be based on the 10-year rainfall event.

Policy 2.4: All hydrological studies and drainage design shall be based on the ultimate development of the entire tributary area.

Policy 2.5: New lateral ditches shall not be allowed to drain to Group I waters directly. They shall flow to wet detention ponds with other 'best management practices' prior to discharge.

Objective 3: Identify and plan for means to effectively protect and improve surface water quality.

Policy 3.1: Treat and/or control runoff to enhance water quality in order to reverse the upward trends in pollutants, especially nutrient and sediment loads.

Policy 3.2: Actively develop and implement a community education program relating to preserving and improving water quality.

Policy 3.3: All construction plans developed for the improvement of water quality shall include a detailed plan for the maintenance access and a maintenance plan.

Policy 3.4: Regional detention areas shall be utilized whenever possible to remove sediment and nutrients from runoff. Group II wetlands may be used if they are not identified to be protected.

Policy 3.5: Encourage the Upper Rum River Watershed Management Organization and the Anoka Conservation District to continue and increase water quality monitoring.

Objective 4: Establish more uniform local and official controls for surface and groundwater management.

Policy 4.1: Anoka County is responsible for the maintenance of all County and Judicial ditches within the corporate boundaries of the City of St. Francis.

Policy 4.2: The Minnesota Department of Natural Resources and the United States Army Corps of Engineers have regulatory authority relating to waters and wetlands identified on their respective inventories.

Policy 4.3: The City is responsible for establishing and implementing a permitting program for all activities relating to drainage, wetlands, erosion control and water resources management.

Policy 4.4: This Plan and all subsequent amendments shall be consistent with all other regulatory agencies.

Policy 4.5: This Plan shall be amended as necessary to remain current.

Objective 5: Prevent Erosion of soil into surface water systems.

Policy 5.1: All erosion and sediment control measures specified in the erosion control plan must be in place prior to the start of grading operations.

Policy 5.2: Temporary sediment basins shall be constructed in areas of new development to prevent sediment from leaving the construction area.

Policy 5.3: Grading areas shall be protected from runoff to reduce erosion.

Policy 5.4: Streets and property adjacent to construction areas shall be kept free from sediment carried by construction traffic.

Policy 5.5: The City shall maintain a street sweeping program to minimize sediment entering the drainage system.

Policy 5.6: Establishment of temporary and permanent vegetation shall be required to minimize the time that a graded area remains in an exposed condition.

Policy 5.7: Erosion control plans shall be required for all land disturbance activities. The erosion control plans shall be consistent with the criteria established by the Board of Water and Soil Resources in their erosion handbook. Also, the MPCA's Urban Best Management Practices Manual shall be used to prepare erosion control plans.

Policy 5.8: All existing storm drain inlets and conveyance systems shall be adequately protected from sedimentation.

Policy 5.9: Natural vegetation shall be preserved to the greatest practical extent.

GROUNDWATER AUGMENTATION

Objective 6: Promote groundwater recharge.

Policy 6.1: Open areas within all proposed development shall maximize infiltration whenever possible.

Policy 6.2: A permanent ponding volume below the outlet or overflow shall be provided in ponds and wetlands to promote groundwater recharge.

Policy 6.3: Groundwater management is achieved through multiple state agency activities and the cooperation of county and city agencies.

Policy 6.4: The use of grassed waterways shall be encouraged where practical to maximize infiltration.

RECREATIONAL, FISH, AND WILDLIFE

Objective 7: Protect and enhance fish and wildlife habitat and water recreational facilities.

- Policy 7.1: Coordinate with the county and municipalities to enhance water-based recreation.
- Policy 7.2: Buffer zones of natural vegetation shall be maintained around ponds and wetlands as much as possible.
- Policy 7.3: Coordinate with the Department of Natural Resources to protect rare and endangered species.
- Policy 7.4: Coordinate with the Department of Natural Resources to enhance fish and wildlife habitats.

REGULATION AND IMPLEMENTATION

Objective 8: Secure the other benefits associated with the proper management of surface and groundwater.

- Policy 8.1: The programs and standards of this plan shall be implemented.
- Policy 8.2: This plan and all subsequent amendments shall be consistent with the regulatory agencies. The regulatory agencies shall include, but not be limited to, Upper Rum River Watershed Management Organization, Anoka County, Minnesota Department of Natural Resources, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and U.S. Environmental Protection Agency.
- Policy 8.3: The City of St. Francis shall support the policies of the Upper Rum River Watershed as published in the Watershed Management Plan.

MANAGEMENT PLAN

St. Francis has worked to both decrease the runoff problems and to reduce the pollutant loads of sediment and nutrients from developing areas. The rural areas of St. Francis develop as rural residential. Some of the zoning designations require the minimum lot size to be 10 acres. Other rural areas allow lot sizes of as little as 2.5 acres. In the urban expansion zone, the minimum lot size is 1.0 acre. Various lot sizes are allowed in the urban residential area with the minimum size generally at about one fourth of an acre.

