3.0 Assessment of Issues and Opportunities

This section of the Plan presents and discusses the water resource management issues and opportunities facing the City, organized by various topics. Issue identification was an important task in development of this Plan and allows the City to prioritize and focus its water resource management actions over the next 10 years. Issue identification included review of Metropolitan Council, MPCA and watershed management organization (WMO) planning documents, review of available studies, discussion with City staff, and a surface water management survey hosted at the City's website. Major opportunities for the City to consider in addressing these issues are summarized at the end of this section.

3.1 Surface Water Quality

Pollutants are discharged to surface waters as either point sources or nonpoint sources. Point source pollutants discharge to receiving surface waters at a specific point from a specific identifiable source (e.g., discharge from wastewater treatment plants). Unlike point sources, nonpoint source pollution cannot be traced to a single source or pipe. Instead, pollutants are carried from land to water in stormwater or snowmelt runoff, in seepage through the soil, and in atmospheric transport. All these forms of pollutant movement from land to water make up nonpoint source pollution. Even though much of pollutants may be carried to and discharged to receiving surface waters via a pipe, the sources of pollutants are ubiquitous throughout a watershed and hence are deemed non-point sources. As such, storm sewer discharges are classified by the State as being non-point sources.

For most water bodies, nonpoint source runoff, especially stormwater runoff, is a major contributor of pollutants and the declining water quality of surface waters. Stormwater runoff includes pollutants such as nutrients (e.g., phosphorus), sediment, chlorides, oil, grease, chemicals (including hydrocarbons), metals, litter, and pathogens (e.g., *E. coli* and fecal coliform), all of which can severely reduce water quality.

For lakes, ponds, and wetlands, phosphorous is typically the pollutant of major concern. Land use changes resulting in increased imperviousness (e.g., urbanization) or land disturbance (e.g., redevelopment) result in increased amounts of phosphorus, chlorides, and other pollutants carried in stormwater runoff. Over time, increased phosphorus in runoff can accumulate in lake, stream and pond sediments, contributing to internal loading under certain conditions in turn driving the growth of algae; which result in numerous collateral unpleasant side effects including aesthetic, odor, toxicity, habitat, recreation, and reducing land value issues. Phosphorus loadings must often be reduced to control or reverse water quality degradation.

Increased urbanization may also result in increased chloride loading from road de-icing practices. Chloride dissolves in stormwater runoff and is not easily removed by traditional stormwater quality best management practices (e.g., sedimentation ponds). Elevated chloride levels can negatively affect fishery populations and other aquatic life.

Algal blooms, overabundant aquatic plants, and the presence of nuisance/exotic species, such as Eurasian watermilfoil, purple loosestrife, and curlyleaf pondweed, carp, zebra mussels and other emerging invasive species interfere with ecological function as well as recreational and aesthetic uses of water bodies. Where more than one of these drivers are present management of the drivers as a group rather than individual autonomous issues may likely be necessary.

The Minnesota Pollution Control Agency (MPCA) is the state regulatory agency primarily tasked with protecting and improving water quality in Minnesota. In its enforcement of the federal Clean Water Act (CWA), the MPCA administers the Municipal Separate Storm Sewer System (MS4) permit program. Subject to this program, the City is required to maintain an MS4 permit from the MPCA and annually submit an MS4 report to the MPCA. The MPCA also maintains a list of impaired waters; issues related to impaired waters are described in greater detail in Section 3.1.2.

The City currently requires implementation of water quality treatment best management practices (BMPs) for development and redevelopment projects consistent with City ordinance and consistent with the requirements of the applicable watershed management organization. The City may need to revise its performance standards to achieve higher levels of water quality treatment in the future in response to changing WMO, state, or federal requirements or to address impaired waters issues.

3.1.1.1 National Pollutant Discharge Elimination System (NPDES)

The City of Richfield is subject to the National Pollutant Discharge Elimination System (NPDES) Stormwater Program. This program is mandated as part of the federal Clean Water Act (CWA) with the goal of reducing pollution from stormwater runoff and implemented in Minnesota by the MPCA. As a city with a population greater than 10,000, the City of Richfield is required to obtain a Municipal Separate Storm Sewer System (MS4) permit from the MPCA for managing non-point source stormwater and comply with its requirements. The NPDES MS4 permit addresses how the City will regulate and improve stormwater discharges. The permit must include a Storm Water Pollution Prevention Program (SWPPP) addressing six minimum control measures (MCMs), including:

1. Public Outreach and Education
2. Public Participation/Involvement
3. Illicit Discharge Detection and Elimination
4. Construction Site Runoff Control
5. Post-Construction Runoff Control
6. Pollution Prevention/Good Housekeeping

The SWPPP identifies issues related to the above minimum measures and more. The SWPPP is designed to address these issues thereby minimizing the discharge of pollutants into the City's stormwater system, protecting and enhancing water quality, and satisfying the appropriate requirements of the Clean Water Act of 1984, as amended.

