COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

# SURFACE WATER MANAGEMENT PLAN

Approved, December 2018

WSB

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## 1. EXECUTIVE SUMMARY

The purpose of this plan is to describe how the current Surface Water Management Plan (SWMP) when combined with City policy and procedures meets statutory, rule, and Metropolitan Council requirements. The purpose of this Surface Water Management Plan is broad and the goal is to guide the City in managing its surface and groundwater resources. This will enable the City to develop drainage facilities in a cost-effective manner, while maintaining or improving the quality of its water resources.

### 1.1. Surface Water Management Plan Purposes

The City of Columbia Heights' Surface Water Management Plan (plan, SWMP, City plan, local plan) is a local management plan that meets the requirements of Minnesota Statutes 103B, Minnesota Rules 8410, the Mississippi Watershed Management Organization (MWMO) Third Generation Watershed Management Plan 2011-2021 (dated May 10, 2011, changes notification July 17, 2016) and the Rice Creek Watershed District 2010 Watershed Management Plan *(*adopted January 4, 2010 and amended November 9, 2016). Minnesota Statute states that the purposes of the water management programs are to:

- Protect, preserve, and use natural surface and groundwater storage and retention systems;
- Minimize public capital expenditures needed to correct flooding and water quality problems;
- Identify and plan for means to effectively protect and improve surface and groundwater quality;
- Establish more uniform local policies and official controls for surface and groundwater management;
- Prevent erosion of soil into surface water systems;
- Promote groundwater recharge;
- Protect and enhance fish and wildlife habitat anFd water recreational facilities; and
- Secure the other benefits associated with the proper management of surface and groundwater.

Minnesota Rule 8410 augments the statutory requirements by requiring the following of local plans:

1. Table of contents
2. Purpose
3. Water resource management related agreements
4. Executive Summary
5. Land and water resource inventory
6. Establishment of policies and goals
7. Relation of goals and policies to local, regional, state, and federal plan, goals and programs
8. Assessment of problems
9. Corrective actions
10. Financial considerations
11. Implementation priorities
12. Amendment procedures
13. Implementation program

There is some overlap in the statutory and rule requirements, though the current Water Resources Management Plan (WRMP) generally meets these requirements as discussed below.

#### *1.1.1. Metropolitan Council Requirements*

Metropolitan Council's 2040 Water Resources Policy Plan expands upon the requirements of Rule 8410 as follows:

1. Communities must commit to a goal of no adverse impacts (non-degradation) for area water resources.
2. The assessment of problems and corrective actions must include Total Maximum Daily Load (TMDL) considerations.
3. Require infiltration of the first half inch of runoff from impervious areas created by projects where there are A and B soils.
4. Require infiltration in wellhead protection areas be based on City's wellhead protection plan.
5. Communities with trout streams must identify actions to reduce thermal pollution.
6. Communities must meet state requirements for development near outstanding resource value waters.
7. Communities must consider stormwater management practices that promote infiltration and filtration including the reduction of impervious surface.
8. Include information of types of Best Management Practices (BMPs) used to improve stormwater quality and quantity including maintenance schedules.

## 1.2. Surface Water Management Responsibilities and Related Agreements

Two watershed districts have jurisdiction over the City of Columbia Heights:

1. Mississippi Watershed Management Organization (MWMO) covers Minneapolis, Saint Paul, Lauderdale, Saint Anthony Village, Fridley, Hilltop, and the Minneapolis Park and Recreation Board. The total watershed extends 39.9 square miles The MWMO makes up approximately 90.3% of Columbia Heights.

2. RCWD includes parts of Anoka, Ramsey and Washington Counties, with a small portion in Hennepin County. RCWD covers approximately 186 square miles and includes 28 cities and townships. RCWD is divided into five different planning regions and Columbia Heights falls within the Lower Rice Creek planning region. RCWD makes up approximately 9.7% of Columbia Heights.

The City also has the following agreements:

1. An agreement with Fridley on the maintenance and discharge from Tertiary Pond.

2. Maintenance agreements with the City of Fridley and MnDOT governing maintenance of storm sewer facilities.

Upon approval of this SWMP by the two watersheds with jurisdiction over the City, it is the City's intent to maintain its current permitting powers through its Permit for Land Disturbing Activities. Currently, the MWMO does not issue permits; no impact to this organization would occur. RCWD is a permitting agency for stormwater management, erosion control, crossings, wetlands, illicit stormwater discharge, drainage systems, floodplains, and appropriation of public waters. The watersheds would continue in their role as project review agencies. MWMO and RCWD have surface water requirements that are discussed in Section 5 of this plan.

The City of Columbia Heights is responsible for construction, maintenance, and operation of the City's stormwater management systems (i.e., ponds, BMP, mechanical structures, sump manholes, pipes, channels) in accordance with its MS4 Permit.

## 1.3. Report Structure

The Columbia Heights Surface Water Management Plan is divided into six sections:

- ***Section 1.0 Executive Summary*** provides background information and summarizes the plan contents.
- ***Section 2.0 Land and Water Resource Inventory*** presents information about the topography, geology, groundwater, soils, land use, public utilities, surface waters, hydrologic system and data, and the drainage system.
- ***Section 3.0 Agency Cooperation*** outlines other governmental controls and programs that affect stormwater management.
- ***Section 4.0 Assessment of Problems and Issues*** presents the City's water management related problems and issues.
- ***Section 5.0 Goals and Policies*** outlines the City's goals and policies pertaining to water management.
- ***Section 6.0 Implementation Program*** presents the implementation program for the City of Columbia Heights, which includes defining responsibilities, prioritizing, and listing the program elements.

## 1.4. Background

This report provides the City of Columbia Heights with a Surface Water Management Plan that serves as a guide to managing the City's surface water system, and brings the City into compliance with Minnesota Statutes. The Plan will guide stormwater activities in the City for the next 10 years (2018-2027). Periodic amendment to the Plan will likely occur in the intervening 10 years so that the Plan remains current to watershed plan amendments and Metropolitan Council requirements.

As shown in **Figure 1**, the City of Columbia Heights (population 19,709 in 2014) is located in southern Anoka County just east of the Mississippi River. Columbia Heights is a well-established community that is fully developed. The City has put emphasis on high quality residential neighborhoods, open space and parks, and well-planned commercial and industrial areas.

The Village of Columbia Heights was formed in 1898 and incorporated as a city of Minnesota in 1921. It is a first ring northern suburb of Minneapolis, just east of the Mississippi River and north of Minneapolis. According to the United States Census Bureau, the city is 3.52 square miles, including 0.11 square miles of water. The City of Hilltop is entirely enclosed within the city. Hilltop relies on Columbia Heights for fire and police service, but manages its own water and sewer services.

Columbia Heights is within two watershed districts: Mississippi Watershed Management Organization (MWMO) and the Rice Creek Watershed District (RCWD). This plan addresses the standards, rules and regulations put forth by the MWMO and the RCWD.

The City of Columbia Heights is considered fully developed. **Section 2.1** of this plan discusses land use in the City.

# 2. LAND AND WATER RESOURCE INVENTORY

## 2.1. Physical Setting

### *2.1.1. Land Use*

**Figures 2 and 3** provide the existing and future land uses for the City of Columbia Heights. The future land uses come directly from the City's 2040 Comprehensive Plan. The City of Columbia Heights is fully developed, although significant redevelopment will likely occur. Though part of the urban core, the City has maintained areas of public open space, wetlands, lakes, and woods that provides balance given the City's urban density. Redevelopment in the City provides opportunities for regional stormwater treatment systems as well as integrated habitat and trail corridors. As redevelopment occurs, the City will consider these types of improvements.

Now and in the future, the portion of Columbia Heights west of Central Avenue will consist primarily of low density residential development. Commercial, industrial, and medium density residential development will exist along the City's southern border with Minneapolis, its western border with Fridley, and along Central Avenue. The City of Hilltop resides entirely within the borders of Columbia Heights. Located from Monroe Street to Central Avenue and between 45th Avenue and 49th Avenue, Hilltop manufactured housing represents medium to high density residential development.

The area east of Central Avenue consists primarily of residential land use and this will persist with minor variation due to redevelopment. Low density, medium density, and high density residential properties are located in the area east of Central Avenue. Minneapolis Water Works facilities represent a major land use on the east side of Central Avenue. More details on land use can be found in the City's 2030 Comprehensive Plan.

Columbia Heights prepared a Water Resources Management Plan in 2000 and has not updated this plan. The 2000 Plan was not approved by the watersheds, which at that time consisted in Six Cities Watershed Management Organization (SCWMO) and Rice Creek Watershed District (RCWD). In 2010, the Six Cities WMO did not have an approved plan and RCWD was updating its own plan, so Columbia Heights chose to not seek official approval until the watershed plans were finalized. Since that time, Six Cities WMO disbanded and its territory was ceded to Mississippi Watershed Management Organization (MWMO). At present, both watersheds have approved watershed plans so Columbia Heights must now obtain official watershed approval of this SWMP.

### *2.1.2. Topography and Watersheds*

Columbia Heights is made up of primarily hilly terrain and features one of the highest points in Hennepin, Ramsey, and Anoka Counties. Elevation in the city ranges from approximately 1,020 feet above mean sea level near the Minneapolis Water Works property to approximately 850 feet above mean sea level along the City's southern border with Minneapolis.

The City's hill topography creates numerous landlocked areas. These landlocked areas combined with undersized storm sewers typical of older, urban areas cause widespread urban flooding during intense summer storms, such as occurred in 1997 and 2001. **Figure 4** shows the drainage patterns for the City.

There are four lakes in the city: Sullivan Lake, Highland Lake, Silver Lake, and Hart Lake. There are also several small ponds around the city. The City's park system is primarily in low lying areas of former swampland that was not suitable for building.

Hydrologically, the City drains to both the Mississippi River and Rice Creek. Jurisdictionally, the City lies within the borders of RCWD and Mississippi WMO as shown in **Figure 5**. On a large scale, the entirety of Columbia Heights is part of the Upper Mississippi River Basin. Approximately 228 acres of the City are within Lower Rice Creek Planning Region of the Rice Creek Watershed District and the remaining 2,025 acres are in the MWMO.

The City of Columbia Heights has contour data that covers the entire City and is based on 2011 LiDAR (Light Detection and Ranging) data. The delineation of hydrologic boundaries occurs through analysis of contour information.

Information regarding the City's surficial and bedrock geology and aquifers is available in the Anoka County Geologic Atlas from the Minnesota Geological Survey.

### *2.1.3. Surficial Geology*

The surficial mean surface geology of Columbia Heights consists of glacial and alluvial (outwash) deposits. Columbia Heights lies within the Grantsburg Sublobe of the Des Moines Lobe. The Grantsburg Sublobe deposited silty till that was reworked by glacial meltwaters which converted much of the area within the community into a sand plain, sandy lacustrine, and valley terrain deposits.

In the Columbia Heights' portion of the sublobe, a till deposit is present as the Hilltop Moraine. These glacial deposits, along with older glacial deposits, range from 100 to 250 feet in thickness and are underlain by bedrock. These glacial deposits were placed 12,500 to 14,000 years ago during the last period of glaciation in the Twin Cities area.

### *2.1.4. Bedrock Geology*

The bedrock underlying the surficial deposits is composed of sedimentary units that are part of the Twin Cities Structural Basin. Several sandstone and limestone units occur as aquifers that are separated by shale confining units. Many Twin Cities communities use these aquifers for their drinking water supply. Columbia Heights does not use aquifer water for its drinking water but rather purchases water from Minneapolis Water Utility, which draws surface water from the Mississippi River at its Fridley intake.

### *2.1.5. Soils*

Soils of the Columbia Heights area are classified into three associations of multiple soil series:

- Zimmerman Complex
- Hayden-Kingsley Complex
- Dundas Complex
- Lino Complex
- Hubbard Complex
- Udorthents Wet Substratum
- Urban Land
- Auolls and Histosols

The texture and composition of the surficial materials are factors that affect permeability. For example, fine-grained, densely packed till has low permeability and high water retention. In these areas, high clay content increases the absorption properties and lessens the permeability. In contrast, outwashes of relatively course-

grained, well-sorted materials will have relatively high permeability and lower water retention ability. Changes in texture and composition of materials may be gradual or abrupt.

Local variations in surficial materials may not be apparent within the City of Columbia Heights because urbanization and development have substantially altered the surface soils. In fact, most near surface soils within Columbia Heights must be considered disturbed unless specific soil borings establish otherwise.

Information about each of the soils in these associations area is available from the Soil Survey of Anoka County (SCS 1977). **Table 2.1** shows the drainage characteristics of each soil series from the above associations. This characteristic determines the amount of surface water runoff from a given area. If the soil is well-drained, a significant portion of the precipitation will be infiltrated into the ground. Alternately, if a soil is very poorly drained, much more precipitation becomes runoff. The Hydrologic Soil Group (HSG) defines a soil's propensity to generate runoff for a given runoff event. More information about HSG and their properties can be found in the Minnesota Pollution Control Agency's (MPCA) Minnesota Stormwater Manual (http://stormwater.pca.state.mn.us/).

**Table 2.1 Soil Series Characteristics**

| Soil Series | Drainage Characteristic | Hydrologic Soil Group |
|---|---|---|
| Zimmerman | Excessively drained | A |
| Hayden-Kingsley | Well drained | B |
| Dundas | Poorly drained | B/D |
| Lino | Somewhat poorly drained | A/D |
| Hubbard | Excessively drainage | A |

Hydrologic Soil Groups characterize diverse soils by similar infiltration capacity. Group A soils have the highest infiltration capacity while Group D have the lowest. Generally, infiltration is not an appropriate practice on Hydrologic Soil Group D soils. **Figure 6** shows the extent of the Hydrologic Soil Groups in the City.

The Minnesota Stormwater Manual, design infiltration rates are provided below:

**Group A** – Group A soils generally range from high infiltration capacity soils (primarily gravel, sandy gravel and silty gravels) with an infiltration rate of 1.63 in/hr to moderately high infiltration capacity soils (primarily sand, loamy sand and sandy loam) with an infiltration rate of 0.8 in/hr.

**Group B** – Group B soils are generally loam or silty loam with an infiltration rate of 0.3 to 0.45 in/hr.

**Group C** – Group C soils are primarily sandy clay loam with an infiltration rate of 0.2 in/hr.

**Group D** – Group D soils are primarily clay loam, silty clay loam, sandy clay, silty clay or clay soils with a low infiltration rate of 0.06 in/hr.

In many cases, development and redevelopment projects rely on soil borings to classify underlying soils. In cases where borings area available, these should be used in lieu of HSG to determine site specific soil infiltration capacity utilizing guidance provided in the Minnesota Stormwater Manual.

### *2.1.6. Climate and Precipitation*

The climate within the Twin Cities is typical of a continental climate. Without the buffering influence of large bodies of water, cold winters and hot summers predominate. It is generally understood that global climate change has had an effect on the Twin Cities' local climate. One area where climate change manifests itself is in rainfall intensities and rainfall depths. The Twin Cities has seen more intense rainfalls the last two decades. The implications of this are clear:

- Flood control facilities, if designed for the 100-year rainfall, may get larger as the statistical 100-year rainfall gets larger.

- Facilities designed for smaller rainfalls, such as infiltration areas and small storm sewer may also get larger as rainfall depths increase for the 1-year to 5-year rainfall events.

The total average annual precipitation in the Twin Cities is approximately 31 inches. The total average annual snowfall is approximately 54 inches. Average monthly temperature, precipitation and snowfall are shown in **Table 2.2**.

**TABLE 2.2 – AVERAGE MONTHLY CLIMATE DATA, MINNEAPOLIS/ST. PAUL, 1981-2010**

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean Daily Temperature (°F) | 15.6 | 20.8 | 32.8 | 47.5 | 59.1 | 68.8 | 73.8 | 71.2 | 62.0 | 48.9 | 33.7 | 19.7 | 46 |
| Average Precipitation (in.) | 0.9 | 0.8 | 1.9 | 2.7 | 3.4 | 4.2 | 4.0 | 4.3 | 3.1 | 2.4 | 1.7 | 1.2 | 31 |
| Average Snowfall (in.) | 12.2 | 7.7 | 10.3 | 2.4 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 9.3 | 11.9 | 54 |

*Source: Minnesota Climatology Working Group*

Additional climatological information for the area can be obtained from the Minnesota State Climatology Office at http://www.climate.umn.edu/.

Rainfall frequency estimates are used as design tools in water resource projects. In 2013, the National Oceanic Atmospheric Administration (NOAA) published the Atlas 14 Precipitation-Frequency document that showed an increase in rainfall intensity and design storms from the previous Technical Paper 40 precipitation values. Selected Atlas 14 rainfall frequencies for Columbia Heights are found in **Table 2.3**.

**TABLE 2.3 – ATLAS 14 RAINFALL FREQUENCIES**

| Recurrence Interval (yrs) | 24-hr Rainfall Depth (in) |
|---|---|
| 1 | 2.5 |
| 2 | 2.8 |
| 10 | 4.3 |
| 50 | 6.3 |
| 100 | 7.4 |

## 2.2. Water Resources

### *2.2.1. Wetlands*

The 2000 Water Resources Management Plan included a Wetland Inventory. All wetlands and water bodies were inventoried and classified throughout the City as part of the plan. The inventory included the following sources:

- United States Fish and Wildlife Service (USFWS) National Wetlands Inventory
- Aerial photography
- USGS 15 Minute topographic maps
- Field observations of wetland characteristics

The boundaries and USFWS classifications of the wetlands are shown in **Figure 7**. The City's classification system for wetlands and water bodies within Columbia Heights was based on the following parameters:

**Table 2.4 Wetland Classifications**

| Classification | Definition |
|---|---|
| I | Wetlands and water bodies that will be used directly by people; classification is based on water quality parameters |
| II | Wetlands that are mainly managed for wildlife habitat; the amount of "bounce" during a 1-year storm event is limited to minimize the disruption of fluctuating water levels on wildlife |
| III | Wetlands whose main function is to assimilate nutrients and sediment; classification is based on nutrient and sediment removal efficiency |
| IV | Wetlands whose main purpose is flood control |

A wetland inventory has not been conducted by the city since that time. The City did not believe that there would be a benefit in conducting a wetland inventory because the city is fully developed. Whenever the opportunity arises, retrofits for water quality and infiltration will occur for public and private projects. Opportunity, rather than inventory, defines how the City proceeds in managing quality of stormwater discharge to wetlands.

The MWMO has conducted a historic wetland assessment within the watershed. In addition, Anoka County completed a 2004 MLCCS Mapping Project, which also defined wetland boundaries.

The Metropolitan Mosquito Control District has developed its own inventory of wetland areas. They have created and maintained a map that provides information on habitat for larval mosquitoes in the seven-county metro area. Each of the identified wetlands is classified based on US Fish and Wildlife Service Circular 39 system. The wetland inventory is updated every five years by field inspection and the maps are available for review at the office of the Metropolitan Mosquito Control District.

### *2.2.2. Major Bodies of Water*

There are four lakes in Columbia Heights: Sullivan Lake (Sandy Lake), Highland Lake, Hart Lake, and Silver Lake. Silver Lake is the largest lake. However, only a small portion of the lake is within the City boundary. All of these lakes are identified by the State of Minnesota as protected waters through the Protected Waters Inventory (PWI).

There are five large ponds in the city: Clover Pond, Labelle Pond, Jackson Pond, Zurek Pond, Secondary Pond, and Tertiary Pond. Labelle Pond and Clover Pond are also PWI water bodies. The regulatory boundary of PWI water bodies is called the ordinary high water level (OHWL). The locations of these major water bodies are shown in **Figure 8**.

Below is a brief summary of each of the lakes and ponds, along with the PWI identification number for the DNR protected waters. Further discussion of lake impairments occurs in **Section 4.**

**Sullivan/Sandy Lake (2-80 P):** Sullivan Lake, also known as Sandy Lake, is classified as a shallow lake. Sullivan Lake is 16 acres in size, and is located near the north border of Columbia Heights near the city of Fridley. Sullivan Lake serves as a detention area for stormwater and has a drainage basin area of 0.73 square miles. The normal water level (NWL) is 880.3 feet and is controlled by a gated outlet structure. There are several trails around the lake that are used for recreational purposes. Sullivan Lake is on the MPCA Impaired Waters List.

**Highland Lake (2-79 P):** Highland Lake is a very shallow lake, 16 acres in size, and is located near the northeast border of Columbia Heights near the cities of Fridley and New Brighton. The lake is located in Kordiak County Park and serves as a stormwater detention area. Runoff from a 0.32 square mile area enters the lake through six different inlet locations. The NWL is 996.1 feet. The lake is surrounded by a fully developed residential area and has high levels of total phosphorus. It is considered to be hypereutrophic and currently being studied by Anoka County. Highland Lake is on the MPCA Impaired Waters List.

**Hart Lake (2-81 P):** Hart Lake is a very shallow lake, 7 acres in size and located near the southern border of Columbia Heights, near the city of St. Anthony Village. The lake is not listed on the impaired waters list. However, it is reported as having very high nutrient concentrations and is classified as hypereutrophic. The lake was assessed in 2010 and determined to have insufficient data for TMDL use assessment.

**Silver Lake (62-83 P):** Silver Lake is approximately 72.5 acres in size and located along the border of Columbia Heights, the City of St. Anthony Village, and New Brighton. Most of the lake is located in the City of St. Anthony Village. The average depth of the lake is approximately seven feet though the maximum depth is 47 feet. Silver Lake is on the MPCA Impaired Waters List and has a TMDL for which a number of water quality improvement projects have been implemented, as discussed later in this SWMP.

**Clover Pond (2-686 W):** Clover Pond is located in the northeast corner of the City and to the northwest of Highland Lake. The drainage area for Clover Pond is 18 acres, its water surface area is about 3.2 acres, and its NWL is elevation 988.4. The pond maintains its NWL with a 12-inch RCP outlet structure at the northwest corner of the pond.

**Labelle Pond (2-687 P):** Labelle Pond is a shallow pond located in Labelle Park and is approximately 9 acres in size. The pond contains a control structure that maintains a normal water level around 924.0.There is a walking trail around Labelle Pond that many citizens in the community enjoy. The pond is currently not a part of a monitoring program and detailed information about the pond is not available.

**Jackson Pond:** Jackson Pond is located between 43rd Ave and 44th Ave, west of Quincy Street and east of Central Avenue. This pond has a drainage area of 547 acres, and a water surface area of approximately 1.6 acres at a NWL of 880.8 feet. The City and MWMO modified Jackson Pond in 2015 to provide more flood storage through a drawdown pump and to provide water quality treatment through installation of an iron

enhanced filter. The MWMO is considering monitoring the pond in the future to determine the effectiveness of the iron enhanced filter. The City would be interested in this collaboration effort.

**Secondary Pond:** Secondary Pond is located north of Highland Lake on the boundary of Columbia Heights and Fridley. The drainage area of Secondary Pond is 2.0 acres at NWL and discharge from the pond is controlled through a 24-inch RCP outlet. The outlet of the pond discharges to Tertiary Pond.

**Tertiary Pond:** Tertiary Pond, located northeast of Secondary Pond within the City of Fridley and the City of New Brighton, has a drainage area of 320 acres in size, and has a water surface area of 1.1 acres at its NWL. Tertiary Pond, located at the low point of the drainage basin, has no outlet and serves as the final retention area for the watershed.

*2.2.3. Water Courses/Trunk Storm Sewer*

There are no major rivers or water courses flowing through the City of Columbia Heights. However, the City lies near the Mississippi River and discharges to it through storm sewer that connects via Fridley or Minneapolis. The City's main storm drains, as shown in **Figure 4** include:

**44th Avenue Storm Drain:** This storm drain begins at Labelle Pond, flows north to intersect 44th Avenue at Tyler Place, west along 44th Avenue to Jackson Pond, west along 44th Avenue to a junction with a storm drain from the south along University Avenue, west along 44th Avenue to Main Street, north along Main Street to a storm drain junction at 45th Avenue and Main Street, and then west to the Mississippi River in a 78-inch storm drain.

**Boundary Storm Drain (Clover Pond to Central Avenue):** This storm drain begins at Clover Pond, flows north to the City boundary with the City of Fridley, and then west along the boundary line to the junction with several storm drains at Central Avenue. The storm drain is located within a drainage easement along the back lot line of properties within the City of Columbia Heights.

**Central Avenue to Sullivan Lake Storm Drain:** This storm drain begins at the junction of several storm drains: the boundary storm drain from the east, the Central Avenue storm drain from the north, and the Central Avenue storm drain from the south. Thirty-inch and 42-inch parallel pipes increasing to twin 48-inch pipes drain the stormwater runoff to Sullivan Lake.

**Sullivan Lake to 53rd Avenue/University Avenue Storm Drain:** This storm drain begins at Sullivan Lake and then flows west along Sullivan Drive to 7th Street, north along 7th Street to 52nd Avenue, west along 52nd Avenue to University Avenue, north along University Avenue to the north City boundary, and then north to the Mississippi River in a 48-inch RCP storm drain. Assuming full flow conditions, this storm drain will handle approximately 82 cfs.

**Storm Sewers Draining the Area North of Silver Lake:** The area north of Silver Lake drains by two major storm sewer systems. These two storm sewers enter the lake through 21-inch RCP and 30-inch RCP outlets with a combined capacity of 40 cfs.

**Storm Sewers Draining the Area South of Silver Lake:** The area south of Silver Lake is drained by two major storm sewer systems. These two storm sewers are combined at a junction near the intersection of 40th Avenue and McKinley Street and drain to Silver Lake by a single 48-inch RCP. In addition to Hart Lake, substantial storage areas are present north of 39th Avenue and 40th Avenue from Cleveland Street to Stinson Boulevard. A

project near Prestemon Park will provide increased storage for the drainage area south of Silver Lake.

**Storm Sewers Draining Southwest corner of the City:** The main storm sewer in this area begins at the intersection of 3rd Street and Edgemoore Place and then flows south along 3rd Street, west along 38th Avenue, north along Main Street, and then west along 39th Street to the Mississippi River.

### *2.2.4. Groundwater and Water Supply*

In Minnesota, various state agencies are responsible for groundwater management and protection. Overlapping jurisdiction in this area often causes confusion in matters of groundwater management. The City will continue to use the best available groundwater information for stormwater infiltration projects to avoid impacts to groundwater resources and private wells.

The DNR regulates groundwater appropriation for agricultural, industrial, and water supply uses. Suppliers of domestic water to more than 25 people or applicants proposing a use that exceeds 10,000 gallons per day or 1,000,000 gallons per year must obtain a water appropriation permit from the DNR. **Figure 9** shows the groundwater appropriation locations within Columbia Heights.

The Minnesota Department of Health (MDH) is the official state agency responsible for addressing all environmental health matters, including groundwater protection. For example, the MDH administers the well abandonment program and, along with the DNR, regulates the installation of new wells.

The MPCA administers and enforces laws relating to pollution of the state's waters, including groundwater. The MPCA also administers Minnesota's NPDES general permit for construction activities and its municipal stormwater permit and program. Both these permits required infiltration, which has the potential to affect groundwater.

The Minnesota Geological Survey provides a complete account of the state's groundwater resources.

The MWMO and RCWD are charged with general responsibilities for groundwater protection and use, but their role is limited to cooperating and assisting the DNR, MDH and MPCA in their groundwater protection efforts.

In 2011, the DNR established the North and East Metro Groundwater Management Area (NEM-GWMA). The NEM-GWMA includes ten communities, including Columbia Heights. The purpose of the program is to address difficult groundwater related resource issues (Minn. Stat. 103G.287, Subd. 4). The timing of implementation items span over a period of 5 years, with some activities listed as ongoing work. The NEM-GWMA lists five objectives to ensure the preservation of groundwater. These include identifying and embracing water conservation best practices, protecting surface waters, preserving water quality, improving appropriations permitting, and protecting water availability. Further discussion of NEM-GWMA activities and information is provided in **Sections 4** through **6**. A link to North and East Metro Groundwater Management Area is provided above. Even though Columbia Heights does not consume groundwater for municipal use, the City will continue to work with the associated agencies to be a good steward of land and water resources, including groundwater.

Groundwater use and potential depletion has recently emerged as an important issue in

the Twin Cities. The agencies identified above along with the Metropolitan Council, several municipalities, and St. Paul and Minneapolis water utilities have each participated in discussions and planning efforts related to this subject. Columbia Heights will be something of a bystander in these efforts since it consumes Mississippi River water provided by the Minneapolis Water Utility. However, these ongoing discussions and the initiatives that follow may require all communities to participate in land stewardship and water conservation practices.. The City will use the best available groundwater information for stormwater infiltration projects to avoid any impacts to groundwater resources and private wells.

There are no municipal or non-municipal wells or intakes within Columbia Heights. Consequently, the City does not have a Wellhead Protection Plan with the Minnesota Department of Health (MDH) because it does not provide potable water from public wells. However, the City will follow guidelines and requirements as set forth in the City of Minneapolis "Source Water Protection Plan" (September 2008).

In addition, the City of New Brighton has a Drinking Water Supply Management Area (DWSMA) that overlaps into the City of Columbia Heights. Any future development or projects within the City of Columbia Heights will involve communicating with and working with City of New Brighton and MDH to ensure that safe drinking water is maintained. Any rules or guidelines related to New Brighton's DWSMA will be applied to projects within Columbia Heights.

### *2.2.5. Monitored Water Quality and Quantity Data*

**Figure 15, Appendix A** provides locations from the MPCA's What's in My Neighborhood data showing environmental information related to contaminated sites, permits, licenses, and inspections, as well as potentially contaminated sites based on land use. Contaminated properties have the potential to impact water quality and should be noted. The What's In My Neighborhood website show an inventory of these properties, as well as sites that have already been cleaned up or in the process of being cleaned up.

Water quality data for the City has been obtained from the Minnesota Pollution Control Agency (MPCA) Environmental Data Access site. This data provides a snapshot of overall water quality and health of local waterbodies. This database is utilized by participating agencies to compile water quality testing data and is almost entirely used for the storage of water quality parameters. This water quality monitoring information/data and monitoring locations can be found at the MPCA's Environmental Data Access site. **Figure 16, Appendix A** shows the location of monitoring sites within the City.

The Metropolitan Council Environmental Services (MCES) Citizen-Assisted Lake Monitoring Program (CAMP) is a group of volunteers who monitor the health of Twin Cities' lakes to assist MCES in providing a comprehensive database that allows cities, counties and watershed management organizations to better manage impaired lakes. The MCES CAMP program involves measuring water transparency. Water transparency trends provide a good indication of water quality and the effectiveness of improved stormwater management practices within a lake's watershed.

MWMO contracts with Anoka Conservation District to monitor lake water quality every 3 years and lake levels annually at Sullivan and Highland Lakes. MWMO monitors stormwater runoff from the City at two discharge locations for the 1NE and 11CHF subwatersheds. Data recorded at the 11CHF discharge location includes flow, water quality, and continuous temperature and conductivity. Data recorded at the 1NE discharge location includes only flow and water quality. MWMO also performs flow monitoring for H&H modeling at La Casita and I694.

The MWMO has two automated rain gauges near Columbia Heights, one at Columbia golf course and one at the railyard by the waterworks.

RCWD performs annual water quality monitoring for Silver Lake. RCWD also continues to support the CAMP program to record data about lake nutrients.

### *2.2.6. Impaired Waters*

**Table 2.5** presents the MPCA's 2018 list of impaired waters within Columbia Heights. "Impaired" means that the waters are too polluted or otherwise degraded to meet the water quality standards set by the State of Minnesota.

**Table 2.5 – Impaired Waters**

| Water Body | Target start/end date | Beneficial Use | Year Listed | Impairment Cause |
|---|---|---|---|---|
| Sullivan/Sandy Lake | 2025 | Aquatic Recreation | 2002 | Nutrient/eutrophication biological indicators |
| Silver Lake | | Aquatic Consumption | 2012 | Mercury in fish tissue |
| | | Aquatic Recreation | 2002 | Nutrient/eutrophication biological indicators |
| | | Aquatic Life | 2014 | Chloride |
| Highland Lake | 2025 | Aquatic Recreation | 2004 | Nutrient/eutrophication biological indicators |

The locations of these impaired water bodies are shown on the water resource assessment map, **Figure 10,** which can be found in **Appendix A.** For more information on impaired waters and TMDL Plans visit the MPCA website http://www.pca.state.mn.us/. The MPCA website contains an *Impaired Waters Viewer*, an interactive map tool that can be used to view impaired waters and their updated water quality data, as well as their updated TMDL Plans.

The Mississippi River, to which Columbia Heights directly discharges, has a number of impairments that the City must consider in it stormwater management program. **Table 2.6** provides currently identified impairments for the river from the Coon Rapids dam to Lake Pepin.

The MPCA has an approved statewide Mercury TMDL study (conducted in 2007) and has worked with stakeholders across the state to identify strategies and timelines that would be included in the implementation plan. A TMDL was also approved for fecal coliform (E.coli) for this portion of the river. Further discussion of the status of these TMDLs and monitoring data is provided in **Sections 4** through **6**.

**Table 2.6 – Mississippi River Impairments Affecting Columbia Heights**

| Beneficial Use | Assessment Year | Assessed condition | Impairment Cause |
|---|---|---|---|
| Aquatic consumption | 1998 | One or more standards not met | Mercury in fish tissue |
| Aquatic recreation | 2009 | One or more standards not met | Fecal Coliform |

| | | | |
|---|---|---|---|
| Aquatic consumption | 2002 | One or more standards not met | PCB in fish tissue |
| Aquatic Life | 2016 | One or more standards not met | Nutrient/eutrophication biological indicators |

The MPCA water quality monitoring includes baseline monitoring. When values of monitored pollutants exceed certain thresholds, active investigation of the source of the exceedance is conducted.

Local governments will be required to incorporate completed TMDL studies into their surface water management plans and incorporate any appropriate TMDL implementation activities within their Stormwater Pollution Prevention Program within 18 months of the approved date. A more detailed discussion on the status of the TMDLs can be found in **Section 4**.

**Sullivan/Sandy Lake:** Sullivan Lake is a part of both the Anoka Conservation District Water Quality Monitoring and MCES CAMP Program. The period of record for this water body is from 1993 to 2013. In 2013, the MWMO contracted the Anoka Conservation District to conduct monitoring activities on Sullivan Lake and the report can be found on the MWMO website. The 2013 results indicated that Sullivan Lake had poor water quality due to high levels of phosphorus and the high to severe levels of algae. The lake has experienced a significant downward trend in water quality. The City will explore and implement measures to address the impairments when a TMDL has been approved.

**Silver Lake:** The watershed of Silver Lake lies within four municipalities and three counties (Anoka, Hennepin, and Ramsey). Silver Lake was placed on the MPCA TMDL list in 2002 for excess in nutrients. Since then, Silver Lake has been monitored at several locations. RCWD, along with the MPCA, developed the Silver Lake TMDL Implementation Plan in May 2011. This plan can be found on the MPCA website. The City of Columbia Heights owns a boat ramp on Silver Lake that includes a regional water quality pond. This pond currently provides removal of 42% of the total phosphorus for the contributing watershed area, which is the northern portion of the southwest watershed to Silver Lake.

**Highland Lake:** Highland Lake is part of the MCES CAMP program and has a period of record of 2000 to 2007. Highland Lake was also a part of a study conducted by Anoka County. The study was developed in support of a report titled “A Review of Transparency Trends in Minnesota Lakes”. The study found that there were ten lakes within Anoka County that had significant transparency and total phosphorus trends. Highland Lake was one of the lakes that showed decreasing transparency trends. Over the same time period that transparency was decreasing, the lake’s total phosphorus concentration was increasing. At the time of the study, Anoka County planned on conducting further monitoring in 2016. The City will explore and implement measures to address the impairments when a TMDL has been approved.

## 2.3. Existing Flood Insurance Studies

The Federal Emergency Management Agency (FEMA) completed the map modernization process for its Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRMs) to identify flood risk within Anoka County in 2015. A copy of the updated FIS and FIRMs can be obtained online through the FEMA Map Service Center at https://msc.fema.gov.

The City of Columbia Heights was included in the Anoka County Flood Insurance Study, effective December 16, 2015. Within the City the following floodplain types exist: Regulatory Floodway, 1% Annual Chance Flood Hazard (100-year Floodplain), and 0.2% Annual Chance Flood Hazard (500-year Floodplain). These areas are shown in **Figure 11**. Development in

these areas is guided by the City of Columbia Heights Floodplain Management Overlay District requirements.

For information regarding any Letter of Map Amendment (LOMA) and Letter of Map Revision (LOMR) refer to the following website equipped with a mapping function: http://msc.fema.gov/portal/search.

## 2.4. Hydrologic System and Data

The City of Columbia Heights had developed a number of stormwater models over the years to support its flood control and water quality projects. Since 1997, the City has prepared a number of XP-SWMM models for different parts of the City. Subwatershed data for those drainage areas shown in **Figure 4** is provided in **Appendix F**. MWMO has since began developing XP-SWMM hydraulic models using Atlas 14 values. These are the updated models currently in use by the City.

- MWMO model completed by Houston Engineering
- MWMO model completed by Barr Engineering

MWMO is in the process of developing comprehensive models for all of the subwatersheds within its boundaries. The City has partnered with the MWMO in these efforts, along with several other communities within the district. The timeline is from 2015 to 2019 and the project is currently active. The MWMO has completed hydrologic and hydraulic and water quality models for over half of Columbia Heights. The remainder of the City will be modeled in 2018. An accurate water quality model will be a good resource for managing stormwater and future projects within the City in order to meet water quality and volume control goals in this plan. These models have incorporated Atlas 14 rainfall data. The subwatersheds 1NE and 11CHF have completed models. These models provide the City with flow rate data. A summary is listed below:

**1NE & 11CHF Hydrologic and Hydraulic Models**- These models were created using XP-SWMM to model hydrology and hydraulics. 1NE represents parts of southern Columbia Heights and 11CHF represents the central and western areas. A main goal modeling studies was to develop information to support and inform capital project planning. Maps in the report show areas of flooding and pipe inundation for the 10-year and 100-year Atlas 14 events. The City has identified some capital improvement projects to address flooding issues in Table 6-1 and will continue to use results from this report in the next phase of budgeting for the CIP. **Table 6-1** will be reviewed annually to add additional projects to address these flooding locations.

**1NE & 11CHF Water Quality Models** – Water quality reports were completed for these two watersheds using P8. The reports identified pollutant yields and areas where more stormwater treatment might be needed. In the 11CHF P8 model, three water quality BMP scenarios were considered for Gauvitte Park, exploring BMP installation in the south, east and center of the park. Projects have been added to **Table 6-1** to explore options for water quality BMPs in Gauvitte Park. BMPs from the Southern Columbia Heights and Northeast Minneapolis Stormwater Retrofit Analysis report generated by Anoka Conservation District were included in **Table 6-1** to propose additional water quality BMPs within the 1NE watershed.

RCWD has completed hydrologic and hydraulic district-wide watershed models that have been updated for Atlas 14. The District also has water quality models that have been adopted. The City will coordinate use of these models with RCWD as needed for those areas within the RCWD boundary.

## 2.5. Natural Communities and Rare Species

The Minnesota DNR produces the Minnesota County Biological Survey (MCBS) identifying natural

communities and rare species. Completed in 1994, the Anoka County survey identifies where evidence indicates the presence of federally or state listed plants. The survey shows there are no rare plants and animals present in Columbia Heights.

The entire City of Columbia Heights has been categorized according to the Minnesota Land Cover Classification System (MLCCS). MLCCS categorizes urban areas based on five levels of land cover. **Figure 12** located in **Appendix A** shows a map of the classified MLCCS areas. MLCCS does not place any restrictions on development; rather, it informs land use planners on open space planning and comprehensive planning.

## 2.6. NPDES Phase II

The City of Columbia Heights is required to have a Municipal Separate Storm Sewer System (MS4) permit through the MPCA's National Pollutant Discharge Elimination System (NPDES) Phase II Program. MS4s designated by rule are urban areas with populations over 10,000 or urban areas with populations greater than 5,000 with the potential to discharge to special or impaired waters. Additionally, NPDES Construction General Permits are required for construction activities that result in land disturbance of equal to or greater than one acre or a common plan of development or sale.

As an MS4, the City is required to implement the following six minimum control measures:

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

For more information on NPDES Permit requirements refer to www.pca.state.mn.us. Refer to **Appendix B** for a copy of the City's MS4 SWPPP (Storm Water Pollution Prevention Plan) and a copy of the City's SWPPP Best Management Practice (BMP) Sheets.

## 2.7. Water Resource Issue Areas

Water resource issue areas were identified through information obtained from City staff, residents, and other agencies. Each issue was analyzed and potential solutions to address the issues were developed as detailed in **Section 4**. Refer to **Figure 13**, in **Appendix A** for the location of site-specific issue areas. The following is a list of some of the water resource issue areas within the City**:**

- Aging and undersized infrastructure
- Drainage issues at various locations
- Vegetation and sediment management within stormwater ponds and DNR waters
- Impaired water quality in area lakes and rivers

## 2.8. Water Resource Management Ordinances and Policies

The City of Columbia Heights has adopted a number of ordinances and zoning overlay districts in an effort to protect water resources within the City. The City will be revising its ordinances to meet certain post construction requirements now part of the MS4 General Permit.

Ordinances and zoning overlay districts currently in place include the following:

- **Surface Water Management** – purpose of this ordinance is to protect surface water within

the City and adopts by reference the City's Surface Water Management Design Standards and NPDES permitting requirements.

- **Floodplain Management** – purpose of this ordinance is to promote the public health, safety, and general welfare and to minimize potential losses due to flooding hazards. This ordinance is adopted to comply with the rules and regulations of the National Flood Insurance Program and the Watershed Management Commission Rules.
    - The Regulatory Flood Protection Elevation shall be no lower than one foot above the regional flood plus any increases in the flood elevation caused by encroachments on the flood plain that result from designation of a floodway.
    - Floodway District (FW**)** – this district includes those areas designated as floodway on the Flood Insurance Rate Map (FIRM) adopted by the City. This ordinance outlines permitted uses and special uses within the Floodway.
    - Flood Fringe District (FF) - this district includes those areas designated as floodway fringe on the FIRM adopted by the City. This ordinance outlines permitted uses and special uses within the Flood Fringe.
    - General Flood Plain District – this district includes those areas designated as Zone A or Zones AE, Zone AO, or Zone AH without a floodway on the FIRM adopted by the City. This ordinance outlines the permissible uses and defines procedures for Floodway and Flood Fringe determinations within the General Flood Plain District.
- **Erosion Control** – this ordinance regulates construction activities that would result in erosion of soils that endanger water resources by reducing water quality and causing the siltation of aquatic habitat for fish and other desirable species. Eroded soils also necessitate the repair of sewers and ditches and the dredging of lakes, which is undesirable.
- **Shoreland Management Overlay District** – this ordinance prohibits any unregulated use of shorelands in the City that would affect the public health, safety, or general welfare not only by contributing to pollution of public waters but also by impairing the local tax base.
- **Illicit Discharge** – this ordinance prohibits discharge of any hazardous substances to any public sewers

The full text for each of these ordinances or zoning overlay districts can be found on the City's website. These ordinances are regularly revised and are regularly updated on the website for reference.

## 3. AGENCY COOPERATION

There are a number of local, State, and Federal agencies that have rules and regulations related to local water management. The City recognizes the roles of these other agencies and will cooperate, coordinate, and partner when possible with these agencies.

This Plan is in conformance with but does not restate all other agency rules that are applicable to water resource management. The following agencies manage or regulate more aspects of water resources within Columbia Heights:

- Minnesota Department of Health www.health.state.mn.us
- Minnesota Pollution Control Agency www.pca.state.mn.us
- Board of Water and Soil Resources www.bwsr.state.mn.us and the Wetland Conservation Act www.bwsr.state.mn.us/wetlands/wca/index.html
- Minnesota Department of Natural Resources www.dnr.state.mn.us
- US Army Corps of Engineers http://www.usace.army.mil/
- Minnesota Department of Agriculture www.mda.state.mn.us
- US Fish and Wildlife Service www.fws.gov
- Anoka County Soil and Water Conservation District http://www.anokaswcd.org/
- Mississippi Watershed Management Organization http://mwmo.org/
- Rice Creek Watershed District www.ricecreek.org
- Minnesota Environmental Quality Board www.eqb.state.mn.us
- Metropolitan Council www.metrocouncil.org
- North and East Metro Pilot Groundwater Management Area (NEM-GWMA)

While these other agencies' rules, policies, and guidelines are not all restated in this Plan, they are applicable to projects, programs, and planning within the City. The MPCA Minnesota Stormwater Manual, which is a document intended to be frequently updated, is also incorporated by reference into this Plan and can be found at www.pca.state.mn.us/water/stormwater/stormwater-manual.html.

Each of the two watersheds with jurisdiction over Columbia Heights has specific requirements that local plan must meet. The following two sections outline these requirements:

### 3.1. Comparison of Regulatory Standards

Applicable developing and redeveloping property within Columbia Heights must meet the requirements of the City's Surface Water Management Design Standards and MWMO Standards Language. Projects located within RCWD's boundaries are subject to review and approval from RCWD and must also meet their applicable permitting requirements.

#### *3.1.1. City of Columbia Heights*

In 2016, the City developed their Surface Water Management Design Standards. This document was written to meet the City's goals outlined in the SWPPP and outlines additional requirements that were adopted from the Minimal Impact Design Standards (MIDS). These standards have incorporated the MWMO and RCWD stormwater requirements. The Surface Water Management Design Standards have been adopted by reference through Chapter 9 – Article 1 Zoning and Land Development city ordinance, found on the City's website. A copy of these design standards can be found in **Appendix C** of this plan.

#### *3.1.2. Mississippi Watershed Management Organization (MWMO)*

The MWMO does not issue permits for development projects, but relies on permitting and enforcement through the City. The MWMO has developed stormwater standards that the City has adopted into their design standards for applicable development. Additional information can be found

in the MWMO's Watershed Management Plan. A copy of MWMO's current stormwater standards language and flow chart can be found in **Appendix D**.

The City will continue to partner and collaborate with the MWMO on both public and private development. The MWMO offers numerous services that the City will look to utilize as opportunities arise. Some of these opportunities are listed below.

- **Planning Efforts**
  - Partnering to look at their stormwater utility fees and if there's a way to restructure so they can give utility credits to encourage property owners to implement stormwater management.
  - Focusing on the lakes as a natural resource; developing management goals for the lakes and identifying opportunities to improve their ecological function (improve water quality and restore/enhance vegetation/habitat)

- **Capital Improvement Projects and Grant Program**
  - Performing stormwater management as part of their upcoming street reconstruction projects (2019/2020 and beyond)
  - Tree trenches along 37th Ave NE (scheduled to be reconstructed, in partnership with the City of Minneapolis in 2023)
  - Partnering with large property owners to target above-and-beyond and/or innovative stormwater management with a quantifiable public benefit.

- **Chloride Reduction:**
  - Support cities in implementing best practices for reducing the use of chloride (temperature sensors, new technologies, etc.)
  - Outreach campaign to businesses and large property owners about reducing the use of chloride on their properties

- **Upcoming TMDLs:**
  - MWMO staff have been in active communication with MPCA on future TMDLS, including the upcoming draft for the Mississippi River impairment, and are able to support affected cities and possibly reduce potential impacts.

### *3.1.3. Rice Creek Watershed District (RCWD)*

RCWD Permitting Rules were last updated in January 2017. The City will continue to coordinate with RCWD for review and permitting of developments. Rice Creek Watershed District (RCWD) permitting requirements are summarized in their current Watershed Management Plan and can be found on their website. Goals and policies are categorized and defined for lakes, wetlands, drainageways and groundwater. A copy of RCWD's current rules can be found in **Appendix E**.

# 4. ASSESSMENT OF ISSUES

Outlined below is an assessment of existing and potential local water resource-related issues that are known as of 2018. These issues have been identified based on an analysis of the land and water resource data collected during the preparation of this plan and through information provided by the City, its residents, and the watershed organizations. A description of any existing or potential issue within the City has been listed and potential future corrective actions have been incorporated into an implementation plan. Refer to **Figure 13** in **Appendix A** for the location of many of the issues discussed below.

## 4.1. System Description

This subsection describes the surface water management system for the City of Columbia Heights. The City was divided into eight major drainage areas, A through H. **Figure 4** shows these areas. The following sections provide a general description of the hydraulic network within each area. Each area's hydrologic characteristics are summarized in the tables included in **Appendix F**.

**Area A:** This major drainage area, located within the center third of the City along 44th Avenue, is the largest within the City with an area of approximately 1.76 square miles. Area A is subdivided into six smaller drainage areas.

Area A is drained by storm sewer that exits from the City at 45th Avenue and Main Street and discharges stormwater westerly to the Mississippi River through a 78-inch pipe. The three main storm sewer drains are as follows:

- 48th Avenue/Monroe Street (Valley View Elementary and Central Middle Schools) west and south 45th Avenue/Main Street
- Labelle Pond west along 44th Avenue through Jackson Pond to 45th Avenue/Main Street, and
- 38th Avenue/University Avenue north along University Avenue to 44th Avenue and north and west to 45th Avenue/Main Street.

Labelle Pond and Jackson Pond are both located within Area A.

**Area B:** This drainage area, located along the northern boundary of the City, is the second largest watershed within the City with an area of approximately 0.84 square miles. The area is drained by an extensive storm drain system, which discharges from the City at 53rd Avenue and University Avenue north to the Mississippi River through a 48-inch pipe. The four main storm sewer drains are as follows:

- Clover Pond west along the north City limit to Central Avenue and then west to Sullivan Lake.
- Sullivan Lake at Sullivan Drive/Washington Street west and north to 53rd Avenue/University Avenue
- 49th Avenue/Jackson Street (Valley View Elementary and Central Middle Schools) north to Sullivan Lake at 51st Avenue/Jefferson Street
- Innsbruck Parkway/Johnson Street west along 49th Avenue to Central Avenue and then north along Central Avenue to a junction with the Clover Pond storm sewer

Clover Pond and Sullivan Lake reduce peak flows in the storm sewer system.

**Area C:** This drainage area, located in the northeast corner of the City, drains approximately 0.50 square miles to a low spot that does not have an outlet. The watershed is drained by an extensive storm drain system, which discharges into Highland Lake located in Kordiak Park. Six storm drains discharge stormwater into Highland Lake. The outlet from Highland Lake flows through a controlled outlet to Secondary Pond, which is located on the City of Columbia Heights' north boundary with the City of Fridley. Highland Lake also has a secondary controlled outlet that discharges to Clover Pond. A storm drain conveys the discharge from Secondary Pond to Tertiary Pond, which is located in the

City of Fridley and does not have an outlet. The City has an agreement with Fridley on the maintenance and discharge from Tertiary Pond.

**Area D:** This drainage area, located in the southeast corner of Columbia Heights, drains approximately 0.45 square miles of the City to Silver Lake. This watershed also drains a portion of the City of St. Anthony, which is located to the east of Columbia Heights. The area is drained by an extensive storm drain system that runs along the City's east boundary with the City of St. Anthony. The four main storm sewers drain as follows:

- 45th Avenue/Stinson Boulevard south along Stinson Boulevard to Silver Lake
- 45th Avenue/Tyler Street south and east to Silver Lake
- Hart Lake east and north to Silver Lake
- 39th Avenue/Alley located east of Polk Street, northeast and east along 40th Avenue to a junction with the Hart Lake storm sewer near 40th Avenue/McKinley Street.

This drainage area includes Hart Lake.

**Area E, F, and G:** These drainage areas, located along the southern boundary of the City, drain approximately 0.53 square miles. The areas are drained by an extensive system of storm drains that discharge south into the Minneapolis storm sewer system at eight locations. From the west to east, these connections along 37th Avenue are at: University Avenue, 5th Street, Madison Place, mid-block between Reservoir Boulevard and Tyler Street, Tyler Street, just west of Pierce Street, Johnson Street, and Hayes Street.

Area E was further divided into smaller drainage areas, one for each major discharge point.

> Subwatershed E1 – This subwatershed is 0.08 square miles and drains to two discharge storm drains on 37th Avenue. Ultimately, discharge from this area is controlled by a 36-inch RCP at Tyler Street.
> Subwatershed E2 – This subwatershed is 0.04 square miles and drains to the 12-inch storm drain at 37th Avenue and Pierce Street.
> Subwatershed E3 – This subwatershed is 0.03 square miles and drains to the discharge storm drain at 37th Avenue and Johnson Street.

Area F has a drainage area of 0.04 square miles and drains to the discharge storm drain at 37th Avenue and Madison Place.

Area G has a drainage area of 0.33 square miles and drains to the discharge storm drain at 37th Avenue and 5th Street, ultimately through a 48-inch storm sewer.

**Area H:** This drainage area, located in the southwest corner of the City, drains approximately 0.12 square miles. The watershed is drained by a storm sewer system that exits from the City at 39th Avenue and California Street and discharges stormwater westerly to the Mississippi River through a 54-inch pipe.

## 4.2. Water Quantity Assessments

### 4.2.1. *City Assessment*

The drainage system in Columbia Heights is broken up into eight major areas, referred to as Areas A through H. The following section provides a discussion of issues that have been identified by the City in each of these major areas. The discussion is based on previous modeling results from prior City flood studies. The City will look to partner with the MWMO and RCWD to address those issues within each respective watershed boundary. As the MWMO completes models for

Columbia Heights incorporating Atlas 14 data, more specific projects can be identified to address each issue.

**Jackson Pond:** Jackson Pond was constructed as a stormwater pond in the 1960s and modified several times since. It's located in a low point of a natural depression. The area around the pond has experienced flooding and the Columbia Heights Flood Insurance Study established 896.2 feet as the 100-year flood level, which would result in the flooding of approximately 30 structures. FEMA has recently reanalyzed Jackson Pond and has established the 100-year flood level as the top of the berm around the pond. The MWMO's XP-SWMM model for the 11CHF watershed currently shows predicted areas of flooding around Jackson Pond for the 100-year Atlas 14 rainfall event as well as some inundated storm sewer pipes for the 10-year rainfall event. The City will collaborate with MWMO to complete a feasibility study for the area to determine appropriate measures for future flooding events. This issue is identified as **Location #1** on **Figure 13, Appendix A**.

**Forty-Fourth Avenue Storm Drain:** The segment of storm drain from Jackson Pond to Main Street has capacity for approximately 176 cfs. The storm drain size is reduced from a 60-inch RCP east of University Avenue to storm drains of 54 inches, 42 inches, and 48 inches between University Avenue and the Main Street/45th Avenue intersection. These decreases in size create pressure flow in the pipes along with some flooding at the Main Street intersections of 44th Avenue and 45th Avenue. Portions of the storm sewer are fairly shallow limiting the amount of surcharging that can occur before stormwater is discharged out of the system at manholes and catch basins. The emergency overflow route generally is from east to west along 44th Avenue. This issue is identified as **Location #2** on **Figure 13, Appendix A**. The City has identified projects in their CIP for storm sewer improvements near this location. These project areas are shown in **Figure 14, Appendix A.**

**Boundary Storm Drain (Clover Pond to Central Avenue):** Several low spots exist in the terrain along the storm drain alignment. Stormwater collects in these low spots and previous analysis indicates that this will continue to be the case. Inlets have been placed in these low spots to drain the stormwater runoff into the storm drain system. Excess water during the storm will overflow these low spots and flow west along the storm sewer alignment to Central Avenue. The excess water will collect at Central Avenue causing flooding of the street and surrounding area. Several houses built within the City of Fridley along the north edge of these low spots have experienced flooding problems. This flooding issue has been corrected.

**Central Avenue to Sullivan Lake Storm Drain:** The outlet pipes at Central Avenue have a combined capacity of approximately 335 cfs, which is less than the calculated 5-year peak runoff rates. The excess runoff would likely cause flooding at the storm drain junction on Central Avenue. The emergency overflow route when the capacity of the storm sewer is exceeded under Central Avenue is to the north. There do not appear to be any structures that are impacted by the overflow route. Localized street flooding does occur in this location. The City will partner with the MWMO to determine any structure impacts from the Atlas 14 rainfall events and possible corrective actions for the street flooding. This issue is identified as **Location #3** on **Figure 13, Appendix A**

**Highland Lake:** This lake is located in Kordiak County Park in the northeast corner of the City. Discharge from the lake is controlled by an outlet structure that includes a sluice gate in a weir box structure. An additional outlet control structure discharges to Clover Pond. A review of the as-built plans indicates that the 100-year water level will encroach in the backyards of several houses located along the east side of the lake and fronting onto West Upland Crest. The 100-year water level will not, however, result in the flooding of any existing homes along the lake, assuming an SCS Type II storm event. Additional study, potentially partnering with MWMO, might be needed to determine the structural impacts of the Atlas 14 rainfall events from the lake high water level. This issue is identified as **Location #4** on **Figure 13, Appendix A**

**Secondary Pond:** This pond is located north of Highland Lake on the boundary of Columbia Heights and Fridley. A review of the as-built plans indicates that the 100-year water level will encroach into the backyards of several houses located around the lake and that it will also encroach into some of the structures. The City will look to partner with the MWMO to investigate the Atlas 14 100-year water level impacts. This issue is identified as **Location #5** on **Figure 13, Appendix A.**

**Tertiary Pond:** This pond is located northeast of Secondary Pond within the City of Fridley and the City of New Brighton. The pond has a large drainage area and a small storage volume and no outlet. This will result in large fluctuations in the water levels for this pond. Additional study of this entire system from Highland Lake to the Tertiary Pond is needed to determine the impacts of the Atlas 14 rainfall event on the systems high water levels. The City will look into partnering with the MWMO to complete this study. This issue is identified as **Location #6** on **Figure 13, Appendix A.**

**Storm Sewers Draining the Area North of Silver Lake:** The storm sewer network north of Silver Lake includes a 21-inch RCP and a 30-inch RCP that have a capacity less than the calculated 5-year peak runoff rate. The excess runoff would be temporarily stored in lot points in intersections and flow overland to the lake. There do not appear to be any structures impacted by the overflow route. The City will continue to monitor this area and will investigate the need to complete a feasibility study to determine potential storm sewer improvements. This issue is identified as **Location #7** on **Figure 13, Appendix A.**

**Storm Sewer along 37th Avenue:** Several areas along 37th Avenue experience frequent flooding. This includes the following areas: 37th and Madison Place, 37th Avenue between Reservoir Boulevard and Tyler Street NE, 37th Avenue and NE Pierce Street and 37th Avenue and Johnson Street NE, 37th and Hart Boulevard, 37th and Huset Parkway. The City will perform a feasibility study to determine potential storm sewer improvements or volume control BMPs to mitigate flooding in this area. This issue is identified as **Location #8** on **Figure 13, Appendix A.**

## 4.3. Water Quality Assessments

### 4.3.1. *City Assessment*

The following discussion of water quality issues is based on results presented in the 2030 Comprehensive Plan. Water quality was assessed using results of PONDNET modeling. Modeling results indicated that several wetland and waterbodies receive substantial amounts of nutrients and sediment from their tributary watersheds. The discussion below includes information the PONDNET modeling and also the following reports:

- Rice Creek Watershed District 2010 State of the Lakes Report
- Mississippi River Watershed Management Organization 2015 Annual Monitoring Report

**Labelle Pond:** Labelle Pond is located at 41st Avenue, just east of Central Avenue. Labelle Pond is primarily used for aesthetic enjoyment. The pond is classified as eutrophic. Algae blooms and odor have been a problem for this pond for several years and is treated annually. Three aerators run seasonally. This issue is identified as **Location #9** on **Figure 13, Appendix A.** The City will continue to treat Labelle Pond for algae blooms.

**Jackson Pond:** Jackson Pond is located southwest of the intersection of Jackson Street and 44th Avenue. The pond was constructed strictly for stormwater detention and reducing stormwater discharge rates and includes filtration as a means to further treat stormwater. Jackson pond has a low aesthetic or wildlife value. The City will look into options to enhance aesthetic and wildlife value as deemed feasible. This issue is identified as **Location #10** on **Figure 13, Appendix A.**

**Clover Pond:** Clover Pond is located northwest of Highland Lake in the northeast corner of the

City. The pond is categorized as eutrophic and has poor water quality. This issue is identified as **Location #11** on **Figure 13, Appendix A.** The City will continue to monitor the quality of the pond.