As with other communities in this general vicinity, much of the land is wet or close to the normal ground water level. The density of the development on the overview of the City is limited. Most of the development will be concentrated on the upper ground, leaving the wetlands and a perimeter of upland primarily undisturbed.

Water quality control is necessary for developments under construction. Research by the Minnesota Pollution Control Agency shows that the soil loss from agricultural properties is very low compared to most other land uses with the exception of forest and

undisturbed grasslands. Rural residential developments after fully developed and established contribute minimally to soil loss. During the development construction period, and the construction of individual lots, the soil loss can be as much as 20 times that of the agricultural uses that previously existed.

Another critical component related to water quality is within urban areas. As urban areas develop, the runoff rates and volumes tend to increase when compared to pre-development conditions. Much of the increased runoff is due to impervious areas created by the construction of parking lots and streets. Salt and sand are used for deicing and snow clearing during the winter. It is imperative that all streets be swept early in the spring prior to heavy rain events. Urban residential areas contribute to heavier nitrogen and phosphorus loadings in the runoff water. Through the use of appropriate Best Management Practices, runoff rates, volumes, and loadings can be controlled and reduced.

In general terms, the conversion of agricultural uses to residential uses will result in no increase but rather a reduction in storm water runoff rates and volumes and loadings. The conversion of wooded areas must be looked at closely to determine development impact. Preserving trees throughout the development process will help maintain predevelopment runoff rates.

WATER QUALITY AND QUANTITY MANAGEMENT

The greatest threat to the surface water resources in St. Francis is the erosion and downstream sedimentation as a result of development construction. In addition, agricultural activities also contribute to sedimentation. The City of St. Francis requires all projects to comply with the National Pollutant Discharge Elimination System permit requirements. As required by the Watershed Plan, St. Francis will update their existing Urban Stormwater Pollution Control for New Developments Ordinance.

The development of property for rural residential lots does not increase rates or volumes of runoff in the St. Francis area within the present zoning controls. Urban development run-off rates and volumes will be evaluated for compliance with the requirements of the Watershed Management Plan. Drainage concerns related to new development include the protection of homes from groundwater and surface water flooding, runoff rates and volumes, and erosion control. Maintaining the natural runoff retention capabilities without degrading the surface or groundwater quality is also a concern. The City of St. Francis reviews each proposed development with the above-mentioned concerns in mind. The Watershed Plan prevents the discharge of any surface water to a Group I wetland or water directly from any property that is developed. As the Group I waters are prevalent in St. Francis, the opportunities for regional facilities are extremely limited.

Growth in St. Francis is expected to continue into the future. As projects develop, each project will be required to provide the detention and drainage facilities needed to mitigate the impacts that the project will have on the hydrologic system. Each

development will be required to implement acceptable best management practices for permanent erosion and sediment control in compliance with the Erosion and Sediment Control Ordinance. The stormwater management strategy in St. Francis will continue to be implemented on a project by project basis.

Hydrology

St. Francis will require the use of TR-55 or TR-20 for the calculation of flow rates and volumes for land use changes. Any land development will be required to compare the pre-developed runoff rates and volumes to the proposed developed conditions. The volumes are critical for the design of the temporary and permanent erosion and sediment control facilities. Also, the volumes are necessary to determine the flood stage protection elevations for habitable structures within the development.

Calculation of a peak flow rates for the design of a particular drainage structure may use the 'rational formula'. These include culverts or drainage swales and other facilities.

Flood Protection

St. Francis will continue to manage their designated floodplains within the floodplain ordinance regulations. The Ordinance will be updated from time to time to stay current with the National Flood Insurance Program as administered by the Minnesota Department of Natural Resources.

In St. Francis, both the Rum River and Seelye Brook have detailed flood profiles developed through the City of St. Francis Flood Insurance Study. Floodplains are shown on County Ditch 18, 19 and a tributary to Cedar Creek. Each of these floodplains is not based on detailed study. The difference is that the detailed study areas have flood elevations published on the Flood Insurance Rate Map. The areas that do not have a detailed study do not have a published flood elevation.

Groundwater Management

The Watershed Plan includes a model Groundwater Protection Ordinance for each of the member communities to use as a guide. The City of St. Francis intends to adopt a Groundwater Protection Ordinance with the model ordinance as a guide. In the management of the surface runoff, the City of St. Francis has always promoted the natural storage of rainfall runoff in the wetland and depressions that are prevalent throughout the City.

Many of the sub-basins do not drain to a watercourse or drainage way. These areas dissipate the runoff through infiltration and evaporation. Minnesota has a net excess rainfall, thus, a majority of the water infiltrates to groundwater. The City of St. Francis requires the use of Best Management Practices for all developments within the City. This helps assure that the water which infiltrates is of a quality that will not degrade the groundwater quality.

