



**Rochester, Minnesota's
Storm Water Management Program Self-Assessment
And
Determination of Maximum Extent Practicable**

As it relates to its National Pollutant Discharge Elimination System/State
Disposal System Municipal Separate Storm Sewer System Permit

Keeping
it Clean



StormWater
MANAGEMENT

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Introduction

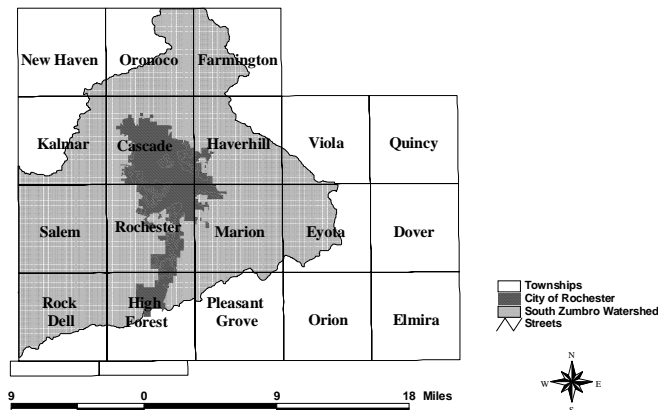
The City of Rochester (City) is designated as a regulated, small Municipal Separate Storm Sewer System (MS4) under the National Pollutant Discharge Elimination System (NPDES) Phase II regulations. As such the City must develop, implement and enforce a storm water management program designed to reduce the discharge of pollutants from our MS4 to the Maximum Extent Practicable (MEP). Under those regulations, each permittee is encouraged to complete a self-assessment in order to develop a storm water management approach that is well-suited to their specific situation. Documentation of the City's self-assessment thereby establishes the MEP framework used to guide the City's decision-making related to the development and implementation of its MS4 permit. The City utilized self assessment guidance from the Environmental Protection Agency (EPA) and from the 2002 Guide Plan prepared on behalf of the League of Minnesota Cities by Bonestroo, Rosene, Anderlik and Associates. This process establishes existing environmental conditions, as well as existing programs, program needs, and priorities.

The City of Rochester is the largest MS4 permittee within the Rochester Urbanizing Area (RUA). Seven other entities have MS4 permit responsibilities within this RUA: District 6 of the Minnesota Department of Transportation, Olmsted County, Rochester Technical and Community College, and the Townships of Marion, Rochester, Haverhill, and Cascade. To date, there has been little collaboration between these entities to address permit goals.

Conditions relevant to the development of an MS4 permit are described and evaluated in the sections below.

1.0 Characteristics of the South Zumbro River Watershed

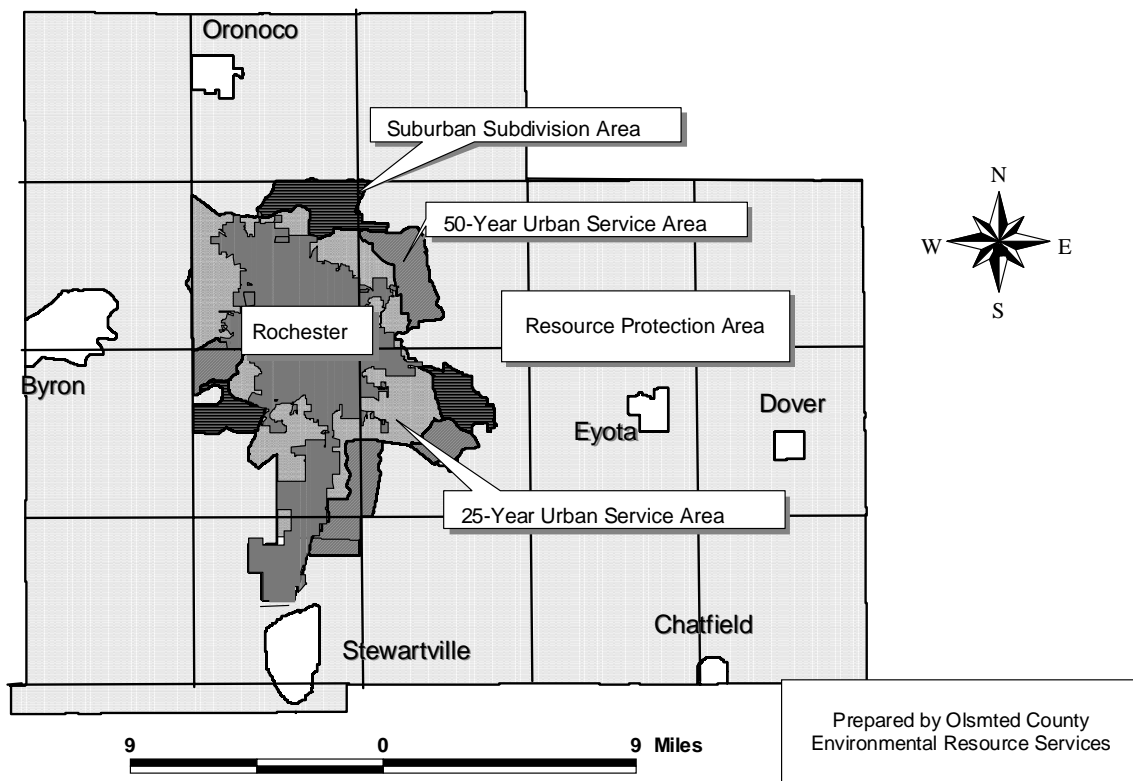
The South Fork of the Zumbro River is the primary water feature within the City of Rochester. The following map shows the extent of the South Zumbro River Watershed (SZRW) within Olmsted County, along with political boundaries for Rochester and the County's eighteen townships.