**Sullivan Lake:** Sullivan Lake is located on the northern edge of the City, west of Highway 65. Sullivan Lake is eutrophic and often experiences algal bloom and odor problems. Sullivan Lake is listed as an impaired water body and has an established TMDL. The City will consider partnering with MWMO as projects are identified to address the TMDL requirements. This issue is identified as **Location #12** on **Figure 13, Appendix A.**

**Highland Lake:** Highland Lake is located in Kordiak County Park in the northeast portion of the City. There is an aeration system in place at the lake that is operated and maintained by Anoka County. The lake is shallow and has high amounts of nutrients. Highland Lake is on the MPCA impaired waters list. Further discussion of Highland Lake is provided in the following section. The City will consider partnering with MWMO in the future as projects are identified to reduce nutrient loading to the lake when a TMDL is approved. This issue is identified as **Location #13** on **Figure 13, Appendix A.**

**Secondary Pond:** Secondary Pond is located on the border of Columbia Heights and Fridley, just north of Highland Lake. The pond is eutrophic and the value of the pond is primarily flood control and aesthetic enjoyment. Algal blooms and odor have not been an issue to date; however, if excess nutrients continue to increase these could become issues for the pond. This pond is also treated annually for algae. This issue is identified as **Location #14** on **Figure 13, Appendix A.**

**Hart Lake:** Hart Lake is located in the southeast corner of the City. According to the RCWD Plan, Hart Lake is considered to be of marginal value for water quality treatment. Given its small size, shallow depth and urban watershed, little water quality improvements can be expected. Efforts should be focused on maintaining existing water quality and preventing future problems. This issue is identified as **Location #15** on **Figure 13, Appendix A.**

**Silver Lake:** Silver Lake is located on the border of Columbia Heights and the City of St. Anthony. The lake is classified as a fisheries lake by RCWD. Water quality problems in the Columbia Heights portion of Silver Lake's watershed result primarily from inadequate treatment of stormwater runoff prior to discharge into the lake. Silver Lake is on the MPCA Impaired Waters List and has an EPA approved TMDL Implementation Plan. A discussion of this is in the following sections. This issue is identified as **Location #16** on **Figure 13, Appendix A.**

**Pike Lake**: Pike Lake is located just north of I694 in the City of New Brighton. The Rice Creek Watershed District Southwest Urban Lakes TMDL has been complete to address the Pike Lake nutrient impairment. The report identifies a categorical wasteload reduction, of which Columbia Heights is one of the listed MS4 cities. Rice Creek Watershed District identifies that only a small portion of Columbia Heights drains to Pike Lake. The City intends on focusing water quality BMPs in drainage areas to Silver Lake, which ultimately drain to Pike Lake and will benefit the water quality downstream.

**Upper Mississippi River:** The Upper Mississippi River is impaired for fecal coliform (E.coli), mercury in fish tissue, PCBs in fish tissue, and nutrient/eutrophication biological indicators. The Upper Mississippi River Bacteria TMDL was developed to protect numerous stream reaches within the Upper Mississippi River Corridor from impairment due to E.coli. All cities within Rice Creek Watershed are required to implement actions to address this TMDL. This issue is identified as **Location #17** on **Figure 13, Appendix A.** The City will implement pet waste management to protect water quality of stormwater runoff. The City will also continue to implement stormwater BMPs that will aid in reducing fecal coliform runoff into the Mississippi River.

### 4.3.2. *Clean Water Act Assessments*

The Impaired Waters List, also known as the 303(d) list from the applicable section of the federal Clean Water Act, records waters that do not currently meet their designated use due to the impact of a particular pollutant or stressor. If monitoring and assessment indicate that a water body is impaired by one or more pollutants, it is placed on the list. At some point a strategy would be developed that would lead to attainment of the applicable water quality standard. The process of developing this strategy is commonly known as the Total Maximum Daily Load (TMDL) process and involves the following phases:

1. Assessment and listing
2. TMDL study
3. Implementation plan development and implementation
4. Monitoring of the effectiveness of implementation efforts

Responsibility for implementing the requirements of the federal Clean Water Act falls to the U.S. Environmental Protection Agency (USEPA). In Minnesota, the USEPA delegates much of the program responsibility to the state Pollution Control Agency (MPCA).

Information on the MPCA program can be obtained at the following web address:
https://www.pca.state.mn.us/water/total-maximum-daily-load-tmdl-projects

A map of impaired waters in Columbia Heights and TMDL's can be found at the following web address:
https://www.pca.state.mn.us/water/impaired-waters-viewer-iwav

The following is an excerpt from the MPCA website describing the program and its need:

> "The Clean Water Act requires states to publish, every two years, an updated list of streams and lakes that are not meeting their designated uses because of excess pollutants. The list, known as the 303(d) list, is based on violations of water quality standards and is organized by river basin. Environmental organizations and citizen groups have sued the EPA because states have not made adequate progress to meet Section 303(d) requirements. The EPA has been sued for various reasons. Over the past 10 years, lawsuits have been filed in 42 states and the District of Columbia. Of those, 22 have been successful. There is currently no such lawsuit in Minnesota. However, beyond the federal requirements, there are many reasons for us to move forward with the development of TMDLs. Foremost is the need to clean up our rivers, streams and lakes to maximize their contributions to the state's economy and quality of life and to protect them as a resource for future generations.
>
> For each pollutant that causes a water body to fail to meet state water quality standards, the federal Clean Water Act requires the MPCA to conduct a TMDL study. A TMDL study identifies both point and nonpoint sources of each pollutant that fails to meet water quality standards. Water quality sampling and computer modeling determine how much each pollutant source must reduce its contribution to assure the water quality standard is met. Rivers and streams may have several TMDLs, each one determining the limit for a different pollutant."

**Table 4.1** lists the 303(d) impaired waters within the City of Columbia Heights

**Table 4.1**
**303(d) 2014 Final List of Impaired Waters**
**Within the City of Columbia Heights**

| Water Body | Year First Listed | Assessment Unit ID # | Affected Use | Pollutant or Stressor | TMDL Complete |
|---|---|---|---|---|---|
| Silver Lake | 2012 | 62-0083-00 | Aquatic Consumption | Mercury in fish tissue | 2007 |
| Silver Lake | 2002 | 62-0083-00 | Aquatic Recreation | Nutrient/eutrophication biological indicators | 2010 |
| Silver Lake | 2014 | 62-0083-00 | Aquatic Life | Chloride | 2016 |
| Sullivan/Sandy Lake | 2002 | 02-0080-00 | Aquatic Recreation | Nutrient/eutrophication biological indicators | None |
| Highland Lake | 2004 | 02-0079-00 | Aquatic Recreation | Nutrient/eutrophication biological indicators | None |
| Mississippi River | 1998 | 07010206-509 | Aquatic Recreation | Fecal coliform, Mercury in fish tissue, PCBs in fish tissue Nutrient/eutrophication biological indicators | Complete for mercury and fecal coliform |

## 4.4. Silver Lake:

### 4.4.1. *Assessment*

Silver Lake is partially located in Columbia Heights and has a TMDL for phosphorus and chloride. The existing load based on modeling years 2006-2007 is 92.5 pounds per year with a target load of 85.7 pounds per year. The City has identified best management practices, including increased ponding and filtration, as an effective way to reduce phosphorus loading to the lake. Regional ponds, rain gardens, native plantings and reforestation, shoreline restoration, and education are specific examples that the City encourages. The City will continue to implement chloride management efforts to meet this TMDL.

### 4.4.2. *Implementation*

The TMDL implementation plan for Silver Lake can be found on www.pca.state.mn.us. Several implementation activities are listed, including the following (as discussed in the 2011 MPCA Silver Lake Implementation Plan) that involve the City of Columbia Heights:

- Columbia Heights Boat Ramp Improvements: A boat ramp, owned by the City of Columbia Heights, currently includes a regional water quality pond. Modeling indicates that this pond currently provides 42% removal of total phosphorus for the contributing drainage area.

  Opportunities exist for enhancing the total phosphorus removal efficiency, including expanding the area and/or depth, adding additional filtration components, or a skimmer device. The City has evaluated options for improving the function of the existing BMP in this area in coordination with Rice Creek Watershed District.

- Silver Lake Beach Improvements: The City of Columbia Heights has completed plans and installed site improvements to Silver Lake Beach Park. Water quality improvements include two infiltration basins and a vegetated swale with intermittent ponding. In addition, water quality benefits are provided by overall impervious surface reduction and conversion of portions of mowed turf to native plants. The improvement results in total phosphorus (TP) removal from the beach watershed and portions of the direct subwatershed.

- Shoreland Buffers and Restoration: Shoreland buffers can be used to treat direct drainage from properties adjacent to the lake. Buffers provide for wildlife habitat and filtering of stormwater pollutants and act as a filter for stormwater runoff from shoreland properties. These practices are primarily targeted toward homes on the west and south shores of the lake, which would include homes within Columbia Heights.

- Columbia Heights Road Reconstruction Rain Gardens: The City of Columbia Heights has reconstructed several roads within the watershed and has implemented small scale rain gardens to treat runoff. These rain gardens provide water quality treatment of previously untreated road drainage within a fully urbanized portion of the City. They were required by the RCWD.

- Road Reconstruction of Stinson Boulevard Retrofits: In 2011, the City of Columbia Heights planned to reconstruct a portion of Stinson Avenue in the watershed within the next five years (by 2016). The goal was to have rain gardens or small scale water quality treatment practices throughout the road reconstruction project to treat road runoff, as required by RCWD. This project has been complete.

- Fisheries Management: Silver Lake supports a recreational fishery. Fish species present include walleye, northern pike, bluegill, crappie, catfish, bullhead, yellow perch, largemouth bass, and common carp. Lake fishery surveys were completed in 1961, 1976, 1981, 1986, 1991, 2000, and 2006. A survey was completed in 2016 but results have not been published at this time. The 2006 survey showed an average catch rate for bluegill and black crappie with both species being smaller than average. The remaining gamefish species abundance is lower than average based on the survey catch rates. The fishery management plan call for stocking 140,000 walleye fry and 100 adult channel catfish in even numbered years.

  Silver Lake suffered from occasional winterkills due to low winter dissolved oxygen concentrations. To mitigate this, the City of Columbia Heights operates an aerator in the northwest corner of the lake.

  Shore fishing along the Three Rivers Park shoreline and the fishing piers installed by the park district is popular.

  Rough fish (primarily common carp) are identified as an internal loading source for phosphorous in the Silver Lake TMDL and the TMDL implementation plan identifies rough fish management as in implementation activity.

  To address this, the City of Columbia Heights along with the City of St. Anthony Village, City of New Brighton, Three Rivers Park District, and the Rice Creek Watershed District supported a study to quantify the carp population, assess spatial usage of the lake by carp, and remove carp biomass to improve water quality.

  The study determined that the Silver Lake supported 1,086 (± 140) individual adult carp or 129 pounds/acre using an 8.2 pound average weight and only the littoral acreage of the lake (62.5 acres). During the study period, biomass was reduced from 129 pounds/acre to roughly

39 pounds/acre resulting in improved water quality and aquatic vegetation density and distribution. This study has since been complete.

Aquatic Macrophyte Management – There is currently not an approved lake management or lake vegetation management plan for Silver Lake. However aquatic macrophyte surveys are completed frequently to assess overall vegetation density and distribution. Vegetation density, distribution, and diversity were metrics in the common carp study described in the previous section.

As part of the initial Silver Lake Carp Management project, Three Rivers Park District staff have continued to sample aquatic vegetation within Silver Lake. Survey methodology involves navigating to pre-determined points and sampling aquatic vegetation with a rake to assign a density rating of 1-5; one being the least dense and five being the most. A similar survey completed by Ramsey County was used for a comparative analysis. The 2008 survey resulted in only three different plant species being found, with an average and maximum density of one. Only 21percent of the sampling points contained vegetation.

In 2014, three separate species were found, and 66 percent of the sites were vegetated. The average density of those sites was a rating of two. In 2015, two separate surveys were performed; the first in June and the second at the end of August. The first survey resulted in 86 percent of the sites being vegetated and an average density of 3.13. The second survey showed 59 percent of the sites vegetated and an average rating of 1.54. The difference between the two surveys was that by the end of August curly leaf pondweed had died off and was not a significant portion of the plant biomass. These survey results represent the native vegetation community. Species diversity doubled by 2015 with six separate species observed; these species include *Potamogeton Crispus* (invasive), *Ceratophyllum demersum*, *Elodea Canadensis*, *Potamogeton Pusillus*, *Naja Flexilis*, and *Lemna minor*. Filamentous algae growth appears to have increased since water clarity increased and is a concern of lakeshore residents.

- Chemical Treatment: An in-lake alum treatment system was proposed in 2011. The system was proposed as a means to get immediate in-lake results for a moderate cost. The clarity of the water would improve in the short term, thereby helping long-term restoration efforts by increasing the light available to aquatic macrophytes. The system was not intended as a management step to reduce annual loading.

### 4.4.3. *Monitoring*

Ramsey County conducted bi-weekly in-lake monitoring during implementation between the months of May and September. Monitoring consists of the following parameters:

- Nutrients
- Chlorophyll-a
- Secchi disk
- Dissolved oxygen
- Specific conductance
- Temperature
- pH

Silver Lake is also monitored by private citizens as part of the Citizen Lake Monitoring Program. All water quality data obtained from monitoring Silver Lake is analyzed by RCWD to determine the water quality trends occurring in the lake.

*Lake Clarity Trend*

The median transparency in Silver Lake from 1973 to 2011 increased at a rate per decade that is insignificant (0.00 feet per decade per MPCA). Between 1973 and 2011 there was such high variability that there was no evidence of a long-term trend, either increasing or decreasing.

Water quality appears to be improving based on more current surface water sampling by Ramsey County Environmental services. This sampling shows a significant increase in secchi depth with the deepest average growing season secchi disk reading within the last 10 years documented in 2015. Additionally, chlorophyll- a, a surrogate for algal concentrations was measured at its lowest level in 2015. Citizen lake monitoring in 2015 recorded a 6.7 meter secchi disk reading; the deepest measurement ever documented. This depth resulted in the sampling station having to be moved. Total phosphorous concentrations have not improved to the extent that chlorophyll-a and secchi depths have improved; however, the 2015 average summer reading met state water quality standards and is on pace to meet those standards again this year.

Based on this recent data and a trend showing that secchi depth, chlorophyll-a, and total phosphorous growing season concentrations are meeting state water quality standards, delisting from the 303(d) impaired waters list may be appropriate.

In addition to the monitoring discussed above, spring and fall aquatic macrophyte surveys were recommended in the implementation plan in 2011.

More information on Silver Lake can be found in the “Silver Lake TMDL Implementation Plan” prepared by RCWD, Emmons & Olivier Resources, Inc and the MPCA in May 2011.

## 4.5. Other Assessments

Other studies conducted in Columbia Heights include:

- Southern Columbia Heights and Northeast Minneapolis Stormwater Retrofit Analysis, prepared by MWMO & Anoka Conservation District (2014)
- Houston Engineering H & H & Water Quality Modeling
- Barr Engineering H & H & Water Quality Modeling

# 5. GOALS AND POLICIES

## 5.1. Purpose

The primary goal of Columbia Heights' Surface Water Management Plan (SWMP) is to bring the City into statutory compliance and provide the City a framework for effective stormwater management. This includes guiding redevelopment activities and identifying and implementing district and regional, retrofits to the existing system. These retrofits consist of both projects and programs. Additionally, the plan provides clear guidance on how Columbia Height's intends to manage surface water in terms of both quantity and quality.

The goals of Columbia Heights' SWMP are consistent with the goals of the Mississippi Watershed Management Organization (MWMO) and Rice Creek Watershed District (RCWD), while addressing the more specific and changing needs of the City. This plan is an update to the 2000 Water Resources Management Plan and the goals of this plan were established in accordance with the guidelines contained in Minnesota Statutes 103B and Minnesota Rules 8410.

A general priority of the City is to cooperate, collaborate, and partner with other entities such as MWMO, RCWD and the MPCA as much as possible as the City implements this plan. Cooperation, collaboration, and partnering results in projects that are less likely to conflict with the goals of the affected entities, are better able to meet long-term goals, and are generally more cost-effective.

In addition to the goals and policies contained in this section, the City will annually review and update its Storm Water Pollution Prevention Plan (SWPPP) to effectively manage its stormwater system and be in conformance with the National Pollutant Discharge Elimination System (NPDES) MS4 Program. Refer to **Appendix B** for the most recent version of the City SWPPP.

## 5.2. Background

Since its last comprehensive plan, prepared a decade ago, the City of Columbia Heights has consistently maintained the following as its overarching goals for stormwater management:

- To continue to provide quality services with limited funding.
- To understand/adapt to the demographic changes taking place in the City.
- To improve the City's housing stock.
- To attract new residents and to retain existing residents and homeowners for the purpose of promoting household growth and stabilizing the tax base.
- To continue to redevelop the City's commercial and industrial property.

The 2040 Comprehensive Plan carries these overarching goals into the next decade, while also strengthening the City's tradition of supporting development and redevelopment.

Specific to the goals and policies of this Surface Water Management Plan are summarized by the following statements from the 2040 Comprehensive Plan:

> *"The City will coordinate planning for city parks, utilities, parking, ROW and other properties, with surface water management efforts to preserve and improve the quality of water resources within existing parks and open spaces."*
>
> *And*
>
> *"…the goal (of the plan) is to guide the City in managing its surface and ground water resources, and enables the City to develop drainage facilities in a cost-effective manner, while maintaining or improving the quality of its water resources."*

## 5.3. City of Columbia Heights SWMP Goals and Policies

### 5.3.1. *Water Quantity*

#### *5.3.1.1. Goal*

Reduce the impact of flooding to existing development and use development and redevelopment as an opportunity to retrofit flood control the existing system.

#### *5.3.1.2. Policies*

1. All designs must use NOAA Atlas 14 Precipitation Frequency Data in stormwater design calculations and modeling.

2. Emergency overflows and transient storage in parking lots, intersections, etc. must be considered when designing new or retrofitting to old storm sewer systems.

3. Detention basins shall be designed with capacity for the critical 100-year event. At a minimum, detention basins should maintain existing flow rates for the 2-, 10-, and 100-year 24-hour rainfalls

4. Drainage analyses shall utilize a hydrograph method of analysis. For the 24-hour rainfall event, an MSE3 distribution should be used. For shorter duration events other distributions may be used with the approval of the City Engineer.

5. All drainage system analyses and designs shall be based on ultimate full development land use patterns.

6. New development shall incorporate stormwater controls to prevent any increase in peak discharge rates for the 2-, 10-, and 100-year events, unless increased discharge is provided for in an approved regional ponding site, and flood storage volumes shall be maintained within the subwatershed.

7. Intercommunity water resources issues planning shall consider alternative solutions:

    a) All drainage studies or feasibility studies, whether by a WMO, water shed district, or municipality, leading to projects in a subwatershed with an intercommunity drainage issue, shall consider the impact of the project on the drainage issue and shall consider the total intercommunity project cost.
    b) Except in emergencies, no solutions or partial solutions to intercommunity drainage issues shall be implemented without prior completion of a feasibility study of options and adoption of a preferred option by the applicable WMO.

8. The following items shall be considered in the management of landlocked basins:

    a) The flood levels established for landlocked basins shall take into consideration the effects of water level fluctuations on trees,

vegetation, erosion, and property values. Steeply sloped shoreland subject to slope failure and shoreland damage should not be in contact with floodwaters for extended periods of time.

b) The capacity of proposed outlets to landlocked basins should not be so small as to cause extended duration of high water levels that would results in damage to upland vegetation.

c) Only the existing tributary area may discharge to a landlocked basin, unless a provision has been made for an outlet from the basin. The form of outlet may range from temporary pumps to gravity storm sewers. The outlet shall be implemented before increased water levels are likely to affect vegetation, slope stability, and property values.

d) The City will ensure RCWD's Rule C(5)(e) is met when creating outlets for landlocked basins within the RCWD boundary.

Definition: Landlocked basins are those where no outlet exists below proposed or existing structures.

9. When development occurs adjacent to a landlocked basin and the basin is not provided an outlet, freeboard should be determined based on one of three methods (whichever provides for the highest freeboard elevation):

   a) Three feet above the HWL determined by modeling back to back 100-year, 24-hour events,

   b) Three feet above the highest known water level, or

   c) Five feet above the HWL determined by modeling a single 100-year, 24-hour event.

   When modeling landlocked basins, the starting water surface elevation should be the basins Ordinary High Water elevation, which can be determined through hydrologic modeling or, in the case of a DNR regulated basin, from a DNR survey. Additionally, continuous simulation of average annual rainfall conditions will also provide insight into whether significant, adverse impact to vegetation would occur due to development around the landlocked basin.

   Definition: Freeboard is the vertical separation between the HWL of the simulated rainfall or runoff event and the lowest ground elevation adjacent to a structure.

10. For basins with a suitable outlet, freeboard will be two-feet above the HWL determined by modeling the 100-year Atlas 14 event. Emergency overflows a minimum of one and a half feet below lowest ground elevation adjacent to a structure should also be provided.

11. Adjacent to channels, creeks, and ravines freeboard will also be two feet to the 100- year Atlas 14 event elevation.

.

12. New storm sewers and open channels shall be designed using the Rational Method or other technical method approved by the City. Runoff Coefficient "C" shall be in accordance with the guidelines provided in the Minnesota Department of Transportation Drainage Manual.

13. Water quality treatment ponds (wet ponds) shall be designed in accordance with National Urban Runoff Program (NURP) standards.

14. Drainage and utility easements shall be dedicated over newly constructed stormwater management features (volume, rate control, and water quality treatment infrastructure) including but not limited to ponds, infiltration basis, rain gardens, underground storage and treatment devices, tree trenches, etc.

5.3.2. *Water Quality*

*5.3.2.1. Goal*

The City of Columbia Heights will work with MWMO and RCWD, and neighboring communities to maintain and/or enhance the water quality of Columbia Heights' lakes, wetlands, streams, and other water resources.

*5.3.2.2. Policies*

1. Surface waters are to be classified and water quality functions are to be maintained according to the provisions set forth in this plan.

2. Wetlands will be protected according to regulations and guidelines in the Wetland Conservation Act. The City will act as the local governmental unit (LGU) for wetlands within the MWMO boundary. RCWD is the WCA LGU for wetlands within the RCWD boundary.

3. Persons proposing or carrying out filling or other development activity in wetlands or water bodies identified in this plan will be notified by the City that their activity may be under the jurisdiction of the 1991 Wetland Conservation Act. They will be directed to contact the City for guidance and permits. For wetlands within RCWD boundary, persons proposing development activity near or within wetlands must also contact RCWD for guidance and permitting requirements.

4. The use of "Best Management Practices" will be promoted to help minimize pollutants in stormwater runoff.

5. The MWMO stormwater standards and flow chart (**Appendix D**) will be applied to development within the City.

    a) For developments that disturb one acre or more acre of land, 1.1 inches of runoff from the net increase in impervious area shall be captured and retained onsite. If this policy cannot be met due to site restrictions, the restrictions must be documented and the development shall follow the Flexible Treatment Options Approach through the MWMO Design Sequence Flow Chart.
    b) The City recognizes that infiltration may not be feasible in some areas either due to land or financial constraints. The City is committed to reducing the pollutant load over time and may consider an aggregate reduction of load across redevelopment areas. This action will occur as redevelopment occurs and will be reviewed on a yearly basis.

6. The City will accept other stormwater quality treatment methods on a case-by-case basis if they meet or exceed the removal efficiencies provided by a NURP pond.

7. Water quality monitoring efforts undertaken by the MWMO, RCWD or Anoka County Soil and Water Conservation District (SWCD) will be supported.

8. The City will actively participate in the development of TMDL studies for Sullivan Lake, Silver Lake and Highland Lake.

9. The City will annually review and update its Storm Water Pollution Prevention Plan (SWPPP).

10. The City will sweep the streets at least two times annually.

11. The City will require the inclusion of skimmers in the construction of new pond outlets, and add skimmers to existing system whenever feasible and practical. The designs shall provide for skimmers that extend 4 inches below the water surface and minimize the velocities of water passing under the skimmer to less than 0.5 feet per second for rainfall events having a one year return frequency. Skimming shall occur for up to the 5-year, 24-hour event.

12. Newly constructed ponds shall include an outlet design allowing for extended detention of the 1- to 5-year rainfall event. The hydrograph duration for pond discharge should extend a minimum of 24 hours for events within the 1- to 5-year range.

13. The City will discourage the use of fertilizers and pesticides in shoreland protection zones to minimize pollutant runoff to public waters.

14. The City will evaluate and implement a road salt application and storage program that reduces the amount of salt usage and chloride contamination. The MPCA website and the Winter Maintenance Assessment tool (WMAt) will be used to the greatest extent possible.

15. The City will continue to implement its retention/treatment basin clean out and maintenance plan that will address maintenance to the extent feasible and practical. The goal of this plan will be to assure that the City's retention and treatment basins will have the capability to retain and treat stormwater in future years.

5.3.3. *Recreation and Fish and Wildlife*

*5.3.3.1. Goal*

Protect and enhance fish and wildlife habitats, water recreational facilities, and water resource aesthetics

*5.3.3.2. Policies*

1. The neighborhood and regional benefits to wildlife habitat and aesthetics should be considered in any proposal to alter or eliminate wetlands, understanding that wetland elimination without mitigation is precluded by state law and understanding that even mitigated wetland impacts must meet strict sequencing guidelines.

2. The City will review recreational water body inlets and outlets for aesthetics.

3. Columbia Heights shall seek to coordinate with the Minnesota Department of Natural Resources (DNR) regarding development of DNR public waters and public water wetlands. Notwithstanding ordinance provisions, both existing and future, that control development of shoreland areas, the City will seek Minnesota DNR comments on development proposals adjacent to DNR public waters and public water wetlands. The City has adopted a Shoreland Ordinance meeting the requirements of the DNR. This can be found on the City's website.

4. The City will look to maintain their current ecosystem protection priorities using park redevelopment opportunities. The City will apply for grant opportunities as they arise. The City will also look to implement measures to protect water quality through parks and other recreation areas by minimizing pet waste, planting vegetated buffers, and implementing stormwater BMPs.

5. Water resources shall be maintained in such a manner as to preserve or restore their intrinsic aesthetic qualities and wildlife habitat.

6. The City will collaborate with the MWMO on monitoring activities they undertake throughout the City. These opportunities could include collecting additional data such as macrophyte surveys, assessments of internal phosphorus loading, inlet/outlet loads, and BMP pollutant removal efficiency. The City will utilize MWMO staff that are experienced in sampling, instrumentation and maintenance of stormwater flow and water quality monitoring, confined space entry, and other areas as needed.

### 5.3.4. *Enhancement of Public Participation; Information and Education*

#### *5.3.4.1. Goal*

Inform and educate the public concerning urban stormwater management and the problems pollutants cause if allowed to enter into our water resources.

#### *5.3.4.2. Policies*

1. Enact a public education program based on the following objectives to reduce stormwater pollution:

   a) Raise awareness of the problem and solutions,
   b) Promote community ownership of the all surface water features,
   c) Recognize responsible parties and actions to date,
   d) Merge public feedback into program execution.

2. Enact a public education program to satisfy the minimum control measures identified in the City's NPDES permit.

3. Coordinate education efforts with the watershed organizations so that redundant efforts are avoided.

### 5.3.5. *Groundwater*

#### *5.3.5.1. Goal*

Maintain and improve groundwater quality and promote groundwater recharge.

#### *5.3.5.2. Policies*

1. To the extent that Wellhead Protection Plans identify areas of groundwater recharge that require protection, the City shall work with the Minnesota Department of Health (MDH) and neighboring communities in developing adequate protection measures. The City will cooperate with other communities that are required to meet the timelines and key milestones described in the North and East Metro Groundwater Management Area (NEM-GWMA) described in Section 2.2.4. Because Columbia Heights does not use groundwater for municipal use, no specific actions are required.

2. Surface water management improvements in likely recharge areas and areas of high vulnerability to chemical or petroleum spills shall be designed to assist groundwater protection. Practically, this means infiltration shall not be considered in developments that include the potential for these types of spills.

Note: The City of Columbia Heights obtains its potable water from the City of Minneapolis Water Utility. Since Columbia Heights is not an active participant in the MDH Wellhead Protection Program, the City will have to rely on MDH and neighboring communities to identify 10-year capture areas. To the extent that future analyses identify these areas within Columbia Heights, the City will then use its subdivision authority to properly regulate these areas.

### 5.3.6. *Wetlands*

#### *5.3.6.1. Goal*

Protect and preserve wetlands through administration and coordination of the Wetland Conservation Act and City Ordinance.

#### *5.3.6.2. Policies*

1. The City will act as the local government unit responsible for enforcing the Wetland Conservation Act of 1991 for those wetlands located within the MWMO boundary. RCWD is the LGU for WCA within the RCWD boundary.

2. Wetland disturbance will be discouraged. Wetlands must not be drained, filled, or excavated wholly or partially, unless replaced by restoring or creating wetland areas of equal public value or as permitted by the Wetland Conservation Act.

3. Clearing and grading will be restricted within close proximity of the wetland boundary to provide for a protective buffer strip of natural vegetation to promote infiltration of sediment and nutrients. In the event that grading occurs close to the wetland boundary, native plant materials shall be reestablished as a buffer strip.

4. A wetland assessment will be required to be prepared for any project that includes a wetland. Minnesota Routine Assessment Methodology for evaluating wetland function (current version 3.0 but as updated in the future) is the required method of assessment.

5. Runoff shall not be discharged directly into wetlands without pretreatment of the runoff.

Refer to MWMO and RCWD Rules and Standards on their websites for Wetland Management Policies within the City. The City has adopted the Wetland Management Policies for each watershed through the adoption of this SWMP. Chapter 9 – Article I:

Zoning and Land Development of the City's ordinances lists requirements for permits regarding wetland impacts.

5.3.7. *Erosion and Sediment Control*

*5.3.7.1. Goal*

Prevent, to the extent possible, sediment from construction sites from entering the City's surface water resources and to control the erosion from drainageways within the City.

*5.3.7.2. Policies*

1. The City has adopted an Erosion and Sediment Control Ordinance that meets or exceeds standards contained in the NPDES construction site permit and watershed organization plans.

5.3.8. *Floodplains*

*5.3.8.1. Goal*

Control development in floodplains and floodways including those subject to FEMA Studies (Mississippi and Minnesota Rivers) and those that are not regulated by FEMA Studies like ponds, wetlands, lakes and channels within the City limits.

The City has adopted the following ordinance and policies:

1. Land use constraints along all open channels, storm sewer overflow areas, depressions, wetlands, and lakes will be managed based on their respective 100-year flood levels computed as part of this plan.

2. The City has adopted a floodplain and shoreline management ordinance consistent with Chapter 6120 of the 1991 Minnesota Rules. (Ordinance 1550). A copy of this ordinance can be found on the City's website.

5.3.9. *Columbia Heights NPDES Permit*

*5.3.9.1. Goal*

Operate and manage the City's surface water system consistent with best current practices and the City's NPDES Permit.

*5.3.9.2. Policy*

1. Projects to correct existing deficiencies, to the extent they are identified, will be prioritized as follows:
   a) Projects intended to reduce or eliminate flooding of structures in known problem areas.
   b) Projects intended to improve water quality in the City's lakes.
   c) Projects intended to retrofit water quality treatment into developed areas.
   d) Projects intended to reduce maintenance costs.
   e) Projects intended to restore wetlands and habitat.

2. The City will actively inspect, and properly operate, maintain and repair its storm water system. The City will follow a regular inspection, cleaning, and repair schedule. Frequency of maintenance will be event-based and informed by

experience and inspection history. The City's SWPPP pages 13-14 outlines the frequency of these activities. The SWPPP can be found in Appendix B of this Plan. Section 5 of this Plan provides some guidelines on pond maintenance and inspection cycles, but the SWPPP will remain the definitive source on the City's intended maintenance and inspection schedules

3. The City will follow best management practices on its own lands and for its own projects including street reconstruction projects – in accordance with the NPDES construction site permit and the City's NPDES MS4 Permit.

5.3.10. *Nondegradation*

*5.3.10.1. Goal*

Improve the quality of the City's and region's surface water resources by, whenever feasible, decreasing the total phosphorous, total suspended solids and water volume discharge.

*5.3.10.2. Policy*

1. Development and redevelopment projects will be reviewed in the context of nondegradation and BMPs will be applied as necessary to maintain or reduce current phosphorous, total suspended solids loads and water volume loads.

2. Treatment will be retrofitted where opportunities on public projects and redevelopment projects exist.

3. The nondegradation strategies of no increase in Total Phosphorus (TP), Total Suspended Solids (TSS) and water volume shall, as much as practical, pertain to discharge to DNR public waters and public watercourses and shall not solely be considered on a city-wide basis.

5.3.11. *Conformance to MPCA Requirements*

*5.3.11.1. Goal*

Ensure that the City is in conformance with requirements set forth by the MPCA for MS4 communities.

*5.3.11.2. Policy*

1. The City currently has a Construction Site Storm Water Management Ordinance and Erosion Control Ordinance, found on the City's website. The City will continue to review and amend this ordinance as required to be consistent with the NPDES Construction Stormwater permit and MS4 permit requirements.

2. As a fully developed community that is retrofitting water quality and infiltration to public and private projects, Columbia Heights would not benefit from a wetland inventory as much as developing communities. Columbia Heights will follow wetland management as set forth in the RCWD and MWMO Rules.

3. There will be no net increase in peak runoff rates from existing conditions for the 2-, 10-, and 100-year storm events.

4. All new development must meet TSS and TP reductions of 90% and 60% respectively.

5. All best management practices for redevelopment must meet TSS and TP reductions of 90% and 60% respectively.

5.3.12. *Financial Management*

*5.3.12.1. Goal*

Ensure that the costs of the surface water system are equitably distributed.

*5.3.12.2. Policy*

1. The City will periodically update its stormwater utility rate structure to accomplish the following:

   a. Meet the requirements of its NPDES permit.
   b. Provide for the maintenance of ponds and outfall structures.
   c. Conduct repairs to the system.
   d. Update its system planning efforts.
   e. Implement rainwater gardens or other water quality retrofits with downtown redevelopment.

2. Other funding sources will be pursued and used including land sale proceeds, partnerships with the Watersheds, State Aid funds, grants, etc. to pay for the implementation activities, when available and appropriate.

5.3.13. *System Design*

*5.3.13.1. Goal*

Ensure that the City's goals are met to preserve, protect, and manage its water resources while also meeting federal, state and watershed regulations.

*5.3.13.2. Policy*

1. The City of Columbia Heights will require new or re-development within the City to follow their "Surface Water Management Design Standards" (March 2016). The design standards have incorporated stormwater requirements of the MWMO and RCWD. For projects located within the RCWD boundary, the more stringent rules shall apply to development. RCWD shall be consulted to determine any necessary permits required from the watershed district.

   The design standards were established to follow the goals and policies that define the City's stormwater management program, which are implemented via the City's Land Use Ordinance (Chapter 9 – Article I: Zoning and Land Development). Generally speaking, the watershed regulations meet the following objectives:

   a) Minimize increases in stormwater runoff rates from any development in order to reduce flooding, siltation and erosion and to maintain the integrity of stream channels,
   b) Minimize increases in nonpoint source pollution caused by stormwater runoff

from development which would otherwise degrade local water quality,
c) Minimize the total annual volume of surface water runoff that flows from any specific hydrologic regime to the maximum extent practicable,
d) Ensure that these management controls are property maintained and pose no threat to public safety, and
e) Implement stormwater management controls to help meet current and future TMDL goals, to address the need to improve water quality, and to meet objectives set forth in this plan.

The entire design standards document can be found in **Appendix C**.

The City's current Land Use Ordinance adopts by reference the Surface Water Management Design Standards document. These Design Standards will be updated in 2018 to incorporate the current MWMO standards; hence adopting the MWMO standards by reference. The updated standards will also be consistent with RCWD rules and the Implementation Table of this Plan. A schedule for this process is outlined below:

- June 2018– August 2018: Review current Design Standards and perform a gaps analysis in comparison with MWMO stormwater standards and flow chart.
- September 2018-October 2018: Update Design Standards and provide a review period that includes MWMO.
- November 2018/December 2018: Approve Design Standards
- January 1, 2019: Begin enforcement of newly adopted Design Standards.

*5.3.13.3. Policy*

1. The City will look for opportunities to partner with the MWMO on stormwater management. For projects where current city code is a limiting factor in proceeding with: green infrastructure + habitat projects; "One Water projects" (integrated wastewater, stormwater, water supply); multi-parcel projects; and shared public/private regional or restorative district system projects the City will review the barriers identified. The City will seek to modify the code /ordinances in a manner that allows for the project to continue while also meeting the City's needs.

5.3.14. *Water Quality System Concepts*

The only effective way to maintain high quality water bodies is to prevent sediment, nutrients, and other materials from entering the storm drainage system. Complete interception of stormwater for treatment at the point of discharge is not currently feasible, though the City encourages the implementation of techniques such as rainwater gardens, infiltration areas, and filtration swales that capture a portion of runoff at the point of generation. Application of these small-scale techniques should be on a site-specific basis.

Pollutant Control

The three main sources for degradation of water quality are:

1. Solids and associated chemicals (including calcium chloride and salt) from erosion and street sanding;
2. Organic material, such as leaves, that enter stormwater ponds; and
3. Fertilizers and other chemicals from impervious surfaces or lawn care.

Identification of the source and implementation of reasonable control measures can minimize the

degradation of Columbia Heights' waterbodies.

In areas where development is taking place, stormwater runoff frequently contains substantial quantities of solids. Most commonly, these sediments are carried by runoff into the storm sewer from large grading sites though fully developed areas also generate sediment loads particularly from winter sanding operations and in areas of structurally failing pipes. For developing areas, strict on-site erosion control practices are required to prevent sediments from entering downstream water bodies. The City conducts inspections to verify that the erosion control practices have been installed and maintained properly.

The BMPs recommended in the MPCA's Protecting Water Quality in Urban Areas should be followed for all development. The Minnesota general NPDES stormwater permit for construction activity requires a permit for construction activities that disturb one or more acres.

When disturbing 10 or more acres, developers are required to provide temporary sedimentation basins to treat the runoff from their grading sites. These basins are intended to prevent the introduction of sediment and its associated pollution into the storm sewer system and are required to function, in their various forms, until grading has ceased and adequate cover has been established. At a minimum, they should meet the requirements set forth in the NPDES general permit for construction activities.

## 5.4. County, State and Federal Agency Requirements

This section presents a synopsis of the current agency requirements while acknowledging the existence of other requirements that may be applicable. The City is committed to the preservation and enhancement of its wetlands and water resources through full compliance with local, state, and federal wetland regulations.

### 5.4.1. *Minnesota Department of Natural Resources*

At the state level, Types 3, 4, and 5 wetlands are protected by statute. These are areas typically recognized as wetlands and are generally characterized by open water and emergent vegetation throughout most of the year. The state has jurisdiction over only those wetlands appearing on the state's inventory of protected waters. Further, wetlands in the inventory were generally those in excess of 10 acres in rural areas or in excess of 2.5 acres in municipalities and incorporated areas. Figure 7 shows the DNR protected waters within the Columbia Heights study area.

If an area meets the jurisdictional criteria but is not on the state's inventory, it is not regulated by the DNR. If it does not meet the statutory criteria but is listed on the inventory, it still is subject to DNR regulation. There is no mechanism presently for adding wetlands to or deleting wetlands from the inventory. The inventory was begun in the late 1970s and all state inventories were completed during the early 1980s. The DNR rules specify that permits may not be issued for any project except those that provide for public health, safety, and welfare. Any private development projects are effectively excluded from permit consideration by this requirement.

The other powers and duties of this Minnesota state agency and its commissioner are wide-ranging. As they affect surface water management within the City they include:

- Regulation of all public waters inventory waterbodies within the City – to the extent of their ordinary high water level
- Regulation of certified floodplains around rivers, creeks, lakes, and wetlands
- Management of the Flood Hazard Mitigation program
- Shoreland Management

### 5.4.2. *U.S. Army Corps of Engineers (USACE)*

The Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (USACE) regulate the placement of fill into all wetlands of the U.S. In 1993, there was a modification of the definition of "discharge of dredged material" to include incidental discharges associated with excavation. This modification of the "discharge of dredged material" definition meant that any excavation done within a wetland required the applicant to go through Section 404 permitting procedures. In 1998, however, this decision was modified so that excavation in wetlands is now regulated by the USACE only when it is associated with a fill action.

### 5.4.3. *Board of Water and Soil Resources (BWSR)*

The local and regional wetland rules are governed by the Wetland Conservation Act (WCA). The WCA, passed in 1991, extends protection to all wetlands unless they fall under one of the exemptions of the WCA. The WCA follows a "no net loss" policy. The wetlands covered under the WCA must not be drained or filled, wholly or partially, unless replaced by restoring or creating wetland of at least equal public value under an approved replacement plan. Replacement ratio is typically 2:1 (two acres created for every one acre filled) for wetland impacts.

A designated LGU is responsible for making exemption and no-loss determinations and approving replacement plans. Currently, Columbia Heights acts as the LGU for WCA within the City's subdivision authority for those areas within the MWMO boundary. RCWD is the LGU for WCA for wetlands within the RCWD boundary.

The powers and duties of this Minnesota state agency also include:

- Coordination of water and soil resources planning among counties, watersheds, and local units of government.
- Facilitation of communication among state agencies in cooperation with the Environmental Quality Board.
- Approval of watershed management plans.

### 5.4.4. *Minnesota Pollution Control Agency (MPCA)*

The MPCA implements provisions of Section 404 of the Clean Water Act with guidance from the EPA through a permitting process. The Section 404 permit also requires a Section 401 water quality certification before it is valid. The EPA has given Section 401 certification authority to the MPCA.

The powers and duties of this Minnesota state agency and its commissioner include:

- Fulfilling mandates from the EPA, particularly in regard to the Clean Water Act.
- Administration of Columbia Heights' NPDES Phase II MS4 permit.
- Administration of the NPDES construction site permit program.
- Administration of the NPDES industrial site discharge permit program.
- Development of TMDLs for waterbodies and watercourses in Minnesota (often in conjunction with other agencies or joint powers organizations such as watersheds).

### 5.4.5. *Environmental Protection Agency*

As it relates to surface water management within Columbia Heights, this agency is charged with interpreting and applying aspects of the Clean Water Act. This has led to the City's need for its NPDES MS4 permit. Total maximum daily load limits, a new initiative mandated by the EPA, also stem from the EPA's role as steward of the Clean Water Act.

5.4.6. *Mississippi Watershed Management Organization and Rice Creek Watershed District*

The powers and duties of these Minnesota statutory authorities include:

- Approval authority over local water management plans.
- Ability to develop rules regarding management of the surface water system.
- Ability to determine a budget and raise revenue for the purpose of covering administrative and capital improvement costs.
- Regulation of land use and development when one or more of the following apply:
    - The City does not have an approved local plan in place.
    - The City is in violation of their approved local plan.
    - The City authorizes the watershed toward such regulation.
- Other powers and duties as given in statute and joint powers agreements.

5.4.7. *State and Federal Jurisdictional Boundaries for Public Wetlands and Waters*

Wetlands are delineated in accordance with the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1987). Wetlands must have a predominance of hydric soils. Hydric soils, by definition, are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, under normal circumstances, a prevalence of hydrophytic (water tolerant) vegetation typically adapted for life in saturated soil conditions. The USACE and BWSR regulate wetlands as defined by a jurisdictional delineation

5.4.8. *Anoka County*

Anoka County SWCD sits on the Technical Evaluation Panel for administration of the Wetland Conservation Act. Anoka County SWCD also conducts NPDES erosion control inspection for construction sites that have obtained the NPDES Construction Permit for Construction Activities. This inspection program is a pilot project funded by the MPCA.

5.4.9. *Metropolitan Council*

Metropolitan Council, through Metropolitan Council Environmental Services, serves as a review agency for local surface water management plans. They also review and approve municipal comprehensive plans.

# 6. IMPLEMENTATION PROGRAM

## 6.1. General

The Implementation Plan section of the Columbia Heights Surface Water Management Plan (SWMP) describes those activities and programs the City will develop toward improving its surface water management program. Since Columbia Heights is largely developed, capital outlay for the trunk sewer system has already occurred so future outlay will be for upgrades and replacement, as well as water quality retrofits as part of redevelopment. Typically, costs for upgrade and replacement would be borne by either the stormwater utility fund or would be recovered through bonds or direct assessment. Given this, a typical financing mechanism developed in most SWMPs, an area charge, is not a part of the Columbia Heights SWMP. The City will partner with MWMO and RCWD on stormwater planning and funding for public and private redevelopment to provide additional stormwater treatment, habitat connections, and alleviate any known flooding areas.

**Table 6.1** contains a comprehensive list of the MS4 activities and projects, programs, and studies that make up the City of Columbia Heights implementation program for the next 10 years (2017 through 2026). The program was developed by evaluating the requirements in the MS4 permit (see MS4 SWPPP Application for Reauthorization in **Appendix B**), reviewing existing information (**Section 2**), identifying potential and existing problems (**Section 4**), reviewing goals and policies (**Section 5**), and then assessing the need for programs, studies, maintenance, or projects. Costs were estimated, possible funding sources were identified, and a schedule was developed to complete the implementation activities. It is anticipated these tables will be updated/revised on an annual basis.

Section 6 also includes:

- An overview of the City's NPDES permit
- A discussion of operation and maintenance procedures and strategies
- An outline of an education program
- Financial considerations for the stormwater utility
- A section referencing applicable design standards for stormwater management
- A section on Watershed implementation priorities
- Implementation priorities for the City

## 6.2. Implementation Priorities

The implementation components listed in **Table 6.1** were prioritized to make the best use of available local funding, meet MS4 Permit requirements, address existing stormwater management problems, and prevent future stormwater management problems from occurring. **Table 6.1** identifies which activities are MS4 Permit Requirements, Annual Requirements, or Capital Projects/Programs/Studies. Projects from the City's Capital Improvement Plan (CIP) are listed and noted in **Table 6.1**. **Figure 14, Appendix A**, shows the locations of these CIP projects. The City's implementation plan reflects its responsibility to protect the public health, safety, and general welfare of its citizens by addressing problems and issues that are specific to the City of Columbia Heights. The City will look for opportunities to increase green space, habitat potential and options for stormwater reuse; and when needed will modify ordinances or best management practices to provide more flexibility in locating District or Regional stormwater treatment for multiple parcels.

**Table 6.1** lists the implementation priorities for the City of Columbia Heights. Some of these projects involve additional project partners, as noted in the table.

## 6.3. Operation and Maintenance

### *6.3.1. Activities*

The stormwater system is a major investment for the City of Columbia Heights – both in terms of initial capital cost and ongoing maintenance costs. The City's primary challenge is to fund ongoing maintenance and periodic upgrades, rehabilitation, and reconstruction. As the system ages, reconstruction will take increasingly more of the stormwater budget. Typically, system maintenance is funded by the city's stormwater utility. The City funds retrofits, upgrades, and reconstruction through a number of mechanisms including the stormwater utility, grants, public/private partnerships, watershed participation, assessments, and the general fund.

The City repairs and maintains all City owned stormwater infrastructure. The City's stormwater system maintenance responsibilities include the following:

- Street sweeping
- Cleaning of sump manholes and catch basins
- Repair of catch basins and manholes
- Assessing pipe condition (typically by televising)
- Inspection of storm sewer inlet and outlet structures
- Pond mowing and other vegetation maintenance
- Excavation of accumulated sediments from ponds

The City has maintained its pipe system for decades and staff has a strong grasp on the costs associated with this. As new development and redevelopment bring ponds and other BMPs into the system, city staff will find that maintenance becomes an increasingly large portion of both staff time and the overall maintenance budget. It is important to quantify the extent of this future commitment so that the funds necessary for pond maintenance activities can be collected via the city's storm water utility. The City's SWPPP found in Appendix B provides additional clarification regarding MS4 requirements for operation and maintenance of City owned stormwater infrastructure.

### *6.3.2. Stormwater Basins*

Stormwater basins represent a sizable investment in the City's drainage system. General maintenance of these facilities helps ensure proper performance and reduces the need for major repairs. Periodic inspections are performed to identify possible problems in and around the basin. Inspection and maintenance cover the following:

- Basin outlets
- Basin inlets
- Side slopes
- Illicit dumping and discharges
- Sediment buildup

### *6.3.3. Sump Manholes and Sump Catch Basins*

Sump manholes and sump catch basins are included in storm sewer systems to collect sediments before they are transported to downstream waterbodies. These structures keep sediments from degrading downstream waterbodies. Once sediments are transported to a lake or pond, they become much more expensive to remove.

Sediments originate primarily from road sanding operations, although construction activity and erosion can also contribute. Since these structures are designed to collect these sediments, they are routinely cleaned to provide capacity for future sedimentation. Suction vacuum equipment is typically used.

*6.3.4. Storm Sewer Inlet Structures*

To fully utilize storm sewer capacity, inlet structures are kept operational in order to get runoff into the system. All efforts are made to keep catch basins and inlet flared ends free of debris and sediments so as not to restrict inflow and cause flood damage. Leaf and lawn litter are the most frequent cause of inlet obstructions. On a routine basis, City staff visually inspects inlet structures to ensure they are operational.

*6.3.5. Open Channels and Ravines*

Overland flow routes constitute an important part of the surface water drainage system. Open channels are typically vegetated and occasionally lined with more substantial materials. The lined channels typically require little or no maintenance. Vegetated channels are periodically inspected and maintained, as high flows can create erosion within the channel.

Eroded channels can contribute to water quality problems in downstream waterbodies as the soil is continually swept away. If not maintained, the erosion of open channels would accelerate and the repair would become increasingly more costly. The erosions of channels are accelerated when these are at steep gradients and are used for conveying urban stormwater.

*6.3.6. Piping System*

The storm sewer piping system constitutes a multimillion-dollar investment for the City. The City performs a comprehensive maintenance program as part of their annual Street Rehab Program to maximize the life of the facilities and optimize capital expenditures. The following periodic inspection and maintenance procedures are followed:

- Catch basin and manhole castings are inspected and are cleaned and replaced as necessary.
- Catch basin and manhole rings are inspected and are replaced and/or regrouted as necessary.
- Catch basin and manhole structures are inspected and are repaired or replaced as needed. Pipe inverts, benches, steps (verifying integrity for safety), and walls are checked. Cracked, deteriorated, and spalled areas are grouted, patched, or replaced.
- Storm sewer piping is inspected either manually or by television to assess pipe condition. Items looked for include root damage, deteriorated joints, leaky joints, excessive spalling, and sediment buildup. The piping system is programmed for cleaning, repair, or replacement as needed to ensure the integrity of the system.

*6.3.7. De-Icing Practices*

Minnesota receives approximately 54 inches of snow during a typical year. This requires a large amount of de-icing chemicals (primarily salt) to be applied to roads and sidewalks each winter.

Estimates indicate that 80 percent of the environmental damage caused from de-icing chemicals is a result of inadequate storage of the material (MPCA 1989). Improper storage as well as overuse of salt increases the risk of high chloride concentrations in runoff and groundwater. High chloride concentrations can be toxic to fish, wildlife, and vegetation.

The following procedures are used for storing de-icing chemicals in the City:

1. De-icing material and sand is stored in waterproof sheds. When and where this is not possible, stockpiles are covered with polyethylene and placed on impervious surfaces. No salty runoff water shall leave salt sheds
2. Road de-icing stockpiles are not located near municipal well areas or in other sensitive groundwater areas.

The City shall encourage businesses within the City to apply the MPCA's Twin Cities Metropolitan Area Chloride Management Plan, particularly the following procedures:

- Promote businesses using the Winter Maintenance Assessment tool (WMAt), a web-based tool maintained by the MPCA that helps identify opportunities to reduce salt use and save money
- Encourage businesses to use contracts that do not bill by the weight of salt used in order to reduce over-use.
- Re-use winter truck wash water for brine making, and reduce the amount of salt on a truck prior to entering the wash
- Create a chart of items to investigate that may reduce salt use/waste.

*6.3.8. Street Sweeping*

Street sweeping is an integral part of the City's effective surface water management system. It greatly reduces the volume of sediments that have to be cleaned out of sump structures and downstream waterbodies. The City has a "street sweeping policy" that includes at least two sweeping operation per year. Spring sweeping begins either late March or early April after the risk of later snowfall has passed and targets sand left from winter sanding operations. Occasional fall sweeping occurs after leaf fall.

Columbia Heights does not allow residents to rake leaves into the street for municipal pick up. Anoka County and the City encourage residents toward composting their yard waste. If residents desire to have yard waste removed by their private hauler then compostable bags or reusable containers are required. Alternately, there are composting sites within Anoka County where yard waste can be brought for a fee. Overall the City's approach to minimizing organic matter entering its stormwater system greatly reduces the incidence of inlet blockages and protects the water quality of downstream waterbodies.

The objective of the City's street sweeping and de-icing programs is to minimize impacts from leaf litter, sand, salt and other debris on the surface waters of the City.

## 6.4. Education and Outreach

*6.4.1. General*

Education can play an important role in any effort to implement a stormwater management program like the one outlined in this SWMP. The objectives of an education effort are different, depending on the target audience. In general, the target audience for this education program is City staff, City residents, and the development community. The following sections describe why education of each of these groups is important and presents educational methods that may be used for each audience.

One of the more important aspects of education and outreach is close coordination with watershed organizations so that redundant efforts are avoided. The City will work to raise the profile of its watershed organizations by including articles on watershed activities in its informational materials. One simple step toward stronger city/watershed partnership is providing a

link to each watersheds website on the city website.

*6.4.2.City Staff*

City Staff have a wide range of responsibilities for implementing this plan. These include:

- Implementing street sweeping and spill response programs.
- Maintaining detention basin/stormwater management pond performance and system operability.
- Planning for and management of projects to enhance pollutant removal performance, wetland quality, etc.
- Carrying out grounds maintenance of City-owned lands/facilities in a way that sets a good example for residents.
- Utilizing BMPs in application of ice control material.
- Application of Best Management Practice policies and regulations to new and redevelopment projects.
- Planning and delivering education programs.
- Working out cooperative arrangements with regulatory and non-regulatory organizations to achieve SWMP objectives.
- Assisting the City Council in the application of the SWMP policies.

Because these responsibilities involve many different levels of City staff, City staff members are trained to have a basic understanding of the SWMP, including:

- A description of the major stormwater management issues (including known stormwater management problem areas, stormwater management expectations for new and re-development projects, and incorporation of stormwater mitigation into capital improvement projects, and regulatory jurisdictions).
- The objectives of the SWMP and the general approach outlined in the SWMP for resolution of these issues.
- The responsibilities of the different work units in implementing the SWMP.
- The information the SWMP provides.
- Identification of in-house experts.

This information is disseminated in presentations at staff meetings, coverage in internal newsletters, and issuance of internal memos.

As part of its NPDES permit, the City has also made a commitment to continuing education for staff in stormwater management. This will take the form of attendance at conferences and workshops.

## 6.5. Financing and the Stormwater Utility

The City will use funds generated from its Stormwater Utility as the primary funding mechanism for its implementation program including; maintenance, repairs, capital projects, studies, etc. If funds from this utility fee do not cover necessary costs, the City will consider adjusting the Stormwater Utility Fee to cover the costs associated with the implementation program. The City will continue to review the stormwater utility fee annually and adjust based on the stormwater related needs of the City and other available funding mechanisms. The City will also take advantage of grant or loan programs to offset project costs where appropriate and cost-effective. The City will look to partner with the MWMO, RCWD, and ACD on cost-sharing for projects within the respective boundaries. Partnership roles will be defined on a project by project basis.

Columbia Heights is a regulated MS4 under the Phase II NPDES Permit. There is a cost associated with preparing an NPDES permit and the associated Storm Water Pollution Prevention Plan (SWPPP). The NPDES permit and SWPPP commit the city to certain activities, including capital projects, for the purpose of improving the quality of the City's stormwater discharge.

## 6.6. Plan Revision and Amendments

The City may need to revise this Plan to keep it current. The City will review current ordinances and related policies with MS4 permit updates to ensure consistency. The City will also review the implementation of these policies to ensure the intent is being met. Any significant amendments that are made to the plan must be submitted to the MWMO, RCWD, and Met Council for review and approval before adoption by the City. The City anticipates updating the Implementation Plan annually. These changes will be submitted to the Watersheds for their record but not for review and approval. The City may amend this plan at any time in response to a petition by a resident or business. Written petitions for plan amendments must be submitted to the City Manager. The petition must state the reason for the requested amendment, and provide supporting information for the City to consider the request.

The City may reject the petition, delay action on the petition until the next full plan revision, or accept the petition as an urgent issue that requires immediate amendment of the plan. The City of Columbia Heights may also revise/amend the plan in response to City-identified needs. This Plan is intended to be in effect for 10 years per state statute. The Plan will be revised/updated at that time, to the extent necessary.

