

The provision of public and private utilities is essential to a healthy community. Richfield offers high quality services for the benefit of its citizens including: water; sanitary sewer collection; surface water management (storm drainage and sewer.) These services as a group comprise the public utilities provided to the community. It is critical that these essential services are properly maintained to assure a safe and reliable service can be offered that makes Richfield an attractive place to live. The City's Water Supply Plan and Local Surface Water Management Plan are included as Appendix F & G to the comprehensive plan. These documents should be referenced for more detailed information pertaining to the comprehensive plan requirements.

WATER SUPPLY

Richfield delivers safe, clean and reliable drinking water to residents throughout the City. The water plant, which provides both filtration and softening is sourced by seven high capacity municipal wells. Water is transported and delivered via the distribution system which is comprised of a single pressure zone with two elevated storage tanks and approximately 120 miles of transmission and distribution water mains ranging in size up to 24 inches in diameter. The City continues to provide safe drinking water in an efficient manner while optimizing current operations and mitigating risk.

SANITARY SEWAGE

As a fully developed community, the City provides sanitary sewer service to all developed property within its boundaries. There are no unsewered areas.

Richfield's sanitary sewage collection and pumping system has not undergone major upgrades in the past ten years and is considered to be in fair to good condition. The current sanitary collection system, as shown in Figure 9-1, is adequate to handle peak average daily flows (ADF) both now and in the future based on Metropolitan Council forecasts shown in Table 9-1. The forecasts have been assigned to their respected Metro Council Environmental Services (MCES) interceptors, which align with the development areas discussed in Chapter 5 Land Use. The City is not planning for any new trunk sewer system connections to the Metropolitan Disposal system.

Service Connections

Figure 9-1 shows all the sanitary sewer piping owned by the City of Richfield and their sizes. All of the Richfield collection system is connected to the MCES interceptor collection system and transported through Minneapolis and Saint Paul to the MCES Pig's Eye Wastewater Treatment Facility. There are no plans to expand this system, which is discussed in the City's Sanitary Sewer Plan (2018). This plan provides additional system information on the capacity and design flows for the existing and future trunk sewers and lift stations.

By the end of the year 2010, the City of Edina began routing wastewater flows through a relief interceptor to relieve capacity issues from MCES Interceptor 1-RF-491 for peak wet weather flows experienced during intense rainfall periods (producing Inflow/Infiltration). Most of Richfield's





Table 9-1. Population, Household, and Employment Forecasts by Interceptor

	Population		Households			Jobs			
MCES Interceptor	2020	2030	2040	2020	2030	2040	2020	2030	2040
1-RF-490	18,550	18,650	18,850	7,950	8,150	8,350	6,300	6,450	6,595
1-RF-491	9,275	9,325	9,425	3,975	4,075	4,175	6,950	7,160	7,340
1-RF-492	0	0	0	0	0	0	40	40	40
1-RF-491R	9,275	9,325	9,425	3,975	4,075	4,175	3,310	3,450	3,525
Total:	37,100	37,300	37,700	15,900	16,300	16,700	16,600	17,100	17,500

Figure 9-1. Sanitary Sewer Piping



growth areas are in the vicinity of the MCES Interceptor 1-RF-491.

The MCES relief line interceptor reduces the flows in the existing interceptor (1-RF-491) by conveying the City of Edina's wastewater around Richfield. The sanitary sewer interceptor from Edina extends from the southwest corner of Richfield to Cedar Avenue at Diagonal Boulevard on the east side.

