SURFACE WATER MANAGEMENT PLAN

July 2018

Prepared for:
City of Mendota Heights
1101 Victoria Curve
Mendota Heights, MN 55118

WSB PROJECT NO. 1735-04

SURFACE WATER MANAGEMENT PLAN

FOR THE

CITY OF MENDOTA HEIGHTS, MINNESOTA

July 2018

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GLOSSARY OF TERMS

DEFINITIONS

100-year Flood: A flood that statistically has a one percent (1%) chance of occurring in any given year.

1-year, 10-year, and 100-year Rainfall: A rainfall event that has a 100 percent, ten percent (10%), and one percent (1%) chance respectively, of happening in any given year.

Alluvial: Made up of the material—such as sand, silt, or clay—deposited on land by streams.

Aquatic Macrophyte: A plant that grows in or near water.

Bounce: The elevation difference between the normal water level (NWL) and the water level after a particular storm event.

Buffer Strip: An area of permanent vegetation that helps to control air, soil, and water quality along with other environmental problems.

Calcareous Seepage Fen: A rare and distinctive wetland characterized by a substrate of non-acidic peat and dependent on a constant supply of cold, oxygen-poor groundwater that is rich in calcium and magnesium bicarbonates. (Source: http://www.bwsr.state.mn.us/wetlands/Calc_fen-factsheet.pdf)

Dredge: Removal of sediments and debris from the bottom of a waterbody.

Environmental Protection Agency (EPA):

Fen: A low and marshy or frequently flooded area of land.

Floatables: Solid water-borne litter and debris, mainly from street litter.

Floodplain: Any land area susceptible to being inundated by floodwaters from any source.

Floodway: The channel of a river or other watercourse and the adjacent land areas that must be reserved to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

Freeboard: The vertical separation between the high water level (HWL) of the simulated rainfall or runoff event and the lowest ground elevation adjacent to a structure.

Hydraulic: Related to the conveyance of liquids through pipes and channels.

Hydrologic: Related to the occurrence, circulation, distribution, and effects of water on the earth's surface, in the soil and underlying rocks, as well as in the atmosphere.

Illicit Discharge: Any direct or indirect non-stormwater discharge to the storm drain system.

Impaired Waters: A body of water that is too polluted or otherwise degraded to meet the water quality standards set by the State of Minnesota.

Infiltration: Wter passing through a substance (generally soil) by filtering or permeating.

Inlet: A place of entry into a waterbody.

Land Locked Basin: Basins where no outlet exists below the proposed or existing structures.

GLOSSARY OF TERMS

Municipal Separate Storm Sewer System (MS4): The system of conveyances (including sidewalks, roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains).

National Pollutant Discharge Elimination System (NPDES) Permit: A permit issued by the EPA that authorizes the discharge of pollutants to waters of the United States, whether the permit is applicable on an individual, group, or general area.

Noxious: Harmful, poisonous, or very unpleasant.

Outfall: A place where a river, drain, or sewer empties.

Overland Drainage: Flow of water over the land, downslope toward a waterbody.

Ponding: The pooling of runoff in flat areas or depressions from which it cannot drain out.

Riprap: Loose stone used to form a foundation for a breakwater or other structure.

Runoff: Precipitation and other surface drainage that is not infiltrated into or otherwise retained by the soil, concrete, asphalt, or other surface upon which it falls.

Skimmers: Structures that confine floatables that may otherwise enter a downstream pond or lake.

Stormwater Pollution Prevention Plan (SWPPP): A document which describes the best management practices and activities to be implemented by a person or business to identify sources of pollution or contamination at a site, and the actions to eliminate or reduce pollutant discharges to stormwater, stormwater conveyance systems, and/or receiving waters to the maximum extent practicable.

Stormwater: Any surface flow, runoff, and drainage consisting entirely of water from any form of natural precipitation.

Surficial Geology: Unconsolidated deposits of variable content and texture that overlie the bedrock surface. Major textural categories include alluvium, terraced sands and gravels, loess, till, and outwash.

Swale: A graded, shallow trench along the land's contour, used to manage stormwater runoff and increase infiltration.

Turbulence: Unsteady movement of air, water, or other fluid.

Watershed: All lands which are enclosed by a continuous hydrologic drainage divide and lay upslope from a specified outlet point.