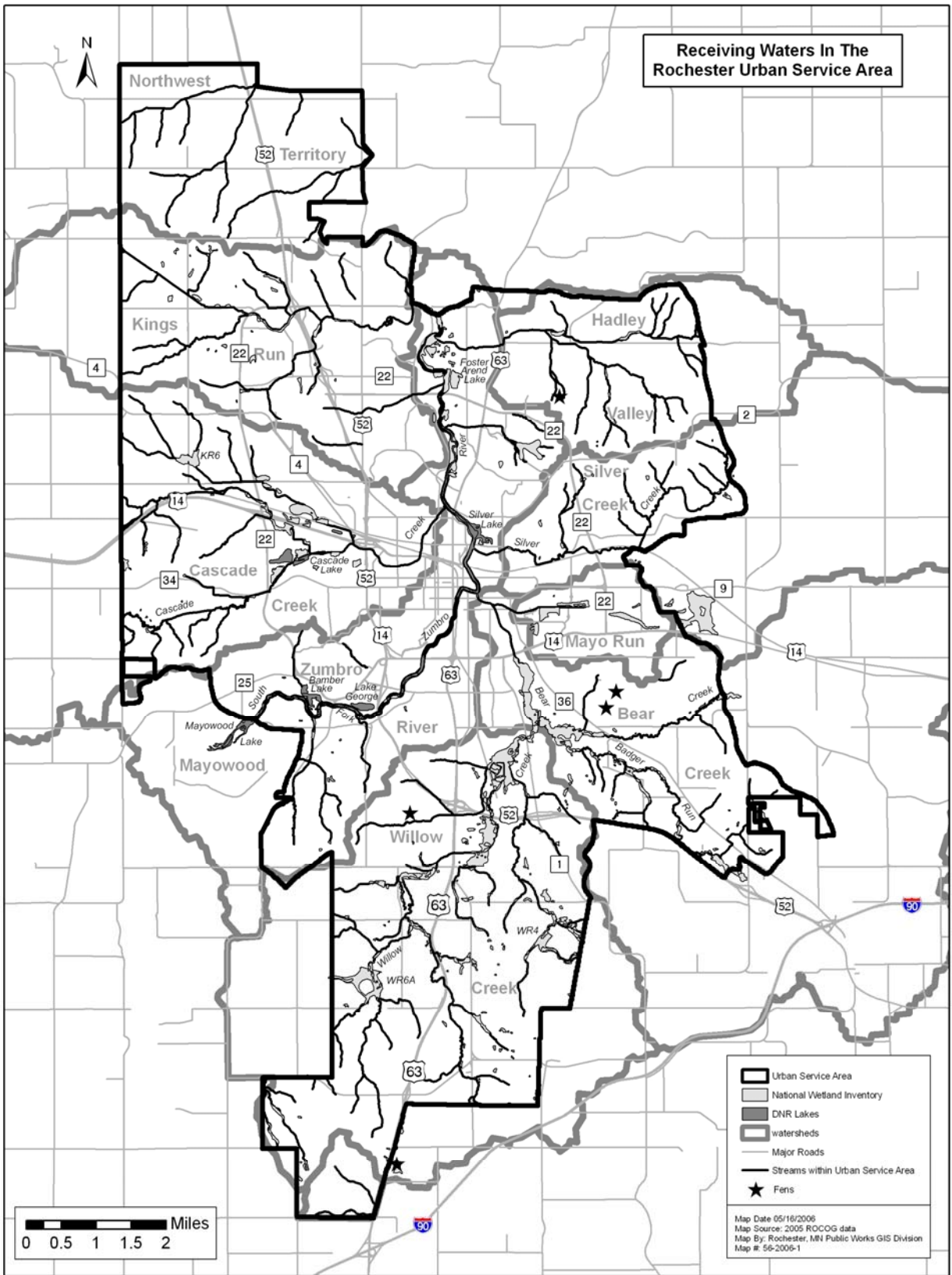
Source: Olmsted County Environmental Services (4/25/01)

The entire SZRW drains a 243,000-acre area in Olmsted and Dodge Counties. Most of the watershed (77% or 186,000 acres) is within Olmsted County. With the exception of approximately 680 acres (~2%) of agricultural land located at its southernmost extremity, the City's 32,093 acres are within the SZRW. In addition to the current City limits, the City's future growth areas (denoted in the figure below as 25-year and 50-year urban service areas) are also within the SZRW. The remainder of the SZRW is comprised of Suburban Subdivision Areas (slated for very low-density residential development), other small cities, and resource (or agricultural) protection areas.

Land Use Designations in the Area Around the City of Rochester



Rochester's receiving waters include the South Fork of the Zumbro River and its tributary creeks, wetlands, and artificial lakes and reservoirs, as described in more detail below and shown in the "Receiving Waters in the Rochester Urban Service Area" figure below.



Most of Rochester is situated within an open basin that is dissected by a dendritic drainage system of creeks and rivers that eroded into and through various sedimentary bedrock formations to form the basin. Some newer parts of Rochester have expanded onto the upper limestone plateau that surrounds Rochester on all but its west, northwest, and north sides.

The South Fork of the Zumbro River is the major surface water feature, which flows north through Rochester and eventually empties into the Mississippi River near Kellogg, MN. It should be noted that approximately six miles of the South Fork of the Zumbro River were reconstructed (widened, deepened, straightened, and reinforced) in the 1980's and 1990's as part of the Rochester Flood Control Project (FCP). Not only did this result in a permanent modification of the geomorphology of the river and its habitats, it is understood that regular dredging is required to sustain the flood control protection standards set by the U.S. Army Corps of Engineers.

The creeks and their tributaries that drain into the South Fork of the Zumbro River within Rochester's future growth areas are: Bear Creek (with Badger Run), Cascade Creek, King's Run, Silver Creek, Mayo Run, Hadley Creek, and Willow Creek. The FCP also permanently modified the lowest reaches of Bear Creek (1.4 miles), Silver Creek (0.3 miles), and Cascade Creek (1.2 miles). Approximately 10 miles of the South Fork of the Zumbro River and 198 miles of tributary creeks flow through Rochester and its future growth areas.

There are no natural lakes within the SZRW, but over time, several artificial lakes have been created within and around the river network. Silver Lake and Lake Zumbro were constructed on the South Fork of the Zumbro River as reservoirs for hydroelectric power production, but only Silver Lake is within the City. Mayowood Lake, which was also created by damming the South Fork of the Zumbro River, but solely for aesthetic reasons, lies outside the City limits. Four other lakes have been created within City limits as a result of aggregate mining activities: Foster Arend Lake, Bamber Lake, Lake George, and Cascade Lake. Chester Lake and six smaller reservoirs were constructed outside City limits to provide upstream flood storage as part of Rochester's FCP. They are located within the Bear Creek, Cascade Creek, Willow Creek, and Silver Creek sub-watersheds, but only the Willow Creek Reservoir (WR6A) and the Cascade Creek Reservoir (KR6) are within the City limits. Numerous, but uncounted, ravines and drainage ways that connect the upper plateau to the lower basin are also an integral part of the natural drainage system.

Wetlands of various sizes and types exist within the SZRW. The City's Storm Water Management Plan (1999) classifies the wetlands into four categories, based primarily on floral diversity/integrity and wildlife habitat criteria:

- Ecosystem support – wetlands altered by human activities, but with values important to adjacent upland ecosystems or drainage to other systems,
- Natural – wetlands with generally intact remnant plant communities,

- Unique – intact wetlands with special and unusual qualities, and
- Urban – isolated wetlands that had already been significantly altered or degraded.