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**TABLE 6.1**

**LOCAL WATER MANAGEMENT IMPLEMENTATION PLAN**

| No. | Project Description | 10 Year Total Cost Estimate [1,3] | Possible Funding Sources [2] | Proposed Cost By Year[1] | | | | | | | | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | |
| **CIP** | | | | | | | | | | | | | | |
| 1 | Trunk Storm Sewer Lining: Central to Jackson - The storm sewer along 44th Avenue from Central Avenue to Quincy Street consists of a 48-inch and 54-inch RCP. These pipes were televised and there were several areas that showed joint deficiencies and structural deficiencies. The structural issues may be related to the pipe depth and the higher traffic volumes on 44th Avenue. Lining the pipes will help maintain pipe integrity and prevent further problems from occurring in the future. | $225,000 | Stormwater Utility, Grants | $225,000 | | | | | | | | | | See City's CIP, Figure 14 ID 13-04 |
| 2 | Tyler Place Storm Sewer Improvement - This project involves the existing storm sewer system on 44th Avenue east of Central Avenue to Tyler Place. The project includes replacing 48-inch storm sewer and manholes with long radius bends and partial replacement of a deteriorated 48-inch RCP and CMP pipe. The 48-inch CMP currently has 90 degree bends and missing manhole bottoms. Long radius bends will improve the hydraulic capacity of the storm sewer. | $205,000 | Stormwater Utility, Grants | | | $205,000 | | | | | | | | See City's CIP, Figure 14 ID 14-01 |
| 3 | Boat Landing Pond Reconstruction - This project involves modifying the existing regional pond located near Silver Lake. The pond receives runoff from an area tributary to 41st Avenue and to the west. Silver Lake has an approved TMDL and this project will reduce the phosphorus loading to Silver Lake, and assist in meeting the City's loading requirement. Currently the pond inlet and outlet are located near each other, which reduces the effectiveness of water quality treatment. | $275,000 | Stormwater Utility, Grants, RCWD | | | $275,000 | | | | | | | | See City's CIP, Figure 14 ID 14-04 |

| No. | Project Description | 10 Year Total Cost Estimate [1,3] | Possible Funding Sources [2] | Proposed Cost By Year[1] | | | | | | | | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | |
| 4 | 40th Ave from Central Ave to Labelle Pond Improvements and Reconstruction - Based on televising records, structures and piping are deficient. This project will line the existing piping and construct new storm sewer on the north side of 40th Ave to capture north drainage and redirect to Labelle Park. This project will eliminate localized flooding problems onto private property. | $275,000 | Stormwater Utility, Grants | | | | $275,000 | | | | | | | See City's CIP, Figure 14 ID 15-01 and 15-03 |
| 5 | Annual Storm Infrastructure Repair - Work will be conducted as part of the annual street reconstruction project zone areas to replace and/or repair catch basins, manholes, and other stormwater structures. | $250,000 | Stormwater Utility, Grants | $25,000 | $25,000 | $25,000 | $25,000 | $25,000 | $25,000 | $25,000 | $25,000 | $25,000 | $25,000 | See City's CIP |
| 6 | Gauvitte Park Area Flood Control/Water Quality Improvements - This project will include surface water improvements for flood mitigation and water quality BMPS based on the completed modeling report. Flood control improvements will address larger areas prone to flooding. Water quality improvements will provide phosphorus and TSS reduction prior to the Mississippi River. | $425,000 | Stormwater Utility, Grants, MWMO | | | $425,000 | | | | | | | | See City's CIP Figure 14 ID 18-03, 18-01 and 19-01 |
| 7 | 44th and Tyler Place Flood Mitigation - Properties located at 4347 and 4357 Tyler Place, 981 and 1016 44th Avenue, and 980 43 ½ Avenue have experienced localized flooding during short duration, high intensity rainfall events. Proposal would be to purchase 981 44th Avenue and demolish, purchase an additional easement and construction of an overflow basin along with berming. Project would remove one property historically prone to flooding and provide additional protection to the 100 year storm event for other properties. | $325,000 | Stormwater Utility, Grants | | | | | $325,000 | | | | | | See City's CIP, Figure 14 ID 16-03 |
| 8 | Railroad Yard Pipe Replacement - Located on 39th Avenue and west of California Street and through an elevation change to the railroad yards. Work would include the replacement of a failed CMP pipe system along with retaining wall and slope restoration. To make the significant vertical transition from 39th Avenue to the railroad yard, a vertical system of piping was placed using CMP pipe. A variety of backfill was used and placed without compaction. Both the piping and backfill have failed. | $360,000 | Stormwater Utility, Grants | | | | | | | $360,000 | | | | See City's CIP, Figure 14 ID 20-01 |
| 9 | Stinson Boulevard Water Quality - Construction of a large bio-infiltration basin along Stinson Boulevard will treat runoff prior to discharging into Silver Lake. This project was identified in the Silver Lake TMDL Implementation Plan. The City will look to partner with RCWD and ACD to help fund the project. | $60,000 | Stormwater Utility, RCWD, ACD, Grants | $60,000 | | | | | | | | | | Silver Lake TMDL Implementation Plan |

| No. | Project Description | 10 Year Total Cost Estimate [1,3] | Possible Funding Sources [2] | Proposed Cost By Year[1] | | | | | | | | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | |
| 10 | Hydrodynamic Device - Intersection of 39th Ave and Johnson St NE - Hydrodynamic device could be installed to accept runoff from the drainage area north of 39 th Ave. NE. A device at this intersection provides benefit due to the convergence of multiple storm sewer lines at a single location. | $56,000 | Stormwater Utility, Grants, MWMO, ACD | | | | | | | | | | $56,000 | Southern Columbia Height and NE Mpls Stormwater Retrofit Analysis Report by ACD; Project ID 1-A |
| 11 | Curb Cut Raingardens - Curb-cut rain gardens could be installed on private property in various locations to maximize contributing drainage area and ensure close proximity to an existing catch basin if an underdrain would be required. Homeowner participation would be the driving factor for this project, with assistance from MWMO, ACD and the City. | $3,000 | Stormwater Utility, Grants, Homeowner Assistance, MWMO, ACD | | | $1,000 | | | $1,000 | | | | $1,000 | Southern Columbia Height and NE Mpls Stormwater Retrofit Analysis Report by ACD |
| 12 | Disconnect Filtration Basin - N of 37th Ave NE - The proposed filtration basin is located on private property behind the apartment complex adjacent to 37th Ave. NE. There is a large open space that could be converted to a filtration basin into which the existing storm sewer line could be daylighted. This project assumes a partnership could be developed with the apartment complex, so no land acquisition costs were included. | $22,000 | Stormwater Utility, Grants, MWMO, ACD | | | | | | | | $22,000 | | | Southern Columbia Height and NE Mpls Stormwater Retrofit Analysis Report by ACD; Project ID 2-E |
| 13 | Disconnect Filtration Basin - Huset Park - A filtration basin within Huset Park was proposed to provide treatment for the drainage area north of the site. The storm sewer line draining south along Jefferson St. NE would be directed into the basin. | $70,000 | Stormwater Utility, Grants, MWMO, ACD | | | | | | $70,000 | | | | | Southern Columbia Height and NE Mpls Stormwater Retrofit Analysis Report by ACD; Project ID 8-A1 and 8-A2 |
| 14 | Water Reuse in Huset Park - A water reuse system has been proposed in the southwestern portion of Huset Park. Based on feasibility, a 100,000 gallon cistern was proposed. Cost share would be needed from MWMO and ACD. | $160,000 | Stormwater Utility, Grants, MWMO, ACD | | | | | | | | | $80,000 | $80,000 | Southern Columbia Height and NE Mpls Stormwater Retrofit Analysis Report by ACD; Project ID 8-C |
| 15 | Iron Enhanced Sand Filter at Huset Park Pond - An Iron enhanced sand filter was proposed as an improvement to the Huset Park pond treatment. The addition of the IESF will increase the reduction of dissolved phosphorus. | $70,000 | Stormwater Utility, Grants, MWMO, ACD | | | | | | | $70,000 | | | | Southern Columbia Height and NE Mpls Stormwater Retrofit Analysis Report by ACD; Project ID 9-A |

| No. | Project Description | 10 Year Total Cost Estimate [1,3] | Possible Funding Sources [2] | Proposed Cost By Year[1] | | | | | | | | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | |
| **SWPPP** | | | | | | | | | | | | | | |
| 16 | Public Education and Outreach Program - Refer to SWPPP | $5,000 | Stormwater Utility / Staff Time | $500 | $500 | $500 | $500 | $500 | $500 | $500 | $500 | $500 | $500 | See SWPPP Application for Reauthorization (Appendix B), Section 4.8.A |
| 17 | Construction Site Stormwater Runoff Control - Refer to SWPPP | $4,000 | Stormwater Utility / Staff Time | $4,000 | | | | | | | | | | See SWPPP Application for Reauthorization |
| 18 | Water Resource Inventory - Refer to SWPPP | $2,000 | Stormwater Utility / Staff Time | $2,000 | | | | | | | | | | See SWPPP Application for Reauthorization |
| 19 | Annual SWPPP Assessment & Annual Reporting - Refer to SWPPP | $15,000 | Stormwater Utility / Staff Time | $1,500 | $1,500 | $1,500 | $1,500 | $1,500 | $1,500 | $1,500 | $1,500 | $1,500 | $1,500 | See SWPPP Application for Reauthorization |
| 20 | Annual Public Meeting/Event - Refer to SWPPP | $10,000 | Stormwater Utility / Staff Time | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | See SWPPP Application for Reauthorization |
| 21 | Online Availability of the Stormwater Pollution Prevent Plan (SWPPP) Program Document - Refer to SWPPP | $5,000 | Stormwater Utility / Staff Time | $500 | $500 | $500 | $500 | $500 | $500 | $500 | $500 | $500 | $500 | See SWPPP Application for Reauthorization |
| 22 | IDDE Public Education and Outreach - Refer to SWPPP | $5,000 | Stormwater Utility / Staff Time | $500 | $500 | $500 | $500 | $500 | $500 | $500 | $500 | $500 | $500 | See SWPPP Application for Reauthorization |
| 23 | Construction Site - Stormwater Runoff Control Program - Refer to SWPPP | $5,000 | Stormwater Utility / Staff Time | $500 | $500 | $500 | $500 | $500 | $500 | $500 | $500 | $500 | $500 | See SWPPP Application for Reauthorization |
| 24 | Post Construction Stormwater Management Program Evaluation/Update - Refer to SWPPP | $5,000 | Stormwater Utility / Staff Time | $5,000 | | | | | | | | | | See SWPPP Application for Reauthorization |
| 25 | Municipal Operations Facility Inventory - Refer to SWPPP | $1,500 | Stormwater Utility / Staff Time | $1,500 | | | | | | | | | | See SWPPP Application for Reauthorization |
| 26 | Local Controls - The City will review and revise as necessary ordinances related to stormwater, erosion control, etc. to remain consistent with regulations, including MWMO. This includes the City Surface Water Design Standards, which is adopted as official control by reference. | $3,600 | Stormwater Utility / Staff Time | $2,000 | | | | $800 | | | | | $800 | |
| 27 | Pollution Prevention & Good Housekeeping BMP's - Refer to SWPPP | $15,000 | Stormwater Utility / Staff Time | $1,500 | $1,500 | $1,500 | $1,500 | $1,500 | $1,500 | $1,500 | $1,500 | $1,500 | $1,500 | See SWPPP Application for Reauthorization |

| No. | Project Description | 10 Year Total Cost Estimate [1,3] | Possible Funding Sources [2] | Proposed Cost By Year[1] 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Routine Maintenance** | | | | | | | | | | | | | | |
| 28 | Pond Inspection and Maintenance - Prioritize inspection and maintenance of BMPs throughout the City to help manage vegetation, sedimentation, and other degradation issues. | $37,000 | Stormwater Utility | $10,000 | $3,000 | $3,000 | $3,000 | $3,000 | $3,000 | $3,000 | $3,000 | $3,000 | $3,000 | See SWPPP Application for Reauthorization |
| 29 | Street Sweeping - Continue to conduct street sweeping operations of all public streets two times annually and as necessary. Refer to SWPPP. | $1,000,000 | Stormwater Utility | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | $100,000 | See SWPPP Application for Reauthorization |
| 30 | Labelle Maintenance - The Weir south at Labelle Pond is in need of continual maintenance. The City will conduct the flood protection maintenance necessary and add it to its maintenance plan. | $5,000 | Stormwater Utility / Private Land Owner | $500 | $500 | $500 | $500 | $500 | $500 | $500 | $500 | $500 | $500 | |
| 31 | Grit Chamber Maintenance - Annual maintenance is needed to clean the underground grit chambers throughout the City. | $100,000 | Stormwater Utility | $15,000 | $5,000 | $15,000 | $5,000 | $15,000 | $5,000 | $15,000 | $5,000 | $15,000 | $5,000 | |
| 32 | Outfall Cleaning - The City will include outfalls in its routine maintenance program and continue to clean on a regular basis and evaluate alternative design. | $5,000 | Stormwater Utility | $500 | $500 | $500 | $500 | $500 | $500 | $500 | $500 | $500 | $500 | |

| No. | Project Description | 10 Year Total Cost Estimate [1,3] | Possible Funding Sources [2] | Proposed Cost By Year[1] 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Monitor and Study** | | | | | | | | | | | | | | |
| 33 | Storm Sewer Monitoring - The City will continue to televise storm sewer in conjunction with reconstruction projects and develop/implement a storm sewer routine inspection program which will notify city employees when storm sewers need cleaning, maintenance and replacement. | $100,000 | Stormwater Utility, Grants | $10,000 | $10,000 | $10,000 | $10,000 | $10,000 | $10,000 | $10,000 | $10,000 | $10,000 | $10,000 | |
| 34 | 49th and Central Flood Mitigation Study - The low area along Central Ave (TH 65) and south of 49th Ave is subject to flooding. The project would involve creating a stormwater model to reflect existing conditions and evaluate potential solutions. The study would model a shared storm sewer system with the City, MnDOT and the County and would identify alternatives to address flooding on the trunk highway. | $25,000 | Stormwater Utility, Grants, MnDOT, Anoka County | $25,000 | | | | | | | | | | See City's CIP, Figure 14 ID 17-03 |
| 35 | University-TH 47 Flood Study - Area on TH 47(MnDOT ROW) floods during high intensity rainfall events requiring road to be temporarily closed. Analysis would identify potential solutions to localized flooding along with opportunity for water quality improvements. | $25,000 | Stormwater Utility, Grants, MnDOT | | | | $25,000 | | | | | | | See City's CIP, Figure 14 ID 16-01 |
| 36 | Westside Flood Mitigation Study - The area between Main Street and University Ave from 44th to 45th Avenue is prone to flooding. Drainage area includes the additional cities of Fridley and Hilltop, along with MnDOT and Anoka County. Model would analyze existing conditions and identify potential solutions for localized flooding. The potential for water quality improvements will also identified. | $35,000 | Stormwater Utility, Grants, MnDOT, Anoka County | $35,000 | | | | | | | | | | See City's CIP, Figure 14 ID 17-04 |
| 37 | Gauvitte Park Area Flood Control/Water Quality Study - Conduct a stormwater model and a preliminary site layout, including storm piping layout, to evaluate the potential for integrating surface water improvements within a park setting. The model would analyze improvements to address flood control and most cost-effective BMP for water quality improvements. | $25,000 | Stormwater Utility, Grants, MWMO | | $25,000 | | | | | | | | | See City's CIP, Figure 14 ID 18-01 and 19-01 |
| 38 | 37th Street Storm Sewer Feasibility Study - Several areas along 37th Avenue experience frequent flooding. This includes the following areas: 37th and Madison Place, 37th Avenue between Reservoir Boulevard and Tyler Street NE, 37th Avenue and NE Pierce Street and 37th Avenue and Johnson Street NE, 37th and Hart Boulevard, 37th and Huset Parkway. The City will perform a feasibility study to determine potential storm sewer improvements or volume control BMPs. | $25,000 | Stormwater Utility, Grants | | | | | | | | $25,000 | | | |

| No. | Project Description | 10 Year Total Cost Estimate [1,3] | Possible Funding Sources [2] | Proposed Cost By Year[1] | | | | | | | | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | |
| 39 | Atlas 14 Flood Study - The City will partner with MWMO to determine any structural impacts for those areas of the City not yet complete for Atlas 14 watershed models. | $20,000 | Stormwater Utility, Grants, MWMO | | | | | $20,000 | | | | | | |

| No. | Project Description | 10 Year Total Cost Estimate [1,3] | Possible Funding Sources [2] | Proposed Cost By Year[1] 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Other** | | | | | | | | | | | | | | |
| 40 | Fish and Weed Management -The City will work with neighboring cities and watershed to develop a fish and vegetation management plan for Silver Lake. | $20,000 | Stormwater Utility / Neighboring Cities Grant Funding, RCWD | | | | $20,000 | | | | | | | |
| 41 | Highland Lake TMDL Projects - Once a TMDL has been completed for Highland Lake, the City will partner with MWMO to complete water quality projects to reduce annual loading. | $80,000 | Stormwater Utility / Neighboring Cities Grant Funding, MWMO | | | | | | | $40,000 | | $40,000 | | |
| 42 | Sullivan Lake TMDL Projects - Once a TMDL has been completed for Sullivan Lake, the City will partner with MWMO to complete water quality projects to reduce annual loading. | $100,000 | Stormwater Utility / Neighboring Cities Grant , MWMO | | | | | | | | $50,000 | | $50,000 | |
| | **TOTAL** | $4,279,100 | | $526,500 | $175,000 | $1,066,000 | $470,000 | $505,800 | $221,000 | $630,000 | $247,000 | $280,000 | $337,800 | |

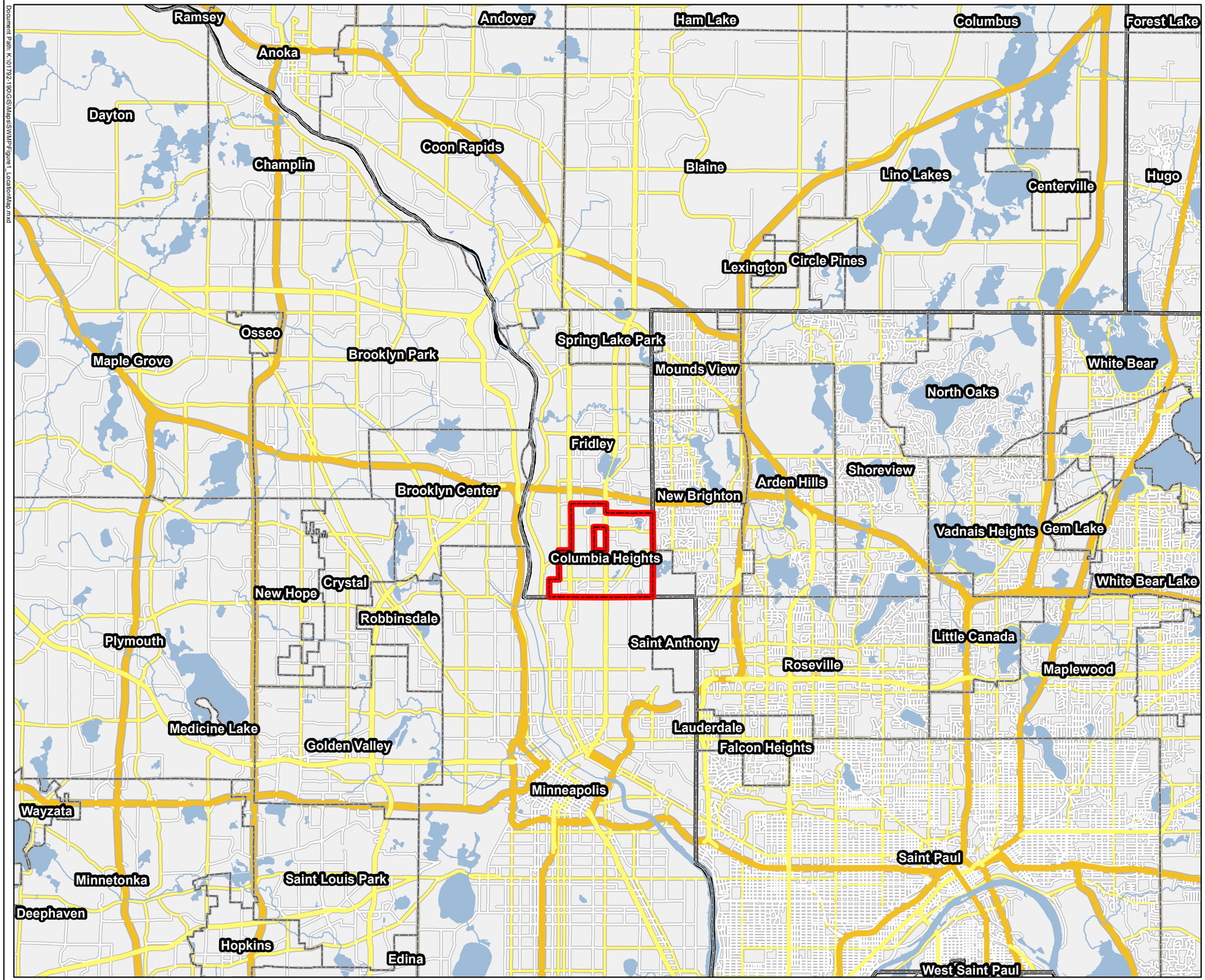
[1] Cost estimates are preliminary and subject to review and revision as engineer's reports are completed and more information becomes available. Table reflects 2015 costs and does not account for inflation. Costs generally include labor, equipment, materials, and all other costs necessary to complete each activity. Some of the costs outlined above may be included in other operational costs budgeted by the City.

[2] Funding for stormwater program activities projected to come from following sources - Surface Water Management Fund, Developers Agreements, Grant Funds, General Operating Fund, or Special Assessments.

[3] Staff time is not included in the cost shown.

**APPENDIX A**

Figures




COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

# Figure 1: Location Map

## Columbia Heights Surface Water Management Plan Columbia Heights, MN

- Columbia Heights Boundary
- City/Township Boundary
- County Boundary
- Lakes
- Streams/Rivers

N

0 2 Miles

WSB

COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

# Figure 2: Existing Land Use Map

## Columbia Heights Surface Water Management Plan Columbia Heights, MN

Columbia Heights Boundary

Existing Land Use

- Unknown
- Single Family Residential
- Townhomes
- TF Residential
- Apartments
- Condominium
- Commercial
- Industrial
- Park
- Vacant
- Public/Semi-Public
- Religious Institution
- ROW

N

0 1,250 Feet

WSB

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COLUMBIA
-HEIGHTS-
REDISCOVER THE HEIGHTS

# Figure 3: Future Land Use Map

## Columbia Heights Surface Water Management Plan Columbia Heights, MN

- Columbia Heights Boundary

Future Land Use

- Unknown
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Transit Oriented Development
- Commercial
- TCD
- Industrial
- Park
- Institutional
- Religious Institution
- Multi-Use District

N

0 1,250 Feet

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COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

# Figure 4: Drainage Patterns & Subwatershed Catch Area Map

## Columbia Heights Surface Water Management Plan
## Columbia Heights, MN

- Infiltration Basin
- Rain Garden
- Lakes/Stormwater Ponds
- Catch Basin
- Storm Sewer
- Flow Direction
- Subwatershed Catch Areas
- Parks
- Columbia Heights Boundary

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COLUMBIA HEIGHTS
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# Figure 5: Watershed Districts/ Watershed Management Organizations

## Columbia Heights Surface Water Management Plan Columbia Heights, MN

Columbia Heights Boundary

Watershed Boundary

Mississippi Watershed Management Organization (MWMO)

Rice Creek Watershed District (RCWD)

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COLUMBIA HEIGHTS
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# Figure 6: Hydrologic Soils Group Map

## Columbia Heights Surface Water Management Plan
## Columbia Heights, MN

Columbia Heights Boundary

Soil Hydric Group

- A
- A/D
- B
- B/D

** Areas that are not shaded indicate urban soils with an unknown hydrologic grouping.

N

0 1,250 Feet

WSB

COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

# Figure 7: Wetland Inventory Map

## Columbia Heights Surface Water Management Plan Columbia Heights, MN

Columbia Heights Boundary

MnDNR National Wetland Inventory

Source: National Wetland Inventory for Minnesota developed by the Minnesota Department of Natural Resources https://www.dnr.state.mn.us/eco/wetlands/nwi_proj.html

N

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COLUMBIA HEIGHTS
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# Figure 8: Major Bodies of Water

## Columbia Heights Surface Water Management Plan Columbia Heights, MN

Columbia Heights Boundary
Lakes
Streams/Rivers

N

0 1,250 Feet

WSB

COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

# Figure 9: Groundwater Appropriation Locations Map

## Columbia Heights Surface Water Management Plan Columbia Heights, MN

- Columbia Heights Boundary

Appropriation Locations

Category

- Non-Crop Irrigation
- Special Categories
- Temporary
- Water Level Maintenance
- Waterworks

Source: Minnesota Water Use Data by the Minnesota Department of Natural Resources

N

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WSB

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COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

# Figure 10: 2018 Impaired Waters

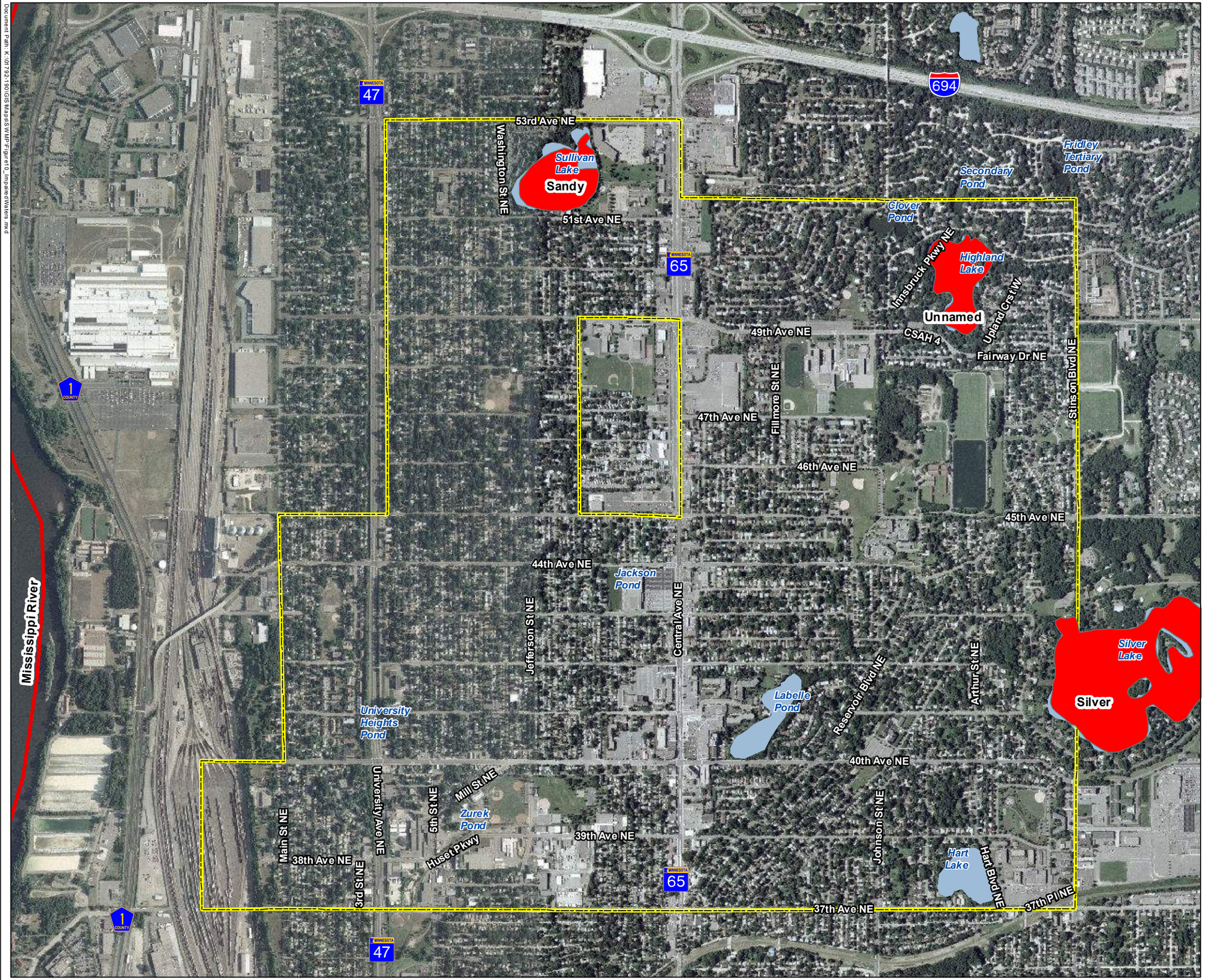
## Columbia Heights Surface Water Management Plan Columbia Heights, MN

- 2016 Impaired Streams
- 2016 Impaired Lakes
- Columbia Heights Boundary
- Lakes
- Streams/Rivers

N

0 1,250 Feet

WSB



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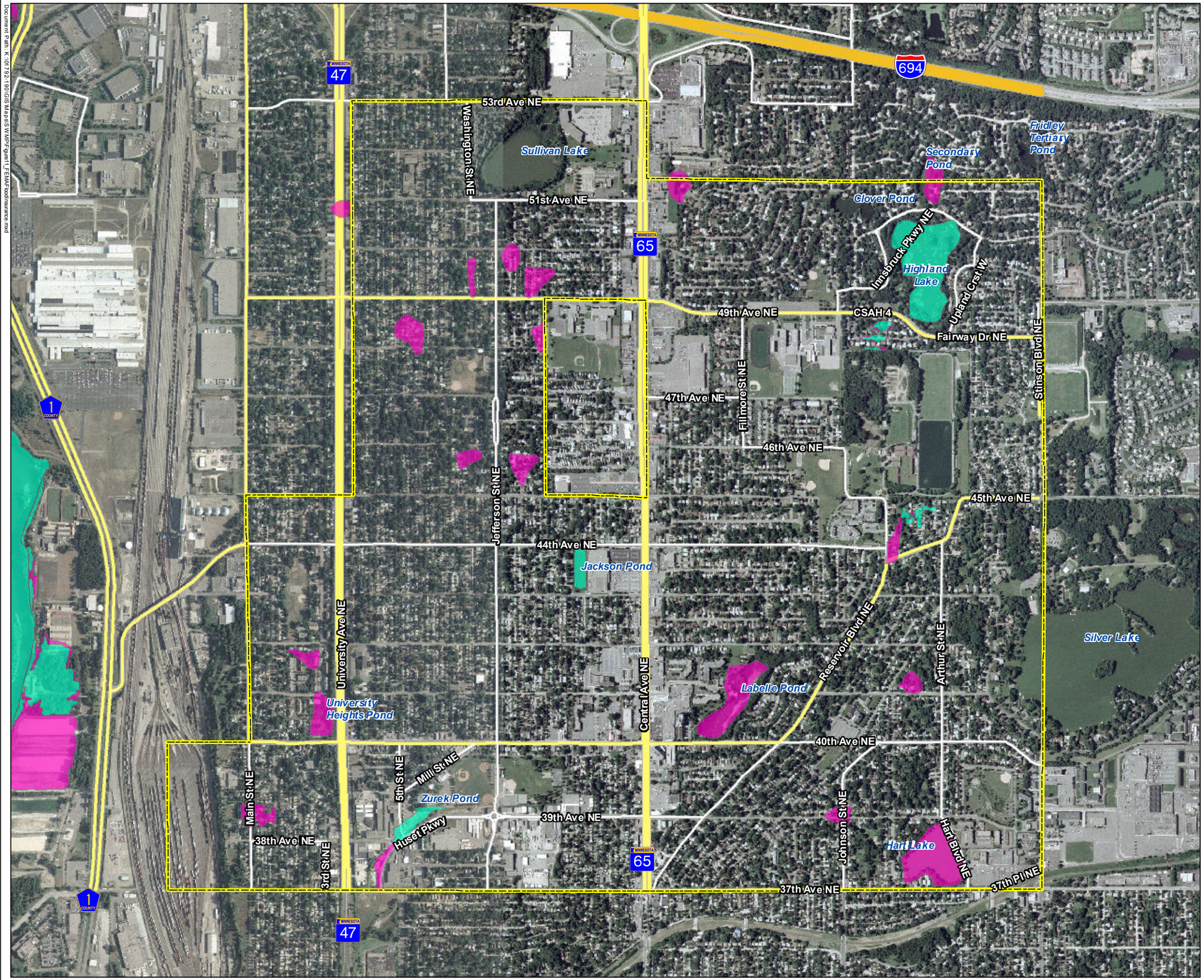


COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

# Figure 11: FEMA Floodplain Map

## Columbia Heights Surface Water Management Plan Columbia Heights, MN

- Columbia Heights Boundary

Floodplain

- 100 Year Floodplain
- 500 Year Floodplain

Source: Anoka County FEMA Flood Zone Map
Released: December 2015

N

0 1,250 Feet

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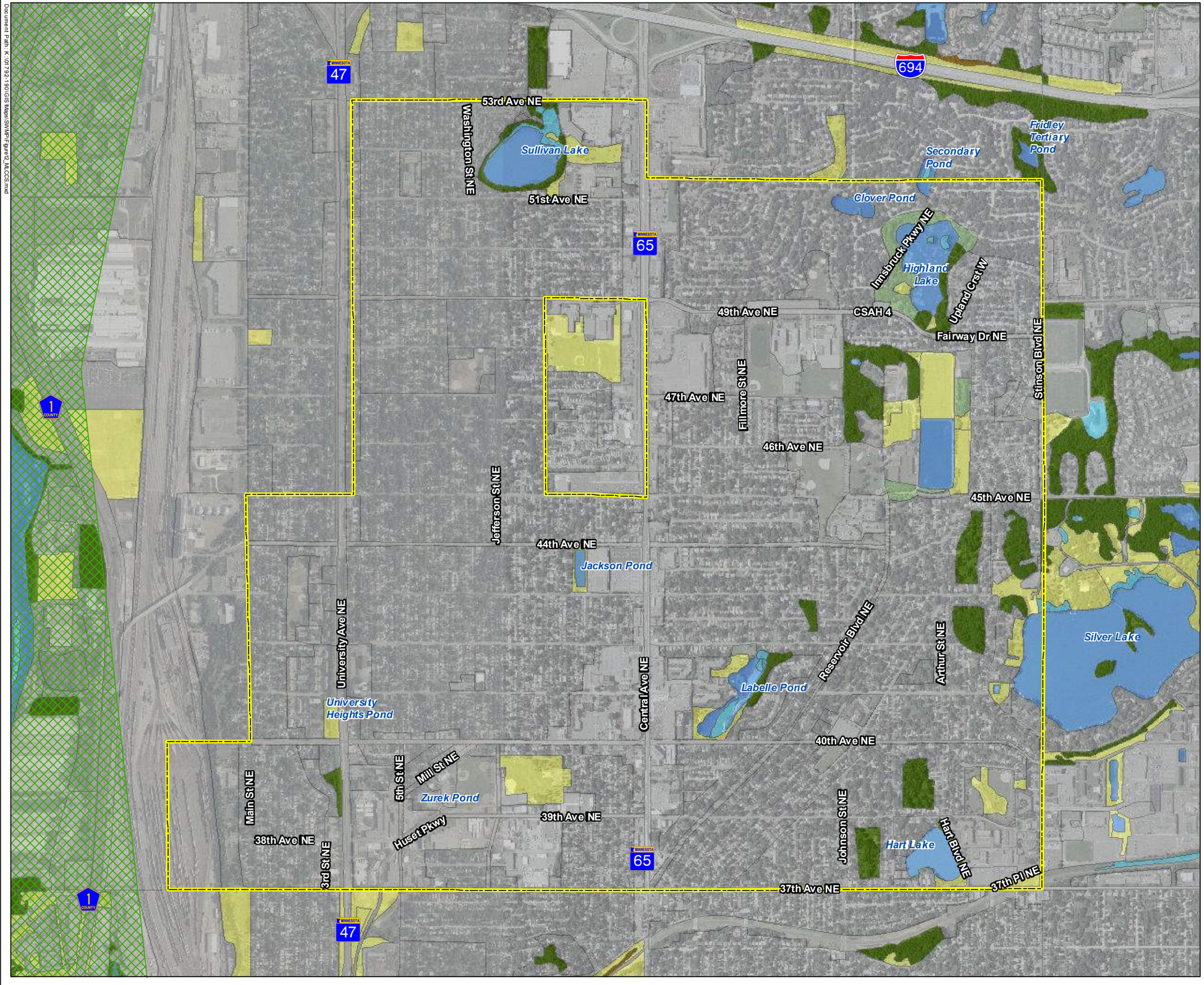



COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

# Figure 12: MLCCS Coverage Map

## Columbia Heights Surface Water Management Plan Columbia Heights, MN

- Conservation Corridors
- Columbia Heights Boundary

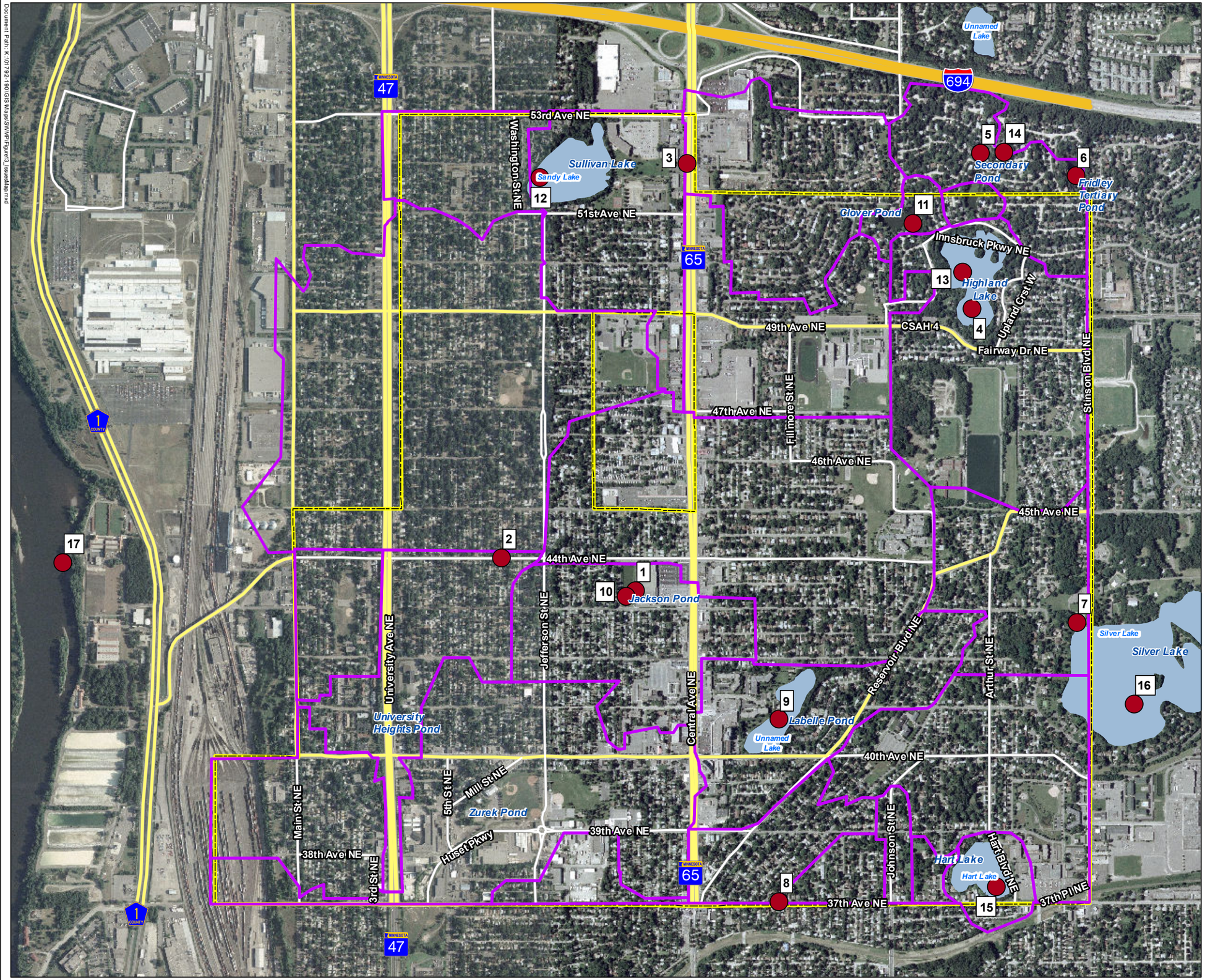
MLCCS Type

- Developed Area
- Planted/Cultivated
- Forest
- Herbaceous
- Shrubland
- Wetlands
- Water

N

0 1,250 Feet

WSB




COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

# Figure 13: Issues Map

## Columbia Heights Surface Water Management Plan Columbia Heights, MN

| Id | Description |
|---|---|
| 1 | Localized flooding in Jackson Pond |
| 2 | Surcharging in 44th Ave storm pipes |
| 3 | Lack of pipe capacity at Central Ave outlet |
| 4 | Highland Lake Atlas 14 flooding |
| 5 | Secondary Pond flooding |
| 6 | Tertiary Pond Atlas 14 flooding |
| 7 | Silver Lake outlet limited capacity |
| 8 | Localized flooding in storm sewer along 37th |
| 9 | Labelle Pond frequent algae blooms |
| 10 | Jackson Pond low aesthetic & wildlife value |
| 11 | Clover Pond poor water quality |
| 12 | Sullivan Lake impairment for phosphorus |
| 13 | Highland Lake impairment for phosphorus |
| 14 | Secondary Pond water quality concerns |
| 15 | Hart Lake poor water quality |
| 16 | Silver Lake impairment and TMDL requirement |
| 17 | Mississippi River TMDL requirement for E.Coli |

- Issue Location
- Subwatersheds
- **Columbia Heights Boundary**
- **Lakes**

N

0 1,250 Feet

WSB

COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

# Figure 14: Implementation Priority Locations

## Columbia Heights Surface Water Management Plan Columbia Heights, MN

Columbia Heights Boundary

CIPs

| CIP ID | Description |
|---|---|
| st-s 13-04 | Trunk Storm Sewer Lining: Central to Jackson Pond to Quincy |
| st-s 14-01 | Tyler Place Storm Sewer Improvements |
| st-s 14-04 | Boat Landing Pond Reconstruction |
| st-s 15-01 | 40th Ave: Central to LaBelle Pond Piping Replacement |
| st-s 15-03 | Trunk Storm Sewer Lining: LaBelle Pond Outlet to Easement |
| st-s 16-01 | University - TH 47 Flood Mitigation/Infiltration Study |
| st-s 16-03 | 44th and Tyler Place Flood Mitigation |
| st-s 17-01 | Trunk Storm Sewer Lining: Easement |
| st-s 17-03 | 49th and Central Flood Mitigation Study |
| st-s 17-04 | Westside Flood Mitigation Study |
| st-s 18-03 | Gauvitte Park Area: Property Acquisition |
| st-s 18-01/19-01 | Gauvitte Park Area Flood Control/Water Quality Study |
| st-s 20-01 | Railroad Yard Pipe Replacement |

N

0 1,250 Feet

WSB

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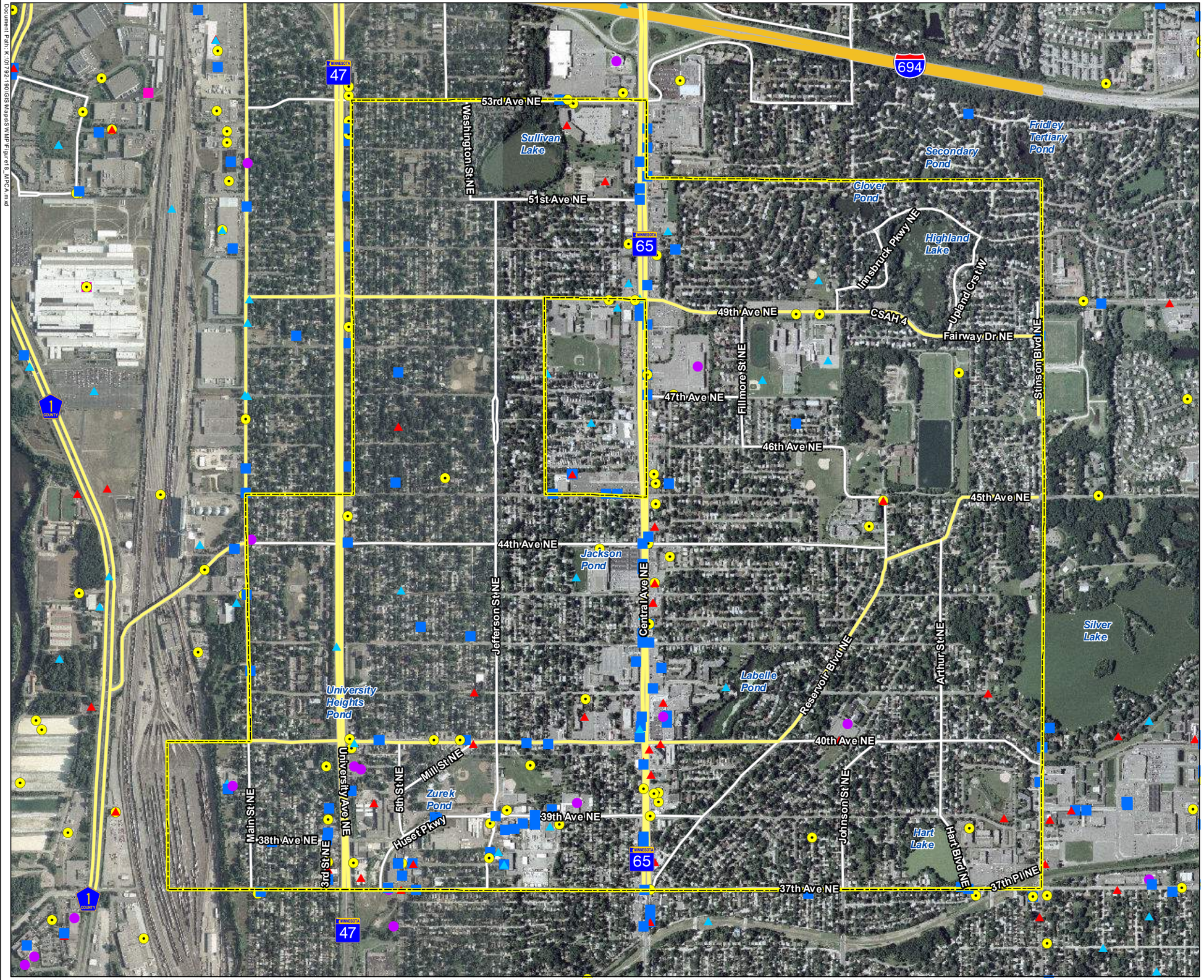
COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

# Figure 15:
# MPCA
# Pollutant Sources

## Columbia Heights Surface Water Management Plan
## Columbia Heights, MN




Columbia Heights Boundary

MPCA

- Air
- Investigation and Cleanup
- Water
- Hazardous Waste
- Tanks and Leaks
- Multiple Activities

Source: Data is from the MPCA's What's in My Neighborhood information. This data set includes environmental information related to contaminated sites, permits, licenses, and inspections, as well as potentially contaminated sites based on use.

N

0 1,250 Feet

WSB

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COLUMBIA HEIGHTS
REDISCOVER THE HEIGHTS

# Figure 16: Water Quality Monitoring Map

## Columbia Heights Surface Water Management Plan Columbia Heights, MN

Columbia Heights Boundary

Surface Water Monitoring Stations

Station Type, Organization

- Discharge, NPDES Permittee
- Lake, MPCA
- Stream, MPCA
- MWMO/ACD Monitoring

N

0 1,250 Feet

WSB

**APPENDIX B**

MS4 SWPPP Application for Reauthorization and BMP Sheets

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

# MS4 SWPPP Application for Reauthorization

**for the NPDES/SDS General Small Municipal Separate Storm Sewer System (MS4) Permit MNR040000 reissued with an effective date of August 1, 2013**

**Stormwater Pollution Prevention Program (SWPPP) Document**

*Doc Type: Permit Application*

**Instructions:** This application is for authorization to discharge stormwater associated with Municipal Separate Storm Sewer Systems (MS4s) under the National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Permit Program. **No fee** is required with the submittal of this application. Please refer to "Example" for detailed instructions found on the Minnesota Pollution Control Agency (MPCA) MS4 website at http://www.pca.state.mn.us/ms4.

**Submittal:** This *MS4 SWPPP Application for Reauthorization* form must be submitted electronically via e-mail to the MPCA at ms4permitprogram.pca@state.mn.us from the person that is duly authorized to certify this form. All questions with an asterisk (*) are required fields. All applications will be returned if required fields are not completed.

**Questions:** Contact Claudia Hochstein at 651-757-2881 or claudia.hochstein@state.mn.us, Dan Miller at 651-757-2246 or daniel.miller@state.mn.us, or call toll-free at 800-657-3864.

## General Contact Information (*Required fields)

**MS4 Owner** (with ownership or operational responsibility, or control of the MS4)

*MS4 permittee name: City of Columbia Heights *County: Anoka
*(city, county, municipality, government agency or other entity)*

*Mailing address: 637 - 38th Ave NE

*City: Columbia Heights *State: MN *Zip code: 55421

*Phone (including area code): (763) 706-3700 *E-mail: andrew-hogg@ci.columbia-heights.mn.us

**MS4 General contact** (with Stormwater Pollution Prevention Program [SWPPP] implementation responsibility)

*Last name: Hogg *First name: Andrew
*(department head, MS4 coordinator, consultant, etc.)*

*Title: Engineering Tech IV, Stormwater Specialist

*Mailing address: 637 - 38th Ave NE

*City: Columbia Heights *State: MN *Zip code: 55421

*Phone (including area code): (763) 706-3700 *E-mail: andrew.hogg@ci.columbia-heights.mn.us

**Preparer information** (complete if SWPPP application is prepared by a party other than MS4 General contact)

Last name: First name:
*(department head, MS4 coordinator, consultant, etc.)*

Title:

Mailing address:

City: State: Zip code:

Phone (including area code): E-mail:

## Verification

1. I seek to continue discharging stormwater associated with a small MS4 after the effective date of this Permit, and shall submit this *MS4 SWPPP Application for Reauthorization* form, in accordance with the schedule in Appendix A, Table 1, with the SWPPP document completed in accordance with the Permit (Part II.D.). ☒ Yes
2. I have read and understand the NPDES/SDS MS4 General Permit and certify that we intend to comply with all requirements of the Permit. ☒ Yes

## Certification (All fields are required)

☒ Yes - *I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted.*

*I certify that based on my inquiry of the person, or persons, who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.*

*I am aware that there are significant penalties for submitting false information, including the possibility of civil and criminal penalties.*

This certification is required by Minn. Stat. §§ 7001.0070 and 7001.0540. The authorized person with overall, MS4 legal responsibility must certify the application (principal executive officer or a ranking elected official).

By typing my name in the following box, I certify the above statements to be true and correct, to the best of my knowledge, and that this information can be used for the purpose of processing my application.

Name: Kevin Hansen
*(This document has been electronically signed)*

Title: Public Works Director/City Engineer Date (mm/dd/yyyy):

Mailing address: 637 - 38th Ave NE

City: Columbia Heights State: MN Zip code: 55421

Phone (including area code): (763) 706-3700 E-mail: kevin.hansen@ci.columbia-heights.mn.us

***Note:** The application will not be processed without certification.*

# Stormwater Pollution Prevention Program Document

## I. Partnerships: (Part II.D.1)

A. List the **regulated small MS4(s)** with which you have established a partnership in order to satisfy one or more requirements of this Permit. Indicate which Minimum Control Measure (MCM) requirements or other program components that each partnership helps to accomplish (List all that apply). Check the box below if you currently have no established partnerships with other regulated MS4s. If you have more than five partnerships, hit the tab key after the last line to generate a new row.

☐ No partnerships with regulated small MS4s

| Name and description of partnership | MCM/Other permit requirements involved |
|---|---|
| *Rice Creek Watershed District Cost-Share Grant Program* | *MCM 2* |

B. If you have additional information that you would like to communicate about your partnerships with other regulated small MS4(s), provide it in the space below, or include an attachment to the SWPPP Document, with the following file naming convention: *MS4NameHere_Partnerships.*

## II. Description of Regulatory Mechanisms: (Part II.D.2)

### Illicit discharges

A. Do you have a regulatory mechanism(s) that effectively prohibits non-stormwater discharges into your small MS4, except those non-stormwater discharges authorized under the Permit (Part III.D.3.b.)? ☒ Yes ☐ No

1. If **yes:**

a. Check which *type* of regulatory mechanism(s) your organization has (check all that apply):

☒ Ordinance ☐ Contract language
☐ Policy/Standards ☐ Permits
☐ Rules
☒ Other, explain: *The City intends to draft a new ordinance within 12 months of the date permit coverage is extended to the City.*

b. Provide either a direct link to the mechanism selected above or attach it as an electronic document to this form; or if your regulatory mechanism is either an Ordinance or a Rule, you may provide a citation:

Citation:

*Chapter 4. Article IV. 4.402, 4.406, Chapter 8. Article II. 8.202 and Article VII. 8.701-8.705*

Direct link:

*http://www.ci.columbia-heights.mn.us/index.aspx?nid=148*

☐ Check here if attaching an electronic copy of your regulatory mechanism, with the following file naming convention: *MS4NameHere_IDDEreg.*

2. If **no:**

Describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, this permit requirement is met:

### Construction site stormwater runoff control

A. Do you have a regulatory mechanism(s) that establishes requirements for erosion and sediment controls and waste controls? ☒ Yes ☐ No

1. If **yes:**

a. Check which *type* of regulatory mechanism(s) your organization has (check all that apply):

☒ Ordinance ☐ Contract language
☐ Policy/Standards ☐ Permits
☐ Rules
☐ Other, explain:

b. Provide either a direct link to the mechanism selected above or attach it as an electronic document to this form; or if your regulatory mechanism is either an Ordinance or a Rule, you may provide a citation:

Citation:

*Ordinance 1547*

Direct link:

*http://www.ci.columbia-heights.mn.us/DocumentCenter/Home/View/298*

☐ Check here if attaching an electronic copy of your regulatory mechanism, with the following file naming convention: *MS4NameHere_CSWreg.*

B. Is your regulatory mechanism at least as stringent as the MPCA general permit to Discharge Stormwater Associated with Construction Activity (as of the effective date of the MS4 Permit)? ☐Yes ☒ No

If you answered **yes** to the above question, proceed to C.

If you answered **no** to either of the above permit requirements listed in A. or B., describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met:

*Ordinance 1547 (4)(a) will be revised to include the new NPDES-CSW permit standards by reference. Draft ordinance revisions will be completed in 2014, for adoption and full implementation within 12 months of the date MS4 permit coverage is extended to the City.*

C. Answer **yes** or **no** to indicate whether your regulatory mechanism(s) requires owners and operators of construction activity to develop site plans that incorporate the following erosion and sediment controls and waste controls as described in the Permit (Part III.D.4.a.(1)-(8)), and as listed below:

| | | |
|---|---|---|
| 1. | Best Management Practices (BMPs) to minimize erosion. | ☒ Yes ☐ No |
| 2. | BMPs to minimize the discharge of sediment and other pollutants. | ☒ Yes ☐ No |
| 3. | BMPs for dewatering activities. | ☒ Yes ☐ No |
| 4. | Site inspections and records of rainfall events | ☒ Yes ☐ No |
| 5. | BMP maintenance | ☒ Yes ☐ No |
| 6. | Management of solid and hazardous wastes on each project site. | ☒ Yes ☐ No |
| 7. | Final stabilization upon the completion of construction activity, including the use of perennial vegetative cover on all exposed soils or other equivalent means. | ☒ Yes ☐ No |
| 8. | Criteria for the use of temporary sediment basins. | ☒ Yes ☐ No |

If you answered **no** to any of the above permit requirements, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met:

### Post-construction stormwater management

A. Do you have a regulatory mechanism(s) to address post-construction stormwater management activities?
☒ Yes ☐ No

1. If **yes:**

a. Check which *type* of regulatory mechanism(s) your organization has (check all that apply):

☒ Ordinance ☐ Contract language
☐ Policy/Standards ☐ Permits
☐ Rules
☐ Other, explain: _____

b. Provide either a direct link to the mechanism selected above or attach it as an electronic document to this form; or if your regulatory mechanism is either an Ordinance or a Rule, you may provide a citation:

Citation: *Chapter 9.106 (Q)(4)(b) & Chapter 9.106 (I)*

Direct link:
*http://www.amlegal.com/nxt/gateway.dll/Minnesota/columbiaheights_mn/chapter9landuse?f=templates$fn=*

*default.htm$3.0$vid=amlegal:columbiaheights_mn$anc=*

☐ Check here if attaching an electronic copy of your regulatory mechanism, with the following file naming convention: *MS4NameHere_PostCSWreg.*

B. Answer **yes** or **no** below to indicate whether you have a regulatory mechanism(s) in place that meets the following requirements as described in the Permit (Part III.D.5.a.):

1. **Site plan review:** Requirements that owners and/or operators of construction activity submit site plans with post-construction stormwater management BMPs to the permittee for review and approval, prior to start of construction activity. ☒ Yes ☐ No

2. **Conditions for post construction stormwater management:** Requires the use of any combination of BMPs, with highest preference given to Green Infrastructure techniques and practices (e.g., infiltration, evapotranspiration, reuse/harvesting, conservation design, urban forestry, green roofs, etc.), necessary to meet the following conditions on the site of a construction activity to the Maximum Extent Practicable (MEP):

   a. For new development projects – no net increase from pre-project conditions (on an annual average basis) of: ☐ Yes ☒ No

      1) Stormwater discharge volume, unless precluded by the stormwater management limitations in the Permit (Part III.D.5.a(3)(a)).
      2) Stormwater discharges of Total Suspended Solids (TSS).
      3) Stormwater discharges of Total Phosphorus (TP).

   b. For redevelopment projects – a net reduction from pre-project conditions (on an annual average basis) of: ☐ Yes ☒ No

      1) Stormwater discharge volume, unless precluded by the stormwater management limitations in the Permit (Part III.D.5.a(3)(a)).
      2) Stormwater discharges of TSS.
      3) Stormwater discharges of TP.

3. **Stormwater management limitations and exceptions:**

   a. Limitations

      1) Prohibit the use of infiltration techniques to achieve the conditions for post-construction stormwater management in the Permit (Part III.D.5.a(2)) when the infiltration structural stormwater BMP will receive discharges from, or be constructed in areas: ☐ Yes ☒ No

         a) Where industrial facilities are not authorized to infiltrate industrial stormwater under an NPDES/SDS Industrial Stormwater Permit issued by the MPCA.
         b) Where vehicle fueling and maintenance occur.
         c) With less than three (3) feet of separation distance from the bottom of the infiltration system to the elevation of the seasonally saturated soils or the top of bedrock.
         d) Where high levels of contaminants in soil or groundwater will be mobilized by the infiltrating stormwater.

      2) Restrict the use of infiltration techniques to achieve the conditions for post-construction stormwater management in the Permit (Part III.D.5.a(2)), without higher engineering review, sufficient to provide a functioning treatment system and prevent adverse impacts to groundwater, when the infiltration device will be constructed in areas: ☐ Yes ☒ No

         a) With predominately Hydrologic Soil Group D (clay) soils.
         b) Within 1,000 feet up-gradient, or 100 feet down-gradient of active karst features.
         c) Within a Drinking Water Supply Management Area (DWSMA) as defined in Minn. R. 4720.5100, subp. 13.
         d) Where soil infiltration rates are more than 8.3 inches per hour.