GLOSSARY OF TERMS

ACRONYMS

BMP – Best Management Practice

BWSR – Board of Water and Soil Resources

cfs – cubic feet per second

CMP – Corrugated Metal Pipe

DNR – Department of Natural Resources

DWSMA - Drinking Water Supply Management Area

EOF – Emergency Overflow

ESC – Erosion and Sediment Control

FEMA – Federal Emergency Management Agency

fps – feet per second

GIS – Geographical Information System

HWL – High Water Level

HSG – Hydrologic Soil Group

ISTS – Individual Sewage Treatment Systems

LGU – Local Governmental Unit

LID – Low Impact Development

LIDAR – Light Detection and Ranging

LMRWD – Lower Minnesota River Watershed District

LMRWMO – Lower Mississippi River Watershed Management Organization

LSWMP – Local Surface Water Management Plan

MDH – Minnesota Department of Health

MIDS – Minimal Impact Design Standards

MLCCS – Minnesota Land Cover Classification System

MnDOT – Minnesota Department of Transportation

MnRAM – Minnesota Routine Assessment Method

MNRRA – Mississippi National River and Recreation Area

MPCA – Minnesota Pollution Control Agency

GLOSSARY OF TERMS

MS4 – Municipal Separate Storm Sewer System

NOAA – National Oceanic Atmospheric Administration

NPDES - National Pollutant Discharge Elimination System

NURP – Nationwide Urban Runoff Program

NWI – National Wetlands Inventory

NWL – Normal Water Level

OHWL – Ordinary High Water Level

P8 – Program for Predicting Polluting Particle Passage through Pits, Puddles, and Ponds

ppb – parts per billion

PWI – Protected Waters Inventory

RCP – Reinforced Concrete Pipe

SWCD – Soil and Water Conservation District

SWMP – Surface Water Management Plan

SWPPP – Stormwater Pollution Prevention Plan

SWU – Stormwater Utility

TCMACMP - Twin Cities Metropolitan Area Chloride Management Plan

TMDL – Total Maximum Daily Load

USACE – US Army Corps of Engineers

USEPA – US Environmental Protection Agency

WCA – Wetland Conservation Act

WHEP – Wetland Health Evaluation Program

WHPP – Wellhead Protection Plan

WMAt – Winter Maintenance Assessment tool

WRMP – Water Resources Management Plan

SECTION 1

1. EXECUTIVE SUMMARY

The purpose of this plan is to describe how the current Surface Water Management Plan when combined with the 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. Purposes

The City of Mendota Heights' Surface Water Management Plan (also referred to as the plan, SWMP, City plan, local plan) is a local management plan that meets the requirements of Minnesota Statutes 103B.235, Minnesota Rules 8410, the Lower Mississippi River Watershed Management Organization Third Generation Watershed Management Plan (dated August 2011, as amended August 2015) and the Lower Minnesota River Watershed District's Third Generation Watershed Management Plan (dated November 2011, as amended June 2015). The purpose of the SWMP is to serve as a guide in conserving, protecting, and managing the City's surface water resources. This plan is an update to the 2006 Local Surface Water Management Plan (LSWMP) and includes updates to the City's HydroCAD Model as well as the incorporation of a P8 Urban Catchment water quality model.

The City submits its SWMP to the Metropolitan Council, the Lower Mississippi River Watershed Management Organization, and the Lower Minnesota River Watershed District for their review. The watershed organizations have 60 days for their review after written receipt of the City SWMP. Metropolitan Council provides comments within 45 days. Metropolitan Council directs its comments to the watershed organizations which then consider these comments in formulating their own.

1.2. Surface Water Management Responsibilities and Related Agreements

The City of Mendota Heights is party to two separate joint powers agreements related to surface water management:

1. With the cities of St. Paul, Lilydale, Mendota, Mendota Heights, Sunfish Lake, West St. Paul, South St. Paul, and Inver Grove Heights establishing the Lower Mississippi River Watershed Management Organization (LMRWMO).
2. With the cities of Bloomington, Burnsville, Carver, Chanhassen, Chaska, Eagan, Eden Prairie, Lilydale, Mendota, Mendota Heights, Minneapolis, Savage, and Shakopee establishing the Lower Minnesota River Watershed District (LMRWD).

The City also has an agreement with both the LMRWMO and LMRWD establishing the City as the Local Government Unit for administering the Wetland Conservation Act (WCA) within the City.