Most wetlands within the SZRW are surface water-fed wetlands located within floodplains associated with the various creeks and rivers. Smaller groundwater-fed wetlands appear either as side hill seeps adjacent to outcroppings of the Decorah Shale bedrock unit or as perched discharge points on the glacial till plain or its outcrop edges. Ten of the groundwater-fed wetlands within Olmsted County have been identified by the Department of Natural Resources (DNR) as calcareous fens, which are classified as Outstanding Resource Value Waters by the State of Minnesota. Four of these calcareous fens exist within City limits: the Airport Fen (formerly the High Forest Fen), the Mutchler fen, the Stonehedge Fen, and the Joyce Park Fen. The Marion 8 Fen is located outside the City limits but within the City's future growth area.

Much of the bedrock geology in Olmsted County is denoted generally as a karst environment, consisting of shallow soils overlying fractured limestone and permeable sandstone formations. This hydrogeologic environment promotes rapid infiltration of surface water to become groundwater and conversely allows groundwater to discharge to the surface. Infiltration can occur either on the upper bedrock plateau or within the lower basin wherever shallow, permeable soils overlie permeable bedrock. Focused groundwater discharge points can exist within river reaches, along shale bedrock outcrops, or within certain areas of the glacial till plain. The basin within which Rochester is situated is a generally flat plain with shallow depth to ground water.

A wide variety of soil types exist within and around the City: highly erodible, colluvial soils are on hill slopes; highly permeable, alluvial soils exist in the floodplains; and nearly impermeable glacial till deposits overlie bedrock in dispersed areas. In cases where the till deposits lie in buried bedrock valleys, they can be quite thick.

Constructed infrastructure components comprise a secondary drainage system within the watershed that ultimately drains to our creeks and rivers. The City uses an extensive Geographic Information System to map these constructed drainage systems, to show their relationship to land features, and conduct analyses. Utilizing this system, the current inventory of the drainage system within Rochester's City limits is as follows:

- 263 miles of storm sewer pipe
- 620 outfalls (confirmed through inspections)
- 8515 storm sewer catch basins
- 5893 storm sewer manholes
- 21 bridges (18 cross water)
- 13 box culverts (all convey water)

- 271 storm water ponds
 - 66 City ponds (including six flood control project reservoirs)
 - 13 Easement ponds (public ponds on private land with easements)
 - 86 Transition ponds (will eventually become public ponds)
 - 93 Private Ponds
 - 11 State ponds
 - 2 County ponds
- 395 lane miles of City streets
 - 311 lane miles of streets with curb and gutter
 - 84 lane miles of streets with ditches (i.e., no curb and gutter)
- 0.5 miles of private roads

Additionally, within Rochester and its adjacent future growth areas, the following non-City transportation infrastructure is as follows:

- 90 miles of State and U.S. Highways (MnDOT is responsible for both), with ditches
- 103 miles of County Roads and County State Aid Highways, with ditches
- 31 miles of township roads, with ditches
- 16 miles of railroad, with ditches

The City has not undertaken an inventory of the miles of drainage easements or the number of culverts, nor are the complete characteristics of private storm sewer systems known.

The City of Rochester and Olmsted County have a consolidated planning department that is responsible for developing land use plans and zoning ordinances and processing all development proposals. In the City, multiple departments provide input during the development process, after which the proposal is reviewed by the Planning and Zoning Commission before being sent to the City Council for final approval or denial.

Rochester is one of the fastest growing cities in Minnesota. Its estimated 2004 population was 94,820 people, an increase of 24,075 since 1990 (Minnesota State Demographic Center, 2000 Census). The annual population growth rate expected over the next five years is 1.2%, or approximately 1,500 people per year. Most of that growth is occurring in former agricultural areas adjacent to the City that have been annexed into the City as development proceeds. Since Rochester is not closely surrounded by other municipalities, there is an abundance of developable land on its periphery, which significantly reduces the demand for infill development and redevelopment.

Land uses within the entire SZRW (Dodge and Olmsted Counties) are approximately 74% agricultural (179,820 acres), 15% urban/suburban development (36,450 acres), 8% forest, 2% water, and 1% wetland. Specifically within Rochester and its future growth areas, the current breakdown of land uses is noted in the table below. Future development patterns are expected to follow this same ratio of land uses.

Land Uses in Rochester and Its Future Growth Areas (1/1/06)

Category	Developed Acres*	Vacant Acres**	% of Total by Category
Farm Dwellings (5 Acre Average)	358	0	0.6
Residential	12,307	20,944	58.5
Parks & Open Space	6,931	0	12.2
Schools, Churches, & Cemeteries	993	45	1.8
Commercial	1,428	1,357	4.9
Industrial	1,149	1,414	4.5
Medical, Government, Utilities	697	59	1.3
Mining	512	0	0.9
Airport	1,783	0	3.1
Roads, RR, Rivers, Lakes & Floodways	6,814	0	12.0
TOTALS	32,972	23,819	100.0

*Developed acres zoned for each category.

** Portion of zoned acres not yet developed.

Note: The 25 Year Urban Service Area and the 50 Year Urban Reserve Area together constitutes Rochester's future growth areas.

Source: Rochester-Olmsted Planning Department (5/06)

Based on data provided by the High Plains Regional Climate Center (a partnership between the National Oceanographic and Atmospheric Administration and the University of Nebraska; http://hprcc.unl.edu/cgi-bin/cli_perl_lib/cliMAIN.pl?mn7004), the average precipitation for the Rochester area from 1948 to 2005 was 30.14 inches. Annual precipitation has ranged from a low of 12.8 inches in 1948 to a high of 43.94 inches in 1990. Over that period, the annual average precipitation has been increasing, with an increase of 9 inches from 1948 to 2005. The Rochester area has received above average precipitation (i.e., > 30.14 inches) during twenty-five of those 57 years, with 11 of the past 16 years receiving above average precipitation. According to the State Climatologist, in spite of the 1976 drought and the 3- to 4-year drought of the late 1980's, the last 25 years in southeastern Minnesota were quite wet when compared with the first three quarters of the 20th Century. June and July are the months that receive the most precipitation.

In addition to experiencing a wetter climate, Rochester is also experiencing a warming trend that has had significant effects in three storm water management areas. First, warmer winters have extended the construction season and blurred the "freeze-up" deadline by which contractors need to have their sites "bedded down" for the winter. This tends to result in some contractors being "caught" without adequate erosion and sediment control (ESC) measures in place before the onset of winter. Similarly, unseasonably warm winters encourage contractors to work in conditions that are difficult to maintain effective ESC's. Second, warmer winters create fewer snow days and more ice days. Icier conditions require increased application of sand and/or salt to provide safe transportation conditions, which subsequently requires the need for additional street sweeping after winter. Third, drier winters and a wetter

climate result in more precipitation received as rainfall events, which has more potential for erosion than snowmelt events.