The MPCA reissued the MS4 General Permit in August, 2013. The current permit shifts from the initial focus on permit program development to measuring program implementation. The most significant revisions to the general permit include:

- Inventory of all ponds, wetlands, and lakes
- Post-construction stormwater standards including no net increase in total phosphorus, total suspended solids, or runoff volume from new development
- Post-construction stormwater standards including a net reduction in total phosphorus, total suspended solids, and runoff volume from redevelopment
- Inventory of facilities that contribute pollutants to stormwater discharges
- Procedures and schedule to determine treatment effectiveness of stormwater ponds
- Additional documentation requirements for minimum control measures

These revisions are described in the Revisions to the MS4 SWPPP Requirements available from the MPCA website: http://www.pca.state.mn.us/index.php/water/water-types-and-programs/stormwater/municipal-stormwater/municipal-separate-storm-sewer-systems-ms4.html#permit

The City completed Part 1 of its MS4 SWPPP Authorization for Renewal under the revised general permit in 2018 and anticipates complete permit reissuance in 2019. The City has already developed and is implementing many of the best management practices (BMP) required in the NPDES permit. The current SWPPP is presented in Appendix C of this Plan.

3.1.2 Impaired Waters and Total Maximum Daily Load (TMDL) Issues

The Clean Water Act (CWA) requires states to adopt water quality standards to protect the nation's waters. Water quality standards designate beneficial uses for each waterbody and establish criteria that must be met to support its designated use(s). Section 303(d) of the CWA requires each state to identify and establish priority rankings for waters that do not meet the water quality standards. In Minnesota, these responsibilities are administered by the MPCA. The list of impaired waters, sometimes called the 303(d) list, is updated by the state every two years.

The MPCA performs Total Maximum Daily Load (TMDL) studies to address impaired waters. A TMDL is a threshold calculation of the amount of a pollutant that a waterbody can receive and still meet water quality standards. A TMDL study establishes the pollutant loading capacity within a waterbody and develops an allocation scheme amongst the various contributors, which include point sources, nonpoint sources, and natural background, as well as a margin of safety. As a part of the allocation scheme, a waste load allocation (WLA) is developed to determine allowable pollutant loadings from individual point sources (including loads from storm sewer networks in MS4 communities), and a load allocation (LA) is developed to establish allowable pollutant loadings from nonpoint sources and natural background levels in a waterbody. A watershed restoration and protection strategy (WRAPS) is similar to a TMDL and may examine other waterbodies in a watershed in addition to impaired waterbodies. Both TMDLs and WRAPSs may result in implementation plans to address water quality issues of the affected waterbodies.

There are no impaired waters located within the City of Richfield. Impaired waters that receive stormwater runoff directly from the city are identified in Table 2-3 and Figure 2-9.

3.1.2.1 Specific TMDLs

Although not located within the city, Minnehaha Creek and Lake Nokomis receive runoff from the city and are included on the impaired waters list (see Table 2-3). The *Minnehaha Creek Watershed District Lakes Total Maximum Daily Load* study (MPCA, 2011) addresses the impairment of Lake Nokomis. That study identified a waste load allocation of 109 lbs/year of phosphorus from the City of Richfield to achieve a site specific total phosphorus standard of 50 ug/L and a total phosphorus waste load allocation of 104 lbs/year to achieve a phosphorus concentration of 40 ug/L. Those waste load allocations represent 7% and 12% reductions from the 118 lbs/year existing MS4 load calculated in the TMDL, respectively. To address this issue, the City and MCWD collaborated to complete the Taft Lake/Legion Lake volume and phosphorus reduction project. That project provides water quality treatment for runoff from the city prior to discharge to Lake Nokomis through a combination of water reuse, infiltration, and flocculation practices (WSB, 2010, as amended). The City documents total phosphorus load reductions as part of its annual reporting to the MCWD.