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 LMRWMO and LMRWD do not issue permits, so no impact to these organizations would occur. The watersheds would continue in their role as project review agencies.

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

1.3. Metropolitan Council Requirements

Metropolitan Council's 2040 Water Resources Management 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.

1.4. Plan Structure

The Mendota Heights SWMP is divided into six sections:

- ***Section 1 Executive Summary*** provides background information and summarizes the plan contents.
- ***Section 2 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 Agency Cooperation*** outlines other governmental controls and programs that affect stormwater management.
- ***Section 4 Assessment of Problems and Issues*** presents the City's water management related problems and issues.
- ***Section 5 Goals and Policies*** outlines the City's goals and policies pertaining to water management.
- ***Section 6 Implementation Program*** presents the implementation program for the City, which includes defining responsibilities, prioritizing, and listing the program elements.

1.4.1. Background

This report provides the City of Mendota Heights with a SWMP that serves as a guide to managing the City's surface water system, and brings the City into compliance with Minnesota Statutes. This plan is an update to the 2006 LSWMP. The plan will guide stormwater activities in the City for the next 10 years (2018-2027). Periodic amendment to the SWMP will likely occur in the intervening 10 years so that the SWMP remains current to watershed plan amendments and Metropolitan Council requirements.

The City of Mendota Heights (population 11,172) is located in northern Dakota County at the confluence of the Mississippi and Minnesota Rivers (**Figure 1**). Mendota 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 Township of Mendota was organized in 1858. After World War II, the area experiencing rapid growth and the need for community planning and services prompted a portion of the original township to incorporate as the Village of Mendota Heights in 1956. The Village of Mendota Heights became the City of Mendota Heights in 1974. Mendota Heights is a first-ring suburb located between the City of West St. Paul and Sunfish Lake to the east, Minneapolis – St. Paul International Airport and Fort Snelling to the West, City of Eagan to the south, and City of St. Paul to the north.

Mendota Heights falls within two watershed districts: Lower Mississippi Watershed Management Organization and the Lower Minnesota River Watershed District. This plan addresses the rules and regulations put forth by the both.

The City of Mendota Heights is considered fully developed. **Section 2.3** of this plan discusses land use in the City.

1.4.2. Summary of Implementation Section

Section 6 of this plan presents the implementation program for the City of Mendota Heights, which includes defining responsibilities, prioritizing, and listing the program elements. Table 6.1, outlines the projects, programs, studies, and Storm Water Pollution Prevention Plan (SWPPP) activities that have been identified as a priority to address water resource needs and problem areas within the City**.**

SECTION 2

2. LAND AND WATER RESOURCE INVENTORY

2.1. Land Use

Figure 1 provides the land use classifications for the City of Mendota Heights, and comes directly from the City's 2030 Comprehensive Plan (Comprehensive Plan). The Comprehensive Plan states that the City of Mendota Heights is predominantly developed. However, the City has maintained substantial areas of public open space, wetlands, lakes, bluffs and wooded areas that give the impression of a lower density of development. According to the Comprehensive Plan, the City will strive to maintain and enrich the mature, fully developed residential environment by preserving natural features and the environment while promoting high quality and well-functioning developments.

The Comprehensive Plan provides a significant amount of narrative and statistical detail on existing and proposed land use and the reader is referred to that document for more information on land use planning. There are a few areas of note that relate to surface water management, one of which is the concentrated industrial area between Highway 13, Highway 55, and Interstate 494. Having a concentrated area of impervious area can be opportunity for regional stormwater treatment when new development occurs, but it can also be a potential hotspot for stormwater pollution and management issues.

The Comprehensive Plan references "focus" areas, or areas remaining to be developed. The focus areas in the Comprehensive Plan are Pilot Knob and Acacia Site, Somerset Area, St. Thomas/Visitation Campuses, Dodd/Highway 110, Furlong District, and "Infill" Sites (any property that has the opportunity to develop, or redevelop, beyond its current level). These focus areas have the potential to play an important role in the management of surface water during the next ten years. As the sites develop and potentially impact water quality and public safety, it will be essential that guidelines and best management practices, as outlined in this SWMP, are followed by developers.

The hydrologic modeling that supports the SWMP used the land use that was used in the 2006 Local Surface Water Management Plan hydrologic model. A combination of aerial photos, the land use classification map, and as-built drawings were used to determine hydrologic characteristics of the full development landscape.