The types of surface water features that exist in the SZRW are a function of the land's natural physical conditions and the climate. The interrelationship between the land's natural physical conditions, land uses, and the built environment affects water quality within the watershed. Rochester's storm water does not discharge to any Waters with Prohibited Discharges or Trout Waters. A very small portion does discharge to one type of Waters with Restricted Discharges: calcareous fens, discussed above.

Several of the receiving waters within Rochester's future growth areas do not meet water quality standards and are listed on the draft 2006 303(d) list of impaired waters, as follows:

Receiving Water	Impaired Use	Impaired Standard
Willow Creek (Co. Rd 8 to Bear Creek)	Aquatic Life	Turbidity
South Fork Zumbro River (Co. Rd 15 to TH 63)	Aquatic Life and Recreation	Fecal coliform bacteria and turbidity
South Fork Zumbro River (TH 63 to Cascade Creek)	Aquatic Recreation	Fecal coliform bacteria
Cascade Creek (Dodge Co. to SFZR)	Aquatic Life	Turbidity
Silver Creek (80 th Ave NE to Silver Lake)	Aquatic Life	Turbidity
South Fork Zumbro River (Cascade Creek to Lake Zumbro)	Aquatic Life	Turbidity

The Willow Creek Reservoir (WR6A) and Silver Lake are also listed as impaired for mercury. However, the May 24, 2005 "Revised Draft Minnesota Mercury Total Maximum Daily Load Report" prepared by the Minnesota Pollution Control Agency (MPCA) does not attribute the impairments to storm water. As such, no MS4 permit-related actions will be required to reduce mercury impairments.

"The Revised Regional Total Maximum Daily Load Evaluation of Fecal Coliform Bacteria Impairments in the Lower Mississippi River Basin in Minnesota was prepared by the MPCA in September 2005 and submitted to the Environmental Protection Agency (EPA) for approval on March 2, 2006. EPA approval of the revised TMDL is still pending. After approval, the MPCA will prepare an implementation plan that will outline the respective reductions that will be required by each pollutant load source. At that time, the City will review the adequacy of its SWPPP to meet the TMDL's Waste Load Allocation and modify it, as appropriate.

Sources of fecal coliform in urban storm water include pet and wildlife waste that can be directly conveyed to streams and rivers via impervious surfaces and storm sewer systems. According to the MPCA, urban storm water contributions tend to be runoff-

driven and, as such, are not a significant contributor under dry and low flow conditions. Wet weather Waste Load Allocations identified for the MS4 permittees in the Rochester urbanizing area are listed as 3%, 4%, 8% or 12%, depending on the portion of the watershed covered by the urbanizing area. Rochester is already implementing and will continue to implement the following bacteria reduction strategies:

- Proper operation of and adequate treatment capacity at the Rochester Water Reclamation Plant to meet pathogen reduction standards;
- Construction of sanitary sewer relief lines to prevent sanitary sewer overflows;
- Televised inspection of sanitary sewer lines to regularly identify sewage leaks needing prompt repair;
- Construction and operation of a separate storm sewer system (which precludes combined sewer overflows);
- Implementation of ESCI requirements at construction sites to prevent the addition of sediment in streams which can serve as a substrate for fecal coliform survival; and
- Treatment of storm water in storm water ponds and reservoirs (sediment removal and UV pathogen reduction).

Additionally, over the last eight years, the City has been extending sanitary sewers to older subdivisions within the City's future growth areas that have demonstrated nitrate contamination of groundwater due to failing septic systems. At this time, only three more eligible subdivisions have the potential to be served.

Beginning in 2007, MPCA intends to prepare a regional turbidity Total Maximum Daily Load (TMDL) evaluation, with a target completion date of 2011. Once Waste Load Allocations are determined and approved, an implementation plan will be prepared that will identify reduction requirements for MS4 permittees. The City is already utilizing and will continue to implement the following best management practices to reduce sediment loads:

- Implementation of ESC requirements at construction sites to prevent the addition of sediment to streams, and
- Collection of sediment in storm water ponds and reservoirs.

2.0 Organizational Perspectives of the City of Rochester

Conditions inherent to the City of Rochester as an organization include factors such as the culture of the City, the balance between budget availability and demand for services, the size and experience of its staff, available equipment, and the attitudes of its leaders and citizenry.

Rochester was founded in 1854 and its environmental protection culture has a notable history. In part due to the presence of the Mayo Clinic since the early 1900's, Rochester has been a leader in advancing environmentally protective infrastructure improvements in the solid waste management, water supply,

wastewater treatment and flood control fields. Mayo Clinic desires a healthy and clean community to receive its patients. It has only been within the last decade, however, that the City began integrating water quality objectives into its Storm Water Management Program. With the onset of the 2003 MS4 permit, attention to water quality issues, including advocating for behavioral changes, became a much larger dimension of the City's Storm Water Management Program. In comparison to other City services, the water quality component of the Storm Water Management Program is still an evolving element that will require cultural shifts on the part of City residents and employees.

When the City identifies problems, it tries to find cost-effective ways to manage them. Although Rochester is perceived as a wealthy community, City government continually struggles to meet service demands that increase disproportionately to its budget growth. That struggle is escalating due to increasing infrastructure costs and reduced federal and state aid, despite the increasing tax base from a larger population. This adds to the difficulty of funding and implementing new programs. Historically fiscally conservative, Rochester incurred multi-million dollar cuts in local governmental aid in 2003 that further tightened budgets and limited services. To offset these cuts and establish a stable funding source for storm water management activities, Rochester adopted an ordinance in 2003 to create a fee-for-service Storm Water Utility to provide adequate, equitable, and stable funding for its storm water management activities. The amount of the fee is based on the amount of impervious surface present on a parcel. This Utility generates approximately \$3.1 million annually to fund storm water management services.

The City of Rochester has 1,944 employees, consisting of 825 full-time and 1,119 temporary/seasonal/part time staff members. Full-time employees are typically well educated, experienced, and trained. There is little staff turnover in the City organization. Within budget, City staff members have access to equipment and materials and external consultants as necessary to provide the needed services. These staff members provide a full array of City services, utilizing a fairly standard organizational structure, to serve a community of nearly 95,000 citizens. Additionally, Rochester hosts over 2.5 million visitors each year, of which 1.2 million are overnight guests. Staff are often over extended trying to respond to the many service demands of the community. Rochester is home to technologically advanced businesses, primarily in the medical and computer fields. As such, it attracts a highly educated employment base. If expertise is lacking in any discipline within the City staff, there are many local resources that can be tapped to help identify the appropriate equipment, methods, or technologies needed for problem solving.