      3) For linear projects where the lack of right-of-way precludes the installation of volume control practices that meet the conditions for post-construction stormwater management in the Permit (Part III.D.5.a(2)), the permittee's regulatory mechanism(s) may allow exceptions as described in the Permit (Part III.D.5.a(3)(b)). The permittee's regulatory mechanism(s) shall ensure that a reasonable attempt be made to obtain right-of-way during the project planning process. ☐ Yes ☒ No

4. **Mitigation provisions:** The permittee's regulatory mechanism(s) shall ensure that any stormwater discharges of TSS and/or TP not addressed on the site of the original construction activity are addressed through mitigation and, at a minimum, shall ensure the following requirements are met:

   a. Mitigation project areas are selected in the following order of preference: ☐ Yes ☒ No

      1) Locations that yield benefits to the same receiving water that receives runoff from the original construction activity.
      2) Locations within the same Minnesota Department of Natural Resource (DNR) catchment area as the original construction activity.
      3) Locations in the next adjacent DNR catchment area up-stream
      4) Locations anywhere within the permittee's jurisdiction.

b. Mitigation projects must involve the creation of new structural stormwater BMPs or the retrofit of existing structural stormwater BMPs, or the use of a properly designed regional structural stormwater BMP. ☒ Yes ☐ No

c. Routine maintenance of structural stormwater BMPs already required by this permit cannot be used to meet mitigation requirements of this part. ☐ Yes ☒ No

d. Mitigation projects shall be completed within 24 months after the start of the original construction activity. ☐ Yes ☒ No

e. The permittee shall determine, and document, who will be responsible for long-term maintenance on all mitigation projects of this part. ☒ Yes ☐ No

f. If the permittee receives payment from the owner and/or operator of a construction activity for mitigation purposes in lieu of the owner or operator of that construction activity meeting the conditions for post-construction stormwater management in Part III.D.5.a(2), the permittee shall apply any such payment received to a public stormwater project, and all projects must be in compliance with Part III.D.5.a(4)(a)-(e). ☐ Yes ☒ No

5. **Long-term maintenance of structural stormwater BMPs:** The permittee's regulatory mechanism(s) shall provide for the establishment of legal mechanisms between the permittee and owners or operators responsible for the long-term maintenance of structural stormwater BMPs not owned or operated by the permittee, that have been implemented to meet the conditions for post-construction stormwater management in the Permit (Part III.D.5.a(2)). This only includes structural stormwater BMPs constructed after the effective date of this permit and that are directly connected to the permittee's MS4, and that are in the permittee's jurisdiction. The legal mechanism shall include provisions that, at a minimum:

a. Allow the permittee to conduct inspections of structural stormwater BMPs not owned or operated by the permittee, perform necessary maintenance, and assess costs for those structural stormwater BMPs when the permittee determines that the owner and/or operator of that structural stormwater BMP has not conducted maintenance. ☒ Yes ☐ No

b. Include conditions that are designed to preserve the permittee's right to ensure maintenance responsibility, for structural stormwater BMPs not owned or operated by the permittee, when those responsibilities are legally transferred to another party. ☒ Yes ☐ No

c. Include conditions that are designed to protect/preserve structural stormwater BMPs and site features that are implemented to comply with the Permit (Part III.D.5.a(2)). If site configurations or structural stormwater BMPs change, causing decreased structural stormwater BMP effectiveness, new or improved structural stormwater BMPs must be implemented to ensure the conditions for post-construction stormwater management in the Permit (Part III.D.5.a(2)) continue to be met. ☒ Yes ☐ No

If you answered **no** to any of the above permit requirements, describe the tasks and corresponding schedules that will be taken to assure that, within twelve (12) months of the date permit coverage is extended, these permit requirements are met:

*Chapter 9 and/or the Water Resource Management Plan will be revised to include the new MS4 regulatory standards, consisting of definitions of prohibited and restricted use for infiltration techniques) and new mitigation provisions. The final ordinance language and/or Plan updates will be formally adopted and implemented within 12 months from the date MS4 permit coverage is extended to the City.*

## III. Enforcement Response Procedures (ERPs): (Part II.D.3)

A. Do you have existing ERPs that satisfy the requirements of the Permit (Part III.B.)? ☐ Yes ☒ No

1. If **yes**, attach them to this form as an electronic document, with the following file naming convention: *MS4NameHere_ERPs*.
2. If **no**, describe the tasks and corresponding schedules that will be taken to assure that, with twelve (12) months of the date permit coverage is extended, these permit requirements are met:

B. Describe your ERPs:

*Public works will inspect sites/complaints, based on general inspection requirements and resident complaints. The department has a standardized form and inspection staff are kept update to date on training. In instances where violations are found, public works contacts the property owner or permit holder with either a verbal or written warning. If complainance is not met, public works forwards enforcement action on to the Fire Department in the case of ordinace violation and the community devoplement department in the case of permit violations. ERP's for Construction Site Erosion and Sediment Control are defined in Ordinance 1547 (9). Post-Construction Stormwater Management and illicit discharge ERPs are not well defined, therefore the City intends to draft ordinance language in 2014, for final adoption within 12 months from the date permit coverage is extended to the City.*

## IV. Storm Sewer System Map and Inventory: (Part II.D.4.)

A. Describe how you manage your storm sewer system map and inventory:

*The City of Columbia Heights has an existing AutoCAD map of the the storm sewer system. The map is currently updated, and is revised as needed following new constructionprojects or modifications to the storm sewer system and the discovery or errors or incorrect information contained in the map.*

B. Answer **yes** or **no** to indicate whether your storm sewer system map addresses the following requirements from the Permit (Part III.C.1.a-d), as listed below:

1. The permittee's entire small MS4 as a goal, but at a minimum, all pipes 12 inches or greater in diameter, including stormwater flow direction in those pipes. ☒ Yes ☐ No
2. Outfalls, including a unique identification (ID) number assigned by the permittee, and an associated geographic coordinate. ☒ Yes ☐ No
3. Structural stormwater BMPs that are part of the permittee's small MS4. ☒ Yes ☐ No
4. All receiving waters. ☒ Yes ☐ No

If you answered **no** to any of the above permit requirements, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met:

C. Answer **yes** or **no** to indicate whether you have completed the requirements of 2009 Minnesota Session Law, Ch. 172. Sec. 28: with the following inventories, according to the specifications of the Permit (Part III.C.2.a.-b.), including:

1. All ponds within the permittee's jurisdiction that are constructed and operated for purposes of water quality treatment, stormwater detention, and flood control, and that are used for the collection of stormwater via constructed conveyances. ☒ Yes ☐ No
2. All wetlands and lakes, within the permittee's jurisdiction, that collect stormwater via constructed conveyances. ☒ Yes ☐ No

D. Answer **yes** or **no** to indicate whether you have completed the following information for each feature inventoried.

1. A unique identification (ID) number assigned by the permittee. ☒ Yes ☐ No
2. A geographic coordinate. ☒ Yes ☐ No
3. Type of feature (e.g., pond, wetland, or lake). This may be determined by using best professional judgment. ☒ Yes ☐ No

If you have answered **yes** to all above requirements, and you have already submitted the Pond Inventory Form to the MPCA, then you do not need to resubmit the inventory form below.

If you answered **no** to any of the above permit requirements, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met:

E. Answer **yes** or **no** to indicate if you are attaching your pond, wetland and lake inventory to the MPCA on the form provided on the MPCA website at: http://www.pca.state.mn.us/ms4 , according to the specifications of Permit (Part III.C.2.b.(1)-(3)). Attach with the following file naming convention: *MS4NameHere_inventory*. ☒ Yes ☒ No

If you answered **no,** the inventory form must be submitted to the MPCA MS4 Permit Program within 12 months of the date permit coverage is extended.

## V. Minimum Control Measures (MCMs) (Part II.D.5)

### A. MCM1: Public education and outreach

1. The Permit requires that, within 12 months of the date permit coverage is extended, existing permittees revise their education and outreach program that focuses on illicit discharge recognition and reporting, as well as other specifically selected stormwater-related issue(s) of high priority to the permittee during this permit term. Describe your **current** educational program, including **any high-priority topics included:**

*The City of Columbia Heights educational program constists of providing information to residents through direct contact, informational displays at the library, and during various city events. Information is also distrubed via newsletters and the webpage. The City of Columbia Heights has focused educational information distribuated to residents who live in areas draining to impaired waters and have also focused educational inforamition to local business.High priority topics include water quility issus in areas draining to imparired areas, trash/litter and BMP to home owner.*

2. List the categories of BMPs that address your public education and outreach program, including the distribution of educational materials and a program implementation plan. Use the first table for categories of BMPs that you have

established and the second table for categories of BMPs that you plan to implement over the course of the permit term.

Include the measurable goals with appropriate timeframes that each BMP category will be implemented and completed. In addition, provide interim milestones and the frequency of action in which the permittee will implement and/or maintain the BMPs. Refer to the U.S. Environmental Protection Agency's (EPA) *Measurable Goals Guidance for Phase II Small MS4s* (http://www.epa.gov/npdes/pubs/measurablegoals.pdf).

**If you have more than five categories**, hit the tab key after the last line to generate a new row.

| Established BMP categories | Measurable goals and timeframes |
|---|---|
| *City Webpage* | *The City will provide a minimum of three different stormwater related articles on the Public Works webpage. City staff will review the content and appropriateness of all materials on the webpage a minimum of once per calendar year of the MS4 permit cycle. New/revised articles for existing topics or high priority topics of interest will be posted periodically at the discretion of City staff.* |
| *Printed Stormwater Articles at Library* | *City staff will provide a minimum of 6 different stormwater related articles will be provided in individual brochures at the Library. City staff will annually record the number of printed media distributed, review the appropriateness of the existing articles, and provide new articles for existing topics or high priority topics of interest (at the discretion of City staff) each calendar year of the MS4 permit cycle.* |
| *City Newsletter "Heights Happenings"* | *One stormwater related article per quarter will be included in the City newsletter each calendar year of the MS4 permit cycle. Article topics will focus on MCM's 3-6 and current/upcoming stormwater related projects within the City. The "Heights Happenings" is mailed to all City residents and is available on the City website.* |
| *Cleanwatermn.org Partner* | *The City will continue to provide funding support for cleanwatermn.org each year of the MS4 permit cycle.* |

| BMP categories to be implemented | Measurable goals and timeframes |
|---|---|
| *Webpage updates (high priority topics)* | *The City's stormwater webpage will be updated with high priority topics, such as phosphorus reduction, pet waste management, and Illicit discharge recognition/reporting in 2014. Periodic webpage updates will be completed throughout each year of the MS4 permit cycle.* |
| *Annual SWPPP Assessment & Annual Reporting* | *City staff will conduct an annual SWPPP assessment in preparation of each annual report. Proposed SWPPP modifications are subject to Part II.G of the MS4 permit. City staff will submit the annual report to the MPCA prior to June 30th* |

3. Provide the name or the position title of the individual(s) who is responsible for implementing and/or coordinating this MCM:

   *Engineering Tech, Stormwater Specialist*

## B. MCM2: Public participation and involvement

1. The Permit (Part III.D.2.a.) requires that, within 12 months of the date permit coverage is extended, existing permittees shall revise their current program, as necessary, and continue to implement a public participation/involvement program to solicit public input on the SWPPP. Describe your current program:

   *The City of Columbia Heights' SWPPP is availible on the webpage and upon citizen requests. The city takes input on the SWPPP via email and phone calls.The city promotes public involvement in programs like Grant oppertunties, storm stenical program, resdiental BMPinformation and other educational information though the city newsletter, city webpage, informational handouts at the libray and upon request.*

2. List the categories of BMPs that address your public participation/involvement program, including solicitation and documentation of public input on the SWPPP. Use the first table for categories of BMPs that you have established and the second table for categories of BMPs that you plan to implement over the course of the permit term.

   Include the measurable goals with appropriate timeframes that each BMP category will be implemented and completed. In addition, provide interim milestones and the frequency of action in which the permittee will implement and/or maintain the BMPs. Refer to the EPA's *Measurable Goals Guidance for Phase II Small MS4s* (http://www.epa.gov/npdes/pubs/measurablegoals.pdf). **If you have more than five categories**, hit the tab key after the last line to generate a new row.

| Established BMP categories | Measurable goals and timeframes |
|---|---|
| *Volunteer Storm Drain Stenciling Program* | *The City's Public Works department provides stenciling kits and staff time for volunteer groups to paint catch basins along City streets. The City will continue this program and map all stenciled structures each calendar year of the MS4 permit cycle.* |
| *Storm Water Survey* | *The City will continue to provide a storm sewer survey on the City's Stormwater webpage (Departments/Public Works). City staff will compile the results of all surveys received each year, in determining the next year's high priority topics and public education materials. This BMP will be completed once each calendar year of the MS4 permit cycle.* |

| BMP categories to be implemented | Measurable goals and timeframes |
|---|---|
| *Volunteer Adopt a Park program* | *The City of Columbia Heights will promote an Adopt a Park Program through the webpage, informational handouts at the library, newsletter, and through the parks program. The city will track the number of times residents volunteer, park locations and the number of bags of trash removed.* |
| *Public Review and Comment of the SWPPP and MS4 Program* | *City staff will continuously solicit public comments on the adequacy of the City's SWPPP and MS4 program, through the use of the City website. Staff will post the SWPPP, current annual report, supporting documents, and contact information for the public to provide comments. Public input received (oral and written) will be recorded in a record of decision and evaluated by the City's MS4 General Contact. City responses (if relevant ) will be made in writing to each commenter.* |

3. Do you have a process for receiving and documenting citizen input? ☐ Yes ☒ No

   If you answered **no** to the above permit requirement, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, this permit requirement is met:

   *The City of Columbia Heights will devlop a written process for receiving and documenting citizen input that will meet the requirements of the permit within 12 months of the date permit coverage is extended to the City.*

4. Provide the name or the position title of the individual(s) who is responsible for implementing and/or coordinating this MCM:

   *Engineering Tech, Stormwater Specialist*

## C. MCM 3: Illicit discharge detection and elimination

1. The Permit (Part III.D.3.) requires that, within 12 months of the date permit coverage is extended, existing permittees revise their current program as necessary, and continue to implement and enforce a program to detect and eliminate illicit discharges into the small MS4. Describe your current program:

   *The City of Columbia Heights inspects for illicit discharges at outfalls during a yearly inspection, along with general inspections and maintenance. In addition the City will investigate any incidents of illicit discharges are suspected either by city staff or residents If an illicit discharge is located within the city's storm water system, the city will find the most cost effective and timely way to eliminate the discharge. If the illicit discharge is an issue with a resident or commercial property owner, then the City will work with the property owner to eliminate the discharge in a timely manner through the enforcement policy .*

2. Does your Illicit Discharge Detection and Elimination Program meet the following requirements, as found in the Permit (Part III.D.3.c.-g.)?

   a. Incorporation of illicit discharge detection into all inspection and maintenance activities conducted under the Permit (Part III.D.6.e.-f.)Where feasible, illicit discharge inspections shall be conducted during dry-weather conditions (e.g., periods of 72 or more hours of no precipitation). ☒ Yes ☐ No

   b. Detecting and tracking the source of illicit discharges using visual inspections. The permittee may also include use of mobile cameras, collecting and analyzing water samples, and/or other detailed procedures that may be effective investigative tools. ☒ Yes ☐ No

   c. Training of all field staff, in accordance with the requirements of the Permit (Part III.D.6.g.(2)), in illicit discharge recognition (including conditions which could cause illicit discharges), and reporting illicit discharges for further investigation. ☒ Yes ☐ No

   d. Identification of priority areas likely to have illicit discharges, including at a minimum, evaluating land use associated with business/industrial activities, areas where illicit discharges have been identified in the past, and areas with storage of large quantities of significant materials that could ☐ Yes ☒ No

result in an illicit discharge.

e. Procedures for the timely response to known, suspected, and reported illicit discharges. ☒ Yes ☐ No

f. Procedures for investigating, locating, and eliminating the source of illicit discharges. ☒ Yes ☐ No

g. Procedures for responding to spills, including emergency response procedures to prevent spills from entering the small MS4. The procedures shall also include the immediate notification of the Minnesota Department of Public Safety Duty Officer, if the source of the illicit discharge is a spill or leak as defined in Minn. Stat. § 115.061. ☐ Yes ☒ No

h. When the source of the illicit discharge is found, the permittee shall use the ERPs required by the Permit (Part III.B.) to eliminate the illicit discharge and require any needed corrective action(s). ☒ Yes ☐ No

If you answered **no** to any of the above permit requirements, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met:

*The City of Columbia Heights will work to update the above permit requirements within 12 months of permit coverage; these updates will meet the requirements of the permit. The City of Columbia Heights will identify priority areas that are likely to include illicit discharges, using GIS information and property information. The city will create a written document that includes procedures for responding to spills and will include emergency response to prevent spills from entering the MS4.*

3. List the categories of BMPs that address your illicit discharge, detection and elimination program. Use the first table for categories of BMPs that you have established and the second table for categories of BMPs that you plan to implement over the course of the permit term.

   Include the measurable goals with appropriate timeframes that each BMP category will be implemented and completed. In addition, provide interim milestones and the frequency of action in which the permittee will implement and/or maintain the BMPs. Refer to the EPA's *Measurable Goals Guidance for Phase II Small MS4s* (http://www.epa.gov/npdes/pubs/measurablegoals.pdf).

   **If you have more than five categories**, hit the tab key after the last line to generate a new row.

| **Established BMP categories** | **Measurable goals and timeframes** |
|---|---|
| *Storm Sewer System Map* | *City staff will continue to review and update (as needed) the storm sewer system map each year of the MS4 permit cycle.* |
| *IDDE Inspections* | *The City will continue to annually conduct IDDE inspections concurrently with stormsewer, outfall, and ponds inspections per the IDDE inspection program.* |

| ***BMP categories to be implemented*** | ***Measurable goals and timeframes*** |
|---|---|
| *Written Procedures for Emergency Response* | *Draft written procedures for emergency and non-emergency response to non-stormwater spills, discharges, and connections in 2014. Implement final written procedures within 12 months from the date MS4 permit coverage is extended is extended to the City.* |
| *IDDE Priority Inspection Map* | *Develop IDDE inspection map in 2014. Utilize map for inspections within 12 months from the date MS4 permit coverage is extended to the city.* |
| *New Illicit Discharge & Connection Ordinance* | *The City intends to consolidate all regulatory language for illicit discharges into one new illicit discharge ordinance. This new ordinance will include refined written procedures and enforcement. City staff will draft ordinance language in 2014 for final adoption within 12 months from the date MS4 permit coverage is extended to the City.* |

4. Do you have procedures for record-keeping within your Illicit Discharge Detection and Elimination (IDDE) program as specified within the Permit (Part III.D.3.h.)? ☒ Yes ☐ No

   If you answered **no**, indicate how you will develop procedures for record-keeping of your Illicit Discharge, Detection and Elimination Program, within 12 months of the date permit coverage is extended:

5. Provide the name or the position title of the individual(s) who is responsible for implementing and/or coordinating this MCM:

   *Engineering Tech, Stormwater Specialist*

## D. MCM 4: Construction site stormwater runoff control

1. The Permit (Part III.D.4) requires that, within 12 months of the date permit coverage is extended, existing permittees shall revise their current program, as necessary, and continue to implement and enforce a construction site stormwater runoff

control program. Describe your current program:

*The Engineering department provides plan review (all public and private development sites) and inspection services for projects that disturb one acre or more. Building department staff conducts plan reviews and regular site inspections on all permitted residential/commercial sites of 5,000 square feet to less than one acre. Engineering department staff receives public complaints of potential non-compliance on all sites within the City and public works inspects and enforce as necessary.*

2. Does your program address the following BMPs for construction stormwater erosion and sediment control as required in the Permit (Part III.D.4.b.):

   a. Have you established written procedures for site plan reviews that you conduct prior to the start of construction activity? ☒ Yes ☐ No

   b. Does the site plan review procedure include notification to owners and operators proposing construction activity that they need to apply for and obtain coverage under the MPCA's general permit to *Discharge Stormwater Associated with Construction Activity No. MN R100001*? ☐ Yes ☒ No

   c. Does your program include written procedures for receipt and consideration of reports of noncompliance or other stormwater related information on construction activity submitted by the public to the permittee? ☐ Yes ☒ No

   d. Have you included written procedures for the following aspects of site inspections to determine compliance with your regulatory mechanism(s):

      1) Does your program include procedures for identifying priority sites for inspection? ☐ Yes ☒ No

      2) Does your program identify a frequency at which you will conduct construction site inspections? ☒ Yes ☐ No

      3) Does your program identify the names of individual(s) or position titles of those responsible for conducting construction site inspections? ☐ Yes ☒ No

      4) Does your program include a checklist or other written means to document construction site inspections when determining compliance? ☒ Yes ☐ No

   e. Does your program document and retain construction project name, location, total acreage to be disturbed, and owner/operator information? ☒ Yes ☐ No

   f. Does your program document stormwater-related comments and/or supporting information used to determine project approval or denial? ☒ Yes ☐ No

   g. Does your program retain construction site inspection checklists or other written materials used to document site inspections? ☒ Yes ☐ No

   If you answered **no** to any of the above permit requirements, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met.

   *The City will add contact information on the stormwater website for the public to provide complaints regarding non-compliance of construction sites. Reciept and consideration of non-compliance will be forward to the Engineering Deparetment for review and appropriate follow-up. City staff will also draft an internal field inspection form for Public Works staff to conduct erosion and sediment control inspections of residential and commercial sites. This inspection form will define priority sites, frequency of inspections, and record retention.*

3. List the categories of BMPs that address your construction site stormwater runoff control program. Use the first table for categories of BMPs that you have established and the second table for categories of BMPs that you plan to implement over the course of the permit term.

   Include the measurable goals with appropriate timeframes that each BMP category will be implemented and completed. In addition, provide interim milestones and the frequency of action in which the permittee will implement and/or maintain the BMPs. Refer to the EPA's *Measurable Goals Guidance for Phase II Small MS4s* (http://www.epa.gov/npdes/pubs/measurablegoals.pdf). **If you have more than five categories,** hit the tab key after the last line to generate a new row.

| **Established BMP categories** | **Measurable goals and timeframes** |
|---|---|
| *Site Plan Review* □ | *The Engineering department provides plan review (all public and private development sites) and inspection services for projects that disturb one acre or more. Building department staff conducts plan reviews and regular site inspections on all permitted residential/commercial sites of 5,000 square feet to less than one acre. The city will continue to use checklists to review plans to ensure the stormwater issues* ***are addressed.*** |
| *Site Inspections and Enforcement* □ | *The City of Columbia Heights will inspect construction sites, in accordance to the State's Construction Stormwater permit and the City's stormwater ordinances. Any infractions will be enforced by the procedures described in the City's enforcement policy.* |
| | |

| BMP categories to be implemented | Measurable goals and timeframes |
|---|---|

4. Provide the name or the position title of the individual(s) who is responsible for implementing and/or coordinating this MCM:

   Engineering Tech, Stormwater Specialist

## E. MCM 5: Post-construction stormwater management

1. The Permit (Part III.D.5.) requires that, within 12 months of the date permit coverage is extended, existing permittees shall revise their current program, as necessary, and continue to implement and enforce a post-construction stormwater management program. Describe your current program:

   *Stormwater Management Plans are reviewed and approved by the Engineering Department to ensure that they meet the City's ordinance in regards to post-construction requirements. In addition, the city inspects and reviews drainage issues in post construction instances, working to resolves these issues.*

2. Have you established written procedures for site plan reviews that you will conduct prior to the start of construction activity? ☒ Yes ☐ No

3. Answer **yes** or **no** to indicate whether you have the following listed procedures for documentation of post-construction stormwater management according to the specifications of Permit (Part III.D.5.c.):

   a. Any supporting documentation that you use to determine compliance with the Permit (Part III.D.5.a), including the project name, location, owner and operator of the construction activity, any checklists used for conducting site plan reviews, and any calculations used to determine compliance? ☒ Yes ☐ No

   b. All supporting documentation associated with mitigation projects that you authorize? ☐ Yes ☒ No

   c. Payments received and used in accordance with Permit (Part III.D.5.a.(4)(f))? ☐ Yes ☒ No

   d. All legal mechanisms drafted in accordance with the Permit (Part III.D.5.a.(5)), including date(s) of the agreement(s) and names of all responsible parties involved? ☐ Yes ☒ No

   If you answered **no** to any of the above permit requirements, describe the steps that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met.

   *The City of Columbia Heights will devlop a written process for recording payments received and legal mechanisms drafted that will meet the requirements of the permit within 12 months from the approval of the City's Swppp.*

4. List the categories of BMPs that address your post-construction stormwater management program. Use the first table for categories of BMPs that you have established and the second table for categories of BMPs that you plan to implement over the course of the permit term.

   Include the measurable goals with appropriate timeframes that each BMP category will be implemented and completed. In addition, provide interim milestones and the frequency of action in which the permittee will implement and/or maintain the BMPs. Refer to the EPA's *Measurable Goals Guidance for Phase II Small MS4s* (http://www.epa.gov/npdes/pubs/measurablegoals.pdf). **If you have more than five categories**, hit the tab key after the last line to generate a new row.

| Established BMP categories | Measurable goals and timeframes |
|---|---|
| *Long-term Operation and Maintenance of BMPs* ☐ | *The City of Columbia Heights will maintain and operate of the long term BMPs owned by the City for the term of the permits. The City will inspect and monitor the BMP to attempt to evaluate the effectiveness of the BMPs.* |
| *Redevelopment Post-Construction Ordinance* | *The City will continue to review construction plans to ensure the compliance of plans meeting the Post Construction requirements within the city ordinances.* |

| BMP categories to be implemented | Measurable goals and timeframes |
|---|---|

5. Provide the name or the position title of the individual(s) who is responsible for implementing and/or coordinating this MCM:

   *Engineering Tech, Stormwater Specialist*

## F. MCM 6: Pollution prevention/good housekeeping for municipal operations

1. The Permit (Part III.D.6.) requires that, within 12 months of the date permit coverage is extended, existing permittees shall revise their current program, as necessary, and continue to implement an operations and maintenance program that prevents or reduces the discharge of pollutants from the permittee owned/operated facilities and operations to the small MS4. Describe your current program:

   *The City currently inspects all Structual Pollution Control Devices, Outfalls, and Ponds each year. City owned and operated stockpiles, storage areas, and material handling areas at the public works facility are inspected for potential non-stromwater discharges on a routine basis. The City sweeps public streets a minimum of two times a year, until snow fall each fall. City staff began evaluating the use of road salt for winter road mantenance activities to reduce chorides entering our waterways. Numerous Public Works employees have participated in pollution prevention workshops/ training programs that were offerred by the watershed districts and public works city staff.*

2. Do you have a facilities inventory as outlined in the Permit (Part III.D.6.a.)? ☒ Yes ☐ No

3. If you answered **no** to the above permit requirement in question 2, describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, this permit requirement is met:

4. List the categories of BMPs that address your pollution prevention/good housekeeping for municipal operations program. Use the first table for categories of BMPs that you have established and the second table for categories of BMPs that you plan to implement over the course of the permit term.

   Include the measurable goals with appropriate timeframes that each BMP category will be implemented and completed. In addition, provide interim milestones and the frequency of action in which the permittee will implement and/or maintain the BMPs. For an explanation of measurable goals, refer to the EPA's *Measurable Goals Guidance for Phase II Small MS4s* (http://www.epa.gov/npdes/pubs/measurablegoals.pdf).

   **If you have more than five categories**, hit the tab key after the last line to generate a new row.

| **Established BMP categories** | **Measurable goals and timeframes** |
|---|---|
| *Employee Training* | *Continue to host a minimum of one staff training event per year to discuss stormwater related topics. City staff will develop an annual training schedule, record the employee names, topics covered, and date of each event, annually through the end of the MS4 permit cycle (July 31, 2018).* |
| *Street Sweeping* | *The City will continue to conduct street sweeping operations a minimum of twice annually (record the sweeping route and date per occurrence). Review and revise (as needed) the street sweeping policy (including schedule, equipment, and disposal), stormwater quality priority areas, and routes annually through the end of the MS4 permit cycle (July 31, 2018).* |
| *Annual Inspection of All Structural Stormwater BMPs (SSBMP)* | *Continue to inspect 100% of all SSBMPs each year of the MS4 permit cycle (July 31, 2018). Record the inspection dates and maintenance completed for each SPCD.* |
| *Inspection of the MS4 Outfalls, Sediment Basins and Ponds* | *Continue to inspect all MS4 outfalls until 100% of all MS4 Outfalls and Ponds have been inspected within the MS4 permit cycle (July 31, 2018)* |
| *Inspection Follow-up Including the Determination of Whether Repair, Replacement, or Maintenance Measures are Necessary and the Implementation of the Corrective Measures* | *Annually, review all pond, outfall, and SPCD inspection records to determine if maintenance, repair, or replacement is needed. Include a description of the findings and any maintenance, repair, or replacement as a result of the inspection findings.* |
| *Evaluation of SPCD Inspection Frequency* | *Review records and evaluate each SPCD's inspection frequency and adjust as needed per MS4 Permit Part III.D.6.e (1.). Evaluate and update inspection records annually through the end of the MS4 permit cycle (July 31, 2018).* |

| **BMP categories to be implemented** | **Measurable goals and timeframes** |
|---|---|
| *Continue Improvements at City Work Yard* | *The City will continue to analyze possible BMP improvements to the City's rear Public Works yard. The City will make improvements which are economically feasible and provide water quality improvements. If BMP's projects are found that are cost effective and provide water quality improvement, the city will work to make the improvements based on city council approval.* |
| *Pond Sediment Excavation and Removal Projects* | *The City will develop a reporting component for pond sediment removal projects within 12 months from the date MS4 permit coverage is extended to the City. Reporting will consist of* |

| | |
|---|---|
| | *documenting the date, pond ID, project limits/construction plans, volume of sediment removed, test results (if any), and disposal location. Begin reporting in 2015.* |
| *Stockpiles, Storage and Material Handling Area Inspections* | *Conduct quarterly written inspections of all stockpile, storage and material handling areas (per the 2014 facility inventory), through the end of the MS4 permit cycle (July 31, 2018).* |
| *Update Public Works MS4 Program* | *Update existing BMPs to coincide with new/revised MS4 permit requirements (refer to question #9).* |

5. Does discharge from your MS4 affect a Source Water Protection Area (Permit Part III.D.6.c.)? ☒ Yes ☐ No

   a. If **no**, continue to 6.

   b. If **yes**, the Minnesota Department of Health (MDH) is in the process of mapping the following items. Maps are available at http://www.health.state.mn.us/divs/eh/water/swp/maps/index.htm. Is a map including the following items available for your MS4:

      1) Wells and source waters for drinking water supply management areas identified as vulnerable under Minn. R. 4720.5205, 4720.5210, and 4720.5330? ☒ Yes ☐ No

      2) Source water protection areas for surface intakes identified in the source water assessments conducted by or for the Minnesota Department of Health under the federal Safe Drinking Water Act, U.S.C. §§ 300j – 13? ☐ Yes ☒ No

   c. Have you developed and implemented BMPs to protect any of the above drinking water sources? ☐ Yes ☒ No

6. Have you developed procedures and a schedule for the purpose of determining the TSS and TP treatment effectiveness of all permittee owned/operated ponds constructed and used for the collection and treatment of stormwater, according to the Permit (Part III.D.6.d.)? ☐ Yes ☒ No

7. Do you have inspection procedures that meet the requirements of the Permit (Part III.D.6.e.(1)-(3)) for structural stormwater BMPs, ponds and outfalls, and stockpile, storage and material handling areas? ☐ Yes ☒ No

8. Have you developed and implemented a stormwater management training program commensurate with each employee's job duties that:

   a. Addresses the importance of protecting water quality? ☒ Yes ☐ No

   b. Covers the requirements of the permit relevant to the duties of the employee? ☒ Yes ☐ No

   c. Includes a schedule that establishes initial training for new and/or seasonal employees and recurring training intervals for existing employees to address changes in procedures, practices, techniques, or requirements? ☐ Yes ☒ No

9. Do you keep documentation of inspections, maintenance, and training as required by the Permit (Part III.D.6.h.(1)-(5))? ☒ Yes ☐ No

   If you answered **no** to any of the above permit requirements listed in **Questions 5 – 9**, then describe the tasks and corresponding schedules that will be taken to assure that, within 12 months of the date permit coverage is extended, these permit requirements are met:

   *The City of Columbia Heights will work to update the above permit requirement within 12 months of permit coverage and the updates will meet the requirements of the permit. The City of Columbia Heights will update city requirements develop and implement BMPs to protect above drinking water sources. The city will develop procedures to determine the TSS and TP treatment effectiveness of owned /operated ponds. The city with create a written inspection procedure for structural stormwater BMPs, pond/outfalls and stockpiles, storage and material handling areas. In addition the city will create a schedule for training employees.*

10. Provide the name or the position title of the individual(s) who is responsible for implementing and/or coordinating this MCM:

    *Engineering Tech, Stormwater Specialist*

## VI. Compliance Schedule for an Approved Total Maximum Daily Load (TMDL) with an Applicable Waste Load Allocation (WLA) (Part II.D.6.)

A. Do you have an approved TMDL with a Waste Load Allocation (WLA) prior to the effective date of the Permit? ☒ Yes ☐ No

   1. If **no**, continue to section VII.

2. If **yes**, fill out and attach the MS4 Permit TMDL Attachment Spreadsheet with the following naming convention: *MS4NameHere_TMDL*.

   This form is found on the MPCA MS4 website: http://www.pca.state.mn.us/ms4.

## VII. Alum or Ferric Chloride Phosphorus Treatment Systems (Part II.D.7.)

A. Do you own and/or operate any Alum or Ferric Chloride Phosphorus Treatment Systems which are regulated by this Permit (Part III.F.)? ☐ Yes ☒ No

1. If **no**, this section requires no further information.
2. If **yes**, you own and/or operate an Alum or Ferric Chloride Phosphorus Treatment System within your small MS4, then you must submit the Alum or Ferric Chloride Phosphorus Treatment Systems Form supplement to this document, with the following naming convention: *MS4NameHere_TreatmentSystem*.

   This form is found on the MPCA MS4 website: http://www.pca.state.mn.us/ms4.

## VIII. Add any Additional Comments to Describe Your Program

| STORMWATER MANAGEMENT IMPLEMENTATION PLAN | | | | | | |
|---|---|---|---|---|---|---|
| No. | Project Description | MS4 Permit Requirement | Initial 12 Month Requirement | Annual Requirement | Projects, Programs, & Studies | Responsible Position |
| 1-A | Develop Written Partnership Agreements - Provide mutually beneficial partnerships to address MS4 permit requirements of providing educational opportunities, illicit discharge detection and elimination, and maintenance of the city conveyance systems. Agreements will be pursued between the City of Columia Heights and the Rice Creek Watershed District. | ✓ | ✓ | | | Engineering |
| 1-B | Education Activity Implementation Plan - The City will provide stormwater education and outreach programs for residents within the City. The City will complete an outline of the education program and implementation schedule for the upcoming permit cycle. | ✓ | ✓ | ✓ | | Engineering |
| 1-C | Education Program: The City or its designee will raise awareness to the audience involved by providing information on stormwater pollution prevention, effects of illicit discharges, best management practices, components of the SWPPP and outside entity resources available to City residents and business owners. | ✓ | ✓ | ✓ | | Engineering |
| 1-D | City Website - The City updates their web page by providing information on high priority stormwater pollution prevention topics and effects of illicit discharge to City residents and business owners. The goal will be to add new material as it becomes available and record the number of website hits annually. | ✓ | | ✓ | | Engineering |
| 1-E | City Newsletter - City staff will develop then distribute stormwater related articles in the City newsletter. This goal will be met by distributing a minimum of two stormwater related articles in the City newsletter each year. | ✓ | | ✓ | | Public Works |
| 1-F | Coordination of Education Program - The City will collaborate and coordinate the development and implementation of the City's educational activities schedule with all three of the City's Watershed Management Commissions. | ✓ | ✓ | ✓ | | Public Works |
| 2-A | Comply with Public Notice Requirements - Provide public notice of meeting to provide input on the SWPPP in accordance with City public hearing notification requirements. | ✓ | | ✓ | | Engineering |

| No. | Project Description | MS4 Permit Requirement | Initial 12 Month Requirement | Annual Requirement | Projects, Programs, & Studies | Responsible Position |
|---|---|---|---|---|---|---|
| 2-B | Annual Meeting - Hold annual public meeting combined with City Council Meeting or other public participation/involvement event to solicit public input on the SWPPP, discuss its effectiveness, or amendments. Explore new venues and enhance meeting effectiveness and participation. Effectiveness will be evaluated based upon the amount of resident feedback received. | ✓ | ✓ | ✓ | | Engineering |
| 2-C | Public Input Consideration and Response Procedures - City staff will respond to all public comments and statements received from the public meeting, and document any proposed changes to the SWPPP for final approval by the City Engineer (if applicable). The goal of this BMP will be met by documenting all written and oral input into the record of decision and submitted in conjunction with the annual report to the MPCA. | ✓ | ✓ | ✓ | | Engineering |
| 2-D | Online Availability of Stormwater Pollution Prevention Program Document - Provide an electronic document of the SWPPP document to allow viewing anytime and easier access to these documents. | ✓ | ✓ | ✓ | | Engineering |
| 3-A | Storm Sewer System Mapping - Update storm sewer map to meet the requirements of Part II.D.4. of the MS4 General Permit. Identify outfalls, including unique identification (ID) number assigned by the permittee, and an associated geographic coordinate. Update pond inventory and submit to MPCA. | ✓ | ✓ | ✓ | | Engineering |
| 3-B | Illicit Discharge Detection and Elimination (IDDE) and Enforcement Ordinance/Rules - Review ordinance annually to ensure that ordinance continues to meet the needs of the City and legal requirements. | ✓ | ✓ | ✓ | | Engineering |
| 3-C | Illicit Discharge Detection and Elimination (IDDE) Program - Develop written program and implement it as defined in City SWPPP to meet requirements of Part III.D.3.c.h. of the MS4 General Permit. Include procedures to meet permit requirements for the following items:<br>-Inform Public about illicit discharges<br>-Employee Training Program (maintain 2 annual training events in spring and fall)<br>-IDDE Inspections<br>-IDDE Investigations and elimination | ✓ | ✓ | ✓ | ✓ | Engineering |

| No. | Project Description | MS4 Permit Requirement | Initial 12 Month Requirement | Annual Requirement | Projects, Programs, & Studies | Responsible Position |
|---|---|---|---|---|---|---|
| 3-D | IDDE Program Updates - Develop written procedures for illicit discharge inspections, investigations, and response actions. Develop a process to document information as described in the Permit (Part III.3.h.) within 12 months following the date permit coverage is extended. | ✓ | ✓ | ✓ | ✓ | Engineering |
| 3-E | Illicit Discharge Inspections - In year 1, the City will map out areas that are identified as high-priority outfalls and around high-risk establishments (fast food restaurants, dumpsters, car washes, mechanics, and oil changes). In years 2-5, the City will integrate those sites into its annual MS4 inspection activities. | ✓ | ✓ | ✓ | ✓ | Engineering/Public work |
| 3-F | Illicit Discharge Investigation - As needed, City staff or a consultant will be used to televise a section of the sewer system, collect grab samples or perform other effective testing procedures to find illicit connection identified in the system. | ✓ | ✓ | ✓ | ✓ | Public Works |
| 3-G | Standard Operating Procedures (SOPs) - Develop SOPs for IDDE within 12 months of the date of permit coverage | ✓ | ✓ | ✓ | | Engineering |
| 4-A | Construction Site Stormwater Runoff Ordinance - Review the recently updated (December 19, 2011) ordinance to ensure it meets the requirements of Part III.D.4.a.(1)-(8) of the MS4 General Permit and that it is at least as stringent as the MPCA general permit to Discharge Stormwater Associated with Construction Activity. | ✓ | ✓ | ✓ | | Engineering |
| 4-B | Construction Site Implementation of Erosion and Sediment Control BMPs - Review and evaluate the efficacy of construction site erosion control plans through regular (weekly to monthly) inspections for construction sites to ensure compliance with City ordinances. Document all inspections and enforcement actions (public and private) and keep on file at City. | ✓ | | ✓ | | Engineering |

| No. | Project Description | MS4 Permit Requirement | Initial 12 Month Requirement | Annual Requirement | Projects, Programs, & Studies | Responsible Position |
|---|---|---|---|---|---|---|
| 4-C | Waste Control BMP's for Construction Site Operators - Maintain established guidelines, inspection criteria, and enforcement procedures for the management of construction site waste. Continue to inspect construction sites for compliance with waste control ordinances for materials that include discarded building materials, concrete truck washout, chemicals, litter and sanitary waste at the construction site that may cause adverse impacts to water quality. | ✓ | | ✓ | | Engineering |
| 4-D | Construction Site Plan Review - The City will require every applicant for a building permit, to meet the requirements for erosion and sediment control for the applicant's project. | ✓ | | ✓ | | Public Works |
| 4-E | Receipt and Consideration of Non-Compliance for Construction Site Stormwater Controls - The City will establish a procedure for the public to report potential construction site erosion control and waste disposal infractions. The goal of this BMP will be achieved by completing the timeline/implementation. | ✓ | ✓ | ✓ | | Engineering |
| 4-F | Stormwater Compliance Inspections - Develop written procedures, checklist and responsible persons to ensure that at least 10% of inspections conducted annually are performed at deemed high priority inspection sites (e.g., near sensitive receiving waters, projects larger than 5 acres) | ✓ | ✓ | ✓ | | Engineering |
| 4-G | Standard Operating Procedures (SOPs) - Complete an annual review of SOPs for site inspections and site plan reviews by evaluating checklists and existing guidelines to ensure they are up-to-date to reflect MPCA's current construction general permit requirements. | ✓ | ✓ | ✓ | | Engineering |
| 4-H | Develop Enforcement Response Procedures (ERPs) - Establish/outline Enforcement Response Procedures for Construction Site Activities. | ✓ | ✓ | ✓ | | Engineering |
| 4-I | Permit Update - Update the City Grading, Building, and ROW permits and Contraction Site Stormwater Runoff ordinance to meet the new permit requirements within 12 month following the date permit coverage is extended. | ✓ | ✓ | ✓ | | Public Works |
| 4-J | Prioritize Inspections - The City will develop a process to determine the frequency for inspecting high priority inspection sites (e.g. near sensitive receiving waters, projects larger than 5 acres). | ✓ | ✓ | ✓ | | Public Works |

| No. | Project Description | MS4 Permit Requirement | Initial 12 Month Requirement | Annual Requirement | Projects, Programs, & Studies | Responsible Position |
|---|---|---|---|---|---|---|
| 4-K | Permit Application System - Develop procedures to integrate construction site stormwater runoff review and inspection documents into permit tracking program. | ✓ | ✓ | ✓ | | Engineering |
| 5-A | Site Plan Review Program - The City will review and revise (if necessary, during the plan review process) permanent BMP designs and criteria for post-construction stormwater management associated with new development and redevelopment projects of one acre or more. The City will also actively look for non-structural opportunities where prudent and feasible. The goal of this BMP will be met if the City conducts plan reviews on new development and redevelopment projects of one acre or more. | ✓ | ✓ | ✓ | ✓ | Engineering and Planning |
| 5-B | Update Ordinance to Meet New Permit Requirements - Complete Ordinance updates for post-construction runoff from new development and redevelopment within 12 months of extension of permit coverage. | ✓ | ✓ | ✓ | | Engineering |
| 5-C | SOPs - In addition to existing stormwater management design guidelines and standards the City will develop SOPs within 12 months of the date of permit coverage to strengthen Post Construction Stormwater Management | ✓ | ✓ | ✓ | | Engineering |
| 5-D | Document Pertinent Project Information - Maintain all related documents pertaining to each new or redevelopment project in more user-friendly filing system for better records management. Implement within 12 months of the date of permit coverage. | ✓ | ✓ | ✓ | | Engineering |
| 6-A | Parking Lots & Street Cleaning - Sweep City maintained streets 2 times per year | ✓ | | ✓ | | Street Maintenance |
| 6-B | Storm Sewer Inspection Program - Conduct one inspection of all City-owned ponds and outfalls prior to expiration date of the MS4 General Permit. Annually inspect 100% of structural pollution control devices. | ✓ | ✓ | ✓ | | Street Maintenance |
| 6-C | Inspection of All Exposed Stockpile, Storage and Material Handling Areas - Based on storm sewer inspection findings determine if repair, replacement, or maintenance measures are necessary to ensure proper function and treatment effectiveness. | ✓ | ✓ | ✓ | | Street Maintenance |

| No. | Project Description | MS4 Permit Requirement | Initial 12 Month Requirement | Annual Requirement | Projects, Programs, & Studies | Responsible Position |
|---|---|---|---|---|---|---|
| 6-D | Structural Stormwater BMP Maintenance Program - Develop written program to utilize results from storm sewer inspection findings to determine if repair, replacement, or maintenance measures are necessary to ensure structures proper function and treatment effectiveness. Document annually the number of structures repaired or scheduled for maintenance. Annually inspect 20% of known public outfalls, sediment basins and ponds each year on a rotating basis | ✓ | ✓ | ✓ | | Engineering / Street Maintenance |
| 6-E | Asset Management System for Record Reporting and Retention - The City will retain all records of inspection, maintenance, and corrective actions of the City's stormwater system. The goal of this BMP will be met if the City retains these records for a period of three years past the expiration of this permit. | ✓ | | ✓ | ✓ | Engineering |
| 6-F | Evaluation of Inspection Frequency - Develop written procedures to modify the frequency of inspections, if after two years of inspections patterns develop warranting a reduction or increase in the frequency of inspection. | | | ✓ | | Public Works/ Engineering |
| 6-G | Landscaping and Lawn Care - Develop written program to track roadside mowing and maintenance on all City roads twice annually (June and Sept) and seven year tree trimming rotation for all City trees. | | | ✓ | ✓ | Public Works/ Parks |
| 6-H | Road Salt Application Review - The City will record the annual activates of the salt distribution program and adjust current practices as necessary. | | | ✓ | ✓ | Public Works |
| 6-I | Evaluation of Proposed Stormwater Infiltration Projects for Impacts on Source Water - The City will prohibit the construction of the infiltration area or incorporate specific BMPs to reduce pollutants from infiltrating within vulnerable DWSMA's. | | | ✓ | ✓ | Public Works |
| 6-J | Park and Open Space Training - Develop written procedures for the existing program to train full-time and seasonal employees on proper use and application of fertilizers and pesticides for maintenance of City lands. | ✓ | ✓ | ✓ | ✓ | Public Works/ Parks |
| 6-K | Fleet and Building Maintenance Training Program - Training focused on automotive maintenance program (automotive inspections and washing), spill cleanup training, hazardous materials training, building leak prevention and inspection training. | ✓ | ✓ | ✓ | ✓ | Public Works |

| No. | Project Description | MS4 Permit Requirement | Initial 12 Month Requirement | Annual Requirement | Projects, Programs, & Studies | Responsible Position |
|---|---|---|---|---|---|---|
| 6-L | Stormwater Systems Maintenance Training Program - Training focused on parking lot and street cleaning, storm drain systems cleaning, road salt materials management. | ✓ | ✓ | ✓ | ✓ | Public Works |
| 6-M | Spill Prevention & Control Plans for Municipal Facilities - Ensure that plans describing spill prevention and control procedures are consistent among all departments. Conduct annual spill prevention and response training sessions to all municipal employees. Distribute education materials to each municipal facility by the end of year 2. | ✓ | ✓ | ✓ | | Engineering |
| 6-N | Facility Inventory - Develop facilities inventory to include potential pollutants at each site. Create a map of all identified facilities. | ✓ | ✓ | ✓ | | Engineering |
| 6-O | Pond Assessment Procedures & Schedule - In year 1, develop procedures for determining TSS and TP treatment effectiveness of city owned ponds use for treatment of stormwater. Implement schedule in year 2-5. | ✓ | ✓ | ✓ | ✓ | Engineering |
| 7-A | TMDL Review & Implementation - Columbia Heights will work cooperatively with the Minnesota Pollution Control Agency and other outside organizations to develop and implement all future TMDL implementation plan(s) for impaired waters designated under Section 303(d), receiving MS4 discharges from within or adjacent to the City. | ✓ | ✓ | ✓ | ✓ | Engineering |

# BMP PAGE

Implementation Table

**Unique Identifying Number:** 1-A

**Permit Requirements Addressed by this BMP:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Part II.D.1. | | | | | | |

**BMP Title:** Develop Written Partnership Agreements

**BMP Description:**

Provide mutually beneficial partnerships to address MS4 permit requirements of providing educational opportunities, illicit discharge detection and elimination, and maintenance of the city conveyance systems. Agreements will be pursued between the City of Columbia Heights and the Rice Creek Watershed District.

**Measurable Goals:**

Determine if this partnership beneficial in the educational, training, and/or enforcement aspects of the MS4 program.

**Responsible Person:**

| | |
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 1-B

**Permit Requirements Addressed by this BMP:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Part III.D.1. | Part III.D.1. | Part III.D.1. | Part III.D.1. | Part III.D.1. | | |

**BMP Title:** Education Activity Implementation Plan

**BMP Description:**

The City will provide stormwater education and outreach programs for residents within the City. The City will complete an outline of the education program and implementation schedule for the upcoming permit cycle.

**Measurable Goals:**

The City will document the number of publications and households served by publication.
The effectiveness of this BMP will be measured by the number of articles and brochures published in newsletters, distributed via City mailings/website and RCWD workshops, and visits to the City's website.
Success of this BMP is defined as developing then implementing the educational activities schedule and distributing/hosting a minimum of four educational materials, workshops, or presentations per year.

**Responsible Person:**

| | |
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 1-C

**Permit Requirements Addressed by this BMP:**

Part III.D.1. | Part III.D.1. | Part III.D.1. | Part III.D.1. | Part III.D.1. | | |

**BMP Title:** Education Program

**BMP Description:**

The City or its designee will raise awareness to the audience involved by providing information on stormwa

**Measurable Goals:**

The City will document the number of publications and households served by publication.
The effectiveness of this BMP will be measured by the number of articles and brochures published in newsletters, distributed via City mailings/website and RCWD workshops, and visits to the City's website.
Success of this BMP is defined as developing then implementing the educational activities schedule and distributing/hosting a minimum of four educational materials, workshops, or presentations per year.

**Responsible Person:**

| | |
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 1-D

**Permit Requirements Addressed by this BMP:**

Part III.D.1. | Part III.D.1. | Part III.D.1. | Part III.D.1. | Part III.D.1. | | |

**BMP Title:** City Website

**BMP Description:**

The City updates their web page by providing information on high priority stormwater pollution prevention topics and effects of illicit discharge to City residents and business owners. The goal will be to add new material as it becomes available and record the number of website hits annually.

**Measurable Goals:**

Track website hits to the stormwater documents available. Track the comments left by community members about the stormwater program.

**Responsible Person:**

| | |
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 1-E

**Permit Requirements Addressed by this BMP:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Part III.D.1. | Part III.D.1. | Part III.D.1. | Part III.D.1. | | | |

**BMP Title:** City Newsletter

**BMP Description:**

City staff will develop then distribute stormwater related articles in the City newsletter. This goal will be met by distributing a minimum of two stormwater related articles in the City newsletter each year.

**Measurable Goals:**

Track the number of newsletters that were distributed.

**Responsible Person:**

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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 1-F

**Permit Requirements Addressed by this BMP:**

Part II.D.1. | Part III.D.1. | Part III.D.1. | Part III.D.1.

**BMP Title:** Coordination of Education Program

**BMP Description:**

The City will collaborate and coordinate the development and implementation of the City's educational activities schedule with all three of the City's Watershed Management Commissions.

**Measurable Goals:**

Track the number of community members who give input and attend the educational activities.

**Responsible Person:**

| | |
|---|---|
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 2-A

**Permit Requirements Addressed by this BMP:**

Part III.D.2. | Part III.D.2. | Part III.D.2. | Part III.D.2. | Part III.D.2. | | |

**BMP Title:** Comply with Public Notice Requirements

**BMP Description:**

Provide public notice of meeting to provide input on the SWPPP in accordance with City public hearing notification requirements.

**Measurable Goals:**

Make sure the notice for the public is posted within the acceptable timeframe for public input. The effectiveness of this BMP will be measured by the number of public notices posted.

**Responsible Person:**

| | |
|---|---|
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 2-B

**Permit Requirements Addressed by this BMP:**

Part III.D.2. | Part III.D.2. | Part III.D.a. | Part III.D.2. | Part III.D.2. | | |

**BMP Title:** Annual Meeting

**BMP Description:**

Hold an annual public meeting combined with a City Council meeting or other public participation/involvement event to solicit public input on the SWPPP, discuss its effectiveness, or make amendments to current SWPPP. Explore new venues and enhance meeting effectiveness and participation.

**Measurable Goals:**

Document attendance and record minutes at the public meeting, record statements and written comments and document changes made to the SWPPP. Effectiveness will be evaluated based upon the amount of resident feedback is received.

**Responsible Person:**

| | |
|---|---|
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# BMP PAGE

Implementation Table

**Unique Idenifying Number:** 2-C

**Permit Requirements Addressed by this BMP:**

Part III.D.2. | Part III.D.2. | Part III.D.2. | Part III.D.2. | Part III.D.2. | | |

**BMP Title:** Public Input Consideration and Response Procedures

**BMP Description:**

The City will conduct a public meeting and host a web page on the City's Storm Water Pollution Prevention Program. City staff will respond to all public comments and statements received from the public meeting, and document any proposed changes to the SWPPP for final approval by the City Engineer (if applicable).

**Measurable Goals:**

The goal of this BMP will be met by documenting all written and oral input into the record of decision and submitted in conjunction with the annual report to the MPCA.

**Responsible Person:**

| | |
|---|---|
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 2-D

**Permit Requirements Addressed by this BMP:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Part III.D.2. | Part III.D.2. | Part III.D.2. | | | | |

**BMP Title:** Online Availability of Stormwater Pollution Prevention Program Document

**BMP Description:**

Provide an electronic document of the SWPPP document to allow viewing anytime and easier access to these documents.

**Measurable Goals:**

The effectiveness of this BMP will be measured by tracking the number of website hits to the SWPPP and the amount of public input submitted electronically.

**Responsible Person:**

| | |
|---|---|
| Name: | Kathy Young |
| Title: | Asst. City Engineer |
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 3-A

**Permit Requirements Addressed by this BMP:**

Part II.D.4. | Part III.C.1. | Part III.D.3. | Part III.D.3. | | | |

**BMP Title:** Storm Sewer System Mapping

**BMP Description:**

Update storm sewer map to meet the requirements of Part II.D.4. of the MS4 General Permit. Identify outfalls, including unique identification (ID) number assigned by the permittee, and an associated geographic coordinate. Update pond inventory and submit to MPCA.

**Measurable Goals:**

The effectiveness of this BMP will be defined as mapping all storm sewer conveyances 12" or greater that are owned by the City. The success of this BMP will be measured by annually updating all City owned storm sewer conveyances equal to or greater than 12".

**Responsible Person:**

| | |
|---|---|
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 3-B

**Permit Requirements Addressed by this BMP:**

Part III.D.3. | Part III.D.3. | Part III.D.3. | | | | |

**BMP Title:** Illicit Discharge Detection and Elimination (IDDE) and Enforcement Ordinance/Rules

**BMP Description:**

Review ordinance annually to ensure that ordinance continues to meet the needs of the City and legal requirements. Elements of this ordinance will include, but are not limited to, defining allowable discharges, setting policy as it pertains to violations and penalties, and mitigation requirements.

**Measurable Goals:**

The effectiveness of this BMP will be measured by the number of enforcement actions issued annually. Success will be defined as the review of existing ordinances or amendments made to the illicit discharge ordinance.

**Responsible Person:**

| | |
|---|---|
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 3-C

**Permit Requirements Addressed by this BMP:**

Part III.D.3. | Part III.D.3. | Part III.D.3. | Part III.D.3. | Part III.D.3. | Part III.D.3. |

**BMP Title:** Illicit Discharge Detection and Elimination (IDDE) Program

**BMP Description:**

Develop written program and implement it as defined in City SWPPP to meet requirements of Part III.D.3.c.h. of the MS4 General Permit. This BMP includes providing information on recycling options, services, and programs within the City. The City will also review the current educational activities undertaken by its staff to eliminate illicit discharges from general City operations.

**Measurable Goals:**

The City will continue to annually review the educational content of printed literature for adequacy and update as necessary. BMP effectiveness will be measured by the number of calls to the City regarding illegal dumping or illicit discharges. Also, success will be defined by providing educational material to the City staff a minimum of one time annually.

**Responsible Person:**

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|---|---|
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 3-D

**Permit Requirements Addressed by this BMP:**

Part III.D.3. | Part III.D.3. | Part III.D.3. | Part III.D.3. | Part III.D.3. | | |

**BMP Title:** IDDE Program Updates

**BMP Description:**

Develop written procedures for illicit discharge inspections, investigations, and response actions. Develop a process to document information as described in the Permit (Part III.3.h.) within 12 months following the date permit coverage is extended. Elements of this ordinance will include, but are not limited to, defining allowable discharges and mitigation requirements.

**Measurable Goals:**

The effectiveness of this BMP will be measured by the number of enforcements actions issued annually.

**Responsible Person:**

| | |
|---|---|
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 3-E

**Permit Requirements Addressed by this BMP:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Part III.D.3. | Part III.D.3. | Part III.D.3. | Part III.D.3. | | | |

**BMP Title:** Illicit Discharge Inspections

**BMP Description:**

In year 1, the City will map out areas that are identified as high-priority outfalls and around high-risk establishments (fast food restaurants, dumpsters, car washes, mechanics, and oil changes). In years 2-5, the City will integrate those sites into its annual MS4 inspection activities. The City will notify the MPCA state duty officer of any hazardous material spills or discharges.

**Measurable Goals:**

The effectiveness of this BMP will be measured by:
1. Annually documenting the number of miles covered by trash and debris collection,
2. Annually documenting all reported non-stormwater discharges occurring on City owned land, private property, and right-of-way, as well as any remedial actions taken (if applicable).

**Responsible Person:**

| | |
|---|---|
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 3-F

**Permit Requirements Addressed by this BMP:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Part III.D.3. | Part III.D.3. | Part III.D.3. | Part III.D.3. | | | |

**BMP Title:** Illicit Discharge Investigation

**BMP Description:**

As needed, City staff or a consultant will be used to televise a selection of the sewer system, collect grab samples, or perform other effective testing procedures to find illicit connection identified in the system.

**Measurable Goals:**

All non-stormwater discharges (as defined in Part III.D.3.f.) were evaluated and determined to be insignificant sources of pollutants to the MS4.

**Responsible Person:**

| | |
|---|---|
| Name: | Lauren McClanahan |
| Title: | Utilities |
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 3-G

**Permit Requirements Addressed by this BMP:**

Part III.A. | Part III.D.3. | Part III.D.3. | Part III.D.3. | Part III.D.3. | Part III.D.3. | Part III.D.3.

**BMP Title:** Standard Operating Procedures (SOPs)

**BMP Description:**

Develop SOPs for IDDE within the initial 12 months of the beginning date of permit coverage.

**Measurable Goals:**

The effectiveness of this BMP and the SOPs for IDDE will be calculated by the amount of regulation as well as maintaining compliance with the NPDES MS4 permit.

**Responsible Person:**

| | |
|---|---|
| Name: | Lauren Letsche |
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 4-A

**Permit Requirements Addressed by this BMP:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Part III.D.4. | Part III.D.4. | Part III.D.4. | | | | |

**BMP Title:** Construction Site Stormwater Runoff Ordinance

**BMP Description:**

Review the City's ordinance to ensure it meets the requirements of Part III.D.4.a.(1)-(8) of the MS4 General Permit and that it is at least as stringent as the MPCA general permit to Discharge Stormwater Associated with Construction Activity.

**Measurable Goals:**

The City will annually review and update as necessary the City's erosion control ordinances. This BMP effectiveness will be calculated by tracking the compliance issues with construction sites.

**Responsible Person:**

| | |
|---|---|
| Name: | Kevin Hansen |
| Title: | Public Works Director |
| Phone: | Engineering |
| Email: | khansen@columbiaheightsmn.gov |

# BMP PAGE

Implementation Table

**Unique Identifying Number:** 4-B

**Permit Requirements Addressed by this BMP:**

Part III.D.4. | Part III.D.4. | Part III.D.4.

**BMP Title:** Construction Site Implementation of Erosion and Sediment Control BMPs

**BMP Description:**

Review and evaluate the efficacy of construction site erosion control plans through regular (weekly to monthly) inspections for construction sites to ensure compliance with City ordinances. Document all inspections and enforcement actions (public and private) and keep on file at City. As part of the City's permit approval standards, BMPs must be implemented in accordance with the NPDES permit.

**Measurable Goals:**

Success of this BMP will be determined by site inspections per NPDES Phase II requirements and City permit approvals.

**Responsible Person:**

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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 4-C

**Permit Requirements Addressed by this BMP:**

Part III.D.4. | Part III.D.4. | Part III.D.4. | Part III.D.4. | | | |

**BMP Title:** Waste Control BMPs for Construction Site Operations

**BMP Description:**

Maintain established guidelines, inspection criteria, and enforcement procedures for the management of construction site waste. Continue to inspect construction sites for compliance with waste control ordinances for materials that include discarded building materials, concrete truck washout, chemicals, litter and sanitary waste at the construction site that may cause adverse impacts to water quality.

**Measurable Goals:**

The effectiveness of this BMP will be measured by the annual recorded number of remedial actions against construction site operations. Success of this BMP will be defined as operator compliance to the City's Waster and Material Disposal, 1350.06 ordinance and NPDES Phase II permit regulations.

**Responsible Person:**

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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 4-D

**Permit Requirements Addressed by this BMP:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Part III.D.4. | Part III.D.4. | Part III.D.4. | | | | |

**BMP Title:** Construction Site Plan Review

**BMP Description:**

Every applicant for a city permit to allow land disturbing activities is required to submit a project specific stormwater management plan (if applicable) and/or erosion control plan to the City for review and approval. Construction permits will be required to meet MPCA NPDES Phase II guidelines for erosion and sediment control and all applicable City ordinances and codes.

**Measurable Goals:**

No City permit to allow land disturbing activities shall be issued until approval of a stormwater management plan (if applicable) and/or erosion control plan, or waiver of the approval requirement has been obtained. Success will be defined as enforcing the permit's submittal requirement.

**Responsible Person:**

| | |
|---|---|
| Name: | Kathy Young |
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 4-E

**Permit Requirements Addressed by this BMP:**

Part III.D.4. | Part III.D.4. | Part III.D.4. | | | | |

**BMP Title:** Receipt and Consideration of Non-Compliance for Construction Site Stormwater Controls

**BMP Description:**

The City will establish a phone line and website contact information through which the public may report potential construction site erosion control and waste disposal infractions. Reported incidents will be inspected within 24 hours of receipt or on the next scheduled work day by the City. Hazardous material spills or discharges will be reported to the MPCA State Duty Officer within 24 hours.

**Measurable Goals:**

The City will establish contact information for receipt of construction site violations. The City will record:
- The number of calls and emails related to SWPPP issues.
- The number of illicit discharge and construction site complaints.
- The number of clean-up activities or SWPPP changes resulting from calls or emails.