Changes from undeveloped land uses—such as natural and agricultural—to more heavily developed land uses —such as low, medium and high density residential and commercial—have a pronounced effect on hydrology. The increased impervious surface associated with the urban land uses leads to higher runoff peak flows and increased runoff volumes. The City is unique in that although it is mostly developed, the land use consists of large areas of institutional land, resulting in less impervious area and more green and open space.

2.2. Topography and Watersheds

The surficial geology of Mendota Heights consists of the glacial and alluvial (outwash) deposits which cover most of the City. Most of Mendota Heights is rolling to hilly terrain interspersed with poorly drained depressions that form many ponds and small lakes. The Comprehensive Plan provides additional detail on the general topography of the City.

The City of Mendota Heights is located near the confluence of the Minnesota and Mississippi Rivers in northern Dakota County. Steep slopes occur along the Minnesota and Mississippi river bluffs along the west and north border of the City. Elevation in the City ranges from approximately 690 feet along the Minnesota River to approximately 1,030 feet along the City's border with West St. Paul. The steep slopes along the river bluffs often result in challenges during hydrologic design and planning to prevent erosion. Additionally, at the bottom of the Minnesota River Bluff adjacent to

Highway 13 is the Gun Club Lake Fen, a calcareous fen with rare and important indicator vegetation for the ecosystem. There has been significant work by LMRWD to improve and protect this resource, which includes special considerations when managing stormwater discharge into the area.

The City's hydrologic system is part of both the Mississippi River and Minnesota River watersheds. The City resides within one watershed management organization and one watershed district. The southwestern portion of the City resides in the LMRWD. The remaining portion of the City lies within the LMRWMO. **Figure 2** shows jurisdictional boundaries for the two watershed organizations within the City.

The City of Mendota Heights has contour data that cover the entire City and is based on 2011 LIDAR (Light Detection and Ranging) data. Information regarding the City's surficial and bedrock geology and aquifers is available in the Dakota County Geologic Atlas from the Minnesota Geological Survey.

2.3. Soils

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

- Kingsley-Mahtomedi Association
- Waukegan-Wadena Hawick Association
- Colo-Algansee-Minneiska Association

Information about each of the soils in these associations area available from the Soil Survey of Dakota County (SCS 1983). **Table 2.1** shows the drainage characteristics of each soil series from the above associations. The drainage nature of the soil is important for determining 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, whereas 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
Kingsley	Deep, well drained	B
Mahtomedi	Deep, excessively drained	A
Waukegan	Deep, well drained	B
Wadena	Deep, well drained	B
Hawick	Deep, excessively drained	A
Colo-Algansee-Minneiska (alluvial soils)	Poor to moderately well drained	B/D

When development or redevelopment occurs within areas of well-drained soils, infiltration shall be considered on a case by case basis. **Section 5.3.2** discusses the City's approach to infiltration.

2.4. Existing Flood Insurance Studies

A search of the Federal Emergency Management Agency (FEMA) website showed no flood insurance studies for the City of Mendota Heights, other than those for the Mississippi and Minnesota Rivers. The Flood Insurance Rate Map for Mendota Heights is effective as of December 2, 2011. Mendota Heights is community number 270110.

2.5. Key Water Resources

Surface waters throughout the City are available for the use and enjoyment of its residents. Many of surface waters that provide an aesthetic amenity to the community also double as a means of access for stormwater to wind its way towards its outfall. These major water resources tend to be State of Minnesota public waters. Below is a brief summary of the major surface water resources. The public waters are labeled with their Public Waters Inventory (PWI) number.

Augusta Lake (PWI #19-81P)
Lake Augusta is a Minnesota Department of Natural Resources (DNR) public water. It is a deep lake with a maximum depth of 33 feet, and an area of 44 acres. The area of its watershed is 410 acres.

LeMay Lake (PWI #19-82W)
This lake is considered a public water wetland by the Minnesota DNR. It is a shallow lake and drains to an outlet under Highway 55. LeMay Lake is next to a residential neighborhood.

Gun Club Lake (PWI #19-78P)
Gun Club Lake and the stream it discharges to are both public waters. The lake is located along the Minnesota River within its floodplain. This lake discharges to an unnamed stream that flows to the Minnesota River, and although it is located in the City, it is managed by Fort Snelling State Park.