Since it has more permit-related responsibilities than any other City department, the Rochester Public Works Department has been designated as the lead agency to oversee permit development and implementation. However, many departments and every employee is a permit stakeholder whose involvement will need to be fostered to implement a successful program. Training for all full time employees is needed along with orientation materials for seasonal and new full time employees.

Additionally, facilitation between departments providing permit services is needed to develop the collaborative roles.

Many citizens are already active in environmental protection activities through their participation in organizations such as: the Zumbro Valley Audubon Society (birds and their habitat), the Izaak Walton League (wetlands), the Zumbro Land Conservancy (open space preservation), the Prairie Enthusiasts (prairie preservation) and the Friends of Quarry Hill Nature Center (nature education). Many other civic groups, youth groups, church organizations, neighborhood groups, and business alliances exist in Rochester that may have a potential interest in public outreach or involvement in the storm water management arena. Condominium and homeowner associations, developers, builders, and construction contractors also have the potential to be allies, as well as target audiences.

The City has many ordinances that address related aspects of storm water management. Efforts are underway to strengthen understanding of and compliance with these ordinances. Over the last three years of permit implementation, ordinance issues have been uncovered that are either being addressed or will need to be addressed during the next permit term to improve the effectiveness of storm water management policies and practices.

Installation and maintenance of adequate ESC structures is the responsibility of developers and builders and their contractors. Understanding of and compliance with the MPCA construction storm water permit requirements has been steadily increasing over the last three years. Additionally, developers participate in the creation of on-site or regional storm water management ponds. Since 2003, the Rochester Association of Builders has emerged as a strong partner to advance proper ESC at construction sites.

3.0 Overall Storm Water Management and Water Quality Philosophy

Rochester's Phase II storm water management permit goal is to restore and maintain the chemical, physical, and biological integrity of Rochester's water resources through pollution prevention and reduction. The City intends to implement its storm water management program so as to meet the requirements of the Phase II permit and its Storm Water Pollution Prevention Program (SWPPP).

The City's Flood Control Project (FCP) goals and funding source are separate from its storm water management program. The FCP was designed and constructed to manage acute flooding and severe storm events. The City's Storm Water Management Program will deal with the chronic rate, quantity, conveyance, and water quality issues associated with urban storm water. In doing so, the City will enhance aquatic and wildlife habitats and improve the urban environment to enhance the quality of life for its citizens.

4.0 Issues Related to Storm Water Management

The current condition of Rochester's water bodies varies throughout the City. In some areas, wetlands and streams are already degraded from urbanization and from past agricultural draining, ditching, and cropping practices. In some cases, wetlands retain the unique, natural, and ecosystem support classifications that are most valued. Stream bank and ravine conditions are unstable in some areas, while other areas are intact and stable. As mentioned earlier, the FCP has significantly and permanently altered the geomorphology, hydrology, and hydraulics of the river. The quality of water in FCP reservoirs and storm water ponds reflects their intended functions as storm water retention and detention basins. Silver Lake, a reservoir formed within the Zumbro River, is of poor quality due to overpopulation by geese and heavy sedimentation, as anticipated in the design of the Flood Control Project. Cascade Lake, an emerging artificial, groundwater fed lake, currently has good water quality and is being designed to be sustainable for its intended recreational uses.

The Minnesota Storm Water Manual (MPCA, 2006) identifies urban pollutant sources as those associated with: vehicular traffic, lawn and garden care, fallout from air pollution, municipal maintenance activities, commercial and industrial activities, illicit discharges, improper disposal of household hazardous waste, pet and wildlife fecal waste, litter, construction activities, combined sewer and sanitary sewer overflows, and runoff from residential driveways and parking areas. Dr. Robert Pitt (The Role of Pollution Prevention in Stormwater Management, 2000) identifies automobile use and maintenance as the source of the vast majority of toxicants and much of the conventional pollutants that are suspended in storm water. A very general list of the contaminants resulting from the activities noted above include: heavy metals, hydrocarbons, salt, sediment, suspended solids, phosphorus, nitrogen, organic debris and its resultant oxygen demand, pesticides, polycyclic aromatic hydrocarbons, polychlorinated biphenyls, sulfur oxides, mercury, bacteria and other pathogens. The addition of impervious surface from urbanization may also cause habitat impacts due to water temperature increases and higher volumes of runoff.

Rochester does not have combined sanitary and storm sewers, so that source is not an issue here. Storm water pollution concerns associated with hazardous waste management, sanitary sewer overflows, and illicit discharges are minor, based on existing infrastructure, services, and practices. Several commercial and industrial businesses located in Rochester are subject to pollution control through MPCA's National Pollutant Discharge Elimination System/State Disposal System permits. These businesses are represented by the following general categories: aviation, aggregate mining and rock quarrying, automotive and metal recycling, computer production and programming, concrete production, food processing, health management, government operations and maintenance, industrial painting, power production, solid waste management, and transit and transportation. Required

compliance with these permits significantly reduces the potential for storm water related impacts from these businesses.

As part of its Wellhead Protection planning efforts, Rochester Public Utilities recently prepared a preliminary Potential Contaminant Source Inventory. Besides the permitted sources described above, RPU identified the following categories of Rochester businesses as having the potential to negatively impact groundwater: auto repair, construction, gas stations, hospitality (e.g., hotels and restaurants), and shopping centers. These same five categories also have the potential to impact storm water. Additionally, there are certain urban activities that are not associated with specific businesses but that are predominant in Rochester, including: landscaping and lawn/garden care, litter, pet and wildlife waste, and runoff from driveways, streets, and parking lots. Based on studies by EPA and others, the underlined categories appear to be the sources and activities that have the most likely potential to impact surface water in Rochester.

As previously mentioned, MPCA has identified impairments of *fecal coliform* bacteria and turbidity, which are therefore the primary pollutants of local concern that are given a higher priority while selecting and implementing Best Management Practices. Because large segments of Rochester's watercourses have been intentionally altered and are repeatedly dredged as part of its Flood Control Project, improvements resulting from storm water management activities cannot be expected to result in habitat restoration along those reaches.

Using the permit's Minimum Control Measure categories as the framework for evaluation, the following table presents an assessment of potential storm water management issue areas. This appraisal was then considered in conjunction with the City's existing programs (Section 5.0) and the permit requirements to determine program priorities (Section 6.0) for the 2006 – 2011 permit period.