**Responsible Person:**

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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 4-F

**Permit Requirements Addressed by this BMP:**

Part III.D.3. | Part III.D.4. | Part III.D.4. | Part III.D.4. | Part III.D.4. | | |

**BMP Title:** Stormwater Compliance Inspections

**BMP Description:**

Construction site operators must conform to all NPDES construction permit standards and City ordinances pertaining to construction site erosion control and waste disposal. Inspection procedures consist of NPDES Phase II inspection requirements and violations reported by the public as defined in BMP Summary Sheets 3-C and 4-E.

**Measurable Goals:**

The City will begin to annually evaluate the effectiveness of site inspections and enforcement procedures via enforcement actions taken annually. Additional and/or revised procedures will be added (if applicable) when deemed necessary or found non-conforming to NPDES Phase II requirements.

**Responsible Person:**

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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 4-G

**Permit Requirements Addressed by this BMP:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Part III.A. | Part III.D.4. | Part III.D.4. | Part III.D.4. | | | |

**BMP Title:** Standard Operating Procedures (SOPs)

**BMP Description:**

Complete an annual review of SOPs for site inspections and site plan reviews by evaluating checklists and existing guidelines to ensure they are up-to-date to reflect MPCA's current construction general permit requirements.

**Measurable Goals:**

The effectiveness of this BMP and the SOPs for IDDE will be calculated by the amount of regulation as well as maintaining compliance with the NPDES MS4 permit.

**Responsible Person:**

| | |
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 4-H

**Permit Requirements Addressed by this BMP:**

Part III.B.1. | Part III.B.2. | Part III.D.4. | Part III.D.4. | Part III.D.4. | | |

**BMP Title:** Develop Enforcement Response Procedures (ERPs)

**BMP Description:**

Establish/outline enforcement response procedures (ERPs) for construction site activities that enforce the standard operating procedures and permit requirements.

**Measurable Goals:**

The effectiveness of this BMP will be measured by the amount of violations and enforcement actions taken place throughout each year within the City.

**Responsible Person:**

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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 4-I

**Permit Requirements Addressed by this BMP:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Part III.D.4. | Part III.D.4. | Part III.D.4. | | | | |

**BMP Title:** Permit Update

**BMP Description:**

Update the City Grading, Building, and ROW permits and Contraction Site Stormwater Runoff ordinance to meet the new permit requirements within 12 month following the date permit coverage is extended. City staff will review and revise (if applicable) current City ordinances and codes annually for conformance to new or amended NPDES construction permit and/or watershed district erosion control standards.

**Measurable Goals:**

The City will annually review and update as necessary the City's erosion control ordinances.

**Responsible Person:**

| | |
|---|---|
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 4-J

**Permit Requirements Addressed by this BMP:**

Part III.D.4. | Part III.D.4. | Part III.D.4. | Part III.D.4. | | | |

**BMP Title:** Prioritize Inspections

**BMP Description:**

The City will develop a process to determine the frequency for inspecting high priority inspection sites (e.g. near sensitive receiving waters, projects larger than 5 acres). The process will be developed onto a city map that calls out these sensitive areas.

**Measurable Goals:**

The City will begin to annually evaluate the effectiveness of site inspections and enforcement procedures via enforcement actions taken annually. Additional and/or revised procedures will be added (if applicable) when deemed necessary or found non-conforming to NPDES Phase II requirements.

**Responsible Person:**

| | |
|---|---|
| Name: | Lauren Letsche |
| Title: | Stormwater Specialist |
| Phone: | (763) 706-3709 |
| Email: | lletsche@columbiaheightsmn.gov |

# BMP PAGE

Implementation Table

**Unique Identifying Number:** 4-K

**Permit Requirements Addressed by this BMP:**

Part III.D.4. | Part III.D.4. | Part III.D.4. | Part III.D.4. | Part III.D.4. | | |

**BMP Title:** Permit Application System

**BMP Description:**

Develop procedures to integrate construction site stormwater runoff review and inspection documents into permit tracking program. The documents will help to maintain compliance with the MPCA and the City Code on these construction sites.

**Measurable Goals:**

The effectiveness of this BMP will be determined by the amount of permits applied for and the ease to complete the inspections of the construction sites.

**Responsible Person:**

| | |
|---|---|
| Name: | Lauren Letsche |
| Title: | Stormwater Specialist |
| Phone: | (763) 706-3709 |
| Email: | lletsche@columbiaheightsmn.gov |

# BMP PAGE

Implementation Table

**Unique Identifying Number:** 5-A

**Permit Requirements Addressed by this BMP:**

Part III.D.5. | Part III.D.5. | Part III.D.5. | Part III.D.5. | Part III.D.5. | | |

**BMP Title:** Site Plan Review Program

**BMP Description:**

The City will review and revise (if necessary, during the plan review process) permanent BMP designs and criteria for post-construction stormwater management associated with new development and redevelopment projects of one acre or more. The City will also actively look for non-structural opportunities where prudent and feasible.

**Measurable Goals:**

The goal of this BMP will be met if the City conducts plan reviews on new development and redevelopment projects of one acre or more. Success of this BMP is defined as annually recording all revised BMP designs and implemented structural and non-structural BMPs on City properties.

**Responsible Person:**

| | |
|---|---|
| Name: | Kathy Young |
| Title: | Asst. City Engineer |
| Phone: | (763) 706-3704 |
| Email: | kyoung@columbiaheightsmn.gov |

# BMP PAGE

Implementation Table

**Unique Identifying Number:** 5-B

**Permit Requirements Addressed by this BMP:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Part III.D.5. | Part III.D.5. | Part III.D.5. | Part III.D.5. | Part III.D.5. | Part III.D.5. | |

**BMP Title:** Update Ordinance to Meet New Permit Requirements

**BMP Description:**

Complete Ordinance updates for post-construction runoff from new development and redevelopment within 12 months of extension of permit coverage.

**Measurable Goals:**

The City will annually review and update as necessary the City's post-construction ordinance and permit requirements.

**Responsible Person:**

| | |
|---|---|
| Name: | Kevin Hansen |
| Title: | Public Works Director |
| Phone: | (763) 706-3705 |
| Email: | khansen@columbiaheightsmn.gov |

# BMP PAGE

Implementation Table

**Unique Identifying Number:** 5-C

**Permit Requirements Addressed by this BMP:**

Part III.D.5. Part III.D.5. Part III.D.5. Part III.D.5. Part III.D.5. Part III.D.5. Part III.D.5.

**BMP Title:** Standard Operating Procedures (SOPs)

**BMP Description:**

In addition to existing stormwater management design guidelines and standards, the City will develop SOPs within the initial 12 months of the date of permit coverage to strengthen Post Construction Stormwater Management.

**Measurable Goals:**

The effectiveness of this BMP and the SOPs for post-construction will be calculated by the amount of regulation as well as maintaining compliance with the NPDES MS4 permit.

**Responsible Person:**

| | |
|---|---|
| Name: | Lauren Letsche |
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| Phone: | (763) 706-3709 |
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 5-D

**Permit Requirements Addressed by this BMP:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Part III.D.5. | Part III.D.5. | | | | | |

**BMP Title:** Document Pertinent Project Information

**BMP Description:**

Maintain all related documents pertaining to each new or redevelopment project in more user-friendly filing system for better records management. Implement within 12 months of the date of permit coverage.

**Measurable Goals:**

The effectiveness of this BMP will be measured by the ability to track records of inspections and maintenance pertaining to this minimal control measure.

**Responsible Person:**

| | |
|---|---|
| Name: | Lauren Letsche |
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| Phone: | (763) 706-3709 |
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 6-A

**Permit Requirements Addressed by this BMP:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Part III.D.6. | Part III.D.6. | Part III.D.6. | | | | |

**BMP Title:** Parking Lots & Street Cleaning

**BMP Description:**

The City currently brush or vacuum sweeps City owned streets a minimum of twice per year in an effort to reduce the amount of sediment and trash from reaching the storm sewer system. One street sweeping activity will occur in the spring (April-June) on all streets, and the second activity will occur in the fall (September –November) on selected areas (as determined by the City Administrator).

**Measurable Goals:**

The City will continue recording the frequency and miles of streets that are annually swept, and quantify the amount of trash/debris removed per sweeping occurrence. Success of this BMP is defined as recording two street sweeping occurrences per year.

**Responsible Person:**

| | |
|---|---|
| Name: | Mike O'Riley |
| Title: | Streets |
| Phone: | (763) 706-3721 |
| Email: | mo'reilly@columbiaheightsmn.gov |

# BMP PAGE

Implementation Table

**Unique Identifying Number:** 6-B

**Permit Requirements Addressed by this BMP:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Part III.D.6. | Part III.D.6. | Part III.D.6. | | | | |

**BMP Title:** Storm Sewer Inspection Program

**BMP Description:**

Conduct one inspection of all City-owned ponds and outfalls prior to expiration date of the MS4 General Permit. Annually inspect of 100% of structural pollution control devices. Newly constructed and rebuild structural pollution control devices will be added to the storm sewer map (BMP summary sheet 3-A) and inspected within one year of post construction.

**Measurable Goals:**

Maintenance and repair specifications and schedules will be developed and implemented as necessary. Success of this BMP will be defined as annually conducting and documenting inspections, repairs, and maintenance projects of all structural pollution control devices.

**Responsible Person:**

| | |
|---|---|
| Name: | Mike O'Riley |
| Title: | Streets |
| Phone: | (763) 706-3721 |
| Email: | mo'reilly@columbiaheightsmn.gov |

# BMP PAGE

Implementation Table

**Unique Identifying Number:** 6-C

**Permit Requirements Addressed by this BMP:**

Part III.D.6. | Part III.D.6. | Part III.D.6. | Part III.D.6. | Part III.D.6. | | |

**BMP Title:** Inspection of All Exposed Stockpiles, Storage, and Material Handling Areas

**BMP Description:**

City staff will annually locate and inspect all exposed stockpiles and storage/material handling areas on City owned properties. All existing onsite BMP's will be inspected for conformance to NPDES Phase II permit requirements. Any identified erosion control issues will be corrected and documented.

**Measurable Goals:**

The effectiveness of this BMP will be measured by the frequency of inspections and corrective actions. Success will be defined as locating and inspecting all exposed stockpiles and storage/material handling on City property a minimum of once each year.

**Responsible Person:**

| | |
|---|---|
| Name: | Mike O'Riley |
| Title: | Streets |
| Phone: | (763) 706-3721 |
| Email: | mo'reilly@columbiaheightsmn.gov |

# BMP PAGE

Implementation Table

**Unique Identifying Number:** 6-D

**Permit Requirements Addressed by this BMP:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Part III.D.6. | Part III.D.6. | Part III.D.6. | Part III.D.6. | Part III.D.6. | | |

**BMP Title:** Structural Stormwater BMP Maintenance Program

**BMP Description:**

This plan will consist of (at a minimum) training materials and workshops for City staff to help reduce storm water pollution caused from park maintenance, fleet and building maintenance, new construction and land disturbances, and storm water system maintenance. Document annually number or structures repaired or scheduled for maintenance.

**Measurable Goals:**

The effectiveness of this BMP will be measured by City staff annually evaluating conformance to the municipal operations pollution prevention plan, and revising (if necessary) the plan components. Success is defined as developing, implementing, and achieving the goals detailed within the plan by the implantation dates described below.

**Responsible Person:**

| | |
|---|---|
| Name: | Lauren Letsche |
| Title: | Stormwater Specialist |
| Phone: | (763) 706-3709 |
| Email: | lletsche@columbiaheightsmn.gov |

# BMP PAGE

Implementation Table

**Unique Identifying Number:** 6-E

**Permit Requirements Addressed by this BMP:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Part III.D.6. | Part III.D.6. | | | | | |

**BMP Title:** Asset Management System for Record Reporting and Retention

**BMP Description:**

The City Administrator will retain all records of inspection, maintenance, and corrective actions of the City's storm water system. Records will be available, by request, to the public upon approval by the City Administrator.

**Measurable Goals:**

The City will record the number of record requests and distributed materials annually. Success will be defined by the City providing the records or materials as requested.

**Responsible Person:**

| | |
|---|---|
| Name: | Lauren Letsche |
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| Phone: | (763) 706-3709 |
| Email: | lletsche@columbiaheightsmn.gov |

# BMP PAGE

Implementation Table

**Unique Identifying Number:** 6-F

**Permit Requirements Addressed by this BMP:**

Part III.D.6. | Part III.D.6. | Part III.D.6. | Part III.D.6. | | | |

**BMP Title:** Evaluation of Inspection Frequency

**BMP Description:**

The City will retain the records of inspection results and any maintenance performed or recommended. After two years of inspections, if patterns of maintenance become apparent, the frequency of inspections may be adjusted at the discretion of the City's engineering consultant.

**Measurable Goals:**

The effectiveness of this BMP will be measured by the annual recording of all inspections completed the previous year. Success of this BMP will be defined as annually reviewing the frequency of inspections to the maintenance completed by the City.

**Responsible Person:**

| | |
|---|---|
| Name: | Kathy Young |
| Title: | Asst. City Engineer |
| Phone: | (763) 706-3704 |
| Email: | kyoung@columbiaheightsmn.gov |

# BMP PAGE

Implementation Table

**Unique Identifying Number:** 6-G

**Permit Requirements Addressed by this BMP:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Park III.D.6 | Part III.D.6. | Part III.D.6. | Part III.D.6. | | | |

**BMP Title:** Landscape and Lawn Care

**BMP Description:**

The City will continue to annually review and, if necessary, adjust its current practices in the use of fertilizer, pesticide and herbicide application, mowing and discharge operations, grass clipping collection, mulching and composting.

**Measurable Goals:**

The City will continue to annually review and adjust (if necessary) its current methods (as previously specified) of landscaping and lawn care maintenance. The City will annually document the results of the review. Success will be defined as annually reviewing and adjusting current practices (if necessary).

**Responsible Person:**

| | |
|---|---|
| Name: | Tim Lund |
| Title: | Parks Foreman |
| Phone: | (763) 706-3710 |
| Email: | tlund@columbiaheightsmn.gov |

# BMP PAGE

Implementation Table

**Unique Identifying Number:** 6-H

**Permit Requirements Addressed by this BMP:**

Part III.D.6. | Part III.D.6. | Part III.D.6. | Part III.D.6. | | | |

**BMP Title:** Road Salt Application Review

**BMP Description:**

The City will review the practices and policies of road salt applications such as alternative products, calibration of equipment, inspection of vehicles and staff training.

**Measurable Goals:**

The City will record, review, then adjust (if applicable) its practices in salt distribution. Success will be defined as reviewing and adjusting current practices as necessary.

**Responsible Person:**

| | |
|---|---|
| Name: | Mike O'Riley |
| Title: | Streets |
| Phone: | (763) 706-3721 |
| Email: | mo'reilly@columbiaheightsmn.gov |

# BMP PAGE

Implementation Table

**Unique Identifying Number:** 6-I

**Permit Requirements Addressed by this BMP:**

Part III.D.6. | Part III.D.6. | Part III.D.6. | Part III.D.6. | | | |

**BMP Title:** Evaluation of Proposed Stormwater Infiltration Projects for Impacts on Source Water

**BMP Description:**

If the proposed infiltration/discharge is determined by the City to potentially affect the local drinking water supply, the City will prohibit the construction of the infiltration area or incorporate the necessary BMPs to minimize the identified pollutant(s) prior to infiltrating the vulnerable portions of the drinking water supply management areas (DWSMAs).

**Measurable Goals:**

The effectiveness of this BMP will be measured by the reduction on pollutants discharged into protected stormwater.

**Responsible Person:**

| | |
|---|---|
| Name: | Lauren Letsche |
| Title: | Stormwater Specialist |
| Phone: | (763) 706-3709 |
| Email: | lletsche@columbiaheightsmn.gov |

# BMP PAGE

Implementation Table

**Unique Identifying Number:** 6-J

**Permit Requirements Addressed by this BMP:**

Part III.D.6. | Part III.D.6. | Part III.D.6. | | | | |

**BMP Title:** Park and Open Space Training

**BMP Description:**

Develop written procedures for the existing program to train full-time and seasonal employees on proper use and application of fertilizers and pesticides for maintenance of City lands.

**Measurable Goals:**

The effectiveness of this BMP will be maintained by holding the training sessions during times of the year when most seasonal employees are present.

**Responsible Person:**

| | |
|---|---|
| Name: | Tim Lund |
| Title: | Parks Foreman |
| Phone: | (763) 706-3710 |
| Email: | tlund@columbiaheightsmn.gov |

# BMP PAGE

Implementation Table

**Unique Identifying Number:** 6-K

**Permit Requirements Addressed by this BMP:**

Part III.D.6. | Part III.D.6. | Part III.D.6. | Part III.D.6. | | | |

**BMP Title:** Fleet and Building Maintenance Training Program

**BMP Description:**

Training focused on automotive maintenance program (automotive inspections and washing), spill cleanup training, hazardous materials training, building leak prevention and inspection training.

**Measurable Goals:**

The effectiveness of this BMP will be measured by City staff annually attending appropriate training sessions throughout the year that focus on stormwater management within the fleet and building maintenance.

**Responsible Person:**

| | |
|---|---|
| Name: | Steve Synoczynski |
| Title: | Shop Foreman |
| Phone: | (763) 706-3715 |
| Email: | ssynoczynski@columbiaheightsmn.gov |

# BMP PAGE

Implementation Table

**Unique Identifying Number:** 6-L

**Permit Requirements Addressed by this BMP:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Part III.D.6. | Part III.D.6. | Part III.D.6. | | | | |

**BMP Title:** Stormwater Systems Maintenance Training Program

**BMP Description:**

Training focused on parking lot and street cleaning, storm drain systems cleaning, road salt materials management.

**Measurable Goals:**

The effectiveness of this BMP will be measured by City staff annually attending appropriate training sessions throughout the year that focus on stormwater management.

**Responsible Person:**

| | |
|---|---|
| Name: | Mike O'Riley |
| Title: | Streets |
| Phone: | (763) 706-3721 |
| Email: | mo'reilly@columbiaheightsmn.gov |

# BMP PAGE

Implementation Table

**Unique Identifying Number:** 6-M

**Permit Requirements Addressed by this BMP:**

Part III.D.6. | Part III.D.6. | Part III.D.6. | Part III.D.6. | | | |

**BMP Title:** Spill Prevention & Control Plans for Municipal Facilities

**BMP Description:**

Ensure that plans describing spill prevention and control procedures are consistent among all departments. Conduct annual spill prevention and response training sessions to all municipal employees. Distribute education materials to each municipal facility by the end of year 2.

**Measurable Goals:**

A spill prevention and control plan effectively reduces the risk of surface and ground water contamination. However, to be effective, workers must be trained, materials and cleanup equipment available, and procedures followed.

**Responsible Person:**

| | |
|---|---|
| Name: | Lauren Letsche |
| Title: | Stormwater Specialist |
| Phone: | (763) 706-3709 |
| Email: | lletsche@columbiaheightsmn.gov |

# BMP PAGE

Implementation Table

**Unique Identifying Number:** 6-N

**Permit Requirements Addressed by this BMP:**

Part III.D.6. | Part III.D.6. | Part III.D.6. | Part III.D.6. | | | |

**BMP Title:** Facility Inventory

**BMP Description:**

The City will develop and maintain an inventory of City-owned facilities that contribute pollutants to stormwater discharges. The inventory will include a map of all identified facilities.

**Measurable Goals:**

The effectiveness of this BMP will be determined by the reduction of pollutants running off of these sites as well as the usability of the inventory.

**Responsible Person:**

| | |
|---|---|
| Name: | Lauren Letsche |
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| Phone: | (763) 706-3709 |
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# BMP PAGE

Implementation Table

**Unique Identifying Number:** 6-O

**Permit Requirements Addressed by this BMP:**

Part III.D.6. | Part III.D.6. | Part III.D.6. | | | | |

**BMP Title:** Pond Assessment Procedures & Schedule

**BMP Description:**

In year 1, develop procedures for determining TSS and TP treatment effectiveness of city owned ponds use for treatment of stormwater. Implement schedule in year 2-5. The schedule (which may exceed this permit term) shall be based on measureable goals and priorities established by the City.

**Measurable Goals:**

The effectiveness of this BMP will be measured by the reduction of TSS and TP discharge into the stormwater systems. Success of this BMP will be defined as conducting and documenting inspections, repairs, and maintenance to the stormwater ponds.

**Responsible Person:**

| | |
|---|---|
| Name: | Lauren Letsche |
| Title: | Stormwater Specialist |
| Phone: | (763) 706-3709 |
| Email: | lletsche@columbiaheightsmn.gov |

# BMP PAGE

Implementation Table

**Unique Identifying Number:** 7-A

**Permit Requirements Addressed by this BMP:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Part III.E. | | | | | | |

**BMP Title:** TMDL Review & Implementation

**BMP Description:**

Columbia Heights will work cooperatively with the Minnesota Pollution Control Agency and other outside organizations to develop and implement all future TMDL implementation plan(s) for impaired waters designated under Section 303(d), receiving MS4 discharges from within or adjacent to the City.

**Measurable Goals:**

1. Establish a baseline of information– determine what processes are in place and what has already been accomplished (i.e. TMDL studies underway) that will help meet these permit conditions during this MS4 permit cycle.
2. Prepare a written inventory of all impaired waters within the jurisdictional boundaries of the MS4, as well as those outside these boundaries likely to have an impact as a result of receiving stormwater discharge from the MS4; compile as much detail about the stormwater discharges they receive from the MS4 as is available.
3. Prepare a map that includes all impaired waters that the MS4 discharge may impact, all MS4 discharge points that may impact these water(s), and delineated watershed(s) that may contribute to the impairment.
4. Complete for records a written overview of the conclusions reached through this review, including the decision making process used to determine what SWPPP revisions may be needed.
5. Prepare a projected schedule and timeline to incorporate any necessary changes into the SWPPP

**Responsible Person:**

| | |
|---|---|
| Name: | Lauren Letsche |
| Title: | Stormwater Specialist |
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| Email: | lletsche@columbiaheightsmn.gov |

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, MN 55155-4194

# MS4 Pond, Wetland, and Lake Inver

Municipal Separate Storm Sewer Syste

*Doc Typ*

| Name of MS4 Permittee | Date form completed | Unique ID Number | Type of Feature (Pond, Wetland or Lake) | Feature Common Name (If Applicable) | Y Coordinate (Latitude) Decimal Degrees |
|---|---|---|---|---|---|
| City of Columbia Heights | 12/11/2013 | 02-79P | Lake | Highland Lake | 45.05868 |
| City of Columbia Heights | 12/11/2013 | 62-83P | Lake | Silver | 45.04394 |
| City of Columbia Heights | 12/11/2013 | 02-80P | Lake | Sullivan Lake | 45.06241 |
| City of Columbia Heights | 12/11/2013 | 02-81P | Lake | Hart lake | 45.03679 |
| City of Columbia Heights | 12/11/2013 | 02-686W | Wetland | Clover | 45.06065 |
| City of Columbia Heights | 12/11/2013 | 02-687W | Wetland | LaBelle | 45.04251 |
| City of Columbia Heights | 12/11/2013 | 1 | Pond | Maureen Drive | 45.04361 |
| City of Columbia Heights | 12/11/2013 | 2 | Pond | Karen Lane | 45.04205 |
| City of Columbia Heights | 12/11/2013 | 3 | Pond | Huset Park Pond | 45.03844 |
| City of Columbia Heights | 12/11/2013 | 4 | Pond | Sullivan Park Pond 3 | 45.06100 |
| City of Columbia Heights | 12/11/2013 | 5 | Pond | Sullivan Park Pond 1 | 45.06123 |
| City of Columbia Heights | 12/11/2013 | 7 | Pond | Sullivan Park Pond 2 | 45.06261 |
| City of Columbia Heights | 12/11/2013 | 8 | Pond | Public Safety Pond | 45.04734 |
| City of Columbia Heights | 12/11/2013 | 9 | Pond | Jackson St. Pond | 45.04366 |
| City of Columbia Heights | 12/11/2013 | 10 | Pond | Grand Ave Pond | 45.05558 |
| City of Columbia Heights | 12/11/2013 | 11 | Pond | Ostrander Park Pond | 45.04062 |
| City of Columbia Heights | 12/11/2013 | 12 | Pond | Kordiak Park Pond 2 | 45.05701 |
| City of Columbia Heights | 12/11/2013 | 13 | Pond | Secondary Pond | 45.06134 |
| City of Columbia Heights | 12/11/2013 | 14 | Pond | Kordiak Park Pond 1 | 45.0561 |
| City of Columbia Heights | 12/11/2013 | 16 | Pond | Hart Lake Pond 1 | 45.03583 |
| City of Columbia Heights | 12/11/2013 | 17 | Pond | Cleveland St. | 45.04469 |
| City of Columbia Heights | 12/11/2013 | 18 | Pond | Prestemon Park Pond 1 | 45.03882 |
| City of Columbia Heights | 12/11/2013 | 19 | Pond | Silver Lake Boat Landing | 45.04296 |
| City of Columbia Heights | 12/11/2013 | 20 | Pond | Silver Lake Park Pond 2 | 45.04629 |
| City of Columbia Heights | 12/11/2013 | 21 | Pond | Silver Lake Park Pond 3 | 45.04679 |
| City of Columbia Heights | 12/11/2013 | 22 | Pond | 37th Liquor Store | 45.03628 |
| City of Columbia Heights | 12/11/2013 | 23 | Pond | Comfort of Home Basin | 45.03691 |
| City of Columbia Heights | 12/11/2013 | 24 | Pond | Columbia Heights HS | 45.0528 |
| City of Columbia Heights | 12/11/2013 | 25 | Pond | Taco Bell 2 | 45.05762 |
| City of Columbia Heights | 12/11/2013 | 26 | Pond | Taco Bell 1 | 45.0573 |
| City of Columbia Heights | 12/11/2013 | 27 | Pond | 4542 Washington | 45.05146 |
| City of Columbia Heights | 12/11/2013 | 28 | Pond | 3942 Van Buren | 45.03953 |
| | | | | | |
| | | | | | |
| | | | | | |

**APPENDIX C**

Design Standards

# Surface Water Management Design Standards

## Engineering Department
## City of Columbia Heights

**March 2016**

**Prepared by WSB & Associates**

# TABLE OF CONTENTS



## APPENDICES

# 1. DESIGN OVERVIEW

The City of Columbia Heights' Stormwater Pollution Prevention Plan (SWPPP) identifies the goals and policies that define the City's stormwater management program, which are implemented via the City's Land Use Ordinance (Chapter 9 – Article I: Zoning and Land Development) and these Surface Water Management Design Standards. Columbia Heights' stormwater requirements were written to meet the City's goals to preserve, protect, and manage its water resources as well as to meet federal, state, and watershed stormwater regulations and to meet the following objectives:

- Minimize increases in stormwater runoff rates from any development in order to reduce flooding, siltation and erosion and in order to maintain the integrity of stream channels,
- Minimize increases in nonpoint source pollution caused by stormwater runoff from development which would otherwise degrade local water quality,
- Minimize the total annual volume of surface water runoff that flows from any specific site during and following development so as not to exceed the predevelopment hydrologic regime to the maximum extent practicable,
- Ensure that these management controls are properly maintained and pose no threat to public safety, and
- Implement stormwater management controls to help meet current and future total maximum daily load (TMDL) goals, to address the need to improve water quality, and to meet objectives in the Local Surface Water Management Plan.

# 2. DEFINITIONS

For the purpose of these Surface Water Management Design Standards, the following definitions describe the meaning of the terms used in this manual:

***Applicant*** means a property owner or agent of a property owner who has filed an application for a City Permit.

***Applicability*** means any land disturbing activity requiring a City of Columbia Heights Stormwater Management Plan as defined in City Ordinance Chapter 9: Land Use; Article I: Zoning and Land Development.

***Channel*** means a natural or artificial watercourse with a definite bed and banks that conducts continuously or periodically flowing water.

***Impervious** Area* means those surfaces that cannot effectively infiltrate rainfall (e.g., building rooftops, pavement, sidewalks, gravel, driveways, swimming pools, etc.).

***Land Disturbance** Activity* means any activity that changes the volume or peak discharge rate of stormwater runoff from the land surface. This may include the grading, digging, cutting, scraping, or excavating of soil, placement of fill materials, paving, construction, substantial removal of vegetation, or any activity that bares soil or rock or involves the diversion or piping of any natural or fabricated watercourse.

***Maintenance Agreement*** means document recorded against the property which provides for long-term maintenance of stormwater treatment practices.

***Nonpoint Source Pollution*** means pollution from any source other than from any discernible, confined, and discrete conveyances, and shall include but not be limited to, pollutants from agricultural, silvicultural, mining, construction, subsurface disposal and urban runoff sources.

***Off-Site Facility*** means a stormwater management measure located outside the subject property boundary described in the permit application for land development activity.

***Redevelopment*** means any construction activity where, prior to the start of construction, the areas to be disturbed have 15 percent or more of impervious surface(s) (*MPCA, Tech Support Document for Post-Construction Stormwater Management)*.

***Responsible Party*** means the entity which will be responsible for ownership and maintenance of Stormwater Treatment Practices.

***Stop Work Order*** means an order which requires that all construction activity on a site be stopped.

***Stormwater Management*** means the use of structural or non-structural practices that are design to reduce stormwater runoff pollutant loads, discharge volumes, and/or peak discharge rates.

***Stormwater Management Plan*** means a set of drawings or other documents submitted by a person as a prerequisite to obtaining a stormwater management approval, which contains all of the required information and specifications pertaining to Stormwater Management.

***Stormwater Reviews*** means any site that either increases impervious surface by greater than 1 acre or redevelops 1 acre or greater of impervious. The review will be completed to evaluate compliance with NPDES permit requirements. For sites either creating or redeveloping less than 1 acre of impervious the City will work with the applicant to determine if water quality practices can be incorporated into the site. Sites less than 1 acre will also not be allowed their drainage to negatively impact downstream properties (or water bodies).

***Stormwater Runoff*** means flow on the surface of the ground, resulting from precipitation.

***Stormwater Treatment Practices (STPs)*** means measures, either structural or nonstructural, that are determined to be the most effective and practical means of preventing or reducing point source or nonpoint-source pollution inputs to stormwater runoff and waterbodies.

***Water Quality Volume ($WQ_v$)*** means that runoff storage volume needed to treat the specified phosphorus loading as determined in Columbia Heights' Surface Water Management Design Guidelines.

***Watercourse*** means a permanent or intermittent stream or other body of water, either natural or fabricated, which gathers or carries surface water.

***Watershed*** means the total drainage area contributing runoff to a single point.

# 3. PROCEDURE FOR REVIEWING STORMWATER MANAGEMENT PLANS

All projects either creating or disturbing 1 acre or greater of new impervious will require the submittal of a Stormwater Management Plan. In lieu of preparation of a Stormwater Management Plan projects disturbing less than 1 acre and down to 10,000 square feet or will result in more than 500 cubic yards of cut or fill are only required to develop an erosion control plan addressing the requirements of Section 6 of these guidelines.

The general review process, from the submittal of the concept and final plans to the issuance of the Stormwater Management Plan approval, is summarized in the following nine steps:

1) Determine what stormwater management provisions apply (stormwater management, erosion control, buffers, floodplain management).

2) What permits, or approvals, are required for the project site, and what waivers and/or exemptions are applicable (COE, DNR, MPCA, Watershed District/Management Organization, WCA, etc.)
3) Determine if the project falls within the Rice Creek Watershed District (RCWD) or the Mississippi Watershed Management Organization (Mississippi WMO).
4) Are the selected practices appropriate for this site?
5) Are the practices designed to meet the minimum performance criteria?
6) Does the Plan meet other resource protection requirements as specified in the City of Columbia Heights Code?
7) Did the applicant submit a letter of credit or cash escrow to cover the estimated cost of site restoration prior to approval? The letter of credit or cash escrow shall be based on $10,000 per acre of gross lot area with $5,000 minimum.
8) Are provisions for long-term maintenance adequate, including access and methods for maintenance defined?
9) Did the applicant install or construct all stormwater management facilities necessary to manage increased runoff so that the two-, ten- and one hundred- year storm peak discharge rates existing before the proposed land alteration shall not be increased and accelerated. Channel erosion shall not occur as a result of the proposed land disturbing or development activity.

# 4. SUBMITTAL REQUIRMENTS

**Requirements for Stormwater Management Plan Approval**

**Stormwater Management Plan Required**

No building or grading permit will be approved unless it includes a Stormwater Management Plan detailing how runoff and associated water quality impacts resulting from the development will be controlled or managed (note the exceptions in Section 3.). This plan must indicate whether stormwater will be managed on-site or off-site and, if on-site, the general location and type of practices.

The Stormwater Management Plan must be signed by a licensed professional engineer in the State of Minnesota, who will verify that the design of all stormwater management practices meet the submittal requirements outlined in the Submittal Checklist found in Appendix A. No building permit, grading permit, or subdivision approval shall be issued until a satisfactory final Stormwater Management Plan, or a waiver thereof, shall have undergone a review and been approved by the City after determining that the plan waiver is consistent with the requirements of this manual.

**Stormwater Management Conceptual Plan Requirements (Optional)**

A stormwater management concept plan submittal is optional, but highly encouraged. A concept plan identifies basic site information, locations of proposed development features, and preliminary locations and sizing of STPs. The concept submittal has a greater chance of identifying major obstacles and can facilitate alternative stormwater management arrangements in a timely fashion and at the onset of project planning. If a concept plan is submitted for review, it should include sufficient information (e.g., maps, basic hydrologic and water quality calculations etc.) to evaluate the environmental characteristics of the project site. This information should show the potential impacts of all proposed development of the site, both present and future, on the water resources, and show the effectiveness and acceptability of the measures proposed for managing stormwater generated at the project site. The intent of this conceptual planning process is to determine the type of stormwater management of stormwater runoff form future development, and to identify major issues prior to completing final plans. The concept plan is less time consuming and more efficient to evaluate proposed development plans with this step of the review process.

The final plan provides more detailed design information for the proposed STPs, and includes much more detail in terms of hydrologic conditions and site features.

For redevelopment an applicant should include within a concept plan measures for controlling existing stormwater runoff discharges and water quality from the site in accordance with the standards of this Manual. After review of the concept plan and modifications are made to that plan as deemed necessary by the City, a final Stormwater Management Plan may be submitted for approval.

**Stormwater Management Plan Requirements (Required)**

Record drawings are required for all projects that impact wetlands and/or the floodplain, require water quality ponding, have significant grade changes, and/or have other unusual circumstances. Record drawings must be certified by a professional land surveyor or civil engineer. (Record drawings should not include temporary erosion control measures.)

1. Plan Details
   - ☐ north arrow, street names, and lot and block numbers for property or subdivision
   - ☐ location of benchmark, based on the City/County benchmark system
   - ☐ key with all line types, symbols, shading, and cross-hatching denoted
   - ☐ illustration key showing symbols for all information pertaining to lot and building design, including grades, easements, lot and block, setbacks, etc…
   - ☐ plan scale (shown graphically on a bar scale) of: 1 inch = 20 feet, 1 inch = 30 feet, 1 inch = 40 feet, or 1 inch = 50 feet. Plans in other scales will not be reviewed.

- ☐ total area of subject property, with subtotals of disturbed **and** undisturbed areas (tabulation permitted)
- ☐ subject property's boundary lines, lot lines and right of way lines
- ☐ all existing and proposed drainage and utility easements
- ☐ all man-made features, including existing and proposed buildings, structures, and paved areas
- ☐ all existing storm sewer facilities within 150 feet of the subject parcel
- ☐ all proposed storm sewer facilities (include grades and size of structures)
- ☐ all existing and proposed natural features including, but not limited to, significant trees and tree lines, wetlands, ponds, lakes, streams, drainage channels, floodplain, etc…
- ☐ show setbacks and buffers for wetlands, ponds, lakes, streams, and floodplains
- ☐ all adjacent plats, parcels, rights-of-way, section lines, extended a minimum of 100 feet (50 feet for single family home construction) beyond the subject parcel in all directions
- ☐ A delineation of all streams, rivers public waters and wetlands located on and immediately adjacent to the site, including any classification given to the water body or wetland by the Minnesota Department of Natural Resources, the Minnesota Pollution Control Agency and/or the United States Army Corps of Engineers.
- ☐ A description of the soils of the site, including a map indicating soil types of areas of critical erosion to be disturbed as well as a soil report containing information on the suitability of the soils for the type of development proposed and describing any remedial steps to be taken by the developer to render the soils suitable.

2. Topography

- ☐ topography details in a minimum of two-foot contour intervals with existing contours as **dashed lines** and proposed contours as dark, **solid lines**, labeled at each edge of the plan and at other appropriate locations
- ☐ standard lot benching detail, where appropriate (maximum slopes: 3:1)
- ☐ direction arrows indicating swales and lot drainage patterns (show percent grades along drainage swales on plan)

3. Elevation Information

- ☐ proposed top of curb elevations at lot corners and driveway or entrances
- ☐ finished spot elevations at all high and low points
- ☐ proposed elevations at garage and lowest floor for proposed buildings
- ☐ proposed finished ground elevations around home for final grading

4. Temporary Erosion Control Best Management Practices (BMPs)

Show location of all structural erosion control measures (with standard detail plates and maintenance information for each), including, but not limited to:

- ☐ temporary rock entrance/exit for all vehicle access points (show on plan and provide detail)
- ☐ perimeter silt fence; silt fence and/or bale checks should also be placed along swales or slopes greater than 50 feet in length (flare ends of silt fence up slope)
- ☐ storm sewer inlet filters (indicate type and show graphically on plan at each location)
- ☐ temporary sediment basins
- ☐ erosion control mats, fiber blankets, netting, temporary seed, or temporary mulch. All exposed soil areas must be stabilized as soon as possible to limit soil erosion but in no case later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased and no later than seven (7) days after construction activity in that portion of the site has temporarily or permanently ceased when discharge points on the project is within one mile of a special or impaired water and flows to that special or impaired water.
- ☐ soil stockpile areas (indicate temporary stabilization measures)
- ☐ **Street Sweeping Required**

Plans must include a note indicating that all adjacent streets will be swept daily, or as directed by the City, to remove all accumulated materials. Failure to perform any street sweeping within six hours of notice by the City will result in the work being performed by the City and all associated costs billed. The City also requires removal of accumulated materials on streets during winter.

5. Final Stabilization

New resident construction requires vegetated stabilization from the front curb line to the back of the structure for the entire width of the lot. Show seeding and/or turf establishment locations and specifications, including:

- ☐ type of seeding (permanent, temporary, dormant)
- ☐ seed type and application rate
- ☐ fertilizer type and application rate
- ☐ mulch type, application rate, and method of anchoring
- ☐ specifications for installation and maintenance of erosion control mats, blankets, or netting
- ☐ note requiring seeding/restoration to be completed within 48 hoursof final grading
- ☐ location of all areas to be vegetated

6. Tree Preservation

Show the following standards when trees are shown for removal or preservation.

- ☐ Identify, tally, and locate all significant trees on site (tally and show graphically on plan).
- ☐ Identify, tally, and locate all significant tree removals on site (tally and show graphically on plan).
- ☐ Show location of all tree preservation fencing required by ordinance specifications (heavy-duty silt fence can also be used for tree protection).

## 5. LIST OF ACCEPTABLE PRACTICES

In the development of the STP appropriate for the development or redevelopment, infiltration (water quality volume) is foremost in importance to apply in the design. Filtration is warranted when site conditions do not allow for an effective infiltration facility. For flooding or rate control, detention systems are typically the preferred practice. Low Impact Design (LID) practices are encouraged when they can be functionally incorporated into the design. Alternative practices may be approved at the discretion of the City Engineer. For when infiltration is not feasible the STPs proposed shall meet the performance identified in the *Minnesota Stormwater Manual*:

**Volume Control Systems:**

- Infiltration trench
- Infiltration basin
- Raingarden
- Underground storage
- Reuse
- Green Roofs
- Trees/Tree Planters

**Filtration Systems:**

- Surface sand filter
- Underground sand filter
- Perimeter sand filter
- Organic filter
- Bioretention system
- Raingarden with underdain
- Pervious pavement with underdrain
- Underground storage with underdrain

- Tree trench

**Detention Systems:**

- Wet pond
- Stormwater re-use systems
- Multiple pond systems
- Extended detention basin
- Micro-pool extended detention basin
- Dry detention ponds
- Underground storage
- Other, as approved by the City of Columbia Heights

**Wetlands:**

- Shallow wetland
- Pond/wetland systems

**Open Channel Systems:**

- Dry swale
- Wet swale
- Grass swale
- Natural channel, or stream

# 6. CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

## 1. Erosion Control

1. The Permittee must plan for and implement appropriate construction phasing vegetative buffer strips, horizontal slope grading, and other construction practices to minimize erosion. All areas not to be disturbed shall be marked (e.g. with flags, stakes, signs, silt fence etc.) on the project site before any work begins.
2. All exposed soil areas must be stabilized as soon as possible to limit soil erosion but in no case later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased and no later than seven (7) days after construction activity in that portion of the site has temporarily or permanently ceased when discharge points on the project is within one mile of a special or impaired water and flows to that special or impaired water.
3. Additional BMPs together with enhanced runoff controls are required for discharges to special waters and impaired waters. The BMPs identified for each special or impaired water are required for those areas of the project draining to a

discharge point on the project that is within one mile of a special or impaired water and flows to that water.

4. The permittee must stabilize the normal wetted perimeter of any temporary or permanent drainage ditch or swale that drains water from any portion of the construction site, or diverts water around the site, within 200 lineal feet from the property edge, or from the point of discharge into any surface water. Stabilization of the last 200 lineal feet must be completed within 24 hours after connecting to a surface water or property edge.
5. Pipe outlet must have temporary or permanent energy dissipation before connecting to surface water.
6. When possible, all slopes must be graded in such a fashion so that tracking marks made from heavy equipment are perpendicular to the slope.
7. All areas disturbed during construction must be restored as detailed in these requirements. The type of permanent restoration shall be clearly shown on the plans including but not limited to sod, seed, impervious cover and structures. A minimum of 6 inches of topsoil must be installed prior to permanent restoration. Areas in which the top soil has been placed and finish graded or areas that have been disturbed and other grading or site building construction operations are not actively underway must be temporary or permanently restored as set forth in the following requirements.
    1) Areas with slopes that area less than 3:1 must be seeded and mulched within 14 days of the area not being actively worked.
    2) Areas with slopes that area greater or equal to 3:1 must be seeded and erosion control blanket placed within 14 days of the area not being actively worked.
    3) All seeded area must be either mulched and disc anchored, hydro- mulched, or covered by erosion control blanket to reduced erosion and protects the seed. Temporary or permanent mulch must be disc anchored and applied at a uniform rate of 2 tons per acre and have 90% coverage.
    4) If the disturbed area will be re-disturbed within a six month period, temporary vegetative cover shall be required consisting of an approved seed mixture and application rate.
    5) If the disturbed area will not be re-disturbed within a six month period, permanent vegetative cover shall be required consisting of an approved seed mixture and application rate.
    6) All areas that will not have maintenance done such as mowing as part of the final design shall be permanently restored using an approved seed mixture and application rate.
    7) Restoration of disturbed wetland areas shall be accomplished using an approved seed mixture and application rate.

8. All erosion control measures must be maintained for the duration of the project until final stabilization has been achieved in accordance with Section 1.7. If construction operations or natural events damage or interfere with any erosion control measures, they shall be restored to serve their intended function.
9. Additional erosion control measures shall be added as necessary to effectively protect the natural resources of the City. The temporary and permanent erosion control plans shall be revised as needed based on current site conditions and to comply with all applicable requirements

**2. <u>Sediment Control Practices</u>**

1. Sediment control practices must be established on all down gradient perimeters before any upgradient land disturbing activities begin. These practices must remain in place until final stabilization has been achieved.
2. If down gradient treatment system is overloaded additional up gradient sediment control practices must be installed to eliminate overloading. The SWPPP must be amended to identify the additional practices.
3. All storm drain inlets must be protected by approved BMPs during construction until all potential sources for discharge have been stabilized. These devices must be maintained until final stabilization is achieved. Inlet protection may be removed if a specific safety concern (street flooding/freezing) has been identified.
4. Temporary stockpiles must have silt fence or other effective sediment controls on the down gradient side of the stockpile and shall not be placed at least twenty five (25) feet from any road, wetland, protected water, drainage channel, or storm water inlets. Stockpile left for more than fourteen (14) days must be stabilized with mulch, vegetation, tarps or other approved means.
5. Vehicle tracking of sediment from a project shall be minimized by approved BMPs. These shall be installed and maintained at the City approved entrances. Individual lots shall each be required to install and maintain entrances throughout the construction building until a paved driveway is installed.
6. Sediment that has washed or tracked from site by motor vehicles or equipment shall be cleaned from paved surfaces throughout the duration of construction.
7. Silt fence or other approved sediment control devices must be installed in all areas as shown on the SWPPP.
8. Silt fence or other approved sediment control devices shall be required along the entire curb line, except for approved opening where construction entrance will be installed or drainage flows away from curb. This device must be maintained until final stabilization is achieved. Ditch checks shall be required in ditch bottoms. Spacing for the check must be as followed:[***Height in feet*** (of the sediment device used)] ***X 100 / Slope Gradient***

9. Dust control measures, such as application of water must be performed periodically due to weather, construction activity, and/or as directed by the City.
10. Flows from diversion channels or pipes (temporary or permanent) must be routed to sedimentation basins or appropriate energy dissipaters to prevent the transport of sediment to outflow or lateral conveyors and to prevent erosion and sediment buildup when runoff flows into the conveyors.
11. A concrete washout shall be installed on projects that require the use of concrete. All liquid and solid wastes generated by concrete washout operations must be contained in a leak-proof containment facility or impermeable liner. A sign must be installed adjacent to each washout facility to inform operators to utilize the proper facilities.
12. All sediment control measures shall be used and maintained for the duration of the project until final. If construction operations or natural events damage or interfere with any erosion control measures, they must be restored to serve their intended function.
13. Additional sediment control measures shall be added as necessary to effectively protect the natural resources of the City. The temporary and permanent erosion control plans shall be revised as needed based on current site conditions and to comply with all applicable requirements.
14. Restrict clearing and grading within 20 feet of an existing wetland boundary to provide for a protective buffer strip of natural vegetation.

## 3. Waterway and Watercourse Protection

1. A temporary stream crossing must be installed and approved by the local government unit and regulating agency if a wet watercourse will be crossed regularly during construction.
2. The watercourse channel shall be stabilized before, during, and within 24 hours after any in-channel work.
3. No in-water work shall be allowed in Public Waters during the MnDNR's work exclusion dates.
4. Prior to placement of any equipment into any waters, all equipment must be free of aquatic plants and non-native animals.
5. All on-site stormwater conveyance channels designed according to the criteria outlined in this document. Stabilization adequate to prevent erosion located at the outlets of all pipes and paved channels is required.

## 4. Temporary Sediment Basins

1. A temporary sediment basin (or permanent) shall be provided when 10 or more acres of disturbed soil drain to a common location prior to the runoff leaving the

site or entering surface waters. The Permittee is also encouraged, but not required to install temporary sediment basins in areas with steep slope or highly erodible soils even if the area is less than ten (10) acres and it drains to one common area. The basins shall be designed and constructed according to the following requirements.

1) The basins must provide storage below the outlet pipe for a calculated volume of runoff from a 2-year, 24-hour storm from each acre drained to the basin, except that in no case shall the basin provide less than 1,800 cubic feet of storage below the outlet pipe from each acre drained to the basin.
2) Where no such calculation has been performed, a temporary (or permanent) sediment basin providing 3,600 cubic feet of storage below the outlet pipe per acre drained to the basin shall be provided where attainable until final stabilization of the site.
3) Temporary basin outlets will be designed to prevent short-circuiting and the discharge of floating debris. The basin must be designed with the ability to allow complete basin drawdown (e.g., perforated riser pipe wrapped with filter fabric and covered with crushed gravel, pumps or other means) for maintenance activities, and provide a stabilized emergency overflow to prevent failure of pond integrity. Energy dissipation must be provided for the basin outlet.
4) Temporary (or permanent) basins must be constructed and made operational concurrent with the start of soil disturbance that is up gradient of the area and contributes runoff to the pond.
5) Where the temporary sediment basin is not attainable due to site limitations, equivalent sediment controls such as smaller sediment basins, and/or sediment traps, silt fences, vegetative buffer strips or any appropriate combination of measures are required for all down slope boundaries of the construction area and for those side slope boundaries deemed appropriate as dictated by individual site conditions. In determining whether installing a sediment basin is attainable, the Permittee must consider public safety and may consider factors such as site soils, slope, and available area on site. This determination must be documented in the SWPPP.
6) The Permittee shall maintain the sedimentation basins and will remain functional until an acceptable vegetative cover is restored to the site, resulting in a pre-development level rate of erosion. The city will not issue building permits for lots containing sediment basins until they have been removed or relocated based on the projects restoration progress.
7) Basins designed to be used for permanent stormwater management shall be brought back to their original design contours prior to acceptance by the City.

## 5. Dewatering and Basin Draining

1. If water cannot be discharged into a sedimentation basin before entering a surface water it must be treated with the appropriate BMPs, such that the discharge does not adversely affect the receiving water or downstream landowners. The Permittee must make sure discharge points are appropriately protected from erosion and scour. The discharge must be dispersed over riprap, sand bags, plastic sheeting or other acceptable energy dissipation measures. Adequate sediment control measures are required for discharging water that contains suspended soils.
2. All water from dewatering or basin draining must discharge in a manner that does not cause nuisance conditions, erosion in receiving channels, on down slope properties, or inundation in wetlands causing significant adverse impact to wetlands.

## 6. Inspections and Maintenance

1. The Permittee shall be responsible for inspecting and maintenance of the BMPs
2. The Permittee must routinely inspect the construction project once every seven (7) days during active construction and within 24-hours of a rainfall event of 0.5 inches or greater in 24-hours.
3. All inspections and maintenance conducted during construction must be recorded in writing and must be retained with the SWPPP. Records of each inspection and maintenance activity shall include:
    1) Date and time of inspection.
    2) Name of person(s) conducting the inspections.
    3) Findings of inspections, including recommendations for corrective actions.
    4) Corrective actions taken (including dates, times, and the party completing the maintenance activities).
    5) Date and amount of all rainfall events 0.5 inches or greater in 24-hours.
    6) Documentation of changes made to SWPPP.
4. Parts of the construction site that have achieved final stabilization, but work continues on other parts of the site, inspections of the stabilized areas can be reduced to once a month. If work has been suspended due to frozen ground conditions, the required inspections and maintenance must take place as soon as runoff occurs or prior to resuming construction, which ever happens first.
5. All erosion and sediment BMPs shall be inspected to ensure integrity and effectiveness. All nonfunctional BMPs shall be repaired, replaced or supplemented with a functional BMP. The Permittee shall investigate and comply with the following inspection and maintenance requirements.

6. All silt fences must be repaired, replaced, or supplemented when they become nonfunctional or the sediment reaches 1/2 of the height of the fence. These repairs shall be made within 24-hours of discovery, or as soon as field conditions allow access.
7. Temporary and permanent sedimentation basins must be drained and the sediment removed when the depth of sediment collected in the basin reaches 1/2 the storage volume. Drainage and removal must be completed within 72-hours of discovery, or as soon as field conditions allow access.
8. Surface waters, including drainage ditches and conveyance systems, must be inspected for evidence of sediment being deposited by erosion. The Permittee shall remove all deltas and sediment deposited in surface waters, including drainage ways, catch basins, and other drainage systems, and restabilize the areas where sediment removal results in exposed soil. The removal and stabilization shall take place within seven (7) days of discovery unless precluded by legal, regulatory, or physical access constraints. The Permittee shall use all reasonable efforts to obtain access. If precluded, removal and stabilization shall take place within 7 calendar days of obtaining access. The Permittee is responsible for contacting all local, regional, state and federal authorities and receiving any applicable permits, prior to conducting any work.
9. Construction site vehicle exit locations shall be inspected for evidence of off-site sediment tracking onto paved surfaces. Tracked sediment shall be removed from all off-site paved surfaces, within 24 hours of discovery, or if applicable, within a shorter time.
10. The Permittee is responsible for the operation and maintenance of temporary and permanent water quality management BMPs, as well as all erosion prevention and sediment control BMPs, for the duration of the construction work at the site. The Permittee is responsible until another Permittee has assumed control over all areas of the site that have not been finally stabilized or the site has undergone final stabilization, and a NOT has been submitted to the MPCA.
11. If sediment escapes the construction site, off-site accumulations of sediment shall be removed in a manner and at a frequency sufficient to minimize off-site impacts (e.g., fugitive sediment in streets could be washed into storm sewers by the next rain and/or pose a safety hazard to users of public streets).
12. All infiltration areas shall be inspected to ensure that no sediment from ongoing construction activities is reaching the infiltration area and these areas are protected from compaction due to construction equipment driving across the infiltration area.

## 7. Pollution Management Measures/Construction Site Waste Control

1. The Permittee must implement the following pollution prevention management measures on the site.
    1) Solid Waste – Collected sediment, asphalt and concrete millings, floating debris, paper, plastic, fabric, construction and demolition debris and other wastes must be disposed of properly and must comply with MPCA disposal requirements.
    2) Hazardous Materials such as oil, gasoline, paint and any hazardous substances must be properly stored, including secondary containment, to prevent spills, leaks or other discharge. Restricted access to storage areas shall be provided to prevent vandalism. Storage and disposal of hazardous waste shall be in compliance with MPCA regulations.
    3) External washing of trucks and other construction vehicles must be limited to a defined area of the site. Runoff shall be contained and waste properly disposed of. No engine degreasing is allowed on site.
    4) The City of Columbia Heights prohibits discharges of any material other than stormwater, and discharges from dewatering or basin draining activities. Prohibited discharges include but are not limited to vehicle and equipment washing, maintenance spills, wash water, and discharges of oil and other hazardous substances.
    5) The Permittee must comply with all other pollution prevention/good housekeeping requirements of the MPCA NPDES Construction General Permit.

**8. <u>Final Stabilization</u>**

1. The Permittee must ensure final stabilization of the project. Final stabilization can be achieved in one of the following ways.
2. All soil disturbing activities at the site have been completed and all soils will be stabilized by a uniform perennial vegetative cover with a density of at least 70 percent over the entire pervious surface area, or other equivalent means necessary to prevent soil failure under erosive conditions and;
    1) All drainage ditches, constructed to drain water from the site after construction is complete, must be stabilized to preclude erosion; and
    2) All temporary synthetic, and structural erosion prevention and sediment control BMPs (such as silt fence) must be removed as part of the site final stabilization; and
    3) The Permittee must clean out all sediment from conveyances and from temporary sedimentation basins that are to be used as permanent water quality management basins. Sediment must be stabilized to prevent it from washing back into the basin, conveyances or drainage ways discharging off-site or to

surface waters. The cleanout of permanent basins must be sufficient to return the basin to design capacity.

3. For residential construction only, final stabilization has been achieved when:
   1) Temporary erosion protection and down gradient perimeter control for individual lots has been completed and the residence has been transferred to the homeowner.
   2) The Permittee must distribute the MPCA "homeowner factsheet" to the homeowner so the homeowner is informed for the need, and benefits, of final stabilization.

**9. Training**

1. The SWPPP must provide a chain of command showing who prepared the SWPPP, who is responsible for the management of the construction site and inspections.
2. The training shall consist of a course developed by a local, state or federal agency, professional organization, water management organization, or soil and water conservation district and must contain information that is related to erosion prevention, sediment control, or permanent stormwater management and must relate to the work that you are responsible for managing.

# 7. GUIDANCE ON STORMWATER TREATMENT PRACTICES (STPS)

Designers are expected to follow the requirements of this section to meet volume control, water quality, and water quantity requirements of the City of Columbia Heights. Designs should meet the stormwater design standards of these Surface Water Management Design Guidelines and the *Minnesota Stormwater Manual*. Deviations from recommended guidance in the *Minnesota Stormwater Manual* will require detailed written explanation. Approval of any deviation from the *Minnesota Stormwater Manual* guidance will be at the discretion of the City.

# 8. BASIC SIZING CRITERIA

Proposed Stormwater Management Plans must incorporate Volume Control, Water Quality Control, and Rate Control as the basis for stormwater management in the proposed development plan. The City of Columbia Heights, as a permitted MS4, requires for new development projects to have a no net increase from pre-project conditions of total volume, TSS, and TP; in addition, for redevelopment projects within the city, it is required to have a net reduction from pre-project conditions of total volume, TSS and TP.

## 1. Volume Control Requirements

Volume control measures are required on projects to meet the water quality criteria of the Mississippi WMO and RCWD's Surface Water Management Plan and Rules, and to meet the requirements of the City of Columbia Heights' MS4 Permit obligations. Volume control shall be required for proposed net new impervious areas greater than 1 acre. If an applicant can demonstrate that the volume control standard has been met, then the water quality sizing criteria shall be considered satisfied.

[For specific RCWD volume control requirements, please refer to the RCWD website.

The RCWD requires a stormwater management permit for subdivision of an area exceeding one acre. A permit is also required for development, other than Public Linear Projects, that creates or reconstructs 10,000 square feet or more of impervious surfaces. For Public Linear Projects, a permit is required to create or reconstruct 10,000 square feet or more of impervious surface through multiple phases or connected actions of a single complete project, as defined by the RCWD, within a Resource of Concern Drainage Area.

## 2. Volume Control Calculations

Depending on applicability, a proposed development shall capture and retain on site 1.0 inches of runoff from the net new impervious surfaces in post-construction conditions and at a minimum as per the requirements of the NPDES Construction General Permit. For projects less than 1 acre the City encourages applicants to incorporate volume control or the water quality provisions to the extent feasible. For linear projects not increasing the extent of the impervious the goal is to reduce the runoff rate, water quality loadings, and volume.

The RCWD requires water quality treatment volume for all projects, except Public Linear Projects.

For projects where it is not feasible to meet the volume reductions requirements it will be required to meeting the water quality requirements of these engineering guidelines.

Infiltration is infeasible when:

- Where industrial facilities are not authorized to infiltrate industrial stormwater under and NPDES/SDS Industrial Stormwater Permit issued by the MPCA.
- Where vehicle fueling and maintenance occur.
- With less than three (3) feet of separation distance from the bottom of the infiltration system to the elevation of the seasonally saturated soils or the top of the bedrock.
- Where high levels of contaminant in soil or groundwater will be mobilized by the infiltrating stormwater.

For areas where infiltration is prohibited the applicant shall consider alternative volume reduction BMPs and the water quality volume must be treated by a wet sedimentation basin, filtration system, regional ponding or similar method prior to the release of stormwater to surface water.

For linear projects with lack of right-of-way, easements or other permissions from property owners to install treatments systems that are capable of treating the total water quality volume on site, the project must maximize treatment through other methods or combination of methods before runoff is released to nearby surface waters. Alternative treatment options include: grassed swales, filtration systems, smaller ponds, or grit chambers. In all circumstances, a reasonable attempt must be made to obtain right-of-way during the project planning and all attempts of infeasibility must be recorded.

The City may restrict the use of infiltration features to meet post-construction requirements for stormwater management, without higher engineering review, if the infiltration techniques will be constructed in the following areas where:

- Soils are predominately Hydrologic Soil Group D (clay) soils.
- Drinking Water Supply Management Areas are present, as defined by Minn. R. 4720.51000, subp.13, unless precluded by a local unit of government with an MS4 permit.
- Soil infiltration rates are more than 8.3 inches per hour unless soils are amended to flow the infiltration rate below 8.3 inches per hour.

In the event that it is infeasible to meet the volume control standard due to contaminated soils, site constraints, etc., the City may authorize lesser volume control for the following situations:

- If the project meets one of the limitations outlined above; and
- If the permittee implements to the maximum extent possible other volume reduction practices, besides infiltration, on the site but may not meet the requirements for post-construction stormwater management.