The Minnehaha Creek impairment is addressed by *Minnehaha Creek E. Coli Bacteria/Lake Hiawatha Nutrients Total Maximum Daily Load* study (MPCA, 2014). That study does not identify a waste load allocation for the City of Richfield

Nine Mile Creek is identified as impaired for aquatic life due to chloride and fish bioassessments. A TMDL addressing the impairment due to chloride was completed in 2010 (Barr, 2010). The TMDL estimated a total road salt chloride load from Richfield to the Nine Mile Creek watershed of 42 tons/year. The TMDL also identified a categorical waste load allocation requiring a 62 percent reduction in salt application for all tributary areas within MS4s (including Richfield). The City achieved that goal in 2011 and has continued to reduce chloride loading since.

3.1.2.2 Chlorides

High chloride concentrations in metropolitan area waterbodies are an emerging water quality concern. A TMDL for Nine Mile Creek impairment due to chloride was completed in 2010 and included waste load reductions for the area of Richfield located within the Nine Mile Creek watershed (see Section 3.1.2.1). In 2015, the MPCA conducted a broader study, working with the cities and other stakeholders in the 7-County Twin Cities metropolitan area to assess chloride levels in regional lakes, streams, wetlands, and groundwater. The study identified two primary sources of chloride to metro water resources: (1) salt applied to roads, parking lots and sidewalks for deicing; and (2) water softener brine discharges to municipal wastewater treatment plants (WWTPs). The MPCA and stakeholders also worked together to develop a plan to restore and protect waters impacted by chloride, documented in the *Twin Cities Metropolitan Area Chloride TMDL* (MPCA, 2016) and *Twin Cities Metropolitan Area Chloride Management Plan* (MPCA, 2016). The City already implements many chloride best management practices, including:

- Tracking annual road salt use
- City-wide water softening

- City staff training

Beginning in 2010, the City began implementing best management practices that reduced road salt application by over 50 percent.

3.1.2.3 TMDL Implementation

Historically, the NMCWD and MCWD have taken the lead in assessing and developing TMDL studies for impaired water bodies that the City of Richfield contributes drainage to. The NMCWD and MCWD capital improvement programs includes projects to address the impairments of Nine Mile Creek and Minnehaha Creek, respectively. Where applicable, these projects are included in the City's implementation program summarized in Table 5-1. The completion of current and future TMDL studies may result in additional projects and programs to address water quality. The City will continue to cooperate with the WMOs to implement projects resulting from TMDLs.

Because the City is largely developed there is limited undeveloped space available for feasible water quality improvement projects to address water quality issues including impaired waters. Therefore, the City will seek opportunities as its lands redevelop to implement water quality improvements (where feasible and effective) and where such improvements will provide added value (see Section 3.6.3). The City promotes the use of regional water quality BMPs to reduce maintenance requirements and minimize land use conflicts. The City plans to use the results of City-wide water quality modeling (see Table 5-3) to identify priority areas where such projects are desirable to address impaired waters and other water quality issues.

3.1.3 Metropolitan Council Issues

Local water management plans must be consistent with the Metropolitan Council's *2040 Water Resource Policy Plan* (May, 2015). The WRPP emphasizes integrating planning for wastewater, water supply, and surface water management. Specific to surface water, the WRPP includes strategies designed to:

- Reduce "nonpoint" and "point" source pollution into receiving waters.
- Decrease stormwater runoff
- Partner with state, federal, and local units of government
- Work with stakeholders to promote protection of water bodies
- Decrease adverse impact on water quality in the region

The goals, policies, and implementation items included in this SWMP have been developed with consideration for the Metropolitan Council's guidance and contribute to the region water management objections identified by the Metropolitan Council. This SWMP is also incorporated into the City's 2018 Comprehensive Plan, which is reviewed and approved by the Metropolitan Council Environmental Services.

3.1.4 Specific Water Quality Issues and Opportunities

3.1.4.1 Lake Water Quality

Although no waterbodies located within the City of Richfield are listed as impaired by the MPCA (see Section 2.7.2.1), lake water quality remains a focus for the City. Long-term average total phosphorus concentrations in Wood Lake, Richfield Lake, and Legion Lake measured from 2009-2015 range from approximately 140 ug/L to 150 ug/L and exceed applicable MPCA eutrophication water quality standards (see Table 2-2). Note that the City also monitors water quality of Taft Lake which is located on Metropolitan Airport Commission property but receives drainage from Richfield. Within the city, Wood Lake, Richfield Lake, Legion Lake and Taft Lake are subject to MPCA water quality standards (see Section 2.7.2). Water quality monitoring data for specific years and waterbodies is available in the *2015 Surface Water Quality and Quantity Monitoring Report* (WSB, 2015) and subsequent annual monitoring reports.