Source:
Metropolitan Council Website
2001 City of St. Francis, *Local Surface Water Management Plan*

MUNICIPAL WATER SERVICE

The St. Francis water distribution system serves seven (7) percent of the total city area. The rest of the community is served by individual or private community wells. The current water distribution system is represented in Figure 1. The St. Francis water distribution system currently consists of four wells, one elevated storage reservoir and water distribution piping ranging in size from 6 to 16 inches in diameter.

The following section provides an overview of the Metropolitan Council's role, policy and guidance relative to municipal water service. Subsequent sections of this chapter include summaries of studies that were completed by the City of St Francis to provide a look at the potential use, locations and cost to construct water supply and distribution components in the City to accommodate growth.

METROPOLITAN COUNCIL POLICIES AND STRATEGIES

The 2003 Regional Development Framework and the regional system plans comprise the Council's Metropolitan Development Guide, which is the region's plan to ensure orderly, coordinated, and economical development of the region.

The central cities and many first-ring suburbs are served by water drawn from the Mississippi River, while the rest of the suburbs are served by groundwater. Minneapolis and the suburbs it serves rely solely on water from the Mississippi River, whereas St. Paul and its suburban clients supplement Mississippi River water with tributary inflow to its Vadnais Lake reservoir system and with high capacity groundwater wells.

ST. FRANCIS WATER SYSTEM STATUS REPORT

The City of St. Francis completed and adopted a Water System Status Report in September, 2004. A modified executive summary is included here. Alterations to the Water System were necessary to comply with new water quality standards and meet the growing demand of the community.

Executive Summary

The City of St. Francis, Minnesota is currently experiencing rapid population growth and expansion of its water system service area. During the past 10 years, population has grown from 2,436 to 7,201. To continue to provide the expanding service area with a reliable water supply, the City of St. Francis implemented several improvements to the system and will continue to implement future projects in accordance with the report.

Existing System Summary

The existing water distribution system is comprised of water main ranging in size from 6 to 16 inches in diameter. The total supply capacity, consisting of 4 wells, is 3,250 gpm from a combination of four wells. The total firm pumping capacity, or the capacity of the system with the largest well out of service, is 2,250 gpm.

Well 2 is designated as "Emergency Back-Up" due to high levels of radium. Well 1 also has high levels of radium but is being blended with Well 3 to acceptable levels. A water treatment facility is under construction to treat Wells 1, 3 and 4 for iron, manganese and radium prior to distribution and will be in service by the end of 2008.

The average day (AD) demand is approximately 750,000 gallons per day. The maximum day demand on record also occurred during 2008 and was approximately 2,100,000 gallons. The current AD pressures range from 54 to 77 psi and provide an available fire flow from 500 gpm to over 3,500 gpm. This fire flow is assuming maximum day (MD) demand conditions with the towers half full and all wells running.

System Pressures
The City is served by one pressure zone with a tower overflow elevation of 1,068. This elevation provides 54 to 77 psi through the water system and is adequate for expansion of the service area.

Storage
The City has a 750,000 gallon elevated tower with an overflow at elevation 1,068. In conjunction with the water treatment facility, a million gallon reservoir is under construction and will be placed in service by December 31, 2008. With the addition of the 1 million gallon ground reservoir, the City will have a total of 1.75 million gallons of storage.

Supply
The City currently has suitable supply to meet the current MD demand. The City should continue to monitor the supply verses the demand to determine the appropriate timing for the construction of a future well. The well should be constructed near the Water Treatment Facility to minimize raw water main.

Water Treatment
The City is currently constructing a Water Treatment Facility for Wells 1, 3 and 4. The dual media gravity filters have a 4,000 gpm capacity and are designed for iron, manganese and radium removal. The radium levels in the Mount Simon-Hinckley wells exceeded the primary drinking water standard and required treatment. The facility was design to meet 2027 projected water demands.

System Trunk Main Improvements
Future expansion will require significant trunk main construction. In 2006 an upsizing was completed to the main along T.H. 47. This main was upgraded to a 12-inch trunk main to increase fire flows in the western half of the City. Future trunk main improvements should include a trunk main loop and river crossing in the north part of the service area.

ST. FRANCIS OBJECTIVES AND POLICIES

It is the policy of the City of St. Francis to fulfill Minnesota Statues Section 473.859, Subd. 3, which require cities with a municipal water supply system to develop a Water Supply, Emergency, and Conservation plan. The City's Water Supply Plan was submitted to the Metropolitan Council and Minnesota DNR on October 14, 2008.

Source:
Met Council Website
2004 City of St. Francis, Water System Status Report

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City of St. Francis

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CITY OF ST. FRANCIS, MN
2008 COMPREHENSIVE PLAN
EXISTING WATER DISTRIBUTION FIGURE

FIGURE 1