### 3. Water Quality Control

The water quality control standard shall be considered satisfied if the volume control standard has been satisfied. In the event that it is infeasible to meet the volume control standard due to contaminated soils, site constraints, etc., the proposed STP will need to maintain the TSS and TP loading for new development, and for redevelopment the goal is to reduce the TSS and TP loadings (MS4 Permit).

Under certain circumstances, some construction projects cannot meet the TSS and/or TP reduction requirements for new or redevelopment projects on the site of the original construction. All methods must be exhausted prior to considering alternative locations where TSS and TP treatment standards can be achieved. After all methods have been exhausted, the permittee will be required to identify alternative locations where TSS and TP treatment standards can be achieved. Mitigation projects will be chosen in the following order of preference:

- Locations that yield benefits to the same receiving water that receives runoff from the original construction activity.
- Locations within the same Department of Natural Resource (DNR) catchment area as the original construction activity
- Locations in the next adjacent DNR catchment area up-stream
- Locations anywhere within the City of Rosemount
- Mitigation projects shall involve the establishment new structural stormwater BMPs or the retrofit of existing structural stormwater BMPs, or the use of a properly designed regional structural stormwater BMP.
- Previously required routine maintenance of structural stormwater BMPs cannot be considered mitigation.
- Mitigation projects must be finished within 24 months after the original construction activity begins.

- A maintenance agreement specifying the responsible party for long-term maintenance shall be identified.
- Payments in lieu of the construction project meeting the TSS and TP treatment standards will be accepted; however, the monies received must be applied to a public stormwater project. The amount of monetary contribution shall be based on $XX.XX per square foot of total impervious surface area (existing & proposed) on the subject property.

**4. Rate Control**

1. At a minimum, detention basins should maintain existing flow rates for the 2, 10, and 100-year 24-hour rainfalls in accordance to the Atlas14 data as shown in the table below:

| Event | Rainfall/Snowmelt Depth (inches) |
|---|---|
| 2-year, 24 hour | 2.84 |
| 10-year, 24 hour | 4.25 |
| 100-year, 24 hour | 7.38 |
| 100-year, 10 day snowmelt | 10.1 |

2. Detention basins shall be designed with capacity for the critical 100-year event, which is defined as the 100-year event that produces the highest water level among a 24 hour rainfall event or the 10-day snowmelt runoff event.
3. The maximum duration for rainfall critical event analysis shall be 24-hours except in cases where basins are landlocked, where back to back 24-hour events and the 10-day snowmelt runoff event shall also be used. In all cases a hydrograph method of analysis should be used. For the 24-hour rainfall event, or back to back 24-hour rainfall events, an SCS Type II distribution should be used. For shorter duration critical events other distributions may be used with the approval of the City Engineer.
4. All drainage system analyses and designs shall be based on proposed full development land use patterns.
5. Development adjacent to a landlocked basin and the basin is not provided an outlet, freeboard should be determined based on one of three methods (whichever provides for the highest freeboard elevation):
    1) Three feet above the HWL determined by modeling back to back 100-year, 24-hour events,
    2) Three feet above the highest known water level, or
    3) Five feet above the HWL determined by modeling a single 100-year, 24-hour event.

6. When modeling landlocked basins, the starting water surface elevation should be the basins Ordinary High Water elevation, which can be determined through hydrologic modeling or, in the case of a DNR regulated basin, from a DNR survey.
7. For basins with a suitable outlet, freeboard will be 2-feet above the HWL determined by modeling the 100-year critical event. Emergency overflows a minimum of 1.5 feet below lowest ground elevation adjacent to a structure should also be provided.
8. Adjacent to channels, creeks, and ravines freeboard will also be 2-feet to the 100-year critical event elevation.
9. A Type II 24-hour rainfall distribution with average antecedent moisture conditions should be utilized for runoff calculations.
10. The recommended minimum outlet diameter is 6 inches due to plugging susceptibility and may supersede the rate control requirement for the 2-year event.
11. City standard detail plates should be utilized for pond outlet structures. Outlet structures should be designed in three phases with primary outlet structure and secondary overflow structure routed to the storm sewer and a defined emergency overflow as the tertiary outlet structure.

## 5. Freeboard

Elevation separations of buildings with respect to ponds, lakes, streams, and stormwater features shall be designed as follows:

1. At least two feet of vertical separation is required from the low opening elevation above the 100-year high water elevation and DNR Ordinary High Water level (if applicable) for the area providing the structure is flood proofed in accordance with Chapter 13 of the City Code. If the structure is not flood proofed in accordance with the requirements of the RCWD then the freeboard requirements will be set by the low floor elevation. In areas where this separation is not or cannot be provided, additional analysis is required showing that the 100-year back-to-back storm event does not affect adjacent homes.
2. Drainage easements and outlots for ponds, lakes, wetlands, streams, etc., shall encompass an area to the calculated two foot above the 100-year HWL.

## 6. Floodplain Management

The City prohibits filling activities within the 100-Year floodplain the will cause an increase in the stage of the 100-year or regional flood or cause in increase in the flood damages in the reach affected unless compensatory storage is provided and/or channel improvement is provide that will not result in the flood stage. Filling within the floodway is prohibited unless the filling meets FEMA, DNR, and Watershed

District/Management Organization requirements. Applications proposing to alter the floodplain shall submit the following:

1) Cut/fill diagrams along with calculations demonstrating that the filling or alteration of the floodplain is not resulting in a reduction in the flood stage/storage.

**7. Buffers**

Buffers are required adjacent to wetlands and encouraged adjacent to streams and lakes for projects requiring a stormwater management plan.

1. The following standards shall guide the creation or restoration of buffers to achieve the goals and policies of the RCWD's Surface Water Management Plan. The Administrator may modify or waive standards depending on each project Site and goals for the wetland.
2. The buffers zones are as follows:
   a. Stream (measured from top of bank) – 25 feet
   b. Lakes (measured from delineated OHWL)
      i. Natural environment lake - 100 feet
      ii. Recreational development lake – 50 feet
      iii. General development lake – 25 feet
   c. Wetlands: Buffers based on a MnRAM classification or similar classification system will be as follows (measured from the delineated wetland edge):
      i. Preserve – 75 feet average and minimum of 50 feet
      ii. Manage 1 – 50 feet average and minimum of 30 feet
      iii. Manage 2 or 3 – 25 feet average and a minimum of 15 feet
   d. The use of a meandering buffer strip to maintain a natural appearance is encouraged in areas of flat topography.
   e. An access corridor, not to exceed 20 feet in width or 20 percent of the buffer edge, whichever is less, is permitted.
   f. Accessory structures intended to provide access to Wetlands such as stairways and docks are permitted in the access corridor.
   g. The buffer may be placed in a conservation easement.
   h. Monuments identifying the conservation easement, designed in accordance with City standards, should be placed every 100 feet to delineate the buffer edge and at intersections with property lines.
   i. Buffer strip vegetation should be appropriate to the goals for the water body. Where acceptable natural vegetation exists in buffer strip areas, the retention of such vegetation in an undisturbed state is preferred. The Minnesota PCA's manual "Plants for Stormwater Design: Species Selection for the Upper Midwest" provides guidance on buffer plant selection.

**8. Shoreland Management**

The City of Columbia Heights has an established adopted shoreland management (Ordinance No. 1550: Shoreland Management). The City code has established setbacks for placement of structures and impervious and also requirements for shoreland alterations. The City also encourages the following for work occurring within the shoreland zone:

1. Encourage the use of natural vegetation or bioengineering techniques for the stabilization of shorelines.
2. Use materials such as granite or fieldstone for shoreline stabilization project where hard armoring is necessary.
3. Encourage the use of techniques that will minimize runoff and improve water quality associated with new development and redevelopment. When possible use existing natural drainage ways, wetlands, and vegetated soil surfaces to convey, store, filter, and retain stormwater runoff before discharge to public waters. When development density, topographic features, and soil and vegetation conditions are not sufficient to adequately handle stormwater runoff using natural features and vegetation, various types of constructed facilities such as diversions, settling basins, skimming devices, dikes, waterways, and ponds may be used. Preference shall be given to designs using surface drainage, vegetated filter strips, bioretention areas, rainwater gardens, enhanced swales, off-line retention areas, and natural depressions for infiltration rather than buried pipes and human-made materials and facilities (*MnDNR Alternative Shoreland Standards, 2005)*.

**9. Long Term Inspection and Maintenance of Stormwater Facilities**

1) No private stormwater facilities may be approved unless a maintenance plan is provided that defines how access will be provided, who will conduct the maintenance, the type of maintenance and the maintenance intervals. At a minimum, all private stormwater facilities shall be inspected annually and maintained in proper condition consistent with the performance goals for which they were originally designed and as executed in the stormwater facilities maintenance agreement.
2) Access to all stormwater facilities must be inspected annual and maintained as necessary. The applicant shall obtain all necessary easement or other property interests to allow access to the facilities for inspection or maintenance for both the responsible party and the City of Columbia Heights.
3) All settled materials including settled solids, shall be removed from ponds, sumps, grit chambers, and other devices, and disposed of properly.

# 9. STORMWATER TREATMENT PRACTICE DESIGN STANDARDS

## 1. Storm Sewers

1. Manhole spacing shall not exceed 400 feet.
2. Where more than one pipe enters a structure, a catch basin/manhole shall be used.
3. Storm sewer pipe should match top of pipe on top of pipe unless grade constraints prevent this. In that case, hydraulic calculations will be necessary to verify that excessive surcharging will not occur.
4. Stormwater pipes shall be designed utilizing the Rational Method. Channel design shall be hydrograph method only. All methods are subject to the City Engineer's approval.
5. Lateral systems shall be designed for the 10-year rainfall using the Rational Method. State Aid roadway storm sewer shall be designed per the State Aid requirements.
6. The minimum full flow velocity within the storm sewer should be 3 feet per second (fps). The maximum velocity shall be 10 fps, except when entering a pond, where the maximum velocity shall be limited to 6fps.
7. Trunk storm sewer should be designed at a minimum to carry 100-year pond discharge in addition to the 10-year design flow for directly tributary areas. The following table shall be used for the calculation of peak rates using the Rational Method:

| Cover Type | 10-Year Runoff Coefficient |
|---|---|
| Single-family Residential | 0.4 |
| Multi-family Residential | 0.5 |
| Commercial | 0.7 |
| Industrial | 0.7 |
| Parks, Open Space | 0.2 |
| Ponds, Wetlands | 1.0 |

8. For storms greater than the 10-year event, and in the case of plugged inlets, transient street ponding will occur. For safety reasons, the maximum depth in streets should not exceed 1.5 feet at the deepest point.
9. To promote efficient hydraulics within manholes, manhole benching shall be provided to 1/2 diameter of the largest pipe entering or leaving the manhole.
10. Vaned grate (3067V) catch basin castings shall be used on all streets.
11. The maximum design flow at a catch basin for the 10-year storm event shall be three (3) cubic feet per second (cfs), unless high capacity grates are provided.

Catch basins at low points will be evaluated for higher flow with the approval of the City Engineer.

12. All structures located in the street are to be a minimum of four feet deep (rim to invert) and a minimum of three feet deep elsewhere. Two-by-three catch basins are to be four (4) feet deep.

## 2. Outlet and Inlet Pipes

1. Inlet pipes of stormwater ponds shall be extended to the pond normal water level whenever possible.
2. Outfalls with velocities greater than 4 fps into channels, where the angle of the outfall to the channel flow direction is greater than 30 degrees, requires energy dissipation or stilling basins.
3. Outfalls with velocities of less than 4 fps, that project flows downstream into a channel in a direction 30 degrees or less from the channel flow direction, generally do not require energy dissipaters or stilling basins, but will require riprap protection.
4. In the case of discharge to channels, riprap shall be provided on all outlets to an adequate depth below the channel grade and to a height above the outfall or channel bottom. Riprap shall be placed over a suitably graded filter material and filter fabric to ensure that soil particles do not migrate though the riprap and reduce its stability. Riprap shall be placed to a thickness at least 2.5 times the mean rock diameter to ensure that it will not be undermined or rendered ineffective by displacement. If riprap is used as protection for overland drainage routes, grouting may be recommended.
5. Discharge velocity into a pond at the outlet elevation shall be 6 fps or less. Riprap protection is required at all inlet pipes into ponds from the NWL to the pond bottom.
6. Where outlet velocities to ponds exceed 6 fps, the design should be based on the unique site conditions present. Submergence of the outlet or installation of a stilling basin approved by the City is required when excessive outlet velocities are experienced.
7. Submerged outlet pipes from ponds are not allowed.

## 3. Channels and Overland Drainage

1. Overland drainage routes where velocities exceed 4 fps should be reviewed by the City Engineer and approved only when suitable stabilization measures are proposed.
2. Open channels and swales are recommended where flows and small grade differences prohibit the economical construction of an underground conduit.

Open channels and swales can provide infiltration and filtration benefits not provided by pip.

3. The minimum grade in all unpaved areas shall be 2%.
4. Maximum length for drainage swales shall be 400 feet.
5. Channel side slopes should be a maximum of 4:1 (horizontal to vertical) with gentler slopes being desirable.
6. Riprap shall be provided at all points of juncture, particularly between two open channels and where storm sewer pipes discharge into a channel.
7. Open channels should be designed to handle the expected velocity from a 10-year design storm without erosion. Riprap may need to be provided.
8. Periodic cleaning of an open channel is required to ensure that the design capacity is maintained. Therefore, all channels shall be designed to allow easy access for equipment.

## 4. Ponds

1. The following should be considered minimum design criteria for ponds. Where on site water quality detention basins are provided copies of the calculations determining the design of the basins must be provided. The size and design considerations will be dependent on the receiving water body's water quality category, the imperviousness of the development and the degree to which on site infiltration of runoff is encouraged. Design of on-site detention basins, as described in the site's runoff water management plan, shall incorporate recommendations from the nationwide urban runoff program (NURP) and "Protecting Water Quality In Urban Areas", published by the Minnesota pollution control agency, as adopted by the city, or the applicable publications, as adopted by the city. The following design considerations are for on-site water quality detention basins based on the receiving water's water quality category. These designs include permanent detention for water quality treatment; extended detention designs may be substituted provided that they provide treatment equivalent to the requirements of this section.
2. A permanent pool (dead storage) volume below the normal outlet shall be greater than or equal to the runoff from a two and one-half inch (2.5") 24-hour storm over the entire contributing drainage area assuming full development.
3. Maximum allowable pond slopes above the outlet elevation are 4:1.
4. All constructed ponds and wetland mitigation areas shall have an aquatic or safety bench around their entire perimeter. The aquatic bench is defined as follows:
    a. Cross-slope no steeper than 10:1.
    b. Minimum width 10 feet.
    c. Located from pond outlet elevation to one foot pond outlet elevation.

5. All constructed ponds shall be provided a maintenance access from an adjacent roadway. The maintenance access shall be provided in the form of an easement no narrower than 20 feet. The maintenance access shall have a longitudinal slope no steeper than 6:1 and minimal cross slope. Maintenance access routes, due to their extra width, also serve well as emergency overflow (EOF) routes.
6. All constructed ponds and wetland mitigation areas shall have a maintenance access bench around sufficient perimeter to provide access to all inlets and outlets. The maintenance bench shall be located within a designated outlot or within a permanent easement. The maintenance bench shall extend from the outlet elevation to one foot above the outlet elevation and its cross slope shall be no steeper than 10:1. The maintenance bench shall connect to the maintenance access.
7. Maximum pond wet volume depth is 8 feet.
8. Mean depth for wet ponds shall be a minimum of 4 feet. If the pond is smaller than 3 acre-feet in volume, mean depths of 3 to 4 feet may be used. Mean depth is defined as the area at outlet elevation divided by the wet volume.
9. All ponds shall be graded to one foot below design bottom elevation. This "hold down" allows sediment storage until site restoration is complete.
10. The top berm elevation of ponds shall be a minimum of one foot above the 100-year pond HWL.
11. Grading shall not block or raise emergency overflows from adjoining properties unless some provision has been made for the runoff that may be blocked behind such an embankment.
12. All ponds shall have a protected EOF that is a minimum of 2 feet below the lowest building opening.

**5. <u>Infiltration/Filtration Practices</u>**

1. Sizing of filtration/infiltration practices, or STPs, shall be in conformance with the volume control requirements of this manual and the *Minnesota Stormwater Manual*.
2. When designing an infiltration practice for volume control and water quality management, on-site testing and detailed analysis are strongly encouraged in order to determine the infiltration rates of the proposed infiltration facility. Documented site-specific infiltration or hydraulic conductivity measurements (double-ring infilitrometer) completed by a licensed soil scientist or engineer is required. In the absence of a detailed analysis, the saturated infiltration rates listed in the Infiltration Rates for Infiltration STPs table found on the *Minnesota Stormwater Manual* shall be used. A piezometer shall be installed in order to ascertain the level of the local groundwater table and demonstrate at least three feet of separation between the bottom of the proposed facility and the

groundwater. The soil boring is required to go to a depth of at least five feet below the proposed bottom of the STP. The soils shall be classified using the Unified Soil Classification system. The least permeable soil horizon will dictate the infiltration rate. Infiltration practices shall be designed to infiltrate the required runoff volume within 48 hours.

3. Pretreatment, in the form of ponds, forebays, filter strips, or other approved methods, shall be provided for all infiltration areas. Pretreatment upstream of volume management practices is a key element in the long-term viability of infiltration areas. The level of pretreatment varies largely depending on the STP and drainage area RCWD, Mississippi WMO, City staff, and *Minnesota Stormwater Manual* recommendations shall be utilized for determining the appropriate level of pretreatment on a case-by-case basis.
4. The infiltration practice shall not be used within fifty feet of a municipal, community or private well, unless specifically allowed by an approved wellhead protection plan.
5. The infiltration practice shall not be used for runoff from fueling and vehicle maintenance areas and industrial areas with exposed materials prosing contamination risk, unless the infiltration practice is designed to allow for spill containment.
6. The infiltration practice shall not be used in Hydrologic Soil Group (HSG) D soils without soil corrections.
7. Vegetation of infiltration/filtration practices shall be as shown in the City of Columbia Heights Standard Details. A plan for management for vegetation shall be included in the Stormwater Pollution Prevention Plan.
8. If soils are unsuitable for infiltration, then filtration may be used with drain tile, provided in accordance with the City of Columbia Heights Standard Details.
9. Subgrade soils for infiltration/filtration practices shall be as presented in the City of Columbia Heights Standard Details. Assume a 40% void ratio for clean washed rock and 20% for construction sand for the purposes of volume calculations.
10. Rock storage beds shall be constructed using crushed angular granite that has been thoroughly washed to remove all fine particles that could result in clogging of the system.
11. For infiltration benches adjacent to ponds, benches shall have slopes no steeper than 5:1 over the proposed infiltration zone. A slope of 10:1 is preferred. The *Minnesota Stormwater Manual* cites concerns with locating infiltration features immediately adjacent to ponds. To address this, benches shall be located to maintain hydraulic separation from the saturated zone of the pond in order to minimize the loss of infiltration potential over time.

6. **Emergency Overflow Paths**
    1. Emergency Overflows (EOFs) shall be sized with a minimum bottom width of five feet and 4:1 side slopes.
    2. The maximum flow depth in EOFs shall be less than equal to one foot as calculated for a 100-year back-to-back storm event.

## 10. DESIGN EXAMPLES

The design process for each of the acceptable Stormwater Treatment Practices is detailed in the *Minnesota Stormwater Manual*, http://stormwater.pca.state.mn.us/index.php/Main_Page.

## 11. STORMWATER TREATMENT PRACTICE DETAIL DRAWINGS

Please refer to the City of Columbia Heights' Engineering Details for the following:

- Bioretention
- Media Filter System
- Vegetative Filter System
- Infiltration Trench
- Infiltration Basin
- Stormwater Pond/Wetland

## 12. CONSTRUCTION SPECIFICATIONS

Construction specifications and details are found in the *Minnesota Stormwater Manual* for each of the acceptable STPs, unless otherwise restricted by this manual.

## 13. CHECKLISTS

Refer to Appendix A & B

- Checklists for Construction Inspection and Operation & Maintenance
- Construction Inspection and Operation & Maintenance Checklists for each of the approved Stormwater Treatment Practices are available in the *Minnesota Stormwater Manual*.

# APPENDIX A

# APPENDIX B

# APPENDIX C

# APPENDIX D

# APPENDIX E

# APPENDIX F

# APPENDIX G

**APPENDIX D**

MWMO Standards

### *3.1.3 THE MWMO'S STANDARDS LANGUAGE*

**1. Stormwater Management Standards**

a. Any project creating greater than one acre of land disturbance is subject to the standards below.
b. The MWMO's Standards, or higher, must be adopted by local units of government and incorporated into their stormwater ordinance or other regulatory control.
c. In order to reduce regulatory complexity, a member may request the MWMO to allow stormwater rules set forth by adjacent watershed management organizations to govern development so long as they can be shown to be substantially equal to or greater than the level of protection afforded by the MWMO Standards.
d. Road mill and overlay project activities need only to comply with MWMO erosion and sediment control standards.
e. See the land disturbance definition for activities that shall not be considered land disturbance for the purposes of determining permanent stormwater management requirements.

**2. Rate Control**

Runoff rates for the proposed activity shall meet the member cities and MS4's runoff rate control requirements, using the member cities' and MS4's required critical storm events (as defined by Atlas 14 Volume 8 and/or subsequent revisions). Runoff rates for the proposed activity and pre-development shall be determined using an Atlas 14-based (nested, regional, state) rainfall distribution using NRCS-approved methodology.

All area contributing to the practice shall be accounted for in the design of the rate control practice. This includes areas off site and beyond the public right-of-way that will be contributing to the practice.

**3. Water Quality / Volume Control**

a. For nonlinear projects, without limitations, that disturb one or more acre of land, 1.1 inches of runoff from the new and fully reconstructed impervious surfaces shall be captured and retained on site.
b. For linear projects on sites, without limitations, that disturb one or more acre of land, the larger of the following shall be captured and retained on site:
    i. 0.55 inches of runoff from the new and fully reconstructed impervious surfaces
    ii. 1.1 inches of runoff from the net increase in impervious area
c. For projects on sites with limitations, the MWMO Design Sequence Flow Chart (Appendix Q) or a MWMO-approved alternative shall be used to identify a path to compliance through Flexible Treatment Options.
    i. The MWMO will develop a MOU with individual member cities and MS4's to address flexible treatment option #3 off site mitigation conditions.

**4. Volume Control Guidance (recommended procedures for volume control projects)**

a. Infiltration volumes and facility sizes shall be calculated using the appropriate hydrologic soil group classification, ASTM Unified Soil Class Symbol, and design infiltration rate from Table B. Select the design infiltration rate from Table B based on the least permeable soil horizon within the first five feet below the bottom elevation of the proposed infiltration management practice. The information provided in Table B is intended to be used in the following manner:

i. For preliminary design purposes, refer to the NRCS soil survey to identify the hydrologic soil groups found on site. This information provides a preliminary indication of the infiltration capacity of the underlying soils.
ii. After volume control/infiltration practices have been located on the grading plans, perform soil borings in the exact location of the proposed practices and in the quantity as described in the Minnesota Stormwater Manual Wiki (Minnesota Pollution Control Agency, 2014) as amended. Soil borings should be logged using the USDA Soil Textural Classification System and the ASTM Unified Soil Class Symbol.
iii. The combination of all the aforementioned information will allow the designer to identify the appropriate design infiltration rate. As the Minnesota Stormwater Manual States, "these infiltration rates represent the long-term infiltration capacity of a constructed infiltration practice and are not meant to exhibit the capacity of the soils in the natural state". A permit applicant can submit field measurements and revised rates (using the correction factors provided in the Minnesota Stormwater Manual) if there is reason to believe the long-term infiltration rates will be other than the design infiltration rates provided in Table B.

b. A geotechnical investigation shall be performed in the location of the proposed volume control practices to confirm or determine underlying soil types, the depth to the seasonally high groundwater table, and the depth to bedrock or other impermeable layer.
c. Infiltration BMPs shall drawdown in the time specified in the Minnesota Stormwater Manual Wiki for that BMP, or less if required by another entity with jurisdiction. Drawdown time and maximum ponding depths are defined in the Minnesota Stormwater Manual Wiki.
d. Infiltration stormwater management practices must be designed to include adequate pretreatment measures before discharge of runoff to the primary infiltration area, consistent with the Minnesota Stormwater Manual Wiki.
e. Design and placement of infiltration stormwater management practices shall be done in accordance with the Minnesota Department of Health guidance called "Evaluating Proposed Stormwater Infiltration Projects in Vulnerable Wellhead Protection Areas." (Final version to govern)
f. Specific site conditions may make infiltration difficult, undesirable, or impossible. Some of these conditions are listed in Table A. A more comprehensive list is provided in the MWMO Design Sequence Flow Chart in Appendix Q.

**Table A: Site Conditions Considered Undesirable for Infiltration Stormwater Management Practices**

| Type | Specific Site Conditions | Submittal Requirements |
|---|---|---|
| Potential Contamination | Potential Stormwater Hotspots (PSHs) | PSH locations and flow paths, Remediation Alternatives Considered |
| | Contaminated Soils | State Permitted Brownfield Documentation, Soil Borings, Remediation Alternatives Considered, Site design alternatives considered |
| Physical Limitations | Low Permeability (Type D Soils) | Soil Borings |
| | High Permeability (soils infiltrating greater than | Soil Borings |

| | | |
|---|---|---|
| | 8.3 inches/hour) | |
| | Bedrock within 5 vertical feet of bottom of infiltration area | Soil Borings |
| | Potential Adverse Hydrologic Impacts (e.g., impacting perched wetland) | Documentation of Potential Adverse Hydrologic Impacts |
| | Seasonal High Groundwater within 5 vertical feet of bottom of infiltration area | Soil Borings |
| | Karst Areas | Soil Borings |
| | Steep Slopes | Steep Slope Determination |
| Land Use Limitations | Utility Locations | Site Map, Alternatives considered |
| | Zoning or Land Use Limitations (Parking, Density, Setbacks, etc.) | Alternatives considered, Documentation of Infeasibility |
| | Adjacent Wells within 200 feet or inside Wellhead Protection Area or Drinking Water Supply Management Areas (DWSMA) | Well Locations or DWSMA |
| | Building Foundation | Ten (10) feet |

*Source: Modified from Minnesota Pollution Control Agency Minimal Impact Design Standards Design Sequence Flow Chart, December 5, 2013*

Note: the most recent version of the Minnesota Stormwater Manual should be used; Table A is provided as optional guidance to the cities

**Table B. Design Infiltration Rates**

| Hydrologic Soil Group | Soil Textures[1] | ASTM Unified Soil Class Symbols | Rate |
|---|---|---|---|
| A | Gravel, sandy gravel, silty gravel | GW, GP, GM, SW | 1.63 in/hr |
| | Sand, loamy sand, sandy loam | SP | 0.80 in/hr |
| B | Loam, silt loam | SM | 0.45 in/hr |
| | | MH | 0.30 in/hr |
| C | Sandy clay loam | ML | 0.20 in/hr |
| D | Clay, clay loam, silty clay loam, sandy clay, silty clay | CL, CH, OH, OL, GC, SC | 0.06 in/hr |

*Source: Minnesota Stormwater Manual Wiki, October 2014*

Note: Design infiltration rates from the most recent version of the Minnesota Stormwater Manual should be used

1 Adapted from the U.S. Department of Agriculture, Natural Resources Conservation Services, 2005. National Soil Survey Handbook, title 430-VI.

5. **Maintenance**
   a. Practices must continue to perform as approved. Owners must follow an inspection and maintenance schedule that has been approved by the permitting entity and correct any post-construction performance issues that arise.
   b. All stormwater management structures and facilities, including volume reduction stormwater management practices, shall be maintained to assure that the structures and facilities function as originally designed. The maintenance responsibilities must be assumed by either the municipality's acceptance of the required easements dedicated to stormwater management purposes, or by the applicant executing and recording a maintenance agreement, or by another enforceable means acceptable to the LGU. If used, the recordable executed agreement must be submitted to the municipality prior to issuance of the project approval from the city." Public developments will require a maintenance agreement in the form of a Memorandum of Agreement or an approved Local Water Management Plan or in compliance with an MS4 Permit that details the methods, schedule, and responsible parties for maintenance of stormwater management facilities for permitted development. A single Memorandum of Agreement for each local government unit may be used to cover all stormwater management structures and facilities required herein, including volume reductions management practices, within the LGU's jurisdiction. This maintenance plan shall address snow management.

6. **Drainage Alterations**
   No person shall alter stormwater flows (resulting in an increase in stormwater flows or a change in existing flow route) at a property boundary by changing land contours, diverting or obstructing surface or channel flow, or creating a basin outlet, without first obtaining any necessary permits from the city..

7. **Bounce and Duration Control**
   a. The project must meet hydroperiod standards adapted from "Stormwater and Wetlands Planning and Evaluation Guidelines for Addressing Potential Impacts of Urban Stormwater and Snowmelt Runoff on Wetlands," (Minnesota Stormwater Advisory Group, June 1997), as follows:
      i. Wetland Susceptibility Class = Highly Susceptible; Permit Storm Bounce = Existing; Inundation Period for 2-Year event = Existing; Inundation Period for 10-year or Greater Event = Existing
      ii. Wetland Susceptibility Class = Moderately Susceptible; Permit Storm Bounce = Existing plus 0.5 feet; Inundation Period for 2-Year event = Existing plus 1 days; Inundation Period for 10-year or Greater Event = Existing plus 7 days
      iii. Wetland Susceptibility Class = Slightly Susceptible; Permit Storm Bounce = Existing plus 1.0 feet; Inundation Period for 2-Year event = Existing plus 2 days; Inundation Period for 10-year or Greater Event = Existing plus 14 days
      iv. Wetland Susceptibility Class = Least Susceptible; Permit Storm Bounce = No Limit; Inundation Period for 2-Year event = Existing plus 7 days; Inundation Period for 10-year or Greater Event = Existing plus 21 days

8. **Flood Control**
   Flood control for the proposed activity shall meet the member cities or MS4's flood control requirements. Member cities and MS4's flood control requirements should minimize property damage due to excess water.

**9. Erosion and Sediment Control**

a. Erosion and sediment control measures shall meet the standards for the General Permit Authorization to Discharge Stormwater Associated with Construction Activity Under the National Pollutant Discharge Elimination System/State Disposal System Permit Program, Permit MN R100001 (NPDES General Construction Permit), issued by the Minnesota Pollution Control Agency, except where more specific requirements are required.

b. Activity shall be phased to minimize disturbed areas subject to erosion at any one time.

c. All construction site waste—such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site—shall be properly managed and disposed of so they will not have an adverse impact on water quality.

d. If silt fence is installed it shall conform to sections 3886.1 and 3886.2, Standard Specifications for Construction, Minnesota Department of Transportation (2005 ed.), as it may be amended.

# MWMO DESIGN SEQUENCE FLOW CHART

**Conduct Site Review:**
- Aerial Photos and Topographic Maps
- County Soil Surveys and other Soil Information as Available
- County Geologic Atlas
- Local Groundwater Levels
- DWSMA and Wellhead Protection Maps
- FEMA and Local Floodplain Maps
- Soil Borings and Site Survey
- MPCA Listing of Potentially Contaminated Sites
- Phase 1 and 2 Environmental Site Assessments
- TMDLs and Local Water Quality Standards
- Wetland Delineations, MNRAM Assessments, and Wetland Classifications
- Proposed Conditions, Conceptual/Preliminary Site Design
- Local zoning and land use requirements/ordinances, including stormwater rate control requirements
- Communication with Local Landowners, LGU, or Others Knowledgeable about the Site
- Site Inspection

**Define Performance**

Development and redevelopment projects: Retain on site a volume of 1.1" from impervious surfaces

Linear projects: Retain on site the larger of 1.1" from all new, or .55" from all new and fully reconstructed (D) impervious surfaces.

Does the project disturb one acre or more?
- No → MWMO performance goal does not apply
- Yes →

Is the project linear?
- Yes → Are there restraints due to lack of available ROW, off site drainage and/or rate control requirements? (F)
  - Yes → Is FTO Alternative No. 2 feasible?
    - Yes →
      - Select FTO Alternative No. 2
      - Provide documentation of offsite run on to project area
      - Provide documentation of lack of ROW.
    - No → Select FTO Alternative No. 3. Provide site survey, maps, regulations, and/or cost estimates documenting that meeting the original performance goal or FTO alternatives is not feasible in addition to other documentation as required by LGU.
  - No →
- No →

Are there zoning and land use requirements (density, parking, setbacks, etc.) that make the Performance Goal not feasible? (G)
- Yes → Is BMP relocation feasible?
  - No → Is FTO Alternative No. 1 feasible?
    - Yes →
      - Select FTO Alternative No. 1
      - Provide regulations, and/or cost estimates documenting infeasibility of meeting the original Performance Goal
    - No → Is FTO Alternative No. 2 feasible?
      - Yes →
        - Select FTO Alternative No. 2
        - Provide regulations, and/or cost estimates documenting infeasibility of meeting the original Performance Goal.
      - No → Select FTO Alternative No. 3. Provide site survey, maps, regulations, and/or cost estimates documenting that meeting the original performance goal or FTO alternatives is not feasible in addition to other documentation as required by LGU.
  - Yes →
- No →

Is the site located in a DWSMA, wellhead protection area, or within 200 feet of a drinking well?
- Yes → Can a local unit of government provide a higher level of engineering review to ensure a functioning system that prevents adverse impacts to groundwater?
  - No →
    - Select FTO Alternative No. 2
    - No infiltration practices allowed
    - Explore non-infiltration volume reduction practices
    - Provide DWSMA or well location map
  - Yes →
- No →

Are there existing or proposed structures or infrastructure (e.g., rate control BMPs, utilities, buildings, roadway, easements) that make the Performance Goal not feasible? (G)
- Yes → Is BMP relocation feasable?
  - No → Is FTO Alternative No. 1 feasible?
    - Yes →
      - Select FTO Alternative No. 1
      - Provide regulations, and/or cost estimates documenting infeasibility of meeting the original Performance Goal
    - No → Is FTO Alternative No. 2 feasible?
      - Yes →
        - Select FTO Alternative No. 2
        - Provide regulations, and/or cost estimates documenting infeasibility of meeting the original Performance Goal
      - No → Select FTO Alternative No. 3. Provide site survey, maps, regulations, and/or cost estimates documenting that meeting the original performance goal or FTO alternatives is not feasible in addition to other documentation as required by LGU.
  - Yes →
- No →

Are active karst areas within 1000 feet up-gradiant or 100 feet downgradiant of the BMP location?
- Yes → Can a local unit of government provide a higher level of engineering review to ensure a functioning system that prevents adverse impacts to groundwater?
  - No → Is BMP relocation onsite to a location without karst feasible?
    - No → Is FTO Alternative No. 2 feasible?
      - Yes →
        - Select FTO Alternative No. 2
        - No infiltration practices allowed
        - Explore non-infiltration volume reduction practices
        - Provide soil borings or report from a professional geologist or geotechnical engineer.
      - No → Select FTO Alternative No. 3. Provide site survey, maps, regulations, and/or cost estimates documenting that meeting the original performance goal or FTO alternatives is not feasible in addition to other documentation as required by LGU.
    - Yes →
  - Yes →
- No →

Is shallow groundwater or shallow bedrock present on site?
- Yes → Conduct detailed site investigation (i.e., borings, excavations, consultation with a professional geologist).
  - → Is there >5 feet of soil depth (> 10 feet is preferred) from bottom of BMP to bedrock and groundwater?
    - No → Is BMP relocation onsite to avoid shallow groundwater and bedrock feasible?
      - No → Can BMP be raised?
        - Yes → Raise BMP enough to ensure 5 feet (preferably 10 feet) of soil between bottom of BMP and top of bedrock and groundwater.
        - No → Is FTO Alternative No. 2 feasible?
          - Yes →
            - Select FTO Alternative No. 2
            - No infiltration practices allowed
            - Explore non-infiltration volume reduction practices
            - Provide soil borings or report from a professional geologist or geotechnical engineer.
          - No → Select FTO Alternative No. 3. Provide site survey, maps, regulations, and/or cost estimates documenting that meeting the original performance goal or FTO alternatives is not feasible in addition to other documentation as required by LGU.
      - Yes →
    - Yes →
- No →

Is there presence of contaminated soils and/or groundwater, or hotspot runoff? (H)
- Yes → Can hotspot or contamination be isolated or remediated to mitigate risk of increased contamination?
  - No →
    - Select FTO Alternative No. 2
    - No infiltration practices allowed
    - Explore non-infiltration volume reduction practices
    - Provide Phase I or II ESAs, or other documentation of potential contamination or hotspot runoff
    - Provide documentation of extent of contamination and remediation alternatives considered
  - Yes →
- No →

Are there very low infiltrating soils (<0.2 inches per hour)?
- Yes → Is BMP relocation onsite to a higher-infiltrating location feasible?
  - No → Can BMP be sized to drain dry within 48 hours (24 hours in locations that are tributary to trout streams)?
    - No → Provide soil boring or infiltration test results documenting low-infiltrating soils.
      - → Is FTO Alternative No. 1 (lower volume control standard) feasible, allowing the BMP to drain within 48 hours (24 hours in locations that are tributary to trout streams)?
        - Yes →
          - Select FTO Alternative No. 1
          - Provide soil boring or infiltration test results documenting high-infiltrating soils.
        - No →
          - Select FTO Alternative No. 2
          - No infiltration practices allowed
          - Explore non-infiltration volume reduction practices
          - Provide soil boring or infiltration test results documenting low infiltration rates.
    - Yes →
  - Yes →
- No →

Are there very high infiltrating soils (>8.3 inches per hour)? (E)
- Yes → Is BMP relocation onsite to a lower-infiltrating location feasible?
  - No → Can subgrade be modified to slow the rate of infiltration to less than 8.3 inches per hour?
    - No →
      - Select FTO Alternative No. 2
      - No infiltration practices allowed
      - Explore non-infiltration volume reduction practices
      - Provide soil boring or infiltration test results documenting high-infiltrating soils.
    - Yes →
  - Yes →
- No →

Are there adverse surface water hydrologic impacts from infiltration practices (e.g., impacting perched wetland)?
- Yes → Can the BMP be relocated onsite to avoid adverse hydrologic impacts?
  - No → Would BMP accommodating FTO Alternative No. 1 avoid adverse hydrologic impacts?
    - No →
      - Select FTO Alternative No. 2
      - Maximize infiltration BMPs to treat up to the 0.55 inch goal, if possible.
      - Explore non-infiltration volume reduction practices
      - Provide report documenting potential hydrologic impacts from infiltration on the site, prepared by registered engineer, hydrologist, or wetlands specialist.
    - Yes →
      - Select FTO Alternative No. 1
      - Maximize infiltration BMPs to treat more than 0.55 inch goal, if possible.
      - Provide report documenting potential hydrologic impacts from infiltration on the site, prepared by registered engineer, hydrologist, or wetlands specialist.
  - Yes →
- No →

**Complete Design Using Performance Goal**
(As modified by FTO Alternatives, if applicable)

**MWMO Project Flexible Treatment Options (FTO)**

The Flexible Treatment Options (FTO) alternatives presented here should be employed when the Performance Goal is not feasible and/or allowed. The designer should document the reasons why the Performance Goal and rejected FTO Alternatives are not feasible and/or allowed.

**FTO 1**
Applicant attempts to comply with the following conditions:
1.a. Achieve at least 0.55" volume reduction goal, and
1.b. Remove 75% of the annual TP load, and
1.c. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site

**FTO #2**
Applicant attempts to comply with the following conditions:
2.a. Achieve volume reduction to the maximum extent practicable (as determined by the Local Authority), and
2.b. Remove 60% of the annual TP load, and
2.c. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site.

**FTO #3**
The MWMO will develop a Memorandum of Understanding with individual member cities and MS4s to address off-site mitigation conditions.

Off-site mitigation (including banking or cash or treatment on another project, as determined by the Local Authority) will be equivalent to the volume reduction Performance Goal.

**Notes:**
A. Volume reduction techniques considered shall include infiltration, rainwater harvesting & reuse, bioretention, permeable pavement, tree boxes, grass swales and/or additional techniques included in the MIDS calculator or the Minnesota Stormwater Manual.
B. Applicant shall document the flexible treatment options decision sequence, following the order of alternatives presented here.
C. For Alternative #2, the applicant is encouraged to use BMPs that reduce volume. Secondary preference is to employ filtration techniques, followed by rate control BMPs.
D. Fully reconstructed impervious surfaces: Areas where impervious surfaces have been removed down to the underlying soils. Activities such as structure renovation, mill and overlay projects and other pavement rehabilitation projects that do not alter the underlying soil material beneath the structure, pavement or activity are not considered full reconstruction. In addition, other maintenance activities such as catch basin and pipe repair/ replacement, lighting, and pedestrian ramp improvements shall not be considered fully reconstructed impervious surfaces. Reusing an existing building foundation and re-roofing of an existing building are not considered fully reconstructed.
E. Soils that infiltrate too quickly may not provide sufficient pollutant removal before the infiltrated runoff enters groundwater.
F. A reasonable attempt must be made to obtain ROW during the project planning process.
G. Other, this is not an exhaustive list.
H. Hotspots includes any portion of a facility where infiltration is prohibited under an NPDES/ SDS industrial stormwater permit issued by the MPCA.

Adapted from MIDS Design Sequence Flow Chart, December 2013

**APPENDIX E**

RCWD Permitting Rules

# RICE CREEK WATERSHED DISTRICT RULES

**BOARD APPROVED: DECEMBER 14, 2016**
**EFFECTIVE DATE: JANUARY 1, 2017**

CERTIFICATION OF
REVISED WATERSHED DISTRICT RULES

I, Michael J. Bradley, Secretary of the Rice Creek Watershed District Board of Managers, certify that the attached is a true and correct copy of the Rules of the Rice Creek Watershed District as revised and adopted by the Board of Managers on December 14, 2016, and effective January 1, 2017.

Dated: 12-14-2016

Michael J. Bradley, Secretary

ACKNOWLEDGEMENT

State of Minnesota
County of Anoka

This instrument was acknowledged before me on December 14, 2016, by Michael J. Bradley, as Secretary of the Rice Creek Watershed District Board of Managers.

THERESA M. STASICA
NOTARY PUBLIC
MINNESOTA
My Commission Expires January 31, 2020

Notary Public

# GENERAL POLICY STATEMENT

The Rice Creek Watershed District (District) is a political subdivision of the State of Minnesota, established under the Minnesota Watershed Law. The District is also a watershed management organization as defined under the Minnesota Metropolitan Surface Water Management Act, and is subject to the directives and authorizations in that Act. Under the Watershed Law and the Metropolitan Surface Water Management Act, the District exercises a series of powers to accomplish its statutory purposes. The District's general statutory purpose is to conserve natural resources through development planning, flood control, and other conservation projects, based upon sound scientific principles.

As required under the Metropolitan Surface Water Management Act, the District has adopted a Watershed Management Plan, which contains the framework and guiding principles for the District in carrying out its statutory purposes. It is the District's intent to implement the Plan's principles and objectives in these rules.

Land alteration affects the rate, volume, and quality of surface water runoff which ultimately must be accommodated by the existing surface water systems within the District. The watershed is large, 186 square miles, and its outlet, Rice Creek, has limited capacity to carry flows. Flooding problems already occur in urbanized areas along Lower Rice Creek and other localized areas.

Land alteration and utilization also can degrade the quality of runoff entering the streams and waterbodies of the District due to non-point source pollution. Lake and stream sedimentation from ongoing erosion processes and construction activities reduces the hydraulic capacity of waterbodies and degrades water quality. Water quality problems already exist in many of the lakes and streams throughout the District.

Projects which increase the rate or volume of stormwater runoff can aggravate existing flooding problems and contribute to new ones. Projects which degrade runoff quality can aggravate existing water quality problems and contribute to new ones. Projects which fill floodplain or wetland areas can aggravate existing flooding by reducing flood storage and hydraulic capacity of waterbodies, and can degrade water quality by eliminating the filtering capacity of those areas.

In these rules the District seeks to protect the public health and welfare and the natural resources of the District by providing reasonable regulation of the modification or alteration of the District's lands and waters to reduce the severity and frequency of flooding and high water, to preserve floodplain and wetland storage capacity, to improve the chemical, physical and biological quality of surface water, to reduce sedimentation, to preserve waterbodies' hydraulic and navigational capacity, to preserve natural wetland and shoreland features, and to minimize public expenditures to avoid or correct these problems in the future.

The District rules include certain rules adopted to implement area-specific Comprehensive Wetland Protection and Management Plans (CWPMP) as provided under the Wetland Conservation Act (WCA). CWPMPs are designed to achieve identified wetland resource management needs within specific drainage areas of the watershed. These rules (within Rule F) apply to a delineated geographic area. Accordingly, a property owner intending an activity subject to District permitting requirements first should determine whether the activity will be governed by the CWPMP rule.

# RELATIONSHIP OF RICE CREEK WATERSHED DISTRICT TO MUNICIPALITIES

The District recognizes that the primary control and determination of appropriate land uses is the responsibility of the municipalities. Accordingly, the District will coordinate permit application reviews involving land development with the municipality where the land is located.

The District intends to be active in the regulatory process to ensure that its water resources are managed in accordance with District goals and policies. Municipalities have the option of assuming a more active role in the permitting process after adoption of a local water management plan approved by the District and adoption and implementation of local ordinances consistent with the approved plan.

The District will also review projects sponsored or undertaken by municipalities and other governmental units, and generally will require permits for governmental projects impacting water resources of the District. These projects include but are not limited to, land development, road, trail, and utility construction and reconstruction.

The District desires to serve as technical advisor to the municipalities in their preparation of local surface water management plans and the review of individual development proposals prior to investment of significant public or private funds. To promote a coordinated review process between the District and the municipalities, the District encourages the municipalities or townships to contact the District early in the planning process.

# RULE A: DEFINITIONS

For the purposes of these rules, the following words have the meanings set forth below.

References in these rules to specific sections of the Minnesota Statutes include any amendments, revisions or recodification of those sections.

**As Constructed and Subsequently Improved Condition (ACSIC):** the geometry of the public drainage system as constructed, including all subsequent legal repairs and alterations.

**Beds of Protected Waters:** all portions of public waters and public waters wetlands located below the ordinary high water level.

**Best Management Practices (BMPs):** measures taken to minimize the negative effects on water resources and systems as referenced in the Minnesota Construction Site Erosion and Sediment Control Planning Handbook (BWSR, 1988), Protecting Water Quality in Urban Areas (MPCA, 1989) and the Minnesota Stormwater Manual (MPCA, 2006) or similar guidance documents.

**Better Site Design (BSD):** an approach to managing runoff that seeks to attain post development hydrology which mimics the undeveloped condition in terms of volume, rate and timing of runoff. The goals of Better Site Design include reducing the amount of impervious cover, increasing the amount of natural lands set aside for conservation, using pervious areas for more effective stormwater treatment, innovative grading and drainage techniques and through the review of every aspect of the project site planning process. Better Site Design involves techniques applied early in the design process to reduce impervious cover, conserve natural areas and use pervious areas to more effectively treat stormwater runoff and promote a treatment train approach to runoff management.

**Bridge:** a road, path, railroad or utility crossing over a waterbody, wetland, ditch, ravine, road, railroad, or other obstacle.

**Bridge Span:** the clear span between the inside surfaces of a bridge's terminal supports.

**Channel:** a perceptible natural or artificial depression, with a defined bed and banks that confines and conducts water flowing either continuously or periodically.

**Comprehensive Wetland Protection and Management Plan (CWPMP):** a locally developed comprehensive wetland protection and management plan approved by the Minnesota Board of Soil and Water Resources, pursuant to Minnesota Rules 8420.0830.

**Criteria:** specific details, methods and specifications that apply to all permits and reviews and that guide implementation of the District's goals and policies.

**Critical Duration Flood Event:** the 100-year precipitation or snow melt event with a duration resulting in the maximum 100-year return period water surface elevation. The critical duration flood event is generally either the 100-year, 24-hour rainfall event as found in NOAA Atlas 14 or the ten-day snow melt event assumed to be 7.2 inches of runoff occurring on frozen ground (CN=100); however, other durations (e.g., 6-hour) may result in the maximum 100 year return period water surface elevation.

**CWPMP Contributing Drainage Area:** the areas tributary to CWPMP jurisdictional areas from which banked or off-site wetland replacement credits may be used to replace wetland impacts under Rule F.6(c). Figure 4 illustrates the Contributing Drainage Area; however, the precise boundary will be determined on a hydrologic basis at the time of permitting.

**Detention Basin:** any natural or man-made depression that stores stormwater runoff temporarily.

**Development:** any land-disturbing activity resulting in creation or reconstruction of impervious surface including, but not limited to, municipal road construction. Normal farming practices part of an ongoing farming operation shall not be considered development.

**District:** the Rice Creek Watershed District established under the Minnesota Watershed Law, Minnesota Statutes Chapter 103D.

**Drainage System:** a system of open channel, pipe or tile, to drain property, including laterals, improvements, and improvements of outlets, which may or may not be a public system under the jurisdiction of the District under Minnesota Statutes Chapters 103B, 103D, or 103E.

**Effectively Drained Wetland:** an area whose natural hydrology has been altered to the point that it is no longer considered wetland.

**Emergency Overflow (EOF):** a primary overflow to pass flows above the design capacity around the principal outlet safely downstream without causing flooding.

**Excavation:** the displacement or removal of soil, sediment or other material.

**Floodplain:** the areas adjoining a waterbody that are inundated during the 100-year flood.

**Floodway:** the channel of a watercourse, the bed of waterbasins and those portions of adjoining floodplains that must be kept free of encroachment to accommodate the 100-year flood.

**Floodway Fringe:** the area between the floodway and the boundary of the 100-year flood.

**Flood Management Zone:** land within the Rice Creek Watershed District draining to and entering Rice Creek downstream from the outlets of Baldwin Lake and Golden Lake.

**Freeboard:** vertical distance between the 100-year flood elevation or emergency overflow elevation of a waterbasin or watercourse and the elevation of the regulatory elevation of a structure.

**Governmental Project:** projects sponsored or paid for by a governmental agency.

**High Quality Wetland:** an existing wetland reflecting a score of “high/high” for the functional indicators “outlet condition” and “vegetative quality”, respectively, using MnRAM 3.4 (or most recent version) or other state approved wetland functional model.

**Impervious Surface:** a compacted surface or a surface covered with material (i.e., gravel, asphalt, concrete, Class 5, etc.) that increases the depth of runoff compared to natural soils and land cover. Including but not limited to roads, driveways, parking areas, sidewalks and trails, patios, tennis courts, basketball courts, swimming pools, building roofs, covered decks, and other structures.

**Infiltration:** water entering the ground through the soil.

**Land-Disturbing Activity:** any disturbance to the ground surface that, through the action of wind or water, may result in soil erosion or the movement of sediment into waters, wetlands or storm sewers or onto adjacent property. Land-disturbing activity includes but is not limited to the demolition of a structure or surface, soil stripping, clearing, grubbing, grading, excavating, filling and the storage of soil or earth materials. The term does not include normal farming practices as part of an ongoing farming operation.

**Landlocked Basin:** a waterbasin lacking an outlet at an elevation at or below the water level produced by the critical duration flood event, generally the 10-day snowmelt event.

**Local Government Unit (LGU):** the public body responsible for implementing the Minnesota Wetland Conservation Act, as defined at Minnesota Statutes §103G.005, subdivision 10e.

**Low Entry Elevation:** the elevation of the lowest opening in a structure.

**Low Floor Elevation:** the elevation of the lowest floor of a habitable or uninhabitable structure, which is often the elevation of the basement floor or walk-out level.

**Major Watercourse:** any watercourse having a tributary area of 200 acres or more.

**Marginally Degraded Wetland**: an existing wetland reflecting a score of "high/low" or "low/high" for the functional indicators "outlet condition" and "vegetative quality", respectively, using MnRAM 3.4 (or most recent version) or other state approved wetland functional model.

**Mill, Reclamation and Overlay:** removal of the top layer(s) of an impervious surface (e.g. roadway, parking lot, sport court) by mechanical means, followed by the placement of a new layer of impervious surface, without exposure of the underlying native soil.

**Moderately Degraded Wetland:** an existing wetland reflecting a score of "medium/medium" or "low/medium" for the functional indicators "outlet condition" and "vegetative quality", respectively, using MnRAM 3.4 (or most recent version) or other state approved wetland functional model.

**Municipal Separate Storm Sewer System (MS4):** the system of conveyances owned or operated by the District and designed or used to collect or convey storm water, and that is not used to collect or convey sewage.

**Municipality:** any city or township wholly or partly within the Rice Creek Watershed District.

**Native Vegetation:** plant species that are indigenous to Minnesota or that expand their range into Minnesota without being intentionally or unintentionally introduced by human activity and that are classified as native in the Minnesota Plant Database.

**NPDES Permit:** general permit authorization to discharge storm water associated with construction activity under the National Pollutant Discharge Elimination System (NPDES), issued by the Minnesota Pollution Control Agency.

**Non-Degraded Wetland:** an existing wetland reflecting a score of "high/medium" or "medium/high" for the functional indicators "outlet condition" and "vegetative quality", respectively, using MnRAM 3.4 (or most recent version) or other state approved wetland functional model.

**Non-Invasive Vegetation:** plant species that do not typically invade or rapidly colonize existing, stable plant communities.

**NURP:** Nationwide Urban Runoff Program.

**100-Year Flood Elevation:** the elevation of water resulting from the critical duration flood event.

**Ordinary High Water Level (OHW):** the highest water level elevation that has been maintained for a sufficiently long period of time to leave evidence upon the landscape. The OHW is commonly that point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial. If an OHW has been established for a waterbody by the Minnesota Department of Natural Resources, it will constitute the OHW under this definition.

**Parcel:** a lot of record in the office of the county recorder or registrar or that otherwise has a defined legal existence.

**Person:** any natural person, partnership, unincorporated association, corporation, limited liability company, municipal corporation, state agency, or political subdivision of the State of Minnesota.

**Political Subdivision:** a municipality, county, town, school district, metropolitan or regional agency, or other special purpose district of Minnesota.

**Pollutant:** Anything that causes or contributes to pollution. Pollutants may include, but are not limited to: paints, varnishes, and solvents; oil and other automotive fluids; non-hazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects, ordinances, and accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind. (This definition is for the purpose of Rule H only and is incorporated from the U.S. EPA model ordinance.)

**Public Linear Project:** a project involving a roadway, sidewalk, trail or utility not part of an industrial, commercial, institutional or residential development.

**Public Waters:** waters identified as public waters under Minnesota Statutes section 103G.005, Subdivision 15.

**Public Waters Wetlands:** all wetlands identified as public waters wetlands under Minnesota Statutes section 103G.005, subdivision 15a.

**Reconstruction:** removal of an impervious surface such that the underlying structural aggregate base is effectively removed and the underlying native soil exposed.

**Resource of Concern:** lakes classified as Tier I, Tier II, Tier III and Tier IV within Table 4-6 of the District's 2010 Watershed Management Plan and subsequently amended Watershed Management Plans approved by BWSR. If an area within the jurisdictional boundary of the District drains to a location outside the District without reaching an ROC, the District will identify the receiving water outside of the District that is the ROC for the purpose of the permit.

**Resource of Concern Drainage Area:** Land draining to a Resource of Concern. The Resource of Concern drainage area excludes lands draining first to an upstream Resource of Concern.

**Seasonal High Water Table:** The highest known seasonal elevation of groundwater as indicated by redoximorphic features such as mottling within the soil.

**Severely Degraded Wetland:** an existing wetland reflecting a score of "medium/low" or "low/low" for the functional indicators "outlet condition" and "vegetative quality", respectively, using MnRAM 3.4 (or most recent version) or other state approved wetland functional model.

**Site:** All contiguous lots of record on which activity subject to any District rule is proposed to occur or occurs, as well as all other lots of record contiguous to any such lot under common ownership at the time of the permitted activity. Linear right of way does not disturb contiguity. For public linear projects not occurring in conjunction with land development, the term means the portion of right-of-way defined by the project work limits.

**Storm Sewer:** a pipe system for stormwater conveyance.

**Stormwater Pond:** Constructed basins placed in the landscape to capture stormwater runoff.

**Structure:** a building with walls and a roof, excluding structures such as pavilions, playgrounds, gazebos, and garbage enclosures.

**Subdivision, Subdivide:** the legal separation of an area, parcel, or tract of land under single ownership into two or more parcels, tracts, lots.

**Technical Evaluation Panel (TEP):** The body described in Minnesota Rules 8420.0240.

**Upland Habitat Area:** A non-wetland area that is contiguous with an existing, restored, or created wetland and scores “C” or better using the Natural Heritage Ranking methodology.

**Waterbasin:** an enclosed natural depression with definable banks capable of containing water.

**Waterbody**: a waterbasin, watercourse or wetland as defined in these Rules.

**Watercourse:** a channel that has definable beds and banks capable of conducting confined runoff from adjacent land.

**Wetland:** area identified as wetland under Minnesota Statutes section 103G.005, subdivision 19.

**Wetland Management Corridor (WMC):** A contiguous corridor encompassing high priority wetland resources identified at a landscape scale in Figure F1 and refined at the time of individual project permitting at a site level as provided for in Rule F, section 6.

# RULE B: PROCEDURAL REQUIREMENTS

1. **APPLICATION AND NOTICE OF INTENT REQUIRED.** Any person undertaking an activity for which a permit is required by these rules must obtain the required permit prior to commencing the activity that is subject to District regulation. Applications for permit must be submitted to the District in accordance with the procedures described in this rule. Required exhibits are specified for each substantive rule below. Applicants are encouraged to contact District staff before submission of an application to review and discuss application requirements and the applicability of specific rules to a proposed project. When the rules require a criterion to be met, or a technical or other finding to be made, the District makes the determination except where the rule explicitly states otherwise. The landowner or, in the District's judgment, easement holder, must sign the permit application and will be the permittee or a co-permittee. For governmental projects, the selected contractor may sign the application on behalf of the governmental applicant.

2. **FORMS.** A District permit application or notice of intent, and District checklist of permit submittal requirements, must be submitted on the forms provided by the District. Applicants may obtain forms from the District office or website at http://www.ricecreek.org/permits.

3. **ACTION BY BOARD OF MANAGERS.** The Board of Managers shall act within sixty days of receipt of a complete permit application. A complete permit application includes all required information, exhibits, and fees. An application will not be ready for Board consideration unless all substantial technical questions have been addressed and all substantial plan revisions resulting from staff review have been accomplished. Permit decisions will be made by the Board except as delegated to the Administrator by written resolution.

4. **ISSUANCE OF PERMITS.** The permit will be issued only after applicant has satisfied all requirements and conditions for the permit, has paid all required District fees, and the District has received any required surety.

5. **CONDITIONAL APPROVAL PENDING RECEIPT OF CHANGES (CAPROC).** The District may conditionally approve an application, but such approval does not result in the issuance of a permit until all conditions precedent to the approval have been resolved. All conditions must be satisfied within twelve (12) months of the date of conditional approval. If a permit is not obtained within the 12-month period, the applicant will be required to reapply for a permit and pay applicable permit fees.

6. **PERMIT TERM.** Permits are valid for an eighteen-month period from the date of issuance unless otherwise stated within the permit, suspended or revoked. To extend a permit, the permittee must apply to the District in writing, stating the reasons for the extension. Any plan changes, and related project documents must also be included in the extension application. The District must receive this application at least thirty (30) days prior to the permit expiration date. The District may impose different or additional conditions on a renewal or deny the renewal in the event of a material change in circumstances. On the first renewal, a permit will not be subject to change because of a change in District rules. An extended stormwater management permit for phased development may be issued pursuant to Rule C.13.

**7. PERMIT ASSIGNMENT.** A permittee must be assigned when title to the property is transferred or, if the permittee is an easement holder, in conjunction with an assignment of the easement. The District must approve a permit assignment and will do so if the following conditions have been met:

**(a)** The proposed assignee in writing agrees to assume all the terms, conditions and obligations of the permit as originally issued to the permittee;

**(b)** The proposed assignee has the ability to satisfy the terms and conditions of the permit as originally issued;

**(c)** The proposed assignee is not changing the project as originally permitted;

**(d)** There are no violations of the permit conditions as originally issued; and

**(e)** The District has received from the proposed assignee a substitute surety to secure performance of the assigned permit.