The City recently implemented the Taft-Legion Volume and Load Reduction Project in cooperation with the MCWD to address water quality issues in Taft and Legion Lakes through a combination of stormwater management practices. The City will continue to evaluate opportunities for stormwater best management practices in the subwatersheds tributary to Richfield Lake and Wood Lake.

3.1.4.2 Stormwater Pond Management

The City has a significant network of stormwater ponds and maintains an inventory of its stormwater ponds consistent with the requirements of the City's MS4 permit. Most of these ponds were likely constructed before tiered outlets designed to improve water quality performance (by better detaining more frequent rainfall events that carry the bulk of the pollutant loading) became common practice.

As part of its regular water quality monitoring, the City evaluates nutrient and total suspended solids in the following City ponds:

- Adams Hill Pond
- Augsburg Pond
- Norby's Pond
- Milner's Pond

Average nutrient concentrations in these ponds measured from 2009 to 2015 suggest that Adams Hill Pond and Augsburg Pond are achieving high removal of total phosphorus (as indicated by total phosphorus concentrations less than 200 ug/L). Average total phosphorus concentrations of closer to 300 ug/L in Milner's Pond and Norby's Pond suggest these ponds are providing poor to moderate nutrient removal (WSB, 2015); it should be noted that these ponds and the surrounding stormwater infrastructure were not designed to provide water quality treatment.

As part of the City's ongoing efforts to improve the performance of the stormwater system, it is recommended that the City may perform preliminary analyses to identify those ponds with opportunities for retrofits to improve stormwater detention and water quality performance. The City will implement these retrofits as redevelopment opportunities and funding allow, focusing on those ponds that could be

upgraded to provide water quality improvements in addition to providing water quantity benefits. The City will also pursue funding for maintenance of retrofitted ponds as part of its ongoing maintenance program (see Section 3.1.4.3).

3.1.4.3 Stormwater System Maintenance Programming

The City is responsible for the operation and maintenance of its stormwater infrastructure. This includes the periodic inspection of storm sewer components as specified in the City's SWPPP. Non-functioning or improperly maintained stormwater management infrastructure may limit the ability of the system to convey runoff, increasing erosion, flood risk, and limiting water quality treatment effectiveness.

As an older, fully developed City, much of the stormwater infrastructure within the City is at or nearing the end of its intended operating life. Aging infrastructure may experience increased failures. Much of the City's stormwater management system will need to be replaced during then coming decades. Replacement of existing stormwater infrastructure represents a significant engineering challenge and capital cost to the City, complicated by the need to provide continuous service and work in fully developed areas crowded by private property and existing utilities.

The City's stormwater funding mechanisms are strained to keep pace with a growing list of issues and demands facing an aging stormwater system. To promote efficiency, the City currently inspects stormwater structures in coordination with its pavement management program, and coordinates stormwater system updates with other utility and transportation work, as opportunities allow.

For projects requiring private and public entities to install and maintain stormwater infrastructure on their property (e.g., to satisfy stormwater performance standards of the WMOs, the City, or MPCA), the City requires maintenance agreements. The number and complexity of private stormwater management facilities within the City has grown over time. To increase efficiency, the City performs maintenance of most private sump manholes at the owner's expense, consistent with a maintenance agreement.

3.1.4.4 Minnehaha Creek Watershed District (MCWD) Phosphorus Reduction Requirement

Within the area of the city under the jurisdiction of the MCWD (see Figure 2-1), the 2007 MCWD Watershed Management Plan (MCWD Plan) required that the City reduce the annual phosphorus loading to receiving waters relative to year 2000 levels in order to achieve MCWD water quality goals in Minnehaha Creek. The 2007 MCWD Plan required a combined 36 lbs/year reduction from the City of Richfield to meet MCWD water quality goals. The City achieves the 2007 MCWD Plan requirement through its street sweeping practices. The City has recently cooperated with MCWD to implement a large water quality improvement project in the Taft and Legion Lake watersheds. The additional pollutant load reduction achieved by the project will provide water quality treatment credit for future development.