MCM Category	Some Potential Problems/Issue Areas
Public Education	<ul style="list-style-type: none"> <li data-bbox="423 1367 1422 1430">❑ Many citizens know little about storm water pollution, how they contribute to it, or how they can help reduce it. <li data-bbox="423 1434 1422 1497">❑ Many citizens and City staff do not know how to recognize or report storm water problems. <li data-bbox="423 1501 1422 1564">❑ Many citizens do not understand why dumping pollutants into catch basins, drainage ways, or streams is problematic. <li data-bbox="423 1568 1422 1694">❑ Rochester has very unique demographics that are challenging from an education standpoint (discussed in more detail below). Most residents are not impacted directly by storm water pollution so this issue is not a prime interest area. <li data-bbox="423 1698 1422 1761">❑ Behavioral change is slow, even with an aware and committed community. <li data-bbox="423 1766 1422 1797">❑ The local public value placed on streams and riparian areas is unknown. <li data-bbox="423 1801 1422 1864">❑ The expectations of many private property owners regarding the City's obligations to address private drainage issues are unrealistic.

MCM Category	Some Potential Problems/Issue Areas
Public Education (continued)	<ul style="list-style-type: none"> ❑ The Environmental Corridor concept that is part of the Storm Water Management Plan needs to be more clearly communicated to planners, engineers, developers, and decision makers. ❑ Communications regarding regulations, policies, design specifications, and technical information need to be repeatedly communicated to a changing population of developers, contractors, engineers and staff. ❑ Interest within the Rochester School District has been limited, despite City overtures.
Public Involvement	<ul style="list-style-type: none"> ❑ It is difficult to catalyze participation when the level of citizen interest in or concern about storm water issues is low. ❑ Citizens involved in local environmental and civic groups already have designated missions that do not involve storm water management. ❑ Citizens are over committed and have little free time to participate in new ventures.
Illicit Discharges	<ul style="list-style-type: none"> ❑ There are periodic, but infrequent, reports of citizens dumping pollutants into catch basins or streams. ❑ Surface water pollution originating from certain categories of dischargers (e.g., restaurants, gas stations, auto repair businesses, etc.) may be occurring, but the extent is unknown. ❑ A comprehensive inventory of potential hot spots has not been completed (e.g., a database showing the location of industrial facilities and the types of discharges that could be expected from each location). ❑ The City has not integrated MPCA's inventory of Industrial NPDES permits into its GIS database. The frequency of MPCA site permit inspections and enforcement of non-permitted discharges is unknown. ❑ The City does conduct inspections of a few industries for the purposes of sewage pre-treatment (by Rochester Water Reclamation Plant staff) and for compliance with hazardous materials management permits (by the Fire Department). Corrections of deficient conditions are independently coordinated by each department, but there is no formal referral mechanism in place for these entities to report illicit discharges to one central location for tracking purposes. ❑ The GIS mapping of the storm sewer system (pipes, manholes, catch basins, storm water ponds, outfalls, and natural lakes and streams) still contains some data gaps. For instance, the clarification of the location and maintenance responsibilities for state and county roads within the City would be useful. ❑ The City does not have widely understood reporting and response procedure for managing illicit discharge complaint responses, investigations or corrective actions. ❑ There are some "litter hotspots" (for example, near grocery stores, convenience stores, shopping centers, and fast food restaurants), but there is no specific program in place to target them for cleanup.

MCM Category	Some Potential Problems/Issue Areas
Construction Site Erosion & Sediment Control	<ul style="list-style-type: none"> ❑ Means to manage new drainage entering natural drainage ways without inducing long range instability are weak. ❑ Some developers/contractors/builders/landscapers lack knowledge of erosion control practices and/or the desire to implement them. ❑ There is a lack of in-field technical training on erosion and sediment control. ❑ Some site operators do not adequately control construction site wastes, such as litter, building materials, and concrete truck washout. ❑ Home style selection, basement excavation, and landscaping can inappropriately affect approved grading plan elevations. ❑ Poor quality soil is often used as topsoil during the re-vegetation stage, which leads to seeding and stabilization failures.
Post Construction Storm Water Management	<ul style="list-style-type: none"> ❑ There are no sweeping requirements for private parking lots and streets. ❑ Most property owners don't understand that drainage easements may not be obstructed and that dumping of yard wastes in drainage ways impacts water quality. ❑ Native vegetation standards for ponds are needed. ❑ A comprehensive assessment of the stabilization condition of natural streams, ravines and drainage ways would be useful. ❑ The variety of permanent BMP options utilized to protect water quality and to control runoff is limited, perhaps due to a lack of demonstration projects that show feasibility of cost, construction, maintenance, and effectiveness. ❑ Thorough procedures for pond maintenance are needed, along with an acceptance policy for newly constructed storm water ponds. ❑ The inspection and maintenance obligations for private storm water facilities are not understood by many owners and stronger tools to leverage owners that are reluctant to complete maintenance may be needed. ❑ Acceptance and integration of innovative development or redevelopment concepts is cumbersome and time consuming and is hindered by lack of knowledge, existing regulations, current processes, and accepted practices. ❑ Developer/engineer/builder/contractor/staff knowledge of storm water friendly design alternatives is limited. The current housing market does not support non-traditional development styles. The sustainability of on-site treatment by non-governmental entities is questionable. The efficacy of some low impact development techniques, such as porous pavement, may not be viable or effective in this climate. ❑ City response to rapid growth strains staff resources and limits the ability to complete long-range environmental planning. ❑ Opportunities for storm water quantity control need further investigation. The viability of storm water volume controls in a karst environment is questionable; particularly give the vulnerability of many Drinking Water Supply Management Areas. ❑ Shorelines are inadequately vegetated to protect water quality in most areas.

MCM Category	Some Potential Problems/Issue Areas
Municipal Good Housekeeping	<ul style="list-style-type: none"> <input type="checkbox"/> Many employees are unaware of pollution issues associated with their activities and do not know alternative, environmentally friendly practices. <input type="checkbox"/> City operations need to be audited to determine what additional practices are needed to prevent storm water pollution and non-storm water discharges from City-owned facilities. <input type="checkbox"/> Consideration should be given to developing floodplain or waterway-specific grounds maintenance practices.
Some Organizational Problems	
	<ul style="list-style-type: none"> <input type="checkbox"/> Employee responsibilities and obligations are diverse. Employees face large workloads with competing, multiple priorities. <input type="checkbox"/> Elected official and administrative leadership could be stronger with a more clearly articulated vision, particularly to better integrate other Departments with more minor storm water management roles. <input type="checkbox"/> The assignment of storm water management responsibilities is scattered throughout the organization, which make communication, accountability, and reporting a challenge. <input type="checkbox"/> Tracking systems and administrative procedures for storm water management activities such as plan reviews, permits, inspections, complaints, enforcement, and maintenance need further development and integration for program evaluation and permit reporting purposes.