Rogers Lake (PWI #19-80P)
A shallow lake with a maximum depth of eight feet, Rogers Lake covers a surface area of approximately 114 acres. It discharges to a storm sewer pipe along Wagon Wheel Trail.

Interstate Valley Creek
This creek is an intermittent stream that begins near the intersection of Highway 110 and Highway 149 (Dodd Road) at the outflow point of Friendly Marsh. The creek flows northward, generally parallels Interstate 35E. Interstate Valley Creek is the single largest watershed within the City of Mendota Heights, and includes areas within the cities of Inver Grove Heights, Sunfish Lake, and West St. Paul.

Ivy Falls Creek
Ivy Falls Creek is an intermittent stream that begins at the Somerset Golf Course. The gradient of the stream is steep, it drops down 180 feet in the 3,000 feet from Dodd Road to Highway 13, including a 50-foot drop at Ivy Falls. The steep gradient has allowed erosion problems to occur. The creek eventually discharges to Pickerel Lake in the City of Lilydale.

Minnesota and Mississippi Rivers
Both of these rivers are Minnesota public waters. Shorelines of both of these rivers are found within city limits, but these shorelines are also in Fort Snelling State Park. The Minnesota and Mississippi River shorelines that are within the City's limits are managed by Fort Snelling State Park and the St. Paul Parks and Recreation Department.

2.5.1. *Impaired Waters*

The MPCA lists the following water bodies located within or near the City as being impaired, meaning that the waters are too polluted or otherwise degraded to meet the water quality standards set by governing bodies:

Table 2.3
Summary of Impaired Water Bodies

Impaired Water Body	Impairment
Minnesota River (ID 07020012-505)	• Turbidity (1996) • Dissolved Oxygen (1998) • Mercury in water column and fish tissue (1998) • Polychlorinated biphenyls (PCB) in fish tissue (1998)
Mississippi River (ID 07010206-509)	• Fecal Coliform (1998) • PCB in fish tissue (2006)
Augusta Lake (ID 19-0081-00)	• Nutrient/eutrophication biological indicators (2010)
Unnamed Creek (ID 07010206-542)	• E.Coli

The locations of these impaired water bodies are shown on the water resource problem areas map (**Figure 3, 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 that can be used to view impaired waters and their updated water quality data, as well as their updated TMDL Plans.

In addition to the water bodies listed above, the City is upstream of other reaches of the Mississippi River. The City may be required to implement the TMDL plans for these water bodies once complete.

2.6. Natural Communities and Rare Species

A Minnesota Land Cover Classification System (MLCCS) search was performed for the areas below the bluffs, where land cover is divided into levels of importance and type. The bluffs themselves are upland areas. **Table 2.2** shows a listing of the land cover types below the bluffs and the area of each type that falls within the Mendota Heights City limits. Of special note is the presence of calcareous seepage fen prairie. The LMRWD and the MLCCS consider calcareous fens to be high priority areas for wetland preservation and restoration.

Table 2.2
MLSS Summary of Areas Below the Bluffs
City of Mendota Heights

Land Cover Description	Total Area (acres)
Oak (forest or woodland) with 11-25% impervious cover	1.9
51% to 75% impervious cover with deciduous trees	18.0
Pavement with 91-100% impervious cover	2.5
Short grasses with sparse tree cover on upland soils	10.2
Short grasses on upland soils	5.5
Oak forest	3.9
Floodplain forest	209.8
Lowland hardwood forest	6.1
Aspen forest - temporarily flooded	1.5
Mixed hardwood swamp - seasonally flooded	7.2

Altered/non-native deciduous woodland	2.8
Altered/non-native dominated temporarily flooded shrubland	0.8
Willow swamp	3.3
Medium-tall grass altered/non-native dominated grassland	12.8
Temporarily flooded altered/non-native dominated grassland	2.0
Calcareous seepage fen prairie subtype	37.0
Mixed emergent marsh - seasonally flooded	62.5
Mixed emergent marsh	106.4
Mixed emergent marsh - intermittently exposed	57.2
Mixed emergent marsh - permanently flooded	22.1
Grassland with sparse deciduous trees - altered/non-native dominated vegetation	3.4
River mud flats	3.6
Slow moving linear open water habitat	139.3
Limnetic open water	145.1
Palustrine open water	41.6

2.6.1. Water Quality Data

Water quality data for the City can be obtained from the MPCA's Environmental Data Access site and up to date information is located on their website. 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 at https://www.pca.state.mn.us/water/water-monitoring-and-reporting.