The 2017 MCWD Watershed Management Plan foregoes prescriptive phosphorus load reduction targets in favor of a more flexible, cooperative approach to achieving water quality goals (see Section 5.3.1). The City's local water management plan (i.e., this Plan) includes strategies and specific steps for achieving pollutant load reductions, including operational, land use, and capital improvements implemented to

address this goal. The City is responsible for annually reporting progress toward the loading reduction goal.

3.2 Water Quantity and Flood Risk

Although both high-water levels (flood-driven) and low-water levels (drought-driven) are of concern to city residents and public officials/staff, more concern and attention is usually paid to flooding because it is a greater threat to public health and safety and can result in significant economic losses.

Flooding may also contribute to negative water quality and ecological impacts that are harder to quantify, including the following:

The City is responsible for managing flood risk within its jurisdiction. The City also cooperates with the MCWD, NMCWD, and RBWMO when appropriate to address water quantity issues, including inter-community issues. Over time, the City has systematically addressed the most significant flood risk issues within the City. The City uses its project review and permit program to ensure that land disturbing activities performed in the city comply with land use restrictions, development standards, and other regulatory controls designed to minimize future flood risk. Water level and flooding issues were not identified as a significant concern by residents responding to the City's surface water management survey (see Section 1.4).

Some areas of nuisance flooding that do not pose a public health risk have been identified within the city through reported observation and previous hydrologic and hydraulic modeling efforts (see Appendix B of the 2008 SWMP). These include localized flooding within alleys or street intersections. Many of these areas have been addressed through projects implemented since the adoption of the 2008 SWMP. The City considers the remaining issues to be low priority due to the low risk to health and property. The City plans to address these issues as opportunities allow (e.g., road reconstruction, redevelopment, and coordination with other City or WMO projects) or if frequency of flooding increases.

3.2.1 Floodplain Management and Flood Insurance Studies

The Federal Emergency Management Agency (FEMA) maps the floodplains of larger basins on flood insurance rate maps (FIRMs). FEMA has published these maps as part of a Flood Insurance Studies (FIS) encompassing the City of Richfield. The City's FIS, together with the City's floodplain ordinance, allows the City to participate in the federal government's national flood insurance program (NFIP). FEMA-mapped floodplain within the City of Richfield is limited to a small area of Taft Lake floodplain located in the extreme northeast of the city.

In addition to FEMA-designated floodplains, the City, NMCWD and MCWD have established their own 100-year water surface elevations and associated floodplains for watershed management purposes. City and WMO-delineated watersheds may differ from FEMA-delineated watersheds due to input data, level of detail, and other factors. FEMA-delineated floodplains within the city were established prior to the publication of the National Oceanic and Atmospheric Administration's (NOAA) Atlas 14 precipitation data

(see Section 2.1). The City reviews proposed projects for compliance with applicable City and WMO floodplain requirements; the NMCWD also reviews proposed activities within its floodplain.

As redevelopment occurs within the city, appropriate rate and volume controls are necessary to avoid creating future flooding issues or exacerbating existing flooding issues. The MCWD, NMCWD, and RBWMO have established rate and/or volume control performance standards applicable to those areas of the city within their respective jurisdictions. The City has adopted these performance standards (see Section 4.3.2).

3.2.2 Intercommunity Drainage and Flow Rates

There are areas of the city where stormwater runoff enters from other communities or is discharged to other communities. It is necessary to manage intercommunity flow rates to prevent increases beyond the capacity of downstream stormwater management systems. Regulation or resolution of intercommunity drainage is often a responsibility of WMOs. Within the RBWMO, the City of Richfield is required to maintain existing intercommunity flow rates unless otherwise specified by an agreement.

3.3 Wetlands

Diverse wetland systems and shoreland vegetation are critical components of a healthy hydrologic system and positively affect soil systems, groundwater and surface water quality and quantity, wildlife, fisheries, aesthetics, and recreation. Development of land and other human activities can affect the hydrology and ecological functions of wetlands and shoreland areas. The results of the City's surface water management survey (see Section 1.4) identified wetland health as a top four priority for the City during the implementation of this SWMP.

Although Richfield is fully developed, the National Wetland Inventory identifies several wetlands throughout the city (see Figure 2-7). The functional values of several of the more significant wetlands have been assessed by the City and the MCWD. More detailed wetland assessment information is included in Appendix D.