Model results show that this relief line sufficiently addressed potential capacity limitations for the City of Richfield along the interceptor. The interceptor sewer increases sewage capacity considerably and allows Richfield to handle increased land use densities along I-494 and Highway 77 consistent with the Comprehensive Plan. This is further demonstrated by the design flows in Table 9-2. The following assumptions were used for determining 2040 design flows:

- » The ratio is the number that the MCES uses to determine the allowable peak hour flow rate for the Richfield collection system at MCES surcharge.
- » The City of Richfield is already fully developed. The Average Daily Flow design flow number for the year 2040 is based on the City's projected land use in that year. The number takes into account all planned development in Richfield for the next 20 years.
- » Based on Richfield's water records and the assumption that all water accounts would be connected to sanitary sewers, the number of sewer connections would be 10,726 and be equal to the number of water accounts in Richfield. The number of sewer connections is broken down in Table 9-3.
- » The city's sanitary sewer system consists of nine lift stations. The lift stations have been sized to handle buildout of their respective service areas. Table 9-4 summarizes the capacity information for each of the lift stations. The locations of the lift stations are shown in Figure 9-1.

Table 9-2.Wastewater Average Daily Flow Projections

	20	20	2	.030	2040		
MCES Interceptor	MCES Total Flow (MGD)	Richfield's Contribution (MGD)****	MCES Total Flow (MGD)	Richfield's Contribution (MGD)****	MCES Total Flow (MGD)	Richfield's Contribution (MGD)****	
1-RF-490*	7.44	2.76	7.51	2.83	6.542	3.884	
1-RF-491**	5.48	1.17	5.49	1.18	3.290	1.476	
1-RF-492***	0.96	0.96	1.01	1.01	3.524	1.941	
M130	8.40	3.72	8.52	3.84	9.405	4.664	

*Flow before 1-RF-490 intersects 1-RF-492

**Flow before 1-RF-491 intersects 1-RF-490

***Flow before 1-RF-492 intersects 1-RF-490

****Contains MAC Flow

Table 9-3. Number of Sewer Connections by Interceptor

Interceptor	# of Sewer Connections	Direct Connections To MCES Interceptor
MCES Interceptor 1-RF-490	5,540	213
MCES Interceptor 1-RF-491	3,587	307
MCES Interceptor 1-RF-492	1,599	0
Totals	10,726	520

Table 9-4. Lift Stations

Lift Station ID	Maximum Depth (ft)	Maximum HGL (ft)	Maximum Total Inflow (mgd)	Total Inflow Volume (MG)
SLS1	2.407	818.407	0.082	0.077
SLS2	4.339	814.339	0.373	0.345
SLS3	8.507	795.707	0.52	0.486
SLS4	6.04	802.98	0.704	0.659
SLS5	3.533	813.923	0.117	0.11
SLS6	3.408	818.978	0.052	0.048

INTERCOMMUNITY CONNECTIONS

Metropolitan Airports Commission (MAC) property and approximately 35 to 40 residential units or equivalents from Edina enter the Richfield sanitary sewer system. Richfield is charged by the Met Council for the sanitary sewer flows generated from these intercommunity connections. Richfield monitors local and regional meters to determine the proportionate charges being covered for Edina and the MAC. Richfield is reimbursed by Edina and the MAC on a monthly basis. In the next year, the City will work with these agencies in developing intercommunity connection agreements.

INFILTRATION AND INFLOW (I/I)

The quantity of Inflow and Infiltration (I/I) entering a wastewater collection system can be estimated utilizing wastewater pumping records, daily rainfall data, and water usage characteristics. Water from inflow and infiltration can consume available capacity in the wastewater collection system and increase the hydraulic load on the treatment facility. In extreme cases, the added hydraulic load can cause bypasses or overflows of raw wastewater. This extra hydraulic load also necessitates larger capacity collection and treatment components, which results in increased capital, operation and maintenance, and replacement costs. As sewer systems age and deteriorate, I/I can become an increasing problem. Therefore, it is important that I/I be reduced whenever it is cost effective to do so.

Richfield has not exceeded the peak flow rate established by the MCES. The City has been examining its sanitary sewer collection system through the development of a computer model to isolate areas in the sewer system, which may need additional capacity. One way to add capacity is to effectively manage I/I. The results of the flow monitoring data the City is collecting for the sanitary sewer model will help the City identify areas with high I/I volumes. The City could use this data for further investigation by performing smoke testing and/or private property building inspections in areas identified with high peak flow rates during wet weather periods as necessary to isolate specific sources of I/I in the Richfield sanitary sewer collection system. The results of future flow monitoring will determine the need for further investigation.