The LMRWD and LMRWMO also monitor creeks and lakes within Mendota Heights. Citizens can visit the respective websites for the most recent monitoring report.

2.7. Groundwater and Water Supply

Various agencies are responsible for groundwater management and protection. The DNR regulates groundwater usage rate and volume as part of its charge to conserve and use the waters of the state. 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. Many of the agencies charged with regulating water usage are currently involved in assessing and addressing concerns of water usage. When and where feasible, the City of Mendota Heights will work with the associated agencies to be good stewards of water resources. 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 Minnesota DNR, regulates installation of new wells. The MPCA administers and enforces laws relating to pollution of the state's waters, including groundwater. The Minnesota Geological Survey provides a complete account of the state's groundwater resources. Dakota County has statutory responsibilities for groundwater management contained in its Environment and Natural Resource Management Policy Plan (adopted and approved in 2006). Dakota County is currently revising the county comprehensive plan, which is scheduled to be submitted for the Board of Water and Soil Resources (BWSR) approval in 2018.

At this time the City of Mendota Heights is not aware of any Drinking Water Supply Management Areas (DWSMAs) within the City's boundaries. However, parts of the City have been flagged as significantly vulnerable to groundwater contamination. Refer to the Dakota County Comprehensive Plan for the most up to date information on DWSMAs and groundwater status.

2.8. Hydrologic System and Data

The City has been divided into four major watershed areas: Gun Club Lake, Ivy Falls Creek, Mississippi Bluffs, and Interstate Valley Creek. Each of these four watershed areas have HydroCAD models that were updated from the 2006 LSWMP for the 2018 SWMP to include the new NOAA Atlas 14 Precipitation Frequency Estimates. The updated HydroCAD Models were used to develop a P8 Urban Catchment Model. Modeling results and discussion can be found in **Appendix E**, and narrative on the City's Hydrologic System can be found in **Section 4.3.**

2.9. NPDES MS4 Permit

The City is holder of an NPDES MS4 Permit, which includes a SWPPP. The City completed a reauthorization in 2013, that included an evaluation of the City's stormwater system, resulting in a final SWPPP that includes existing and proposed BMPs, responsible persons, measurable goals, and timelines for implementation.

2.10. Water Resource Management Ordinances and Policies

The City Ordinance for Mendota Heights includes *Stormwater Management, Illicit Discharge, .* The City Ordinance can be found online at the City of Mendota Heights website, and includes sections on construction site management stormwater, illicit discharge and storm sewer connection regulations, and post-construction stormwater runoff regulations.

SECTION 3

3. AGENCY COOPERATION

There are several 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 SWMP is in conformance with, but does not restate, all other agency rules that are applicable to water resource management. The following agencies deal with or regulate water resources throughout the City:

- 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 (www.mvp.usace.army.mi)
- Minnesota Department of Agriculture (www.mda.state.mn.us)
- US Fish and Wildlife Service (www.fws.gov)
- Dakota County Soil and Water Conservation District (http://www.dakotaswcd.org/)
- Lower Mississippi River Watershed Management Organization (http://www.dakotaswcd.org/watersheds/lowermisswmo/)
- Lower Minnesota River Watershed District (http://www.watersheddistrict.org/)
- Minnesota Environmental Quality Board (www.eqb.state.mn.us)
- Metropolitan Council (www.metrocouncil.org)

While these other agencies' rules, policies, and guidelines are not all restated in this SWMP, 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 SWMP and can be found at www.pca.state.mn.us/water/stormwater/stormwater-manual.html.

3.1. County, State, and Federal Agency Requirements

This section of the SWMP 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.