The demographic characteristics of Rochester present several challenges from an education standpoint. First, the population is highly mobile. According to the 2000 Census, 51% of the population in 2000 lived in a different house in 1995, and 26% moved to Rochester from elsewhere. According to tabulations of IRS tax return data, over 60,000 people moved to Olmsted County (the smallest geographic unit reported is the County) during the 1990's, and about 53,000 moved out, as compared to the 2000 population of 124,277. Second, the newcomer population includes a high proportion of foreign-born immigrants with limited English proficiency. According to Census estimates, 71% of the net migration that has occurred since 2000 is of foreign origin. Third, reaching households through school-based education has two problems. Rochester public school attendance includes speakers of 52 different languages and 20% of the public school students in the Rochester School District speak a language other than English in the home. Only around 23% of households in the Rochester school district have children enrolled in school. Fourth, reaching households through employer-based education is also a challenge. Rochester is the largest employment center in the region, attracting workers from 452 separate minor civil divisions, according to the 2000 Census. The 2000 Census also indicated that 31,347 (43%) of 72,141 workers that hold jobs in Rochester commuted from outside the city. Finally, SE Minnesota does not have a regional team that works collaboratively on storm water education issues. Elsewhere in the state, there are active regional programs because colleges, U of MN extension agents, and Agency staff have catalyzed and sustained the efforts. The absence of a four-year college in Rochester, along with the downsizing of Extension, DNR, MPCA, and other Agency staff will make it difficult to emulate the successful regional models found elsewhere in Minnesota.

5.0 Current Activities Used to Manage Storm Water

Historically, the City's storm water management goal was to prevent property damage from storm water by constructing a system to quickly convey it away from developed areas into area creeks and streams in order to protect lives and property. Beginning in 1995, the City started a comprehensive surface water management planning process to integrate traditional planning for adequate conveyance infrastructure with water quality protection components. A 35-member Steering Committee comprised of business, residential, and government representatives guided this planning process. The City's first Surface Water Management Plan was published in 1997, at which time formal requirements for the construction of on-site and regional storm water management ponds was initiated. The Plan was amended in 1999 and renamed the Storm Water Management Plan (SWMP). That same year, the City's Zoning Ordinance and Land Development Manual were updated to incorporate the SWMP by reference. Three amendments to the SWMP were completed in 2004 to address storm water management in the future growth areas of King's Run, Hadley Valley, and the Northwest Territory. Each successive SWMP has promoted a water quality and environmental corridor approach that, with time, is intended to provide a more ecologically integrated storm water management system.

Several related initiatives have impacted water resources management within the SZRW.

- Under the auspices of several 319 grants, Olmsted County has implemented many watershed-level initiatives over the past 15 years. These grants have supported activities ranging, for example, from baseline groundwater data gathering to trend assessment to storm water management pilot projects.
- Olmsted County is responsible for preparing a Water Management Plan that incorporates the City's Storm Water Management Plan by reference.
- A collaborative of nine southeast Minnesota Counties involved in water planning comprises the SE MN Water Resources Board.
- In 2003, the Olmsted County Public Works Department completed a South Zumbro River Storm Water Management Plan in conjunction with a Capital Improvement Plan to direct the construction of future storm water management ponds as a means to avoid costly bridge replacements. The South Zumbro Joint Powers Board, which was originally established to oversee the implementation of Rochester's Flood Control Project, served as the Policy Advisory Committee for this effort.
- The SZRW is within the Lower Mississippi River Basin. The Minnesota Pollution Control Agency is leading the Basin Alliance for the Lower Mississippi in Minnesota (BALMM), primarily focusing on rural initiatives to protect water quality.
- The Zumbro Watershed Partnership has recently been formed to address water quality issues throughout the entire Zumbro River Watershed, which encompasses six counties in SE Minnesota. This is a volunteer organization funded by grant monies and memberships. To date, their focus has been on rural and agricultural issues.

The City has been implementing a number of storm water management activities for many years. The following list, organized by Minimum Control Measure categories, provides a brief overview of routine activities that have been part of the existing storm water management program. A more comprehensive list of the City's ongoing storm water management activities may be found in the 2006 – 2011 SWPPP.

Public Education

- Distribute information through the use of the storm water web site, press releases and interviews, fact sheets, posters, information booths, utility bill stuffers, etc.
- Respond to requests for presentations about storm water management.
- Provide technical assistance and training to interested parties.
- ESC education and training for developers, engineers, builders, and contractors.
- Train City staff.

Public Involvement

- Citizen input solicited at the annual informational meeting and throughout the development review process.
- Respond to citizen complaints and inquiries.
- Assist with school programs and student projects, such as “Summer of Service” and the Children’s Water Festival by providing water quality related activities.
- Litter collection by the Sentence-to-Serve and Community Work Service crews.
- Litter control in Parks through the Adopt-A-Park program.

Illicit Discharges

- Complaint response.
- Storm sewer system mapping.
- Identification of illegal drain and sewer service connections by City inspectors. (These are rare incidents, averaging less than one per year.)
- Acceptance of septic tank septage and RV waste by the Rochester Water Reclamation Plant (RWRP).
- The City video logs each segment of the sanitary sewer collection system at least every two years to monitor for sewage leaks. (Since August 2001, the City experienced only ten releases onto the ground, all of which were less than 1,000 gallons.)
- During hazardous material permit inspections, the Fire Department provides corrective action recommendations for identified illicit discharge problems to the property owner (and, as appropriate, to the Building Safety Department, the RWRP, or the MPCA).
- The Fire Department also responds to spills of hazardous materials and strives to contain spills to prevent the migration of the contaminants to the sewer system, surface water, and groundwater. They independently

document the spills and insure that qualified companies manage the cleanup and provide for proper disposal.

- Litter is a minor nuisance problem that is managed along with road dirt via the City's street sweeping activities. Full-City sweeps are generally completed three times per year while the downtown business district is swept twice per week. City parking ramps are also swept.
- Implementation of the Water Quality Protection Project to replace failing septic systems in specifically designated subdivisions.
- Additionally, the County Solid Waste Division provides an integrated waste management system that serves City residents and that is funded by waste generators, consisting of: a Recycling Center, a materials reuse center, a Hazardous Waste Facility (for residents and Small Quantity Generators), a waste-to-energy facility, and a landfill to manage the disposal of municipal solid waste, construction and demolition debris, and ash.

Construction Site Erosion and Sediment Control

- Grading, ESC, and drainage plan development, review and approval.
- Inspection of construction sites, residential and commercial developments, and individual house construction lots for proper ESC, with follow-up enforcement, as needed.