Overloading wetlands beyond their natural capacity with water, sediment, or nutrients can diminish their effectiveness in providing water quality benefits and impact habitat. Most natural wetland systems have developed with relatively low levels of sediment and nutrient inputs (riparian wetlands located in floodplains are an exception). When land use and upstream hydrologic systems become altered, the hydraulic, natural sediment, and nutrient loads may increase in magnitude and frequency. These changes may result in tipping the ecological balance to benefit non-native and invasive plant species and create aesthetic and offensive odor issues, thereby reducing the benefits to wildlife, fisheries, amphibians, and humans. Degraded water quality in wetlands can pass on to downstream waters, contributing to degradation of additional resources.

Wetlands and shoreland areas provide valuable habitat for many types of wildlife including waterfowl, songbirds, raptors, mammals, fish, and many species of amphibians. Maintaining and improving wildlife viability requires that water resources and land management activities consider the life cycles of various

animals. By considering habitat benefits or detriments when approaching water resources projects, the City has the opportunity to protect and enhance these benefits.

The overall ecological health of wetland and shoreland areas can be significantly impacted by the presence or absence of vegetated buffers (see Section 3.3.1) and aquatic invasive species (see Section 3.3.2).

3.3.1 Wetland and Shoreland Buffers

Buffers are upland, vegetated areas located adjacent to wetlands and shoreland areas. Many of the hydrologic, water quality, and habitat benefits achieved by wetland and shoreland areas are directly attributable to, or dependent on, the presence of buffers. Vegetation reduces erosion by shielding the soil from rain and binding soil particles with root materials. Vegetation obstructs the flow of runoff, thereby decreasing water velocities, allowing infiltration, and reducing the erosion potential of stormwater runoff. Vegetation roots also provide avenues for deeper infiltration. As a physical barrier, vegetation also filters sediment and other insoluble pollutants from runoff. Vegetation scatters sunlight and provides shade, reducing water temperature in the summer, limiting nuisance algae growth, and reducing the release of nutrients from the sediment. Buffers also have habitat benefits; native plants provide the best food and shelter for native wildlife, fish, and amphibians.

Projects located within the jurisdiction of the MCWD and NMCWD are subject to the buffer requirements established by those watershed districts. The RBWMO also encourages the establishment of buffers to protect wetland and water resources, but has not established buffer requirements. City policies regarding vegetated buffers are included in Section 0.

3.3.2 Invasive Species (AIS)

The term "invasive species" describes plants, animals, or microorganisms within lakes and streams that are non-native and that 1) cause or may cause economic or environmental harm or harm to human health, or 2) threaten or may threaten natural resources or the use of natural resources in the state (Minnesota Statutes Chapter 84D.01). Aquatic invasive species (AIS) is a term given to invasive species that infest lakes, wetlands, rivers, or streams and overrun or inhibit the growth of native species. Aquatic invasive species pose a threat to natural resources and local economies that depend on them.

AIS identified in the City of Richfield include goldfish in Wood Lake and other smaller waterbodies. Goldfish and other invasive fish such as carp, when present in significant numbers, may impact water quality by disturbing bottom sediment, reducing water clarity and releasing sediment-bound phosphorus that may contribute to algal growth.

Although not identified within the city, common invasive plants found in neighboring cities include Eurasian watermilfoil, curlyleaf pondweed and buckthorn (an upland invasive species). Curlyleaf pondweed is of special concern due to its potential as a source of internal phosphorus loading. Buckthorn is also of concern as it can overtake vegetation in buffers and forested areas and reduce their ability to treat and infiltrate water.

At the state level, management of AIS is the responsibility of the MDNR. The City cooperates with the MDNR, WMOs, and Hennepin County to address the impacts of AIS at the local level. Buckthorn management is typically considered the responsibility of the landowner of the property where buckthorn is growing. More information about AIS is available from the MDNR at: http://www.dnr.state.mn.us/invasives/aquatic/index.html

3.3.3 City Wetland Management and Wetland Classification

The City serves as the LGU for administering the Wetland Conservation Act (WCA) within the jurisdictions of the MCWD and RBWMO; within the jurisdiction of the NMCWD, the NMCWD serves as the LGU for administering the WCA. As the LGU, the City's role includes requiring and verifying that all projects impacting wetlands meet the requirements of the WCA. The City also pursues opportunities to preserve wetlands and create wetland buffers.

Per the requirements of WCA, the City has developed a comprehensive wetland inventory (see Section 2.6.3). The City also requires a site-specific delineation of the wetland boundary as part of proposed development or redevelopment activities. The City uses the Minnesota Rapid Assessment Method (MnRAM) when performing functions and values assessments. The City implements wetland management performance standards through its wetlands ordinance (City code Chapter 427) and this Plan.