The MCES has established wastewater flow goals for each community discharging wastewater into the Metropolitan Disposal System (MDS) based on average day flows and allowable peaking factors. These enforced wastewater flow goals are aimed at reducing excessive I/I within the City's sanitary sewer system and also the MCES interceptor system. Richfield will reduce inflow and infiltration (I/I) into the sewage collection system in order to maintain the MCES Design Peak Hour to Average Daily Flow (P/A) Ratio of 2.5.

The city's estimated clear water flow is shown in Table 9-5. This data is based on three years of data from 2015 to 2017 (see Table 9-6). Average I/I represents roughly 5% of the average sewer flows.

Table 9-5. Estimated I/I Rate

	MGD
Average Flow (MGD)	3.131
Peak Month Flow (MGD)	3.267
Base Flow (MGD) Winter Water Usage)	2.967
Average Annual I/I (MGD)	0.164
Peak Month I/I (MGD)	0.300







Infiltration and Inflow Practices

The bulk of I/I that enters Richfield's sanitary sewer system has come from heavy rain events in older residential neighborhoods, which are predominately pre-1970 homes (90% of the housing stock) that have older sewer lines and infrastructure. The City is actively televising these neighborhoods on an annual basis to determine any sewer lining needs. This effort has coincided with the City's mill and overall program that started in 2016. The program has included approximately \$400,000 on an annual basis to address I/I issues. These dollars have been used for sewer linings (approximately 10,000 to 20,000 feet annually), joint repairs, and sealing manholes. However, funding at this level will not fully address all of the City's estimated I/I needs. The City predicts it would take another 30 years at the current funding level to make all of the necessary I/I improvements. Based on this funding gap, the City will likely bond for funding in the next 10 years.

Standards for minimizing I/I is found in City's Ordinance under Section 700 & 705. The objectives of Section 700 & 705 are to regulate the introduction of pollutants into the sanitary sewer system by any person; to prohibit illicit connections and discharges to the sanitary sewer system; to establish authority to carry out all inspections, surveillance, and monitoring procedures necessary to ensure compliance with this ordinance; and to establish enforcement mechanisms for violations of this Section. The ordinance will continue to be followed and will be amended within twelve months of the adoption of this plan to include the disconnection of existing clearwater sources.



I/I Reduction Goals and Strategies

The City of Richfield's goal is to reduce I/I whenever feasible to reduce cost for maintenance and operation (O&M) of their sanitary sewer collection system and overall MCES wastewater treatments cots to the City. The strategy is to maintain an efficient and effective collection system through regular maintenance of the system including scheduled inspection, repair and replacement as needed to accomplish this goal. The City's I/I goals and strategies are described below.

Goals for I/I Reduction

- » To minimize or eliminate I/I entering private and public sewer infrastructure
- » To reduce ratepayer costs for transporting and treating wastewater
- » To minimize liability from water pollution and public health risks



Strategies for I/I Reduction

- » Educate property owners about I/I by posting information on the City's web site and distributing information via email blasts and community newspapers.
- » Encourage private property owners to proactively inspect and repair or replace older segments of private sanitary sewer connections that are beyond their service life.
- » Explore grants or other financial assistance programs to provide financial assistance to private property owners wishing to replace or repair private sewer connections to the city main.
- » Make sure sump pumps and building drains are not connected to the sanitary sewer system. This can be done through educational information and when permits are required for home improvements or expansions.
- » Ensure careful construction, maintenance and rehabilitation practices are followed in all aspects, both public and private, of the sanitary sewer system.



SURFACE WATER MANAGEMENT

The City prepared a Surface Water Management Plan (SWMP) in 2018 (See Appendix G). The SWMP sets the course for the City's management of stormwater and water resources within the City. The SWMP provides data and other background information on resources, assesses city-wide and specific issues, sets goals and policies for the City and its resources, and lays out an implementation program to achieve the City's goals. Its recommendations are included here by reference.