3.1.1. Minnesota Department of Natural Resources

Types 3, 4, and 5 wetlands are protected by statute at the state level. 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 are generally those in excess of ten acres in rural areas or in excess of two and a half acres in municipalities and incorporated areas. **Figure 6** shows the DNR protected waters within the Mendota Heights SWMP 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 currently no mechanism 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 western portions of the City abutting the Minnesota River are located in the Mississippi River Critical Area Corridor. According to the DNR:

> The purposes of designating the Mississippi River and this portion of the Minnesota River as a state critical area include the following:
>
> a) protecting and preserving a unique and valuable state and regional resource for the benefit of the health, safety, and welfare of the citizens for the state, region, and nation;
> b) preventing and mitigating irreversible damage to this resource;
> c) preserving and enhancing its natural, aesthetic, cultural, and historical value for public use;
> d) protecting and preserving the river as an essential element in the national, state, and regional transportation, sewer and water, and recreational systems; and protecting and preserving the biological and ecological functions of the corridor.
>
> The DNR has three primary roles for the Mississippi River Critical Area Program. The DNR has undertaken the mandate of reviewing existing ordinances that affect lands within the Mississippi River Critical Area Corridor for their compliance with state critical area standards and guidelines. Technical assistance for ordinance development will be provided to local communities to ensure adoption and approval of a compliant state critical area ordinance or any ordinance amendments. DNR will also provide individualized technical assistance for amending existing ordinances or developing proposed ordinances that will be consistent with the voluntary Mississippi National River and Recreation Area (MNRRA) Comprehensive Management Plan policies.
>
> In addition, adoption or amendment of plans and ordinances affecting lands within the Mississippi River Critical Area Corridor and relating to Executive Order 79-19 purposes and standards are effective only after approval by the DNR. The DNR reviews the plans and ordinances to ensure their consistency with the provisions of Executive Order 79-19, following an evaluation by the Metropolitan Council.
>
> In communities where critical area plans and ordinances have become effective, the local governmental unit also must notify the DNR area hydrologist at least 30 days before action is taken for all development applications or variances requiring a public hearing or discretionary action. In communities where plans and regulations have not been adopted or approved, the DNR is also to be notified about additional types of projects listed in the Interim Regulations. DNR will review and comment on the project's compliance with critical area and state requirements and MNRRA policies, as well as provide technical assistance as requested. Notice of the final action is to be sent to the DNR.
>
> The City of Mendota Heights has adopted appropriate rules and ordinance to serve as the local government unit (LGU) conducting critical area review and implementation. As the Minnesota DNR adopts new rules the City will in turn revise its rules and ordinance to remain the LGU. In cases where a large subdivision of land might occur within the Critical Area, the City would transfer its review authority to the Minnesota DNR.

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 (OHWL).
- Regulation of certified floodplains around rivers, creeks, lakes and wetlands.
- Management of the Flood Hazard Mitigation program.
- Shoreland Management.

3.1.2. US Army Corps of Engineer (USACE)

The Environmental Protection Agency (EPA) and the USACE regulate the placement of fill into all wetlands of the U.S. In 1993, the definition of "discharge of dredged material" was modified 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.

3.1.3. Board of Water and Soil Resources (BWSR)

The local and regional wetland rules are governed by the WCA. The WCA, passed in 1991, extends protection to all wetlands unless they fall under one of the exemptions. 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 two acres created for every one acre filled for wetland impacts.

A designated LGU is responsible for making exemption and no-loss determinations as well as approving replacement plans. Currently, Mendota Heights acts as the LGU for the WCA within the City's subdivision authority.

The powers and duties of BWSR 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.

3.1.4. 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 MPCA and its commissioner include:

- Fulfilling mandates from the EPA, particularly in regard to the Clean Water Act.
- Administration of Mendota 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).

3.1.5. Environmental Protection Agency (EPA)

As it relates to surface water management within Mendota Heights, the EPA 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.

3.1.6. Lower Minnesota River Watershed District (LMRWD) and Lower Mississippi River Watershed Management Organization (LMRWMO)

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.

3.1.7. 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 the BWSR regulate wetlands as defined by a jurisdictional delineation.

For wetlands that fall under the Minnesota DNR jurisdiction, the OHWL determines the boundary of the Minnesota DNR's jurisdiction. The OHWL is established by the DNR.

3.1.8. Dakota County

Dakota County Soil and Water Conservation District (SWCD) sits on the Technical Evaluation Panel for administration of the WCA.

3.1.9. 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 and have a prominent role in the Mississippi River Critical Area Corridor as described on the DNR website:

> "The Metropolitan Council reviews existing plans that affect lands within the Mississippi River Critical Area Corridor. Technical assistance is provided to assist communities in amending or adopting plans to become consistent with Executive Order 79-19 standards and guidelines and any voluntary MNRRA Comprehensive Management Plan policies. The council reviews all critical area plans and ordinances and makes an evaluation to DNR prior to the approval decision. In addition, the council administers the pass-through funds from the National Park Service to provide financial assistance to communities wishing to revise their plans and ordinances. The council is also involved with oversight of the Metropolitan Land Planning Act."