3.4 Groundwater

Groundwater is a valuable resource that must be protected from contamination and conserved for sustainable use. The City of Richfield obtains its drinking water from wells extending into bedrock aquifers (see Section 2.5.1). Increased population in the Twin Cities metropolitan area has put increased pressure on these aquifers. In addition, development results in larger impervious areas and more compacted soils, thus decreasing opportunities for infiltration and recharge.

Maintaining clean, safe groundwater supplies is critical to human and environmental health and to the economic and social vitality of communities. Groundwater can be contaminated by commercial and industrial waste disposal, landfills, leaking underground storage tanks, accidental spills, fertilizer/pesticide applications, and illicit disposal of contaminants such as engine oils. Prevention of groundwater contamination through best management practices is critical. Increased public awareness of the importance of groundwater protection on the public's general health and well-being is critical to promote responsible practices.

While infiltration is sometimes used for stormwater treatment, it may have negative consequences in areas with vulnerable groundwater resources. Many locations within the city are not favorable for infiltration (e.g., wellhead protection areas, presence of tight soils or contamination). Infiltration practices must be implemented with consideration of guidance provided by the MPCA in its NPDES General Construction Stormwater permit (2013, as amended), and the Minnesota Department of Health's (MDH), *Evaluating Proposed Stormwater Infiltration Projects in Vulnerable Wellhead Protection Areas* (2007).

3.4.1 Wellhead Protection

The Minnesota Department of Health administers and enforces the Minnesota Water Well Code through its wellhead protection program. This program regulates the installation of new wells, and is intended to prevent contaminants from entering the recharge zones of public well supplies. As part of this program, cities that pump groundwater to supply their residents with drinking water are required to prepare wellhead protection plans (WHPPs).

The City of Richfield prepared and maintains a WHPP, currently being updated. The WHPP delineates drinking water supply management areas (DWSMA) for the City's municipal groundwater wells, assesses the water supply's susceptibility to contamination from activities on the land surface, and establishes management programs, such as identification and sealing of abandoned wells, and education/public awareness programs. The DWSMA represents the boundaries of the recharge area to the well and is the area to be protected and managed by the wellhead protection plan. The City's Wellhead Protection Areas are shown in Figure 2-5.

Minnesota Rules 4720 requires that wellhead protection plans be submitted to watershed management organizations for review. The MDH guidelines for evaluating proposed stormwater infiltration projects in vulnerable wellhead protection areas is available from the MDH website: http://www.health.state.mn.us/divs/eh/water/swp/stormwater.pdf

3.5 Erosion and Sediment Control

Sediment is a major contributor to water pollution. Stormwater runoff from streets, parking lots, and other impervious surfaces carries suspended sediment consisting of fine particles of soil, dust and dirt. Abundant amounts of suspended sediment are carried by stormwater runoff from actively eroding areas.

Although erosion and sedimentation are natural processes, they are often accelerated by human activities, especially during construction activities. Prior to construction, the existing vegetation on a site intercepts rainfall and slows down stormwater runoff rates, which allows more time for runoff to infiltrate into the soil. When a construction site is cleared and graded, the vegetation (and its beneficial effects) is removed. Also, natural depressions that provided temporary storage of rainfall are filled and graded, and soils are exposed and compacted, resulting in increased erosion, downstream sedimentation, and decreased infiltration. As a result, the rate and volume of stormwater runoff from the site increases (Metropolitan Council, 2001). The increased stormwater runoff rates and volumes cause increased soil erosion, which releases significant amounts of sediment that may enter the City's water resources.

Regardless of its source, sediment deposition decreases water depth, degrades water quality, smothers fish and wildlife habitat, and degrades aesthetics. Sediment deposition can also wholly or partially block culverts, manholes, and other stormwater facilities, causing flooding. Sediment deposition in detention ponds and wetlands also reduces the storage volume capacity, resulting in higher flood levels and/or reducing the amount of water quality treatment provided. Suspended sediment, carried in water, clouds lakes and streams and disturbs aquatic habitats. Phosphorus attached to sediment particles also can

create algae and in turn reduce the oxygen content of water. Erosion also results in further channelization of stormwater flow, increasing the rate of stormwater runoff and further accelerating erosion.

As erosion and sedimentation increase, the City's stormwater management systems (e.g., ponds, pipes) require more frequent maintenance, repair, and/or modification to ensure they will function as designed.