Until assignment is approved, the permittee of record as well as the current title owner will be responsible for permit compliance.

**8. PERMIT FEES.** The District will charge applicants permit fees in accordance with a schedule that will be maintained and revised from time to time by the Board of Managers to ensure that permit fees cover the District's actual costs of administrating and enforcing permits. The current fee schedule may be obtained from the District office or the District website at http://www.ricecreek.org/permits. An applicant must submit the required permit fee to the District at the time it submits its permit application. No permit fee will be charged to the federal government, the State of Minnesota or a political subdivision of the State of Minnesota.

**9. PERFORMANCE SURETY.**

**(a) POLICY.** It is the policy of the Board of Managers to conserve the District's water resources by assuring compliance with its rules. The District ensures compliance by requiring a bond or other surety to secure performance of permit conditions and compliance with District rules, as well as protection of District water resources in the event of noncompliance with permit conditions and/or rules. A project for which the applicant is the federal government, the State of Minnesota or a political subdivision of the State of Minnesota is exempt from surety requirements.

**(b) PERFORMANCE SURETY REQUIREMENT.** A surety or sureties, when required, must be submitted in a form acceptable to the District. When a cash escrow is used, it will be accompanied by an escrow agreement bearing the original signature of the permittee and the party providing the escrow, if not the permittee. The District will require applicants to submit a surety or sureties in accordance with a schedule of types and amounts that will be maintained and revised from time to time by the Board of Managers. The current schedule of surety amounts and acceptable forms and sources as well as surety agreement may be obtained from the District office or the District website at http://www.ricecreek.org/permits.

An applicant may submit a bond or an irrevocable letter of credit to the District to secure performance of permit conditions for activities for which the required surety amount as determined above is in excess of $5,000; however, the first $5,000 of any performance surety must be submitted to the District as a cash escrow. The bond or letter of credit must be submitted before the permit is issued.

**(c) FORM AND CONTENT OF BOND OR LETTER OF CREDIT.**

**(1)** The bond or irrevocable letter of credit must be in a form acceptable to the District and from a surety licensed to do business in Minnesota.

**(2)** The bond or irrevocable letter of credit must be in favor of the District and conditioned upon the performance of the party obtaining the bond or letter of credit of the activities authorized in the permit, and compliance with all applicable laws, including the District's rules, the terms and conditions of the permit and payment when due of any fees or other charges required by law, including the District's rules. The bond or irrevocable letter of credit must provide that if the bond conditions are not met, the District may make a claim against the bond or letter of credit.

**(d) RELEASE OF PERFORMANCE SURETY.** Upon written notification from permittee of completion of the permitted project, the District will inspect the project to determine if it is constructed in accordance with the terms of the permit and District rules. If the project is completed in accordance with the terms of the permit and District rules and the party providing the performance surety does not have an outstanding balance of money owed to the District for the project, including but not limited to unpaid permit fees, the District will release the bond or letter of credit, or return the cash surety if applicable. Final inspection compliance includes, but is not limited to, confirmation that all erosion and sediment control BMPs and stormwater management features have been constructed or installed as designed and are functioning properly, and completion of all required monitoring of wetland mitigation areas. The District may return a portion of the surety if it finds that a portion of the surety is no longer warranted to assure compliance with District rules.

# RULE C: STORMWATER MANAGEMENT PLANS

**1.** **POLICY.** It is the policy of the Board of Managers to manage stormwater and snowmelt runoff on a local, regional and watershed basis; to promote natural infiltration of runoff throughout the District to preserve flood storage and enhance water quality; and to address the unique nature of flooding issues within the Flood Management Zone, through the following principles:

**(a)** Maximize water quality and flood control on individual project sites through Better Site Design practices and stormwater management.

**(b)** Minimize land use impacts and improve operational and maintenance efficiency by siting stormwater BMPs, when needed, regionally unless local resources would be adversely affected.

**(c)** Treat stormwater runoff before discharge to surface waterbodies and wetlands, while considering the historic use of District water features.

**(d)** Ensure that future peak rates of runoff are less than or equal to existing rates.

**(e)** Reduce the existing conditions peak rate of discharge along Lower Rice Creek and the rate of discharge and volume of runoff reaching Long Lake, to preserve the remaining floodplain storage volume within Long Lake and mitigate the historic loss of floodplain storage.

**(f)** Preserve remaining floodplain storage volume within the Rice Creek Watershed to minimize flood potential throughout the District.

**2.** **REGULATION.** A permit incorporating an approved stormwater management plan is required under this rule for development, consistent with the following:

**(a)** A permit is required for subdivision of an area exceeding one acre. This includes subdivision for single-family residential, multi-unit residential, commercial, industrial, or institutional development.

**(b)** A permit is not required for single-family residential construction on an individual lot of record. If the lot is within a development previously approved by the District, the construction must conform to the previous approval.

**(c)** A permit is required for development, other than Public Linear Projects, that creates or reconstructs 10,000 square feet or more of impervious surface. This threshold is cumulative of all impervious surface created or reconstructed through multiple phases or connected actions of a single complete project, as defined by the District, on a single parcel or contiguous parcels of land under common ownership, development or use.

**(d)** For Public Linear Projects, a permit is required to create 10,000 square feet or more of impervious surface through multiple phases or connected actions of a single complete project, as defined by the District, within a Resource of Concern Drainage Area.

**(e)** Rule C requirements do not apply to sidewalks and trails 10 feet wide or less that are bordered down-gradient by vegetated open space or vegetated filter strip with a minimum width of 5 feet.

**(f)** Rule C requirements do not apply to Bridge Spans and Mill, Reclamation & Overlay projects.

**(g)** Rule C.6 requirements do not apply to single family residential subdivisions creating

seven or fewer lots that:

**(1)** Establish no new public roadway; and

**(2)** Include no private roadway/driveway serving three or more lots.

Rate control provisions of Rule C.7 still apply.

**3. STORMWATER MANAGEMENT PLAN REQUIRED.** A stormwater management plan shall be submitted with the permit application for a project equaling or exceeding the threshold of Section 2. The stormwater management plan shall fully address the design and function of the project proposal and the effects of altering the landscape relative to the direction, rate of discharge, volume of discharge and timing of runoff.

**4. MODELING REQUIREMENTS FOR STORMWATER MANAGEMENT PLANS.**

**(a)** A hydrograph method or computer program based on NRCS Technical Release #20 (TR-20) and subsequent guidance must be used to analyze stormwater runoff for the design or analysis of discharge and water levels within and off the project site. The runoff from pervious and impervious areas within the model shall be modeled separately.

**(b)** In determining Curve Numbers for the post-development condition, the Hydrologic Soil Group (HSG) of areas within construction limits shall be shifted down one classification for HSG B (Curve Number 74) and ½ classification for HSG A (Curve Number 49) to account for the impacts of grading on soil structure unless the project specifications incorporate soil amendments in accordance with District Soil Amendment Guidelines. This requirement only applies to that part of a site that has not been disturbed or compacted prior to the proposed project.

**(c)** The analysis of flood levels, storage volumes, and discharge rates for waterbodies and stormwater management basins must include the NOAA Atlas 14 values, as amended, for the 2 year, 10 year and 100 year return period, 24-hour rainfall events and the 10-day snowmelt event (Curve Number 100), in order to identify the critical duration flood event. The District Engineer may require analysis of additional precipitation durations to determine the critical duration flood event. Analysis of the 10-day snowmelt event is not required for stormwater management detention basins with a defined outlet elevation at or below the 100 year return period, 24-hour rainfall event elevation.

**5. STORMWATER MANAGEMENT PLAN FRAMEWORK.**

**(a)** When an existing regional BMP is proposed to manage stormwater runoff, the applicant shall show that the BMP was designed and constructed to manage the stormwater runoff from the project site, the applicant has permission to utilize any remaining capacity in the BMP, the BMP is subject to maintenance obligations enforceable by the District, and it is being maintained to its original design.

**(b)** A combination of Stormwater BMPs may be used to meet the requirements of section(s) 6, 7, and 8.

**(c)** A local surface water management plan or ordinance of the local land use authority may contain standards or requirements more restrictive than these rules. The stormwater management plan must conform to the local surface water management plan or ordinance of the local land use authority.

**(d)** The proposed project must not adversely affect off-site water levels or resources supported by local recharge, or increase the potential for off-site flooding, during or after construction.

**(e)** A landlocked basin may be provided an outlet only if it:

**(1)** Conforms with District Rule F, as applicable.

**(2)** Provides sufficient dead storage volume to retain the runoff resulting from back-to-back 100-year, 24-hour rainfall events.

**(3)** Does not create adverse downstream flooding or water quality conditions as a result of the change in the rate, volume or timing of runoff or a change in drainage patterns.

**(f)** A municipality or public road authority may prepare a comprehensive stormwater management plan setting forth an alternative means of meeting the standards of sections 6 and 7 within a defined subwatershed. Once approved by the District and subject to any stated conditions, the plan will apply in place of those sections.

## 6. WATER QUALITY TREATMENT.

**(a)** Development creating or reconstructing impervious surface shall apply Better Site Design (BSD) techniques as outlined in Chapter 4 of the MPCA Minnesota Stormwater Manual as amended (www.stormwater.pca.mn.us). A BSD guidance document and checklist is available on the District's website.

**(b)** Sediment shall be managed on-site to the maximum extent practicable before runoff resulting from new or reconstructed impervious surface enters the off-site drainage system.

**(c) WATER QUALITY TREATMENT STANDARD.**

**(1)** The required water quality treatment volume standard for all projects, except Public Linear Projects, is determined as follows:

$$\text{Required Water Quality Treatment Volume } (ft^3) = \text{Area of New or Reconstructed Impervious Surface } (ft^2) \times 1.1 \text{ (in)} \div \text{TP Removal Factor from Table C1} \div 12 \text{ (in/ft)}$$

**(2)** The required water quality treatment volume standard for Public Linear Projects is determined as follows:

$$\text{Required Water Quality Treatment Volume } (ft^3) = \text{Area of New Impervious Surface } (ft^2) \times 0.75 \text{ (in)} \div 12 \text{ (in/ft)}$$

**(3)** For alternative Stormwater BMPs not found in Table C1 or to deviate from TP Removal Factors found in Table C1, the applicant may submit a TP Removal Factor, expressed as annual percentage removal efficiency, based on supporting technical data, for District approval.

**(4)** Stormwater runoff treated by the BMP during a rain event will not be credited towards the treatment requirement.

**TABLE C1. TP REMOVAL FACTORS FOR PROPERLY DESIGNED BMPS.**

| BMP | BMP Design Variation | TP Removal Factor * |
|---|---|---|
| Infiltration ** | Infiltration Feature | 1.00 |
| Water Reuse ** | Irrigation | 1.00 |
| Biofiltration | Underdrain | 0.65 |
| Filtration | Sand or Rock Filter | 0.50 |
| Stormwater Wetlands | Shallow Wetland | 0.40 |
| | Pond/Wetland | 0.55 |
| Stormwater Ponds *** | Wet Pond | 0.50 |
| | Multiple Pond | 0.60 |

Source: Adapted from Table 7.4 from the Minnesota Stormwater Manual, MPCA.
* Refer to MPCA Stormwater Manual for additional information on BMP performance. Removal factors shown are average annual TP percentage removal efficiencies intended solely for use in comparing the performance equivalence of various BMPs.
** These BMPs reduce runoff volume.
*** Stormwater ponds must also provide 2.5" of dead storage as required by Section 9(d)(2).

**(d) BMP LOCATIONAL SITING.**

**(1)** BMPs shall be located either on-site to treat runoff at the point of generation, or regionally within the Resource of Concern Drainage Area.

**(2)** If infiltration is feasible on site (see Table C2), on-site or regional BMPs must provide volume control to meet the standard of subsection 6(c). If infiltration is not feasible, any BMP may be used.

**(3)** Off-site and/or regional BMPs must be sited in the following priority order:

**(i)** In a downstream location that intercepts the runoff volume leaving the project site prior to the Resource of Concern.

**(ii)** Anywhere within the same Resource of Concern Drainage Area (see Figures C1A-C1E) that results in no greater mass of Total Phosphorus reaching the resource of concern than on-site BMPs.

**TABLE C2. SPECIFIC CONDITIONS THAT MAY RESTRICT INFILTRATION.**

| Type | Specific Project Site Conditions | Required Submittals |
|---|---|---|
| Potential Contamination | Potential Stormwater Hotspots (PSH) | PSH Locations and Flow Paths |
| | Contaminated Soils | Documentation of Contamination Soil Borings |
| Physical Limitations | Low Permeability Soils (HSG C & D) | Soil Borings |
| | Bedrock within three vertical feet of bottom of infiltration area | Soil Borings |
| | Seasonal High Water Table within three vertical feet of bottom of infiltration area | Soil Borings High Water Table |
| | Karst Areas | Soil Borings |
| Land Use Limitations | Utility Locations | Site Map |
| | Nearby Wells (Private and/or Municipal) * | Well Locations |

* Refer to Minnesota Stormwater Manual or the Minnesota Department of Health for setback requirements.

**(e)** Stormwater runoff from all new and reconstructed impervious surface must be treated for total phosphorus if feasible. Notwithstanding, runoff from undisturbed site impervious surface may be treated in lieu of treating new or reconstructed impervious surface, provided the runoff from that surface drains to the same Resource of Concern as the new/reconstructed surface not being treated. Except for Public Linear projects, the area not treated for phosphorus may not exceed 15 percent of all the new or reconstructed impervious surface. For all untreated surface, TSS must be removed to the maximum extent practicable.. Total water quality treatment volume for the project must be provided in aggregate pursuant to subsections 6(c) and 6(d).

**(f)** For single-family residential development, the runoff from impervious surface other than parking or driving surface that, in the District's judgment, cannot reasonably be routed to a stormwater BMP is considered effectively treated for water quality if:

**(1)** The length of the flow path across the impervious surface is less than the length of the flow path across the pervious surface to which it discharges; and

**(2)** The pervious surface is vegetated and has an average slope of five percent or less.

**(g)** Banked "volume control" credits and debits established by public entities for Public Linear Projects with the RCWD prior to the effective date of this rule will continue to be recognized and enforced until all credits are used or all debits are fulfilled. Existing credits and debits may be used and fulfilled, respectively, anywhere within the applicant's jurisdiction.

## 7. PEAK STORMWATER RUNOFF CONTROL.

**(a)** Peak stormwater runoff rates for the proposed project at the project site boundary, in aggregate, must not exceed existing peak runoff rates for the 2-year, 10-year and 100-year, 24-hour rainfall events, or a different critical event duration at the discretion of the District Engineer. Notwithstanding, peak runoff may be controlled to this standard in a regional facility consistent with paragraph 7(b). Aggregate compliance for all site boundary discharge will be determined with respect to runoff not managed in a regional facility.

**(b)** Any increase in a critical duration flood event rate at a specific point of discharge from the project site must be limited and cause no adverse downstream impact. Table C3 shows the maximum curve numbers that may be utilized for existing condition modeling of those project site areas not covered by impervious surface.

**(c)** Within the Flood Management Zone only (see Figure C2), the applicant shall provide peak rate control for the 2, 10 and 100 year 24-hour rainfall events beyond the existing condition peak rate of runoff by reducing the peak rate to ≤80% of the existing condition. This requirement does not apply if the project is a Public Linear Project.

**TABLE C3. CURVE NUMBERS FOR EXISTING CONDITION PERVIOUS AREAS.**

| Hydrologic Soil Group | Runoff Curve Number * |
|---|---|
| A | 39 |
| B | 61 |
| C | 74 |
| D | 80 |

* Curve numbers from NRCS Technical Release #55 (TR-55).

**TABLE C4. HYDROPERIOD STANDARDS.**

| Wetland Susceptibility Class | Permitted Storm Bounce for 2-Year and 10-Year Event * | Inundation Period for 2-Year Event * | Inundation Period for 10-Year Event * |
|---|---|---|---|
| Highly susceptible | Existing | Existing | Existing |
| Moderately susceptible | Existing plus 0.5 ft | Existing plus 1 day | Existing plus 7 days |
| Slightly susceptible | Existing plus 1.0 ft | Existing plus 2 days | Existing plus 14 days |
| Least susceptible | No limit | Existing plus 7 days | Existing plus 21 days |

Source: Adapted from: Stormwater and Wetlands Planning and Evaluation Guidelines for Addressing Potential Impacts of Urban Stormwater and Snowmelt Runoff on Wetlands.
* Duration of 24-hours for the return periods utilizing NOAA Atlas 14.

**8. BOUNCE AND INUNDATION PERIOD.**

**(a)** The project must meet the hydroperiod standards found in Table C4 with respect to all down-gradient wetlands.

**(b)** Wetland Susceptibility Class is determined based on wetland type, as follows:

**(1)** Highly susceptible wetland types include: sedge meadows, bogs, coniferous bogs, open bogs, calcareous fens, low prairies, coniferous swamps, lowland hardwood forests, and seasonally flooded waterbasins.

**(2)** Moderately susceptible wetland types include: shrub-carrs, alder thickets, fresh (wet) meadows, and shallow & deep marshes.

**(3)** Slightly susceptible wetland types include: floodplain forests and fresh wet meadows or shallow marshes dominated by cattail giant reed, reed canary grass or purple loosestrife.

**(4)** Least susceptible wetland includes severely degraded wetlands. Examples of this condition include cultivated hydric soils, dredge/fill disposal sites and some gravel pits.

**9. DESIGN CRITERIA.**

**(a)** Infiltration BMPs must be designed to provide:

**(1)** Adequate pretreatment measures to remove sediment before runoff enters the primary infiltration area;

**(2)** Drawdown within 48-hours or 72-hours from the end of a storm event, for surface or sub-surface features, respectively. Soil infiltration rates shall be based on the appropriate HSG classification and associated infiltration rates (see Table C5). The least permeable layer of the soil boring column must be utilized in BMP calculations (see Design Criteria (e). Alternate infiltration rates based on a recommendation and certified measurement testing from a licensed geotechnical engineer or licensed soil scientist will be considered. Infiltration area will be limited to horizontal areas subject to prolonged wetting;

**(3)** A minimum of three feet of separation from the Seasonal High Water Table; and

**(4)** Consideration of the Minnesota Department of Health guidance document Evaluating Proposed Stormwater Infiltration Projects in Vulnerable Wellhead Protection Areas. Documentation shall be submitted to support implementation of this guidance document and will be accepted at the discretion of the District Engineer.

**(b)** Water Reuse BMPs must conform to the following:

**(1)** Design for no increase in stormwater runoff from the irrigated area or project site.

**(2)** Required design submittal packages for water reuse BMPs must include:

**(i)** An analysis using Metropolitan Council Stormwater Reuse Guide 'Water Balance Tool Irrigation Constant Demand' spreadsheet for irrigation practices or 'Water Balance Too Non-Irrigation Constant Demand' Spreadsheet for non-irrigation practices. The tools are available for download at: http://www.metrocouncil.org/wastewater-water/planning/water-supply-planning/studies-projects-workgroups-(1)/completed-studies-projects/stormwater-reuse-guide.aspx;

**(ii)** Documentation demonstrating adequacy of soils, storage system, and delivery system; and

**(iii)** Operations plan.

**(3)** Approved capacity of an irrigation practice will be based on:

**(i)** An irrigation rate of 0.5 inches per week over the irrigated pervious area(s) or the rate identified through the completion of the Metropolitan Council Stormwater Reuse Guide 'Water Balance Tool Irrigation Constant Demand' Spreadsheet (whichever is less); or as approved by the District; and

**(ii)** No greater than a 26 week (April 15th to October 15th) growing season.

An additional water quality treatment capacity beyond 0.5 inches per week may be recognized under a subsection C.5(f) plan or a C.13 phased development permit based on a three-year average of monitoring records of volume irrigated.

**(4)** Approved capacity of a non-irrigation practice shall be based on the rate identified through the completion of the Metropolitan Council Stormwater Reuse Guide 'Water Balance Tool Non-Irrigation Constant Demand' spreadsheet, or as approved by the District.

**(c)** Biofiltration/filtration BMPs must be designed to provide:

**(1)** Adequate pretreatment measures to remove sediment before runoff enters the primary biofiltration area;

**(2)** Drawdown within 48-hours or 72-hours from the end of a storm event, for surface or sub-surface features, respectively;

**(3)** A minimum of 12-inches of organic material or sand above the rock trench or draintile system; and

**(4)** Drain tile system must be designed above the Seasonal High Water Table.

**TABLE C5. SOIL TYPE AND INFILTRATION RATES.**

| Hydrologic Soil Group | Soil Textures | Corresponding Unified Soil Classification | | Infiltration Rate (in/hr) |
|---|---|---|---|---|
| A | Gravel<br>Sandy Gravel<br>Silty Gravels | **GW** | Well-graded gravels, sandy gravels | **1.63** |
| | | **GP** | Gap-graded or uniform gravels, sandy gravels | |
| | | **GM** | Silty gravels, silty sandy gravels | |
| | | **SW** | Well-graded gravelly sands | |
| | Sand<br>Loamy Sand<br>Sandy Loam | **SP** | Gap-graded or uniform sands, gravelly sands | **0.8** |
| B | Loam<br>Silt Loam | **SM** | Silty sands, silty gravelly sands | **0.45** |
| | | **MH** | Micaceous silts, diatomaceous silts, volcanic ash | **0.3** |
| C | Sandy Clay Loam | **ML** | Silts, very fine sands, silty or clayey fine sands | **0.2** |
| D | Clay Loam<br>Silty Clay Loam<br>Sandy Clay<br>Silty Clay<br>Clay | **GC** | Clayey gravels, clayey sandy gravels | **0.06** |
| | | **SC** | Clayey sands, clayey gravelly sands | |
| | | **CL** | Low plasticity clays, sandy or silty clays | |
| | | **OL** | Organic silts and clays of low plasticity | |
| | | **CH** | Highly plastic clays and sandy clays | |
| | | **OH** | Organic silts and clays of high plasticity | |

Source: Adapted from the “Design infiltration rates” table from the Minnesota Stormwater Manual, MPCA, (January 2014).

**(d)** Stormwater ponds must be designed to provide:

**(1)** Water quality features consistent with NURP criteria and accepted design standards for average and maximum depth;

**(2)** A permanent wet pool with dead storage at least equal to the runoff volume from a 2.5-inch rainfall over the area tributary to the pond;

**(3)** An outlet structure capable of preventing migration of floating debris and oils for at least the one-year storm;

**(4)** An identified emergency overflow spillway sufficiently stabilized to convey flows greater than the 100-year critical storm event; and

**(5)** An outlet structure to control the 2-year, 10-year & 100-year frequency events.

**(e)** Soil borings (utilizing ASTM D5921 and D5879, as amended) shall be considered for design purposes, and provided to the District, for each proposed BMP. The soil borings must be taken to a depth of at least 5 feet below the bottom of the proposed feature.

**(f)** An outfall structure discharging directly to a wetland, public water or public water wetland must incorporate a stilling-basin, surge-basin, energy dissipater, placement of ungrouted natural rock riprap or other feature to minimize disturbance and erosion of natural shoreline and bed resulting from stormwater discharges. Where feasible, outfall structures are to be located outside of the natural feature.

**TABLE C6. LOW FLOOR AND LOW ENTRY FREEBOARD REQUIREMENTS.**

| Freeboard | Regional Flood Elevations | | Detention Basins , Wetlands & Stormwater Ponds | | Infiltration and Biofiltration Basins | | | Rain Gardens* |
|---|---|---|---|---|---|---|---|---|
| | 100-yr | EOF | 100-yr | EOF | Bottom | 100-yr | EOF | EOF |
| **Low Floor** | 2.0 ft | 1.0 ft | 0.0 ft | NA | 0.0 ft | NA | NA | NA |
| **Low Entry** | NA | NA | 2.0 ft | 1.0 ft | NA | 2.0 ft | 1.0 ft | 0.5 ft |

**(g)** All new residential, commercial, industrial and other habitable or non-habitable structures, and all stormwater BMPs, must be constructed so that the lowest floor and lowest entry elevations comply with Table C6.

The low entry freeboard criterion of Table C6 may be deemed met when the structure does not have the required vertical separation, but is protected from surface flooding to the required elevation by a berm or other natural or constructed topographic feature capable of providing flood protection.

Within a landlocked basin, minimum low floor elevations must be at least one foot above the surveyed basin run out elevation. Where a structure is proposed below the run out elevation of a land-locked basin, the low floor elevation will be a minimum of two feet above the highest water level of either the 10-day snowmelt event or back-to-back 100-year, 24-hour rainfalls. Aerial photos, vegetation, soils, and topography may be used to derive a "normal" water elevation for the purpose of computing the basin's 100-year elevation.

**(h)** All stormwater management structures and facilities must be designed for maintenance access and be properly operated and maintained in perpetuity to assure that they continue to function as designed. The maintenance responsibility must be memorialized in a document executed by the property owner in a form acceptable to the District and filed for record on the deed. Alternatively, a public permittee may meet its perpetual maintenance obligation by executing a programmatic or project-specific maintenance agreement with the District. Regional ponds owned by public entities that are only used to meet the rate control requirements of the District rule do not need a maintenance agreement with the District.

**(i)** The permittee must use construction best practices so that the facility as constructed will conform to design specifications and the soil and surrounding conditions are not altered in a way adverse to facility performance.

**(j)** Before work under the permit is deemed complete, the permittee must submit as-built plans demonstrating that at the time of final stabilization, stormwater facilities conform to design specifications. If at any time the District finds that the stormwater facility is not performing as designed, on District request the permittee must undertake reasonable investigation to determine the cause of inadequate performance.

**10. EASEMENTS.**

**(a)** Before permit issuance, the permittee must, submit a copy of any plat or easement required by the local land use authority establishing drainage or flowage over stormwater management facilities, stormwater conveyances, ponds, wetlands, on-site floodplain up to the 100-year flood elevation, or any other hydrologic feature.

**(b)** Before permit issuance, the permittee must convey to the District an easement over the public drainage system specifying a District right of maintenance access over the following minimum widths:

**(1)** For tiled/piped systems, 66 feet wide perpendicular to the direction of flow, centered on the tile line or pipe;

**(2)** For open channel systems, a variable width perpendicular to the direction of flow, to include the open channel itself and all areas within 16.5 feet from the top of the ditch bank.

**(c)** Public Linear Projects are exempt from the public drainage system easement requirement of Section 10(b).

**(d)** For projects within the District's Comprehensive Wetland Protection and Management Plan (CWPMP) areas, the Wetland Management Corridor (WMC) boundary delineation, buffer and easement requirements found at Rule F.6 apply. As stated in Rule F.5(e), Public Linear Projects are not subject to the requirements of Rule F.6.

**11. REQUIRED EXHIBITS.** The following exhibits must accompany the permit application. One set, full size (22 inches by 34 inches) and one reduced (maximum size of 11 inches by 17 inches) or electronic version.

**(a)** An erosion & sediment control plan and, for projects that require an NPDES permit, a Storm Water Pollution Prevention Plan.

**(b)** Property lines and delineation of lands under ownership of the applicant.

**(c)** Delineation of the subwatershed contributing runoff from off-site, proposed and existing subwatersheds onsite, emergency overflows, and drainageways.

**(d)** Geotechnical analysis including soil borings at all proposed stormwater management facility locations utilizing ASTM D5921 and D5879, as amended.

**(e)** Proposed and existing stormwater facilities' location, alignment and elevation.

**(f)** Delineation of existing on-site wetland, marshes and floodplain areas.

**(g)** Identification of existing and proposed normal, ordinary high and 100-year water elevations on-site.

**(h)** Identification of existing and proposed contour elevations within the project site related to NAVD 88.

**(i)** Construction plans and specifications of all proposed stormwater management facilities, including design details for outlet control structures.

**(j)** Stormwater runoff volume and rate analyses for the 2- 10- and 100-year critical events, existing and proposed conditions utilizing NOAA Atlas 14.

**(k)** All hydrologic, water quality and hydraulic computations completed to design the proposed stormwater management facilities.

**(l)** Narrative including a project description, discussion of BMP selection, and revegetation plan for the project site.

**(m)** Other project site-specific submittal requirements as may be required by the District.

## 12. EXCEPTIONS.

**(a)** Rate control criteria of Section 7 may be waived if the project site discharges directly to a water body with large storage capacity (such as a public water), the volume discharged from the project site does not contribute to a downstream flood peak, and there are no downstream locations susceptible to flooding.

**(b)** Section 6 and Section 7 are waived for a portion of a project that paves a gravel roadway if the right-of-way ditch is maintained and does not discharge a concentrated flow directly to a wetland or another sensitive water body.

## 13. EXTENDED PERMIT TERM AND REGIONAL FACILITIES FOR NON-RESIDENTIAL PHASED DEVELOPMENT.

**(a)** The following definitions apply to this section:

**(1)** “Area Development Permit” (ADP) means a District stormwater management permit for non-residential development that includes construction of a stormwater management facility explicitly intended to serve compliance requirements for a parcel other than that on which the facility is located.

**(2)** “Phased Development Permit” (PDP) means a District stormwater management permit for non-residential development that includes construction of a stormwater management facility explicitly intended to serve compliance requirements not just

for development under the permit, but also for subsequent development on that parcel or a contiguous parcel under common ownership.

**(b)** If an off-site stormwater management facility approved under a prior ADP cannot be used for compliance due to a rule change occurring since the date of ADP approval, the District nevertheless by permit will approve its use, subject to the following:

**(1)** The applicant must demonstrate that the facility was built in compliance with the ADP, that the ADP identified the development site as one that may use the facility, and that the requirements of subsection 5(a), above, are met.

**(2)** If the current rule requires a level of peak flow or volume control, or of water quality treatment, beyond that provided by the off-site facility, the applicant must provide for the additional treatment. This does not disallow use of an existing facility on the ground that it does not meet a sequencing requirement with respect to the BMP location or type.

The protection against rule change provided by this subsection 13(b) does not apply if the District makes written findings, on the basis of new knowledge or information, that use of the facility would have a material adverse impact on a water quality, flood management or other specific public interest, or if the approval date of the development permit is more than 10 years after the date of ADP approval.

**(c)** The District may issue a PDP with a permit term of up to 10 years.

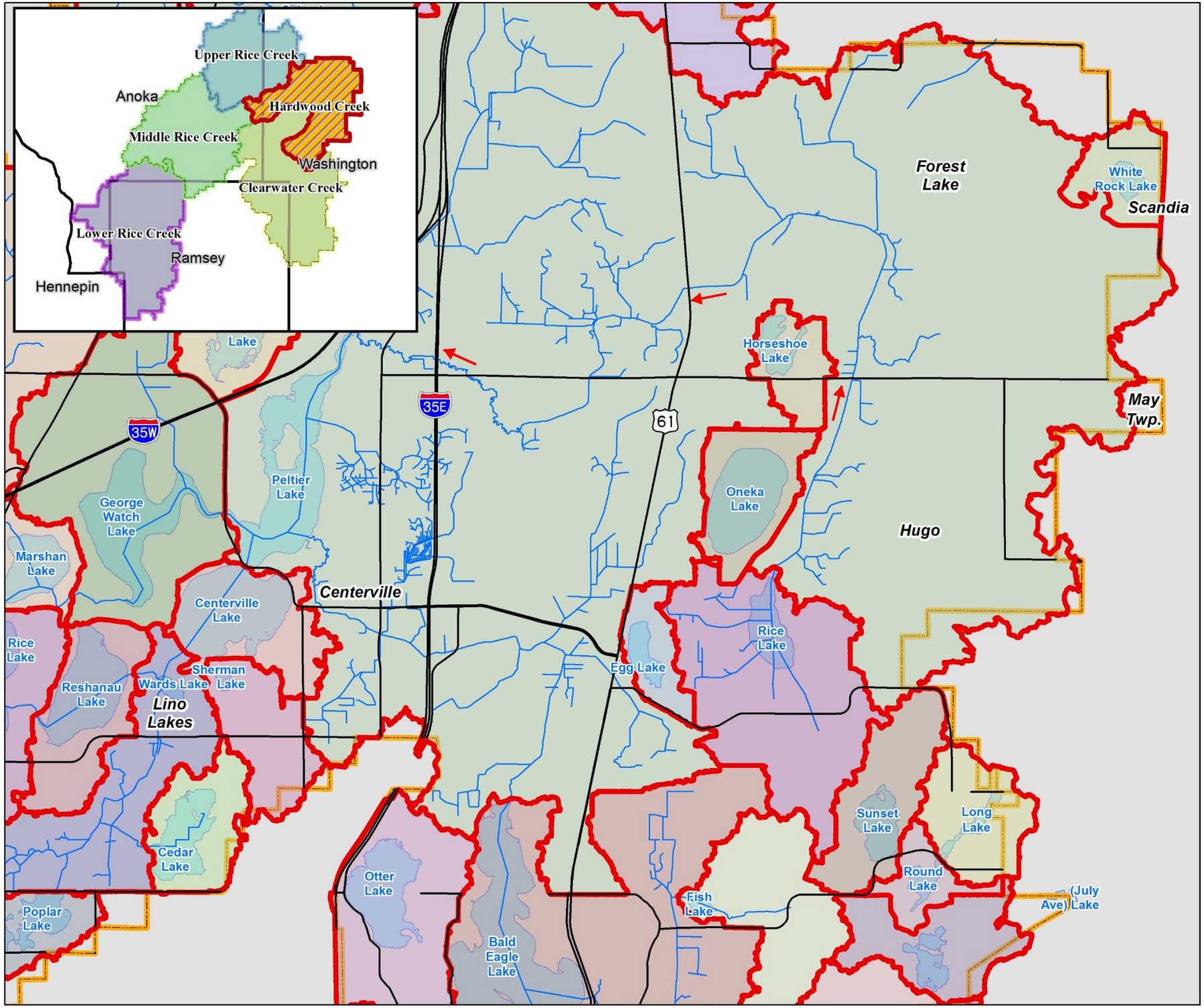
**(1)** During the permit term, development using the stormwater management facilities approved under the PDP will not be subject to a rule change occurring after the date of PDP approval, provided the PDP states the design criteria to which subsequent development will conform and the proposed development meets those criteria.

**(2)** If a PDP is in effect as of December 1, 2014**,** on request the District will extend the permit expiration date in accordance with this subsection 13(c). In such a case, the requirement that the permit state design criteria is relaxed. However, the applicant must demonstrate the design and constructed capacity of the facilities and the capacity allocated to the proposed development.

**(3)** If a PDP was approved after December 1, 2004 but has expired, an application for a subsequent development phase may be considered under the terms of subsection 13(b), above.

**(d)** This section does not apply to an ADP or a PDP approved before December 1, 2004.

# Rice Creek Watershed District




Flow Direction
RCWD Watercourses
Lakes
RCWD Legal Boundary
Resource of Concern Drainage Area
Transportation System
Cities
Counties

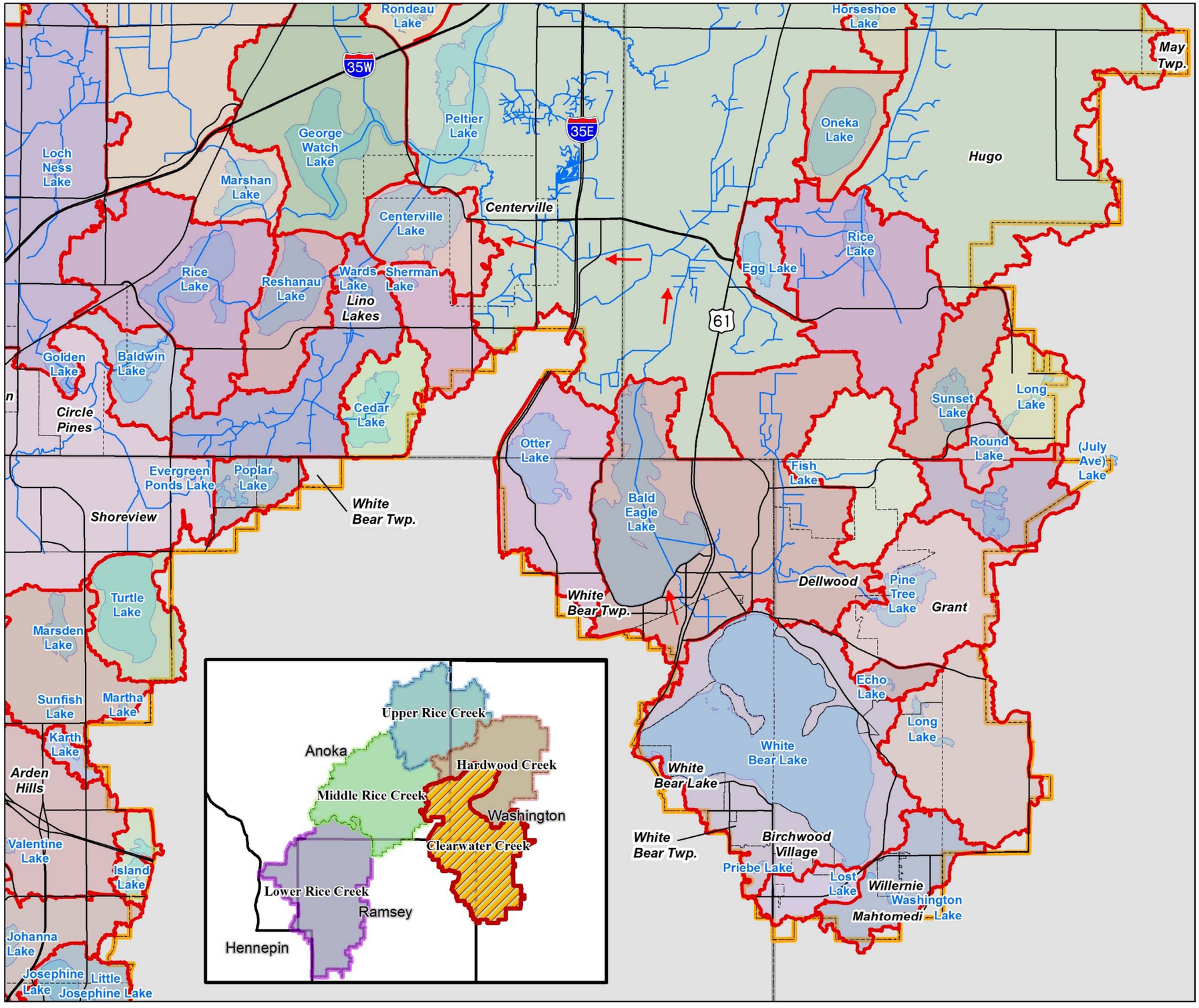
0 0.5 1 2 Miles

Sources: RCWD, TLG, MN DOT

**C1A: Resources of Concern Drainage Area of Hardwood Creek**

RCWD
RICE CREEK WATERSHED DISTRICT

# Rice Creek Watershed District







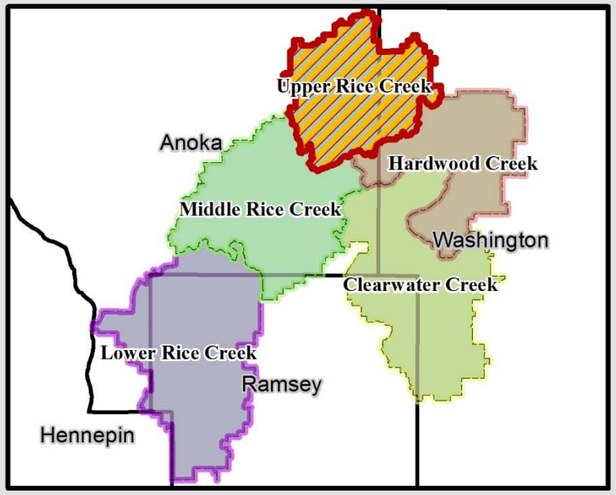
- Flow Direction
- RCWD Watercourses
- Lakes
- RCWD Legal Boundary
- Resource of Concern Drainage Area
- Transportation System
- Cities
- Counties

0 0.5 1 2 Miles

Sources: RCWD, TLG, MN DOT

**C1B: Resources of Concern Drainage Area of Clearwater Creek**

RCWD
RICE CREEK WATERSHED DISTRICT




# Rice Creek Watershed District

N
W E
S

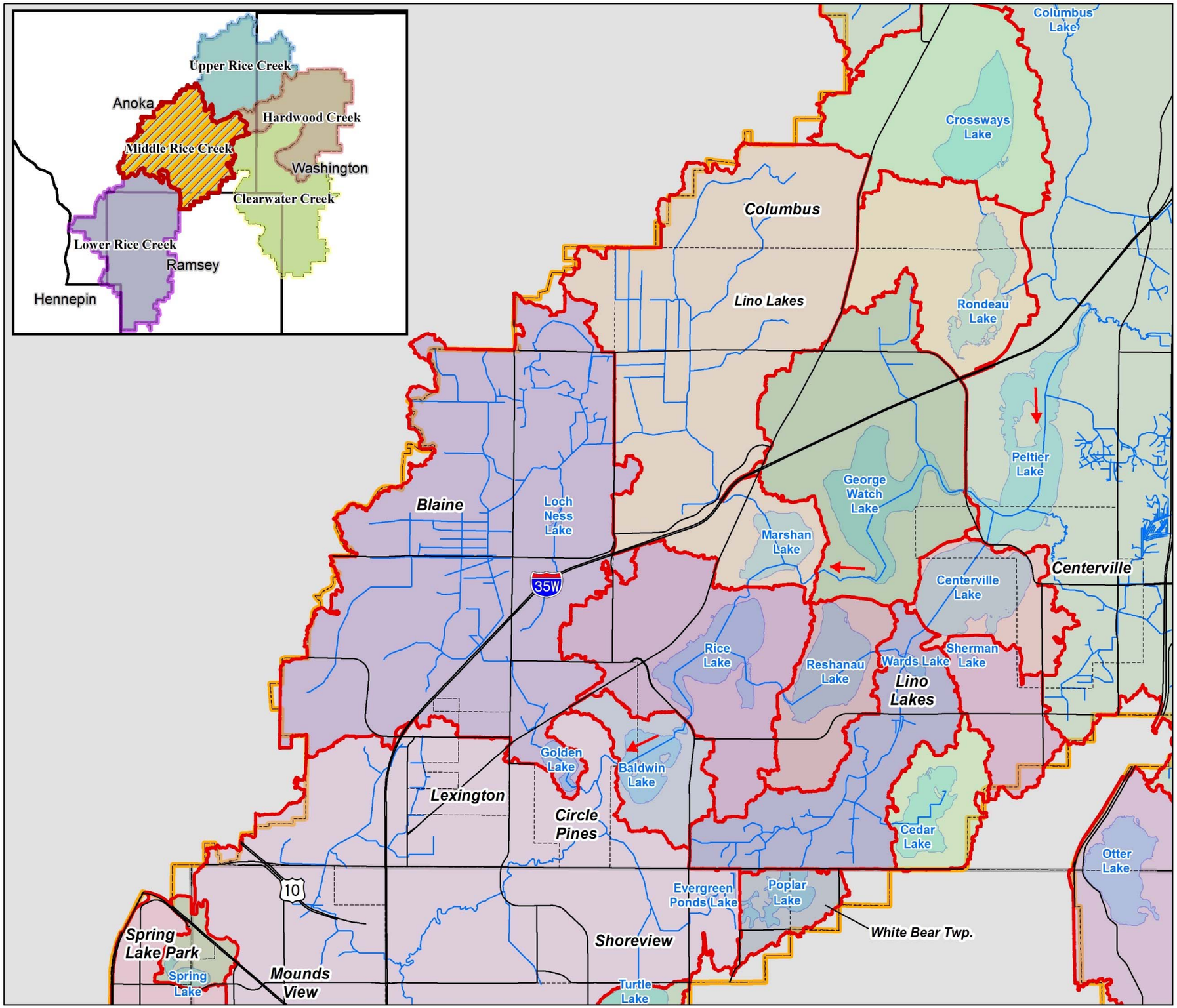
- Flow Direction
- RCWD Watercourses
- Lakes
- RCWD Legal Boundary
- Resource of Concern Drainage Area
- Transportation System
- Cities
- Counties

0 0.5 1 2 Miles

Sources: RCWD, TLG, MN DOT

**C1C: Resources of Concern Drainage Area of Upper Rice Creek**

RCWD
RICE CREEK WATERSHED DISTRICT




# Rice Creek Watershed District

N
W E
S

- Flow Direction
- RCWD Watercourses
- Lakes
- RCWD Legal Boundary
- Resource of Concern Drainage Area
- Transportation System
- Cities
- Counties

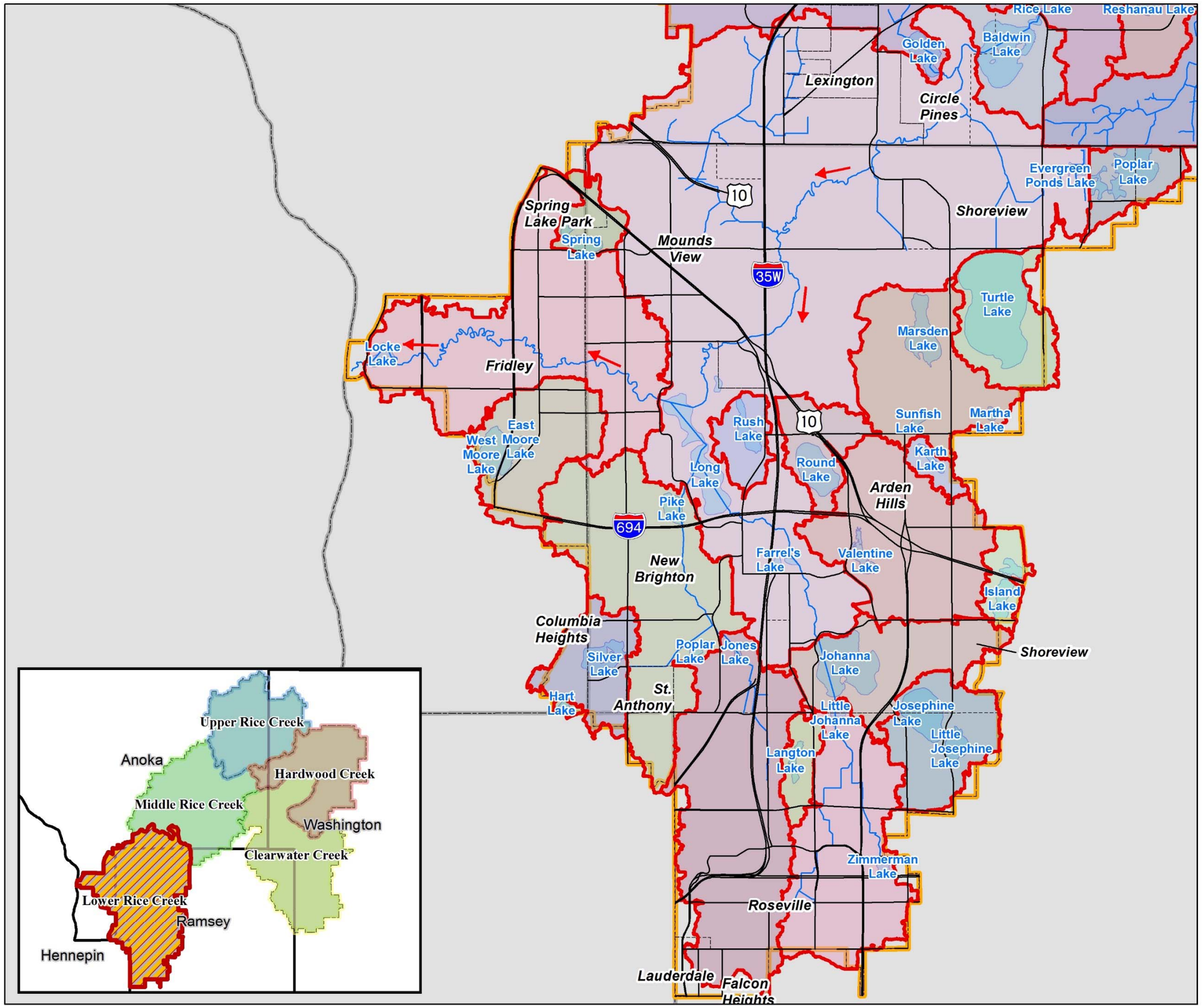
0 0.5 1 2 Miles

Sources: RCWD, TLG, MN DOT

**C1D: Resources of Concern Drainage Area of Middle Rice Creek**

RCWD
RICE CREEK WATERSHED DISTRICT

# Rice Creek Watershed District




- Flow Direction
- RCWD Watercourses
- Lakes
- RCWD Legal Boundary
- Resource of Concern Drainage Area
- Transportation System
- Cities
- Counties

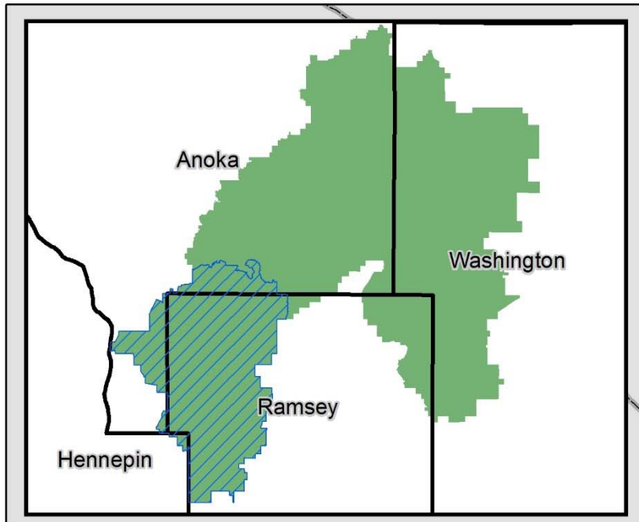
0 0.5 1 2 Miles

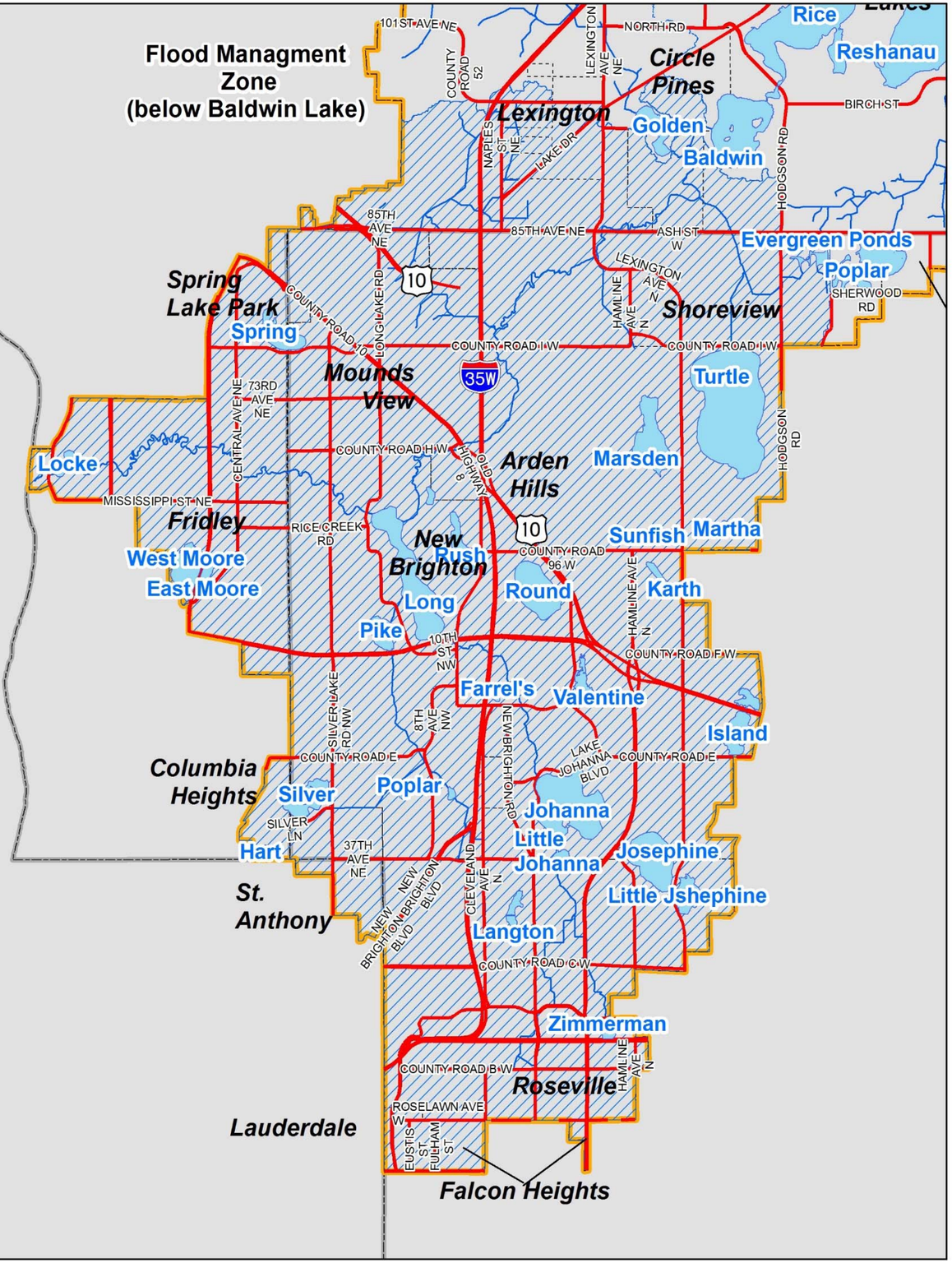
Sources: RCWD, TLG, MN DOT

**C1E: Resources of Concern Drainage Area of Lower Rice Creek**

RCWD
RICE CREEK WATERSHED DISTRICT

# Rice Creek Watershed District




- RCWD Watercourses
- Lakes
- Flood Management Zone
- RCWD Legal Boundary
- Transportation System
- Cities
- Counties

0 0.5 1 2 Miles

Sources: RCWD, TLG, MN DOT

**C2: Flood Management Zone**

RCWD
RICE CREEK WATERSHED DISTRICT

# RULE D: EROSION AND SEDIMENT CONTROL PLANS

**1. POLICY.** It is the policy of the Board of Managers to prevent erosion of soil into surface water systems by requiring erosion and sediment control for land-disturbing activities.

**2. REGULATION.**

**(a)** An erosion and sediment control plan must be submitted, and a permit received from the District, for:

**(1)** Surface soil disturbance or removal of vegetative cover on one acre or more of land;

**(2)** Surface soil disturbance or removal of vegetative cover on 10,000 square feet or more of land, if any part of the disturbed area is within 300 feet of and drains to a lake, stream, wetland or public drainage system; or

**(3)** Any land-disturbing activity that requires a District permit under a rule other than Rule D.

**(b)** A person disturbing surface soils or removing vegetative cover on more than 5,000 square feet of land, or stockpiling on-site more than fifty (50) cubic yards of earth or other erodible material, but not requiring a permit under the criteria of this rule, must submit a notice in advance of disturbance on a form provided by the District and conform the activity to standard best practices established by and available from the District.

**(c)** Rule D does not apply to normal farming practices that are part of an ongoing farming operation.

**(d)** Rule D does not apply to milling, reclaiming or overlay of paved surfaces that does not expose underlying soils.

**3. DESIGN CRITERIA FOR EROSION CONTROL PLANS.** The applicant must demonstrate that the standards of Rule C, subsections 7(a) and (b), are met. In addition, Erosion and Sediment Control Plans must comply with the following criteria:

**(a)** Natural project site topography and soil conditions must be specifically addressed to reduce erosion and sedimentation during construction and after project completion.

**(b)** Site erosion and sediment control practices must be consistent with the Minnesota Pollution Control Agency document “Protecting Water Quality in Urban Areas” (1994), as amended, and District-specific written design guidance and be sufficient to retain sediment on-site.

**(c)** The project must be phased to minimize disturbed areas and removal of existing vegetation, until it is necessary for project progress.

**(d)** The District may require additional erosion and sediment control measures on areas with a slope to a sensitive, impaired or special water body, stream, drainage system or wetland to assure retention of sediment on-site.

**(e)** The plan must include conditions adequate to protect facilities to be used for post-construction stormwater infiltration.

**4. REQUIRED EXHIBITS.** The following exhibits must accompany the permit application. One set, full size (22 inches by 34 inches) and one reduced (maximum size of 11 inches by 17 inches) or electronic version.

**(a)** An existing and proposed topographic map which clearly indicates all hydrologic features and areas where grading will expose soils to erosive conditions. The Plan must also indicate the direction of all project site runoff.

**(b)** Tabulation of the construction implementation schedule.

**(c)** Name, address and phone number of party responsible for maintenance of all erosion and sediment control measures.

**(d)** Quantification of the total disturbed area.

**(e)** Clear identification of all temporary erosion and sediment control measures that will remain in place until permanent vegetation is established. Examples of temporary measures include, but are not limited to, seeding, mulching, sodding, silt fence, erosion control blanket, and stormwater inlet protection devices.

**(f)** Clear identification of all permanent erosion control measures such as outfall spillways and riprap shoreline protection, and their locations.

**(g)** Clear Identification of staging areas, as applicable.

**(h)** Documentation that the project applicant has applied for the NPDES Permit from the Minnesota Pollution Control Agency (MPCA), when applicable.

**(i)** A stormwater pollution prevention plan for projects that require an NPDES Permit.

**(j)** Delineation of any floodplain and/or wetland area changes.

**(k)** Other project site-specific submittal requirements as may be required by the District.

**5. CONSTRUCTION ACTIVITY REQUIREMENTS.** Any activity subject to a permit under this rule must conform to the standards of the NPDES construction general permit, as amended, regarding construction-site erosion and sediment control.

**6. INSPECTIONS.**

**(a)** The permittee shall be responsible for inspection, maintenance and effectiveness of all erosion and sediment control measures until final soil stabilization is achieved or the permit is assigned (see Rule B), whichever comes first.

**(b)** The District may inspect the project site and require the permittee to provide additional erosion control measures as it determines conditions warrant.

**7. FINAL STABILIZATION.**

**(a)** Erosion and sediment control measures must be maintained until final vegetation and ground cover is established to a density of 70%.

**(b)** Temporary erosion and sediment control BMPs will be removed after disturbed areas have been permanently stabilized.

# RULE E: FLOODPLAIN ALTERATION

**1. POLICY.** It is the policy of the Board of Managers to:

**(a)** Utilize the best information available in determining the 100-year flood elevation.

**(b)** Preserve existing water storage capacity within the 100-year floodplain of all waterbodies and wetlands in the watershed to minimize the frequency and severity of high water.

**(c)** Enhance floodplain characteristics that promote the natural attenuation of high water, provide for water quality treatment, and promote groundwater recharge.

**(d)** Preserve and enhance the natural vegetation existing in floodplain areas for aquatic and wildlife habitat.

**2. REGULATION.** No person may alter or fill land within the floodplain of any lake, stream, wetland, drainage system, major watercourse, or public waters without first obtaining a permit from the District. Shoreline/streambank restoration or stabilization, approved in writing by the District and/or County Conservation District as necessary to control erosion and designed to minimize encroachment and alteration of hydraulic forces, does not require a permit under this Rule.

**3. CRITERIA FOR FLOODPLAIN ALTERATION.**

**(a)** Fill within a designated floodway is prohibited.

**(b)** Fill within the floodplain is prohibited unless compensatory floodplain storage volume is provided within the floodplain of the same water body, and within the permit term. If offsetting storage volume will be provided off-site, it shall be created before any floodplain filling by the applicant will be allowed.

**(c)** Any structure or embankments placed within the floodplain will be capable of passing the 100-year flood without increasing the elevation of the 100-year flood profile.

**(d)** Compensatory floodplain storage volume is not required to extend an existing culvert, modify an existing bridge approach associated with a Public Linear Project, or place spoils adjacent to a public or private drainage channel during channel maintenance, if there is no adverse impact to the 100-Year Flood Elevation.