Generally, the City's surface and stormwater management efforts focus on reducing the volume and improving the quality of stormwater runoff. The City is in the process of developing or updating hydrologic, hydraulic, and water quality models to identify issues related to water quantity and water quality within the City and prioritize those issues for future action. As a fully developed City, redevelopment provides the most advantageous opportunity to implement best management practices (BMPs) to address surface water and stormwater issues.

Surface Water Strategies

The City's surface water goals (see Chapter 4) are supported by more specific policies and strategies. The policies and strategies are intended to complement applicable county, regional, or state policies and regulations. The City's policies and actions are organized into four strategies. These strategies will assist the City in targeting its main audiences for the purposes of storm water management as follows:

- » Cooperation with other governmental entities
- » Education, Training, and Outreach
- » Regulation and Permitting
- » Operations

The use of these strategies as they pertain to the management of surface water and stormwater is described in greater detail in the SWMP. Specific policies associated with each strategy are documented in the SWMP.

Surface Water Management Implementation Program

The City's SWMP describes the significant components of the City's surface water and stormwater implementation program, including:

- » Implementation of the City's NPDES MS4 Permit
- Operation and maintenance of the City's stormwater system
- » Education and public involvement
- » Enforcement of ordinances and official controls
- » Projects, including investigative studies and capital improvements

Under the U.S. Environmental Protection Agency's (EPA) Storm Water National Pollutant Discharge Elimination System (NPDES) Rules, Richfield is required to maintain a Municipal Separate Storm Sewer System (MS4) Permit for managing non-point source stormwater. As part of the permit, the City must also prepare and maintain a Storm Water Pollution Prevention Program (SWPPP) addressing all requirements of the permit. The SWPPP outlines the appropriate best management practices used by the City to control or reduce the pollutants in stormwater runoff to the maximum extent practicable. These practices are a combination of education, operations and maintenance, system design and engineering methods, and other such provisions that are appropriate to meet the requirements of the NDPES permit.

Richfield is responsible for maintaining its stormwater system, including storm sewer pipes, ponds, pond inlets and outlets, and channels. The City implements an operation and maintenance program consistent with the requirements of its MS4 SWPPP. Stormwater pond maintenance is a significant element of the City's overall maintenance program. The program includes sediment removal in many of the primary stormwater treatment ponds in the City. Other elements of the City's maintenance program include, but are not limited to: catch basin cleaning, street sweeping, and maintenance of privately-owned stormwater BMPs.

The City performs various education and communication activities to further promote awareness of water resource issues and develop community capacity for watershed stewardship. The City's education and public involvement program is closely tied with the City's implementation of its NPDES MS4 permit and has been designed to be in conformance with the City's NPDES MS4 permit. The watershed management organizations (WMOs) within the City also have strong education and public involvement programs. The City will continue to work with the WMOs within the city to coordinate education and public involvement efforts to maximize impact and minimize redundancy. The City has instituted regulatory controls and a corresponding permit program to limit negative impacts to water and natural resource resulting from development, redevelopment, and other land-disturbing activities. The City requires proposers of residential projects with land-disturbing activities of one acre or commercial, industrial, institutional, or mixed-use projects to submit a stormwater management plan to the City for approval prior to construction. The City coordinates its project review and permitting process with the WMOs with jurisdiction in the City, where applicable.

In addition to its ongoing programs and permit activities, the City performs studies and capital projects to address surface water and stormwater issues. These may include investigative studies to identify issues (e.g., lake diagnostic studies, hydrologic and hydraulic modeling) and feasibility studies to evaluate potential solutions. Following assessment of feasibility, the City may construct (or cooperate with other entities to implement) to construct capital projects to implement a solution. To maximize efficiency, the City seeks to coordinate its capital improvements road reconstruction, redevelopment opportunities, or other coordinated projects. The City may also prioritize projects based on the availability of grant funding, cost-share opportunities, or availability of other funding sources or manpower that may reduce the City's financial responsibility.