Monitoring the stormwater system, including inspection of sediment build-up in stormwater ponds, continues to be an important task for the City. Continued urbanization in the city will result in increased erosion and sedimentation unless effective erosion prevention and sediment control measures are implemented before, during, and after construction.

In recognition of these issues, the City's ordinances (Chapter 428) and project approval processes address erosion and sediment control at construction sites. The current ordinance requires implementation of temporary and permanent erosion and sediment control measures for developments and other projects. The City will continue its ongoing review of its erosion control program to evaluate its effectiveness and improve it where possible and feasible. In addition, the NMCWD review projects within its jurisdiction which result in more than 50 yards of cut or fill or more than 5,000 square feet of grading.

In addition to meeting City and applicable WMO requirements, owners and operators of construction sites disturbing one or more acres of land must obtain a National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit from the MPCA. Owners/operators of sites smaller than one acre that are a part of a larger common plan of development or sale that is one acre or more must also obtain permit coverage. A key permit requirement is the development and implementation of a Stormwater Pollution Prevention Plan (SWPPP) with appropriate best management practices (BMPs). The SWPPP must be a combination of narrative and plan sheets that: (1) address foreseeable conditions, (2) include a description of the construction activity, and (3) address the potential for discharge of sediment and/or other potential pollutants from the site. The SWPPP must include the following elements:

- Temporary erosion prevention and sediment control BMPs
- Permanent erosion prevention and sediment control BMPs
- Permanent stormwater management system
- Pollution prevention management measures

A project's plans and specifications must incorporate the SWPPP before applying for NPDES permit coverage. The permittee must also ensure final stabilization of the site, which includes final stabilization of individual building lots.

3.6 Opportunities

The City of Richfield has several distinct opportunities which may assist them in implementing this SWMP. The City will actively pursue these opportunities.

3.6.1 Watershed Management Organization Cooperative Efforts and Funding

The City of Richfield cooperates with the RBWMO, MCWD, and NMCWD to address surface water management issues. In the past, these WMOs have provided technical support and funding assistance in completing joint projects within the city. The City will continue to collaborate with and contribute to these organizations and take advantage of the available benefits. City staff will continue to participate as active members of WMO Technical Advisory Committees (TACs) and participate in WMO programs and projects, as requested. Specific opportunities for collaboration include proposed projects included in the NMCWD, MCWD, or RBWMO capital improvement programs. For example, the City collaborated with the MCWD to implement the Taft Lake/Legion Lake volume and load reduction project to improve water quality. The City may also benefit by leveraging educational materials and opportunities developed by the WMOs to promote good watershed stewardship among its residents.

3.6.2 Partnership with Neighboring Cities

The City will continue to seek opportunities to partner with neighboring cities to address intercommunity issues. An example of this include ongoing collaboration with the City of Bloomington to address local flooding issues south of Interstate 494, an issue caused in part by drainage originating in the City of Richfield. The City will pursue a cooperative effort for solving this problem, as the most comprehensive solutions will require the support of each affected community.

3.6.3 Redevelopment Opportunities

The City of Richfield is fully developed. Therefore, opportunities for updating and upgrading the City storm drainage system will exist in redevelopment renovation and replacement activities. As private and public properties redevelop, the City will implement the policies and programs of this Plan. The City will continue to be proactive in using the regulatory controls at its disposal to ensure that opportunities presented by redevelopment to improve the stormwater system and implement the policies of this plan are not lost.

3.6.4 Low Impact Development Practices

The City promotes the use of low impact development practices (e.g., green roofs, bio-swales, water reuse) throughout the city, where appropriate. These techniques promote water quality improvements and reduction of runoff volumes to receiving waters.

3.6.5 Coordination with Other City Programs

Coordinating stormwater and surface water management activities with other City programs presents an opportunity to increase operational efficiency, reduce costs, leverage funds and limit the frequency and duration of disruptions to City services. The City's street reconstruction program, for example, may be coordinated with stormwater management activities so that potentially disruptive maintenance or improvements may be performed simultaneously with road maintenance, minimizing the number of closures.

3.6.6 Developing Community Capacity

Reducing lawn irrigation, directing stormwater runoff to pervious areas, cleaning up pet waste, and other activities have a positive cumulative impact on water resources. The City may continue to develop community capacity for watershed stewardship through its education and public involvement program (see Section 5.4), demonstration projects, and coordination with outreach efforts of WMOs and other agencies (e.g., Minnesota Cities Stormwater Coalition and Watershed Partners).