**(e)** Compensatory floodplain storage volume is not required for a one-time deposition of up to 10 cubic yards of fill, per parcel, if there is no adverse impact to the 100-Year Flood Elevation. The one-time deposition does not include public linear projects.

**(f)** Floodplain alteration is subject to the District's Wetland Alteration Rule F, as applicable.

**(g)** Structures to be built within the 100-year floodplain will have two feet of freeboard between the lowest floor and the 100-year flood profile.

**4. DRAINAGE EASEMENTS.**

**(a)** Before permit issuance, the permittee must submit a copy of any plat or easement required by the local land use authority establishing drainage or flowage over stormwater

management facilities, stormwater conveyances, ponds, wetlands, on-site floodplain up to the 100-year event, or any other hydrological feature.

**(b)** Before permit issuance, the permittee must convey to the District an easement over the public drainage system specifying a District right of maintenance access over the following minimum widths:

**(1)** For tiled/piped systems, 66 feet wide perpendicular to the direction of flow, centered on the tile line or pipe;

**(2)** For open channel systems, a variable width perpendicular to the direction of flow, to include the open channel itself and all areas within 16.5 feet from the top of the ditch bank.

**(c)** Public Linear Projects are exempt from the public drainage system easement requirement of Section 4(b).

**5. REQUIRED EXHIBITS.** The following exhibits must accompany the permit application. One set, full size (22 inches by 34 inches) and one reduced (maximum size of 11 inches by 17 inches) or electronic version.

**(a)** Site plan showing property lines, delineation of the work area, existing elevation contours of the work area, ordinary high water elevations, and 100-year flood elevations. All elevations must be reduced to NAVD 1988 datum.

**(b)** Grading plan showing any proposed elevation changes.

**(c)** Determination by a professional engineer or qualified hydrologist of the 100-year flood elevation before and after the project.

**(d)** Computation of change in flood storage capacity resulting from proposed grading.

**(e)** Erosion and sediment control plan in accordance with District Rule D.

**(f)** Other project site-specific submittal requirements as may be required by the District.

# RULE F: WETLAND ALTERATION

**1. POLICY.** It is the policy of the Board of Managers to:

**(a)** Maintain no net loss in the quantity, quality, and biological diversity of Minnesota's existing wetlands.

**(b)** Increase the quantity, quality, and biological diversity of Minnesota's wetlands by restoring or enhancing diminished or drained wetlands.

**(c)** Avoid direct or indirect impacts from activities that destroy or diminish the quantity, quality, and biological diversity of wetlands.

**(d)** Replace wetland values where avoidance of activity is not feasible or prudent.

**(e)** Accomplish goals of the adopted Comprehensive Wetland Protection and Management Plans (CWPMPs).

**2. REGULATION.** No person may fill, drain, excavate or otherwise alter the hydrology of a wetland without first obtaining a permit from the District.

**(a)** The provisions of the Minnesota Wetland Conservation Act (WCA), Minnesota Statutes §§103G.221 through 103G.2372, and its implementing rules, Minnesota Rules 8420, apply under this Rule and govern District implementation of WCA as well as District regulation of non-WCA wetland impacts, except where the Rule provides otherwise.

**(b)** This rule does not regulate alteration of incidental wetlands as defined in Minnesota Rules chapter 8420, as amended. An applicant must demonstrate that the subject wetlands are incidental.

**(c)** An activity for which a No-Loss decision has been issued under Minnesota Rules chapter 8420 is subject to the applicable requirements of chapter 8420 but not otherwise subject to this Rule.

**(d)** Clearing of vegetation, plowing or pasturing in a wetland as part of an existing and ongoing farming operation is not subject to this rule unless the activity results in draining or filling the wetland.

**3. LOCAL GOVERNMENT UNIT.** The District intends to serve as the "Local Government Unit" (LGU) for administration of the Minnesota Wetland Conservation Act (WCA), except where a particular municipality in the District has elected to assume that role in its jurisdictional area or a state agency is serving as the local government unit on state land. Pursuant to its regulatory authority under both WCA and watershed law, when the District is serving as the LGU it will require wetland alteration permits for wetland-altering activities both as required by WCA and otherwise as required by this Rule.

**4. CRITERIA.**

**(a)** When the District is serving as the LGU, it will regulate wetland alterations that are not subject to WCA rules and do not qualify for an exemption at Minnesota Rules 8420.0420 or do not meet the “no-loss” criteria of Minnesota Rules 8420.0415 according to the rules and procedures of WCA, except as specifically provided in this Rule. Alteration under

this paragraph requires replacement at a minimum ratio of 1:1 to ensure no loss of wetland quantity, quality or biological diversity. Replacement activities will be credited consistent with the actions eligible for credit in Minnesota Rules 8420.0526.

**(b)** A wetland alteration not subject to WCA that does not change the function of a wetland and results in no net loss of wetland quantity, quality or biological diversity is exempt from the replacement requirement in Section 4(a) of this Rule.

**(c)** The wetland replacement exemptions in Minnesota Rules 8420.0420 are applicable under this Rule, except as modified within CWPMP areas under Section 6.

**(d)** Alterations in wetlands for the purposes of wildlife enhancement must be certified by the local Soil and Water Conservation District as compliant with the criteria described in Wildlife Habitat Improvements in Wetlands: Guidance for Soil and Water Conservation Districts and Local Government Units.

**5. ADDITIONAL DISTRICT REQUIREMENTS.** In addition to the wetland replacement plan components and procedures in WCA, the following more specific requirements will apply to the District's review of WCA and, except as indicated, non-WCA wetland alterations:

**(a)** Applicants must adequately explain and justify each individual contiguous wetland alteration area in terms of impact avoidance and minimization alternatives considered.

**(b)** Where the wetland alteration is proposed in the context of land subdivision, on-site replacement wetland and buffer areas, as well as buffers established undersection 6(e), must:

**(1)** Be located within a platted outlot.

**(2)** Be protected from future encroachment by a barrier (i.e. stormwater pond, infiltration basin, existing wetland, tree line, fence, trail or other durable physical feature).

**(3)** Have boundaries posted with signage approved by the District identifying the wetland/buffer protected status. On installation, the applicant must submit a GIS shapefile, or CADD file documenting sign locations.

**(c)** The upland edge of new wetland creation must have an irregular and uneven slope. The slope must be no steeper than 8:1 over the initial 25 feet upslope from the projected wetland elevation contour along at least 50 percent of the upland/wetland boundary and no steeper than 5:1 along the remaining 50 percent of the boundary.

**(d)** The District will not allow excess replacement credits to be used for replacement on a different project unless the credits were designated for wetland banking purposes in the original application in accordance with WCA rules and have been deposited into the WCA wetland banking system.

**(e)** Within the boundary of a District developed and BWSR approved CWPMP (see Figure F1), Rule F and WCA are further modified to include Section 6. Public Linear Projects located in a CWPMP jurisdictional area and not part of an industrial, commercial, institutional or residential development are not subject to Section 6 of this Rule.

**6. COMPREHENSIVE WETLAND PROTECTION AND MANAGEMENT PLANS.** All District Comprehensive Wetland Protection and Management Plans (CWPMPs) are incorporated into this Rule. The specific terms of Rule F will govern, but if a term of Rule F is susceptible to more than one interpretation, the District will apply the interpretation that best carries out the intent and purposes of the respective CWPMP.

**(a) PRE-APPLICATION REVIEW.**

**(1)** In cases where wetland fill, excavation or draining, wholly or partly, is contemplated, the applicant is encouraged to submit a preliminary concept plan for review with District staff and the Technical Evaluation Panel (TEP) before submitting a formal application. The following will be examined during pre-application review:

**(i)** Sequencing (in accordance with WCA and Federal Clean Water Act requirements, reducing the size, scope or density of each individual proposed action, and changing the type of project action to avoid and minimize wetland impacts).

**(ii)** Wetland assessment.

**(iii)** Applying Better Site Design principles as defined in Rule A.

**(iv)** Integrating buffers and other barriers to protect wetland resources from future impacts.

**(v)** Exploring development code flexibility, including conditional use permits, planned unit development, variances and code revisions;

**(vi)** Reviewing wetland stormwater susceptibility (see Rule C.8) and coordinating Wetland Management Corridor (WMC) establishment with existing adjacent WMCs.

**(2)** At the pre-application meeting, the applicant shall provide documentation sufficient to assess project alternatives at a concept level and such other information as the District specifically requests.

**(3)** On receipt of a complete application, the District will review and act on the application in accordance with its procedural rules and WCA procedures.

**(4)** The TEP shall be consulted on decisions related to replacement plans, exemptions, no-loss, wetland boundaries and determination of the WMC.

**(b) WETLAND MANAGEMENT CORRIDORS.**

**(1)** At the time of permitting, the preliminary Wetland Management Corridor (WMC) boundary (see Figure F1) will be adjusted in accordance with subsections F(6)(b)(2) and (3), below. Notwithstanding, within the Columbus CWPMP, commercial/Industrial zoned areas within Zone 1 will remain outside of the WMC (see Figure F2).

**(2)** The applicant must delineate the site level WMC when wetland impacts are proposed:

**(i)** Within the Preliminary WMC; or

**(ii)** Within 150 feet of the Preliminary WMC and greater than the applicable *de minimis* exemption amount, per Minnesota Rules 8420.0420;

If the proposed project does not meet criterion (b)(2)(i) or (b)(2)(ii), above, an applicant may accept the Preliminary WMC boundary on the project site, as made more precise on a parcel basis by the use of landscape-scale delineation methods applied or approved by the District and need not comply with Section 6(b)(3) and 6(b)(4).

**(3)** The applicant shall complete a wetland functional analysis using MnRAM 3.4 (or most recent version) when defining the site level WMC boundary.

**(i)** The WMC boundary will be expanded to encompass any delineated wetland lying in part within the preliminary WMC and any wetland physically contiguous with (not separated by upland from) the landscape-scale WMC.

**(ii)** The District, in its judgment, may retract the WMC boundary on the basis of site-level information demonstrating that the retraction is consistent with the associated CWPMP and does not measurably diminish the existing or potential water resource functions of the WMC. In making such a decision, the District may consider relevant criteria including wetland delineation, buffer and floodplain location, WMC connectivity, protection of surface waters and groundwater recharge, and whether loss would be reduced by inclusion of compensating area supporting WMC function.

**(iii)** If the site level functional analysis shows the presence of Non-degraded or High Quality wetland within 50 feet of the site level WMC, the WMC will be expanded to the lateral extent of the Non-degraded or High Quality wetland boundary plus the applicable buffer as defined in section 6(e).

**(iv)** If the WMC lies within or contiguous to the parcel boundaries of the project, the lateral extent of the final WMC may be increased by the applicant to include all wetland or other action eligible for credit contiguous with the site level WMC. The extended WMC boundary must connect property to the WMC boundary on adjacent properties and reflect local surface hydrology.

**(4)** A map of the final WMC boundary must be prepared and submitted to the District for approval. The map will reflect any change to the boundary as a result of the permitted activity. A GIS shapefile or CADD file of the final WMC boundary shall be submitted to the District.

**(5)** A variance from a requirement of Section 6(b) otherwise meeting the criteria of District Rule L may be granted if the TEP concurs that the wetland protection afforded will not be less than that resulting from application of standard WCA criteria.

**(c) WETLAND REPLACEMENT.**

**(1)** The wetland replacement exemptions in Minnesota Rules 8420.0420 are not applicable within CWPMP areas, except as follows:

**(i)** The agricultural, wetland restoration, utilities, *de minimis* and wildlife habitat exemptions found at Minnesota Rules 8420.0420, subparts 2, 5, 6, 8 and 9, respectively, are applicable, subject to the scope of the exemption standards found at Minnesota Rules 8420.0420, subpart 1.

**(ii)** The drainage exemption, Minnesota Rules 8420.0420, subpart 3, is applicable if the applicant demonstrates, through adequate hydrologic modeling, that the drainage activity will not change the hydrologic regime of a CWPMP-mapped high quality wetland (see Figure F3) within the boundary of a WMC. Wetland and plant community boundaries will be field-verified.

**(iii)** Buffer and easement requirements of Section 6(e) and 6(f) do not apply to wetland alterations that qualify for one of the exemptions listed in Section 6(c)(1)(i), unless the project of which the wetland alteration is a part is subject to Rule C.10(d).

**(2)** Replacement plans will be evaluated and implemented in accordance with Minnesota Rules 8420.0325 through 8420.0335, 8420.0500 through 08420.0544 and 8420.0800 through 8420.0820, except that the provisions of this Rule will apply in place of Minnesota Rules 8420.0522, and 8420.0526. The foundation of the CWPMPs is to limit impact to, and encourage enhancement of, high-priority wetlands and direct unavoidable impact to lower-priority wetlands in establishing the WMC. In accordance with Minnesota Rules 8420.0515, subpart 10, this principle will guide sequencing, replacement siting, WMC boundary adjustment and other elements of replacement plan review. The District will use the methodology of Minnesota Rules 8420.0522, subpart 2 to determine wetland replacement requirements for partially drained wetlands.

**(3)** A replacement plan must provide at least one replacement credit for each wetland impact acre, as shown in Table F1. The replacement methods must be from the actions listed in Table F2 or an approved wetland bank consistent with Section 6(d)(1).

**(4)** Acres of impact and replacement credit are determined by applying the following two steps in order:

**(i)** Multiply actual wetland acres subject to impact by the ratios stated in Table F1.

**(ii)** Calculate the replacement credits by multiplying the acreage for each replacement action by the percentage in Table F2. All replacement areas that are not within the final WMC will receive credit based on a replacement location outside the final WMC. However, when the replacement area is within the parcel boundaries of the project and there is no Preliminary WMC within those boundaries, and there is no opportunity to extend the WMC boundary from adjacent parcels of land, then the mitigation area will be credited as replacement inside the final WMC. If an applicant intends replacement also to fulfill mitigation requirements under Section 404 of the Clean Water Act, then the applicant may elect replacement credit based on a replacement location outside the final WMC.

**(5)** The replacement plan must demonstrate that non-exempt impacts will result in no net loss of wetland hydrological regime, water quality, or wildlife habitat function through a wetland assessment methodology approved by BWSR pursuant to the Wetland Conservation Act, Minnesota Statutes §103G.2242.

**TABLE F1. WETLAND REPLACEMENT RATIOS FOR CWPMP AREAS.**

| Wetland Degradation Type | Anoka County | | Washington County | |
|---|---|---|---|---|
| | Outside WMC | Inside WMC | Outside WMC | Inside WMC |
| Moderately or Severely Degraded Wetland | 1:1 | 2:1 | 2:1 | 3:1 |
| Marginally or Non-Degraded Wetland | 1.5:1 | 2.5:1 | 2.5:1 | 3.5:1 |
| High Quality Wetland and/or hardwood, coniferous swamp, floodplain forest or bog wetland communities of any quality | 2:1 | 3:1 | 3.5:1 | 4:1 |

**TABLE F2. ACTIONS ELIGIBLE FOR CREDIT FOR CWPMP AREAS.**

| Actions Eligible for Credit | Inside of the Final WMC | Outside of the Final WMC |
|---|---|---|
| **Wetland Restoration** | | |
| Hydrologic and vegetative restoration of moderately and severely degraded wetland | up to 75% Determined by LGU and TEP | up to 50% Determined by LGU and TEP |
| Hydrologic and vegetative restoration of effectively drained, former wetland | 100% | 75% |
| **Wetland Creation** | | |
| Upland to wetland conversion | 50% | 50% |
| **Wetland Protection & Preservation** | | |
| Protection via conservation easement of wetland previously restored consistent with MN Rule 8420.0526 subpart 6 | up to 75% Determined by LGU and TEP | up to 75% Determined by LGU and TEP |
| **Columbus CWPMP Only:** Preservation of wetland or wetland/upland mosaic (requires a 3rd party easement holder and other matching action eligible for credit) | 25% Determined by LGU and TEP | 12.5% Determined by LGU and TEP |
| Restoration or protection of wetland of exceptional natural resource value consistent with MN Rule 8420.0526, subpart 8 | Up to 100% Determined by LGU and TEP | Up to 100% Determined by LGU and TEP |
| **Buffers** | | |
| Non-native, non-invasive dominated buffer around other action eligible for credit, consistent with Section 6(e) | 10% | 10% |
| Native, non-invasive dominated buffer around other action eligible for credit, consistent with Section 6(e) | 25% | 25% |
| Upland habitat area contiguous with final WMC wetland (2 acre minimum), as limited by Rule F.6(e)(5) | 100% | NA |
| **Vegetative Restoration** | | |
| Positive shift in MnRAM assessment score for “Vegetative Integrity” from “Low” to “Medium” or “High” | Up to 50% Determined by LGU and TEP | NA |

**(6)** The location and type of wetland replacement will conform as closely as possible to the following standards:

**(i)** No wetland plant community of high or exceptional wildlife habitat function and high or exceptional vegetative integrity, as identified in the required wetland assessment, may be disturbed.

**(ii)** No replacement credit will be given for excavation in an upland natural community with Natural Heritage Program rank B or higher, or with identified Endangered, Threatened or Special Concern species.

**(7)** In the Columbus CWPMP only, preservation credit can be used for up to 50% of the wetland replacement required. The remaining 50% must be supplied by a non-preservation replacement action as shown within Table F2. Additionally:

**(i)** All other eligible actions for credit within this rule must be considered before preservation is approved as an action eligible for credit.

**(ii)** The Technical Evaluation Panel must find that there is a high probability that, without preservation, the wetland area to be preserved would be degraded or impacted and that the wetland meets the criteria of Minnesota Rules 8420.0526 subpart 9.A through 9.D.

**(iii)** Non-degraded, High Quality, and Moderately Degraded wetland is eligible for Preservation Credit within Zone 1 (see Figure F2).

**(iv)** Non-degraded and High Quality wetland is eligible for Preservation Credit within Zone 2 (see Figure F2).

**(v)** Wetland ranked "Low" for "vegetative integrity" is not eligible for replacement credit through Preservation.

**(vi)** Banked preservation credit may be used only within the Columbus CWPMP area (see Figure F1).

**(8)** Replacement credit for Wetland Protection and Preservation (see Table F2) requires that a perpetual Conservation Easement be conveyed to and accepted by the District. The easement must encompass the entire replacement area, and must provide for preservation of the wetland's functions by the fee owner and applicant. The applicant must provide a title insurance policy acceptable to the District, naming the District as the insured. The fee owner and the applicant also must grant an access easement in favor of the District, the local government unit and any other state, local or federal regulatory authority that has authorized use of credits from the mitigation site for wetland replacement. The fee owner must record or register these easements on the title for the affected property.

**(9)** Replacement credit for Vegetative Restoration (see Table F2) may be granted only for wetland communities scoring "Low" for Vegetative Integrity. The TEP must find that there is a reasonable probability for restoration success.

**(10)** Unless a different standard is stated in the approved replacement or banking plan, the performance standard for upland and wetland restored or created to generate credit is establishment, by the end of the WCA monitoring period, of a medium or high quality plant community ranking with 80% vegetative coverage consisting of a native, non-invasive species composition.

**(11)** Notwithstanding any provision in this rule to the contrary, for wetland impacts resulting from public drainage system repairs undertaken by the Rice Creek Watershed District that are exempt from Clean Water Act Section 404 permit requirements but are not exempt from replacement under Section 6(c)(1) of this Rule, replacement may occur subject to the following priority of replacement site sequencing:

**(i)** Within bank service areas 6 or 7 or with the concurrence of governing board of the local county or watershed district, within any county or watershed district whose county water plan, watershed management plan, or other water resource implementation plan contains wetland restoration as a means of implementation.

**(ii)** Throughout the state in areas determined to possess less than 80% of pre-settlement wetland acres.

**(12)** A variance from a requirement of Section 6(c) otherwise meeting the criteria of District Rule L may be granted if the TEP concurs that the wetland protection afforded will not be less than that resulting from application of standard WCA criteria.

**(d) WETLAND BANKING.**

**(1)** Replacement requirements under Section 6(c) of this Rule may be satisfied in whole or part by replacement credits generated off-site within any CWPMP area, but not by credits generated outside of a CWPMP area except as provided in Section 6(d)(5).

**(2)** The deposit of replacement credits created within a CWPMP area for banking purposes and credit transactions for replacement will occur in accordance with Minnesota Rules 8420.0700 through 8420.0745. Credits generated within a CWPMP area may be used for replacement within or outside of a CWPMP area.

**(i)** The District will calculate the amount of credit in accordance with the standard terms of WCA. This measure of credit will appear in the BWSR wetland banking account.

**(ii)** The District also will calculate the amount of credit in accordance with Section 6(c) of this rule. The District will record this measure of credit internally within the CWPMP's wetland bank accounting. The District will adjust this internal account if the BWSR account is later debited for replacement outside of a CWPMP area. Where credits are used for replacement within a CWPMP area, the District will convert credits used into standard WCA credits so that the BWSR account is accurately debited.

**(3)** To be recognized, bank credit from Preservation in the Columbus CWPMP (see Table F2) must be matched by an equal amount of credit from a non-Preservation replacement action.

**(i)** Credit derived from Preservation as the replacement action may be used only within the Columbus CWPMP boundary.

**(ii)** If the matching non-Preservation credit is used outside of the Columbus CWPMP area, the Preservation credit within the Columbus CWPMP wetland bank account will be debited in the amount of the matching non-Preservation credit.

**(5)** Banked wetland credit created outside of the CWPMP areas, but within the CWPMP Contributing Drainage Area, may be used to replace impact within the CWPMP areas. An applicant proposing to use credits under this paragraph must field verify at the time of application that the banked wetlands are located within the CWPMP Contributing Drainage Area.

**(6)** Credits generated under an approved wetland banking plan, inside a CWPMP or its contributing drainage area (See Figure F4), utilized to replace impact within a CWPMP area will be recognized in accordance with the approved banking plan.

**(e)** **VEGETATED BUFFERS.** Vegetated buffers are required to be established adjacent to wetlands within CWPWP areas as described below.

**(1)** Wetland buffer will consist of non-invasive vegetated land; that is not cultivated, cropped, pastured, mowed, fertilized, used as a location for depositing snow removed from roads, driveways or parking lots, subject to the placement of mulch or yard waste, or otherwise disturbed except for periodic cutting or burning that promotes the health of the buffer, actions to address disease or invasive species, or other actions to maintain or improve buffer or habitat area quality, each as approved in writing by District staff. The application must include a vegetation management plan for District approval. For public road authorities, the terms of this subsection will be modified as necessary to accommodate safety and maintenance feasibility needs.

**(2)** Buffer adjacent to wetland within the final WMC must average at least 50 feet in width, measure at least 25 feet at all points, and meet the average width at all points of concentrated inflow. For private projects dedicating

public right of way, the buffer requirement may be reduced based on compelling need and a TEP recommendation to the District in support that the wetland protection afforded is reasonable given the circumstances.

**(3)** Buffer adjacent to wetland restored, created or preserved for replacement credit, not within the final WMC, must meet the minimum width standards as described in MN Rule 8420.0522, subpart 6.

**(4)** Buffer adjacent to High Quality Wetland, or to replacement wetland adjacent to High Quality Wetland, must be at least 50 feet wide at all points. For private projects dedicating public right of way, the minimum width may be reduced based on compelling need and a District finding that the wetland protection afforded is reasonable given the circumstances. In making this finding, the District will give substantial weight to the TEP recommendation.

**(5)** The area of buffer for which replacement credit is granted must not exceed the area of the replacement wetland except and specific to when the buffer is to meet the 50- foot requirement of Sections 6(e)(2) and 6(e)(4) and is further limited to the buffer area required to encapsulate another action eligible for credit.

**(6)** Buffer receiving replacement credit as upland habitat area contiguous with the final WMC must be at least two acres in size.

**(7)** No above- or below-ground structure or impervious surface may be placed within a buffer area permanently or temporarily, except as follows:

**(i)** A structure may extend or be suspended above the buffer if the impact of any supports within the buffer or habitat area is negligible, the design allows sufficient light to maintain the species shaded by the structure, and the structure does not otherwise interfere with the function afforded by the buffer.

**(ii)** A public utility, or a structure associated with a public utility, may be located within a buffer on a demonstration that there is no reasonable alternative that avoids or reduces the proposed buffer intrusion. The utility or structure shall minimize the area of permanent vegetative disturbance.

**(iii)** Buffer may enclose a linear surface for non-motorized travel no more than 10 feet in width. The linear surface must be at least 25 feet from the wetland edge. The area of the linear surface will not be eligible for replacement credit. For projects proposing non-motorized travel no more than 10 feet in width, the linear surface may be reduced to less than 25 feet from the wetland edge based on compelling need and a TEP recommendation to the District in support that the wetland protection afforded is reasonable given the circumstances.

**(iv)** A stormwater features that is vegetated consistent with Section 6(e)(1), including NURP ponds, may be located within buffer and count toward buffer width on site-specific approval.

**(8)** Buffer area is to be indicated by permanent, freestanding markers at the buffer edge, with a design and text approved by District staff in writing. A marker shall be placed at each lot line, with additional markers placed at an interval of no more than 200 feet and as necessary to define variation in a meandering boundary. If a District permit is sought for a subdivision, the monumentation requirement will apply to each lot of record to be created. On public land or right-of-way, the monumentation requirement may be satisfied by the use of markers flush to the ground, breakaway markers of durable material, or a vegetation maintenance plan approved by District staff in writing.

**(9)** As a condition of permit issuance under this Rule, a property owner must file on the deed a declaration in a form approved by the District establishing a vegetated buffer area adjacent to the delineated wetland edge within the final WMC and other wetland buffers approved as part of a permit under this Rule. The declaration must state that on further subdivision of the property, each subdivided lot of record shall meet the monumentation requirement of Section 6(e)(8). On public land or right-of-way, in place of a recorded declaration, the public owner may execute a written maintenance agreement with the District. The agreement will state that if the land containing the buffer area is conveyed to a private party, the seller must file on the deed a declaration for maintenance in a form approved by the District.

**(10)** Buffer may be disturbed to alter land contours or improve buffer function if the following criteria are met:

**(i)** An erosion control plan is submitted under which alterations are designed and conducted to expose the smallest amount of disturbed ground for the shortest time possible, fill or excavated material is not placed to create an unstable slope, mulches or similar materials are used for temporary soil coverage, and permanent vegetation is established as soon as possible after disturbance is completed.

**(ii)** Wooded buffer and native riparian canopy trees are left intact;

**(iii)** When disturbance is completed, sheet flow characteristics within the buffer are improved; average slope is not steeper than preexisting average slope or 5:1 (horizontal: vertical), whichever is less steep; preexisting slopes steeper than 5:1 containing dense native vegetation will not require regrading; the top 18 inches of the soil profile is not compacted, has a permeability at least equal to the permeability of the preexisting soil in an uncompacted state and has organic matter content of between five and 15 percent; and habitat diversity and riparian shading are maintained or improved. Any stormwater feature within the buffer will not have exterior slopes greater than 5:1.

**(iv)** A re-vegetation plan is submitted specifying removal of invasive species and establishment of native vegetation suited to the location.

**(v)** A recorded Declaration or, for a public entity, maintenance agreement is submitted stating that, for three years after the project site is stabilized, the property owner will correct erosion, maintain and replace vegetation, and remove invasive species to establish permanent native vegetation according to the re- vegetation plan.

**(vi)** Disturbance is not likely to result in erosion, slope failure or a failure to establish vegetation due to existing or proposed slope, soil type, root structure or construction methods.

**(11)** Material may not be excavated from or placed in a buffer, except for temporary placement of fill or excavated material pursuant to duly-permitted work in the associated wetland, or pursuant to paragraph 6(e)(10) of this Rule.

**(f)** **EASEMENT.** The property owner must convey to the District and record or register, in a form acceptable to the District, a perpetual, assignable easement granting the District the authority to monitor, modify and maintain hydrologic and vegetative conditions within the WMC wetland and buffer adjacent to WMC wetland, including the authority to install and maintain structural elements within those areas and reasonable access to those areas to perform authorized activities. The WMC shall be identified and delineated as part of the recorded easement.

**(g)** **PARTIAL ABANDONMENT.** As a condition of permit issuance, the District may require a property owner to petition the District for partial abandonment of a public drainage system pursuant to Minnesota Statutes §103E.805. A partial abandonment under this Section may not diminish a benefited property owner's right to drainage without the owner's agreement.

**7.** **REQUIRED EXHIBITS.** The following exhibits must accompany a permit application for both WCA and non-WCA wetland alterations.

**(a)** **SITE PLAN.** An applicant must submit one full size (22 inches by 34 inches) and one reduced (maximum size of 11 inches by 17 inches) or electronic version of a site plan showing:

**(1)** Property lines and delineation of lands under ownership of the applicant.

**(2)** On-site location of all public and private ditch systems

**(3)** Existing and proposed elevation contours, including the existing run out elevation and flow capacity of the wetland outlet, and spoil disposal areas.

**(4)** Area of wetland to be filled, drained, excavated or otherwise altered.

**(b)** **WETLAND DELINEATION REPORT.** An applicant must submit one hard copy and one electronic copy of a wetland delineation report conforming to a methodology authorized for WCA use and otherwise consistent with Minnesota Board of Water & Soil Resources guidance. The following requirements and clarifications apply to submittals of wetland delineation reports to the District and supplement the approved methodology and guidance:

**(1)** Wetland delineations should be conducted and reviewed during the period of May 1 - October 15. The District may accept delineations performed outside this time frame on a case-by-case basis. The District will determine if there is sufficient information in the report and visible in the field at the time to assess the three wetland parameters (hydrophytic vegetation, hydric soils, hydrology) in relation to the placement of the wetland delineation line. If proper assessment of the delineation is not possible, the District may consider the application incomplete until appropriate field verification is possible.

**(2)** An applicant conducting short- or long-term wetland hydrology monitoring for the purpose of wetland delineation/determination must coordinate with the District prior to initiating the study.

**(3)** For a project site with row-cropped agricultural areas, the wetland delineation report must include a review of Farm Service Agency aerial slides (if available) for wetland signatures per Guidance for Offsite Hydrology/Wetland Determinations (July 1, 2016), as amended, and Section 404 Clean Water Act or subsequent State-approved guidance. This review is to be considered along with field data and other pertinent information, and is not necessarily the only or primary basis for a wetland determination in an agricultural row-cropped area.

**(4)** The wetland delineation report must follow current BWSR/ACOE Guidance for Submittal of Delineation Reports, and include:

**(i)** Documentation consistent with the 1987 Corps of Engineers Wetlands Delineation Manual and Northcentral and Northeast Regional Supplement.

**(ii)** National Wetland Inventory (NWI) map, Soil Survey Map, and Department of Natural Resources (DNR) Protected Waters Map of the area being delineated.

**(iii)** Results of a field investigation of all areas indicated as potential wetland by mapping sources including: NWI wetlands, hydric soil units, poorly drained or depressional areas on the Soil Survey Map, and DNR Protected Waters or Wetlands.

**(iv)** Classifications of each delineated wetland using the following systems:

- Classification of Wetlands and Deep Water Habitats of the United States (Cowardin et al. 1979)
- Fish and Wildlife Service Circular 39 (Shaw and Fredine 1971)
- Wetland Plants and Plant Communities of Minnesota and Wisconsin (Eggers & Reed, 3rd Edition, 2011)

**(v)** A survey map (standard land survey methods or DGPS) of delineated wetland boundaries.

**(5)** As a condition of District approval of any wetland delineation, applicants shall submit X/Y coordinates (NAD 83 state plane south coordinate system) and a GIS shapefile of the delineated wetland boundaries. All data shall be collected with a Trimble Geoexplorer or equivalent instrument with sub-meter accuracy.

**(c)** **WETLAND REPLACEMENT PLAN APPLICATION.** An applicant submitting a plan involving a wetland alteration requiring replacement must submit five copies of a replacement plan application and supporting materials conforming to WCA replacement plan application submittal requirements and including the following additional documents:

**(1)** Plan sheet(s) clearly identifying, delineating, and denoting the location and size of each wetland impact area and all replacement actions for credit.

**(2)** Plan sheet(s) with profile views and construction specifications of each replacement wetland including proposed/estimated normal water level, proposed/estimated boundary of replacement wetland, topsoiling specifications (if any), grading specifications, and wetland/buffer seeding specifications.

**(d)** **FUNCTIONS AND VALUES ASSESSMENT.** An applicant must submit a before-and-after wetland functions and values assessment using a WCA-accepted methodology for a project in a CWPMP area or otherwise involving at least one acre of wetland impact requiring replacement.

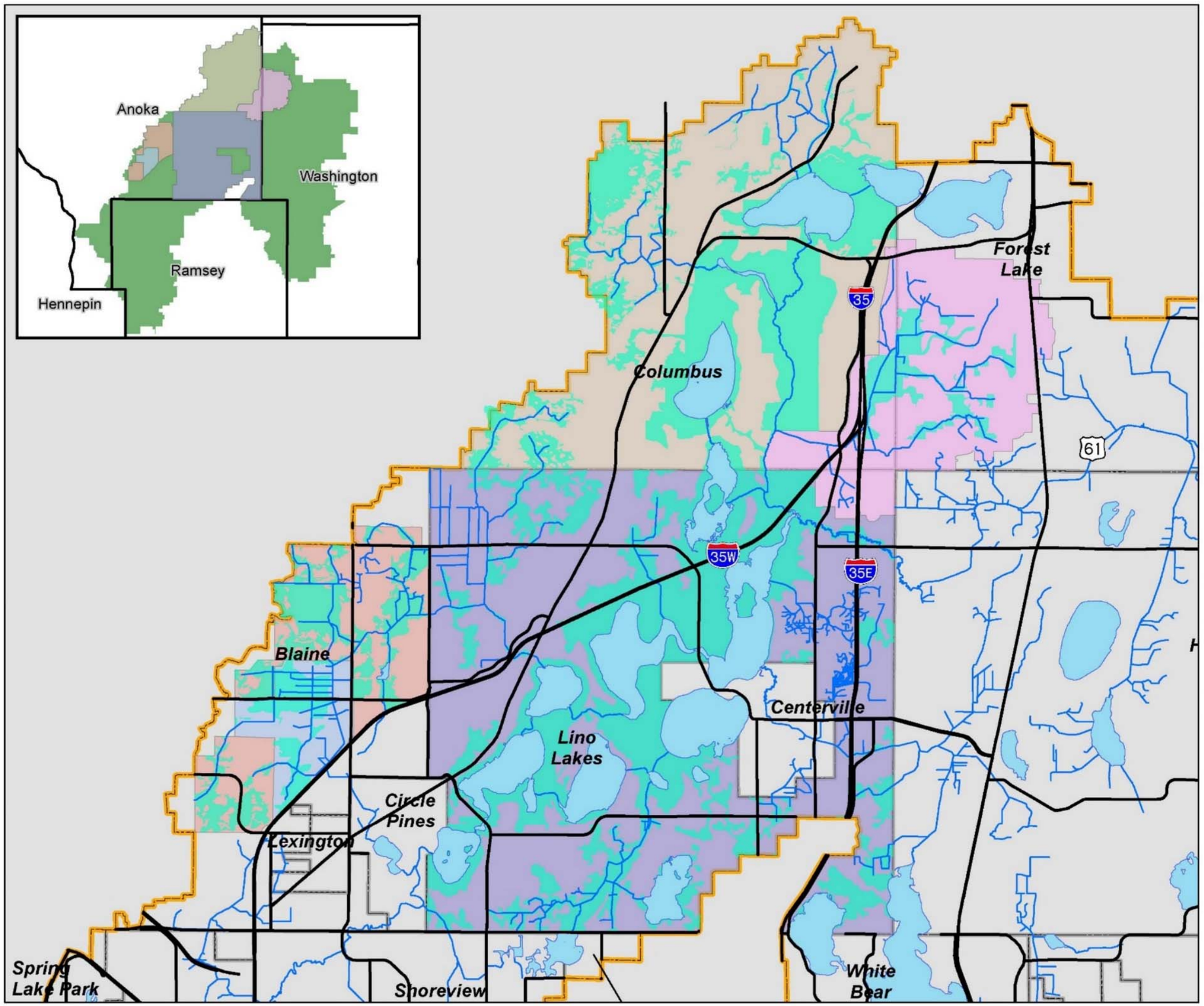
**(e)** Erosion and sediment control plan in accordance with District Rule D.

**(f)** On District request, the applicant will conduct an assessment of protected plant or animal species within the project site, where such assessment is not available from existing sources.

**(g)** Other project site-specific submittal requirements as may be required by the District.

# Rice Creek Watershed District




N
W E
S

- Major Roads
- RCWD Watercourses
- Lakes
- Wetland Management Corridor
- Cities
- RCWD Legal Boundary
- Counties

**CWPMPs**

- Village Meadows
- Anoka County Ditch 53-62
- Anoka/Washington Judicial Ditch 4
- Lino Lakes CWPMP
- Columbus CWPMP

0 0.5 1 2 Miles

Sources: RCWD, TLG, MN DOT
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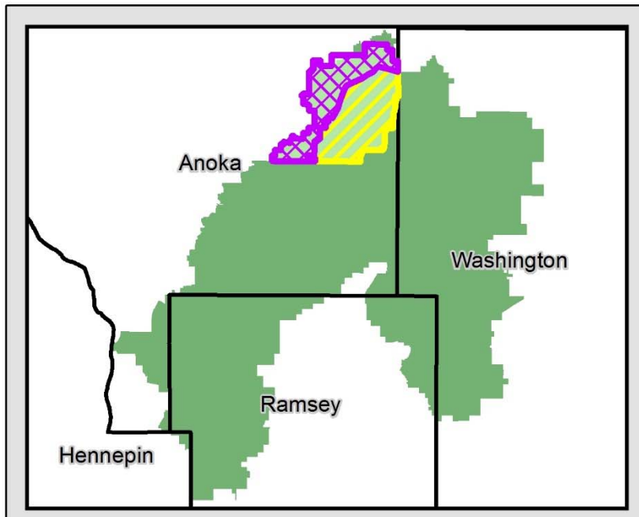
**F1: Comprehensive Wetland Protection and Management Plan Boundaries and Wetland Management Corridor**

RCWD
RICE CREEK WATERSHED DISTRICT




# Rice Creek Watershed District


Transportation System
RCWD Watercourses
Lakes
RCWD Legal Boundary
Cities
Counties

**WMC Adjustment Zones**

Zone I
Zone II

**Wetland Degredation Status**

Non-Degraded
Moderately
Severely

0 0.25 0.5 1 Miles

Sources: RCWD, TLG, MN DOT

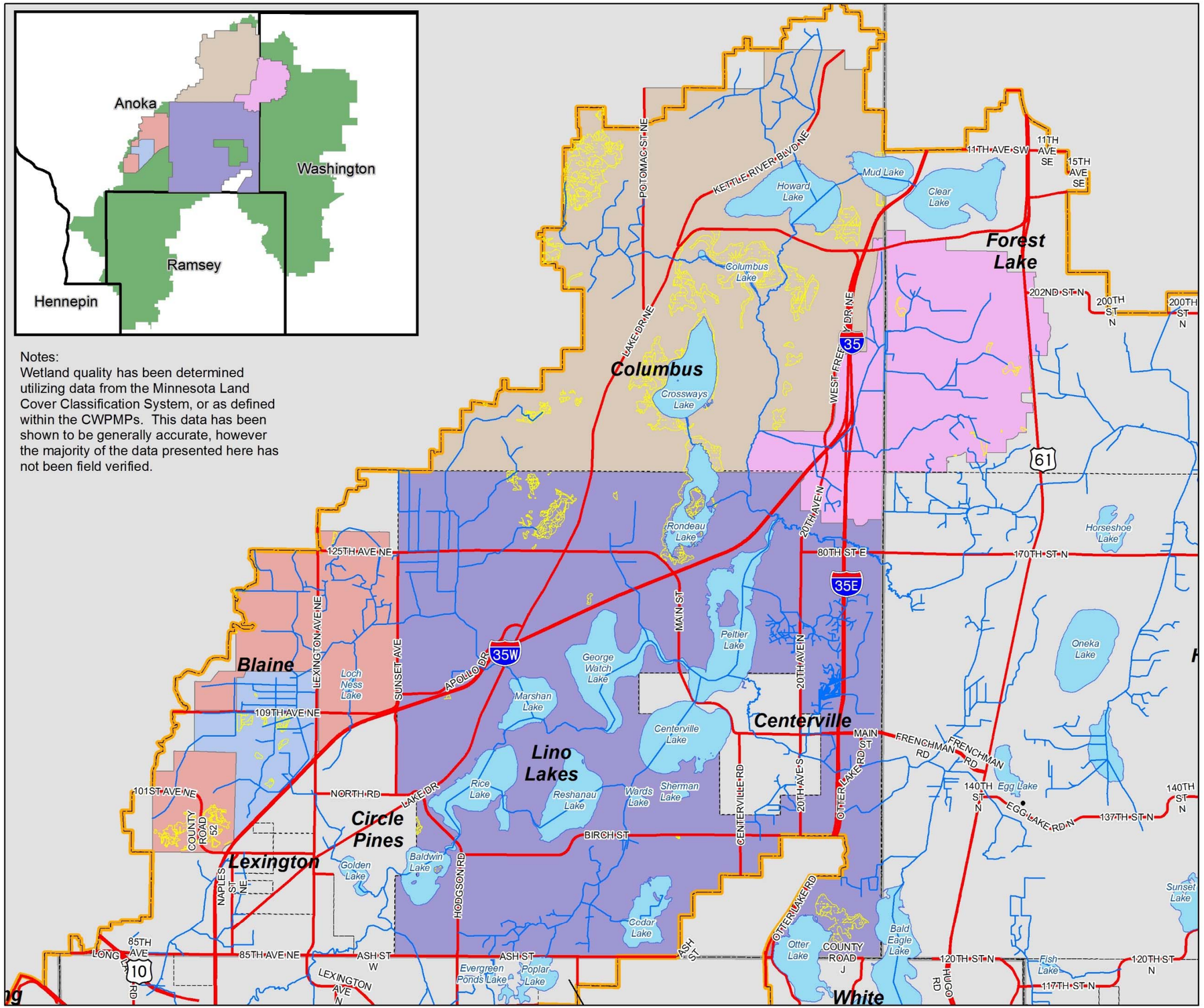
**F2: Columbus Commerical/Industrial Zoned Areas and Wetland Degredation Status**

RCWD
RICE CREEK WATERSHED DISTRICT

# Rice Creek Watershed District




Notes:
Wetland quality has been determined utilizing data from the Minnesota Land Cover Classification System, or as defined within the CWPMPs. This data has been shown to be generally accurate, however the majority of the data presented here has not been field verified.




- RCWD Watercourses
- Lakes
- High Quality Wetland (see Notes)
- RCWD Legal Boundary
- Transportation System
- Cities
- Counties

**CWPMPs**

- Village Meadows
- Anoka County Ditch 53-62
- Anoka/Washington Judicial Ditch 4
- Lino Lakes CWPMP
- Columbus CWPMP

0 0.5 1 2 Miles

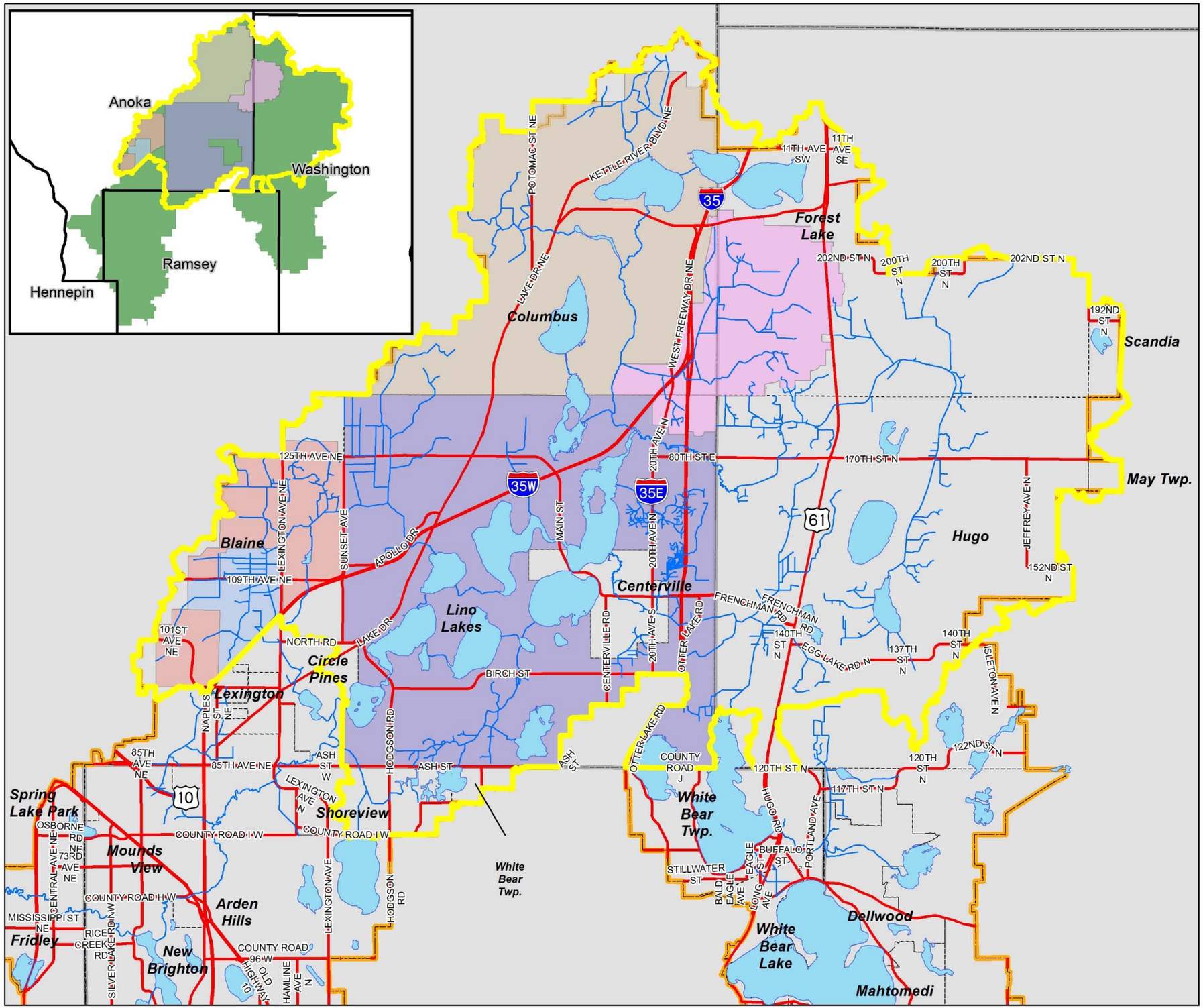
Sources: RCWD, TLG, MN DOT

**F3: High Quality Wetlands Within CWPMPs**

RCWD
RICE CREEK WATERSHED DISTRICT

# Rice Creek Watershed District







- Contributing_Drainage_Area_to_CWPMP
- RCWD Watercourses
- Lakes
- RCWD Legal Boundary
- Transportation System
- Cities
- Counties

**CWPMPs**

- Village Meadows
- Anoka County Ditch 53-62
- Anoka/Washington Judicial Ditch 4
- Lino Lakes CWPMP
- Columbus CWPMP

0 1 2 4 Miles

Sources: RCWD, TLG, MN DOT

**F4: Contributing Drainage Area to CWPMPs**

RCWD
RICE CREEK WATERSHED DISTRICT

# RULE G: CROSSINGS OF NATURAL & ARTIFICIAL CONVEYANCE SYSTEMS

**1.** **POLICY.** It is the policy of the Board of Managers to preserve the capacity of the present drainage systems to accommodate future needs.

**2.** **REGULATION.** No person may construct, improve, repair or alter the hydraulic characteristics of a utility, bridge or culvert structure (i.e., crossing) on a creek, public drainage system or major watercourse in the District, without first obtaining a permit from the District.

**3.** **CRITERIA.** A permit application for a crossing of a public drainage system will not obligate the District, in its function as drainage authority, to investigate or hold proceedings to establish the As Constructed and Subsequently Improved Condition (ACSIC) of the drainage system. Permit issuance is not a warranty and the crossing owner will remain responsible should the crossing at any time be found to be an obstruction or subject to future modification or replacement under the drainage law. In addition, a crossing must:

**(a)** Preserve existing design hydraulic capacity or, if on a public drainage system, hydraulic capacity conforming to the drainage right of benefited lands consistent with existing drainage proceedings.

**(b)** Retain existing navigational capacity.

**(c)** Not adversely affect water quality.

**(d)** Be designed to allow for future erosion, scour, and sedimentation considerations.

**(e)** Be designed for maintenance access and be maintained in perpetuity to continue to meet the criteria of Section 3. The maintenance responsibility must be memorialized in a document executed by the property owner in a form acceptable to the District and filed for record on the deed. Alternatively, a public permittee may meet its perpetual maintenance obligation by executing a programmatic or project-specific maintenance agreement with the District.

**4.** **SUBSURFACE CROSSINGS.** A crossing beneath a creek, public drainage system or major watercourse must maintain adequate vertical separation from the bed of the watercourse. The District will determine adequate separation by reference to applicable guidance and in view of relevant considerations such as soil condition, the potential for upward migration of the utility, and the likelihood that the bed elevation may decrease due to natural processes or human activities. The District also will consider the feasibility of providing separation and the risks if cover diminishes. Nothing in this paragraph diminishes the crossing owner's warranty or responsibility under Section 3, above. The applicant must submit a record drawing of the installed utility.

**5.** **REQUIRED EXHIBITS.** The following exhibits must accompany the permit application. One set, full size (22 inches by 34 inches) and one reduced (maximum size of 11 inches by 17 inches) or electronic version.

**(a)** Construction details showing:

**(1)** Size and description of structure including existing and proposed flow line (invert) elevations.

**(2)** Existing and proposed elevations of utility, bridge or culvert.

**(3)** End details with flared end sections or other appropriate energy dissipaters.

**(4)** Emergency overflow elevation and route.

**(b)** Narrative describing construction methods and schedule

**(c)** Erosion and sediment control plan in accordance with District Rule D.

**(d)** Computations of watershed area, peak flow rates and elevations, and discussion of potential effects on water levels above and below the project site.

**6.** **EXCEPTION.** Criterion 3(a) may be waived if the applicant can demonstrate with supporting hydrologic calculations the need for an increase in discharge rate in order to provide for reasonable surface water management in the upstream area and that the downstream impacts of the increased discharge rate can be reasonably accommodated and will not exceed the existing rate at the municipal boundary.

# RULE H: ILLICIT DISCHARGE AND CONNECTION

**1. POLICY.** It is the policy of the Board of Managers to:

**(a)** Regulate the contribution of pollutants to the District's Municipal Separate Storm Sewer System (MS4) by any user;

**(b)** Prohibit Illicit Connections and Discharges to the District's MS4;

**(c)** Carry out inspection and monitoring procedures necessary to ensure compliance with this Rule under statutory and related authority.

**2. PROHIBITION**. No person shall discharge or cause to be discharged into a public drainage system within the District any materials, including but not limited to pollutants or waters containing any pollutants that cause or contribute to a violation of applicable water quality standards, other than stormwater.

**3. EXCEPTIONS.** The commencement, conduct or continuance of any illegal discharge to the waters of the District is prohibited except as described as follows:

**(a)** The following discharges are exempt from discharge prohibitions established by this rule:

**(1)** Water line flushing or other potable water sources

**(2)** Landscape irrigation or lawn watering

**(3)** Diverted stream flows

**(4)** Rising ground water

**(5)** Ground water infiltration to storm drains

**(6)** Uncontaminated pumped ground water

**(7)** Foundation and footing drains

**(8)** Firefighting activities

**(b)** Discharges specified in writing by the District, or other federal, state or local agency as being necessary to protect the public health and safety.

**(c)** Dye testing is an allowable discharge, but requires a verbal notification to the District prior to the time of the test.

**(d)** The prohibition shall not apply to any non-storm water discharge permitted under an NPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the Federal Environmental Protection Agency, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the storm drain system.

**4. ILLICIT CONNECTIONS PROHIBITED**

**(a)** The construction, use, maintenance or continued existence of illicit connections to the public drainage system is prohibited.

**(b)** This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.

**(c)** A person is considered to be in violation of this rule if the person connects a line conveying sewage to the public drainage system, or allows such a connection to continue.

# RULE I: DRAINAGE SYSTEMS

**1.** **POLICY.** It is the policy of the Board of Managers to regulate new construction, improvement or repair of drainage systems (open and tiled) for the following purposes:

**(a)** To preserve the capacities of drainage systems to accommodate future needs.

**(b)** To improve water quality and prevent localized flooding.

**(c)** To prevent the loss of drainage.

**2.** **REGULATION.** No drainage system may be altered, constructed, improved or repaired without first obtaining a permit from the District. The permit is in addition to any formal procedures or District approvals that may be required under Minnesota Statutes Chapter 103E or other drainage law. The Board of Managers may waive the requirement of a permit under this rule for repair to a drainage system if the applicant proposes to repair a tiled system of less than fifty feet in length, and where such repair would not alter the invert of the system.

**3.** **CRITERIA.** A project proposing to alter, construct, improve or repair a drainage system must:

**(a)** Comply with orders or findings issued by the District or a previous Drainage Authority.

**(b)** Comply with all Federal, State and District wetland protection rules and regulations.

**(c)** Demonstrate that such activity will not adversely impact upstream and/or downstream water quality or quantity.

**(d)** Provide stable channel and outfall.

**(e)** Demonstrate concurrence with regional pond or subdivision drainage plans approved by the District, if applicable.

**(f)** Conform to District Rule F (Wetland Alteration), as applicable.

**(g)** If drainage system is proposed to outlet a landlocked basin, provide sufficient dead storage volume to retain back-to-back 100-year, 24-hour rainfalls and runoff.

**(h)** Be designed for maintenance access and be maintained in perpetuity to avoid constituting an obstruction and otherwise to continue to meet the criteria of Section 3. The maintenance responsibility must be memorialized in a document executed by the property owner in a form acceptable to the District and filed for record on the deed. Alternatively, a public permittee may meet its perpetual maintenance obligation by executing a programmatic or project-specific maintenance agreement with the District.

**4.** **REQUIRED EXHIBITS.** The following exhibits must accompany the permit application. One full size (22 inches by 34 inches) and one reduced (maximum size of 11 inches by 17 inches).

**(a)** Map showing location of project and tributary area.

**(b)** Existing and proposed cross sections and profile of affected area.

**(c)** Description of bridges or culverts required.

**(d)** Narrative and calculations describing wetland impacts and effects on water levels above and below the project site.

**(e)** Erosion and sediment control plan in accordance with District Rule D.

**(f)** Hydrologic and hydraulic analysis of the proposed project.

# RULE J: APPROPRIATION OF PUBLIC WATERS

**1.** **POLICY.** It is the policy of the Board of Managers to regulate the appropriation of public waters as follows.

**2.** **REGULATION.** A permit from the District is required for the appropriation of water from:

**(a)** A public waterbasin or wetland that is less than 500 acres and is wholly within Hennepin or Ramsey County.

**(b)** A protected watercourse within Hennepin or Ramsey County that has a drainage area of less than 50 square miles.

**3.** **CRITERIA.** A permit applicant for appropriation of public waters as described above must complete and submit to the District an appropriation checklist. The appropriation checklist form may be obtained from the District office.

# RULE K: ENFORCEMENT

1. **VIOLATION OF RULES IS A MISDEMEANOR.** Violation of these rules, a stipulation agreement made, or permit issued by the Board of Managers under these rules, is a misdemeanor subject to a penalty as provided by law.

2. **DISTRICT COURT ACTION.** The District may exercise all powers conferred upon it by Minnesota Statutes Chapter 103D in enforcing these rules, including criminal prosecution, injunction, or action to compel performance, restoration or abatement.

3. **ADMINISTRATIVE ORDER.** The District may issue a cease and desist or compliance order when it finds that a proposed or initiated project presents a serious threat of soil erosion, sedimentation, or an adverse effect upon water quality or quantity, or violates any rule or permit of the District.

# RULE L: VARIANCES

**1.** **VARIANCES AUTHORIZED.** The Board of Managers may hear a request for variance from a literal provision of these rules where strict enforcement would cause undue hardship or practical difficulty because of circumstances unique to the property under consideration. The Board of Managers may grant a variance if an applicant demonstrates that such action will be in keeping with the spirit and intent of these rules and in doing so may impose conditions on the variance as necessary to find that it meets the standards of section 2, below. A variance request must be addressed to the Board of Managers as part of a permit application and must address each of the four criteria listed in the standard.

**2.** **STANDARD.** In order to grant a variance, the Board of Managers must determine that:

**(a)** Special conditions apply to the structures or lands under consideration that do not apply generally to other land or structures in the District.

**(b)** Because of the unique conditions of the property involved, undue hardship or practical difficulty to the applicant would result, as distinguished from mere inconvenience, if the strict letter of the rules were applied. Economic considerations alone do not constitute undue hardship or practical difficulty if any reasonable use of the property exists under the terms of the District's rules.

**(c)** The proposed activity for which the variance is sought will not adversely affect the public health, safety or welfare; will not create extraordinary public expense; and will not adversely affect water quality, water control or drainage in the District.

**(d)** The intent of the District's rules is met.

**3.** **PRACTICAL DIFFICULTY DEFINED.** In evaluating practical difficulty, the Board of Managers will consider the following factors:

**(a)** How substantial the variation is from the rule provision;

**(b)** The effect of the variance on government services;

**(c)** Whether the variance will substantially change the character of watershed resources or be a substantial detriment to neighboring properties;

**(d)** Whether the practical difficulty can be alleviated by a technically and economically feasible method other than a variance;

**(e)** How the practical difficulty occurred, including whether the landowner created the need for the variance; and

**(f)** In light of all of the above factors, whether allowing the variance will serve the interests of justice.

**4.** **TERM.** A variance expires on expiration of the CAPROC approval or permit associated with the variance request.

**5.** **VIOLATION.** A violation of any condition set forth in a variance is a violation of the District permit that it accompanies and automatically terminates the variance.

**APPENDIX F**

Subwatershed Data

# Hydrologic Data

| Subwatershed | Area (ac) | % Impervious | Pond Name | Downstream Subwatershed | Outlet Type |
|---|---|---|---|---|---|
| A1 | 118 | 65% | LaBelle Pond | A2 | Weir Structure w/24" BCCMP |
| A2 | 302 | 73% | | A4 | 60" RCP |
| A3 | 122 | 81% | Jackson Pond | A2 | 42" BCCMP & 60" BCCMP |
| A4 | 112 | 81% | | A5 | 54" RCP |
| A5 | 47 | 76% | | A6 | 48" RCP |
| A6 | 401 | 78% | | Fridley | 78" RCP |
| B1 | 14 | 55% | Clover Pond | B2 | 12" RCP w Flared End |
| B2 | 134 | 66% | | B4 | 30" RCP & 42" RCP |
| B3 | 134 | 80% | | B4 | 42" RCP & 42" RCP |
| B4 | 130 | 76% | Sullivan Lake | B5 | Weir Structure w/48" RCP |
| B5 | 64 | 84% | | Fridley | 48" RCP |
| C1 | 197 | 60% | Highland Lake | C2 | Weir structure w/18" RCP |
| C2 | 9 | 53% | Secondary Pond | C3 | 24" RCP w/flared end |
| C3 | 77 | 45% | Tertiary Pond | None | No outlet |
| D1 | 102 | 52% | | Silver Lake | 30" RCP & 21" RCP |
| D2 | 28 | 79% | Hart Lake | D3 | 18" CMP w/apron |
| D3 | 155 | 65% | | Silver Lake | 48" RCP |
| E1 | 55 | 70% | | Minneapolis | 36" RCP |
| E2 | 22 | 64% | | Minneapolis | 12" RCP |
| E3 | 14 | 67% | | Minneapolis | 18" RCP |
| E4 | 9 | 50% | | Minneapolis | 7" RCP |
| F1 | 27 | 86% | | Minneapolis | 30" |
| G1 | 234 | 84% | | Minneapolis | 48" |
| H1 | 90 | 83% | | Fridley | 54" |