Post Construction Storm Water Management

- Preparation of technical specifications and construction of storm sewers and catch basins (or oversight of public storm sewers constructed by others).
- Response on as needed basis to localized flooding complaints and drainage problems to identify if long-term solutions are possible.
- Acquisition of drainage easements where future maintenance work on private property may be needed.
- The City requires that new development must adequately address post-construction storm water management (limiting discharge rates to pre-development conditions), typically by financial contribution to the regional storm water pond fund, utilizing design criteria and technical standards acceptable to the MPCA.
- Stabilization of creeks and other drainage-ways.
- Storm water management planning and special studies.
- Development plan review.
- Wetland delineations, restoration, and replacements.
- Implementation of floodplain and shoreland ordinances, participation in the national flood insurance program, and the Federal Emergency Management Agency's Community Rating System.

Municipal Good Housekeeping

- Only trained and certified applicators apply pesticides, herbicides, and fertilizers to City lands.
- Routine parkland, building, and vehicle maintenance.
- Proper materials storage, including indoor salt storage.

- Periodic dredging of the FCP, based on sedimentation thresholds set by the Army Corps of Engineers in the FCP Maintenance Manual.
- Storm sewer inspection and maintenance/repair in public rights-of-way and driveway culvert cleaning is conducted on an as needed basis.
- Roadside and pond vegetation management.
- Maintenance agreements between the City and MnDOT and between the City and Olmsted County for maintenance by the City of certain non-City roads within the City limits.
- A Materials Processing Facility is being constructed within the City as a site to process sediment from storm water pond maintenance, river dredging, and street sweeping.
- Routine inspection, maintenance, and repair of catch basins, ponds, and outfalls.
- Washout repairs and storm sewer pipe cleaning occurs as discovered.
- Staff are dispersed to known “hot spots” and throughout the City after storm events to quickly address drainage maintenance issues.

Other

- Implementation of Industrial NPDES permits at the Airport, Silver Lake Power Plant, and the RWRP.
- Record keeping.

These activities will be maintained at current service levels as part of the 2006 -2011 SWPPP.

6.0 Program Priorities

Prior to 2003, the City had a proactive, reasonably successful storm water management program. Since the adoption of the MS4 permit in 2003, the City has made significant strides addressing program gaps. Three key areas will need priority focus during the 2006 – 2011 permit period:

- Coalition building with other MS4s within the Rochester Urbanizing Area to provide more effective public education so that individuals better understand storm water impacts and the actions that can be taken to reduce them;
- Formalization and integration of illicit discharge detection and elimination activities; and
- Evaluation of ongoing operation and maintenance practices by City staff to determine their impact on storm water quality, with subsequent training for those individuals.

Summary

Rochester, like all growing cities, continues to struggle with budget limitations and increasing service demands in all areas. Storm water management needs must be balanced with organizational and economic limitations to create a successful storm water management program that strives to protect water quality, serves Rochester

residents, and meets permit requirements. Accordingly, the City has prepared a SWPPP for the 2006 – 2011 permit period that, to the best of its ability, addresses water quality protection by committing to realistically achievable and economically feasible practices. The following table summarizes the City’s assets that support the BMPs included in the SWPPP, along with the major constraints that limit its scope.

Program Assets	Program Constraints
<ul style="list-style-type: none"> <input type="checkbox"/> 98% of the City is within the South Zumbro River watershed. 	<ul style="list-style-type: none"> <input type="checkbox"/> There has been little collaboration among the 7 MS4s that are located primarily within the same watershed.
<ul style="list-style-type: none"> <input type="checkbox"/> The City has access to a sophisticated Geographic Information System (GIS). 	<ul style="list-style-type: none"> <input type="checkbox"/> The full potential of the GIS has not been realized.
<ul style="list-style-type: none"> <input type="checkbox"/> The City is addressing the impaired status of its receiving waters by implementing BMPs that reduce fecal coliform bacteria and turbidity impacts. 	<ul style="list-style-type: none"> <input type="checkbox"/> Other watershed sources of fecal coliform bacteria and turbidity may not be reducing their contributions, making the City’s reduction appear negligible.
<ul style="list-style-type: none"> <input type="checkbox"/> The City hires educated and experienced staff and provides necessary training. 	<ul style="list-style-type: none"> <input type="checkbox"/> Behavioral and cultural change is slow, regardless of a focus on training. <input type="checkbox"/> The City’s rapid growth and high visitor numbers stretch staff resources to the limit. <input type="checkbox"/> Interdepartmental collaboration and coordination is weak.
<ul style="list-style-type: none"> <input type="checkbox"/> The City instituted a Storm Water Utility to provide a stable funding source for storm water management services. 	<ul style="list-style-type: none"> <input type="checkbox"/> Even with the Utility, the service demands exceed the budget.
<ul style="list-style-type: none"> <input type="checkbox"/> The educational level of Rochester’s citizens is, on average, high. 	<ul style="list-style-type: none"> <input type="checkbox"/> Regardless of educational level, it is difficult to capture people’s interest in a subject if the impacts are not viewed as personal. <input type="checkbox"/> Education activities are difficult to implement and measure due to Rochester’s unusual demographics.
<ul style="list-style-type: none"> <input type="checkbox"/> The City’s growth boundaries have few limits which enables the City to implement BMPs utilizing larger tracts of land as development proceeds. 	<ul style="list-style-type: none"> <input type="checkbox"/> The City’s physical setting is constrained by its hydrogeologic setting, especially as it relates to volume control.

Program Assets	Program Constraints
<input type="checkbox"/> The City has comprehensive Storm Water Management Plans in place.	<input type="checkbox"/> Neighboring communities and related activities completed by other organizations may not be as comprehensive as the City's program.
<input type="checkbox"/> The development process in Rochester is extensive and offers many opportunities for public input.	<input type="checkbox"/> This same process limits the pursuit of innovative development approaches. However, the strong housing market is the strongest driver of traditional approaches.
<input type="checkbox"/> Rochester Area Builders is a strong partner and promoter of implementing proper ESC requirements.	<input type="checkbox"/> Without a specific CEU requirement for ESC to renew builders' licenses, competing education priorities may continue to eclipse ESC training.
<input type="checkbox"/> Rochester does not have much heavy industry and the industries it does have are compliant with their own NPDES permits. <input type="checkbox"/> Businesses expect a clean city, eliminating many storm water issues and making others incidental.	<input type="checkbox"/> There are a handful of potential pollutant sources/activities that need further investigation to determine whether they have significant impacts. However, staff time to pursue these complicated and time consuming evaluations is limited.
	<input type="checkbox"/> The FCP has resulted in the permanent alteration of a portion of Rochester's rivers that will not be remedied through the SWPPP.
	<input type="checkbox"/> Permitting processes can inhibit many routine maintenance activities.