SECTION 4

4. ASSESSMENT OF ISSUES

Section 4 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 SWMP 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 in **Section 6**. Refer to **Figure 5** for the location of many of the issues discussed below.

4.1. Water Quality Assessments

4.1.1. City Assessment

The City investigated the location of stormwater discharge into a fen that is located near the southwest part of the City. The assumption was that the stormwater was discharging to the Fort Snelling State Park Fen, which is a Restricted Discharge Water under the City's National Pollutant Discharge Elimination System (NPDES) permit. But the investigation determined that the stormwater discharge flowed to the Gun Club Lake Fen, which is not a Restricted Discharge Water.

The City prepared a self-assessment as part of developing its SWPPP. In that self-assessment, a list of potential sources or types of pollution was developed. The City does not know of a particular source or type of pollution that is prevalent within the City. Although it is not a list of actual pollution occurrences, the list repeated below does provide information for consideration and management..

- At Ivy Park Pond, there appears to be a problem where skimmers are collecting excessive floatables. A significant portion of stormwater entering the pond comes from West St. Paul. Increased maintenance attention is paid to this location.
- Lawn and landscape fertilizers are a potential source of pollution. The City purchases and uses only phosphorous-free products. The application of fertilizers containing phosphorus is currently prohibited by state law unless the results of a soil test show that phosphorus is indeed the limiting nutrient for turf growth.
- A typical salt is used on the streets. The City recognizes chloride pollution as a water quality issue, and is looking at alternative deicing products to reduce salt and sediment in stormwater and reduce street sweeping costs. Additionally, the City is looking to incorporate the Twin Cities Metropolitan Area Chloride Management Plan to reduce salt use during winter applications.
- Emergency fuel dumping from aircraft flying into the Minneapolis-St. Paul International airport is a potential source of pollution. In the past, citizens have reported strong jet fuel odors believed to be from fuel dumping. Fuel dumping is not known to be a frequent problem.
- Pet waste is recognized as a nuisance and a pollution source. Signs in parks instruct pet owners to clean up after their pets, as required by ordinance. Waste from geese is considered a serious problem. Geese use the City's lakes and ponds throughout the year.
- Failing septic systems are a potential source of pollution, although not currently perceived to be a problem. Approximately 40 septic systems exist in the City. City ordinance requires inspections of the systems. The Mendota Heights ordinance that regulates septic systems is identical to that of Dakota County and meets all Metropolitan Council and MPCA requirements.
- Soil erosion along the bluffs and at construction sites is a potential source of pollution. The storm sewer system contains some hanging outfalls, and there is scour around some outfalls.

4.1.2. 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 after being added to the list, 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 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 US Environmental Protection Agency (USEPA). In Minnesota, the USEPA delegates much of the program responsibility to the 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 Mendota Heights and TMDL's can be found at the following web address:
https://www.pca.state.mn.us/water/impaired-waters-viewer-iwav

Table 4.1 Lists the 303(d) impaired waters within the City of Mendota Heights

Table 4.1
303(d) 2016 Final List of Impaired Waters
Within the City of Mendota Heights

Water Body	**Year First Listed**	**Assessment Unit ID #**	**Affected Use**	**Pollutant or Stressor**	TMDL start/TMDL complete
Minnesota River	1998	07020012-505	Aquatic life	Dissolved oxygen	2004*/-
Minnesota River	1998	07020012-505	Aquatic consumption	Mercury in water column	2008*/-
Minnesota River	1998	07020012-505	Aquatic consumption	Mercury in fish tissue	2008*/-
Minnesota River	1998	07020012-505	Aquatic consumption	PCB in fish tissue	1998/2025
Minnesota River	1996	07020012-505	Aquatic life	Turbidity	2014/2019
Augusta Lake	2010	07010206-506	Aquatic Recreation	Nutrient/Eutrophication Biological Indicators	2010/2014

**TMDL Plan has been approved but has not been started.*

Upstream from the Mendota Heights city limits, the Mississippi River is also listed as impaired (assessment unit ID 07010206-509). This listing could potentially affect management of drainage that directly discharges to the river. The river's affected uses are aquatic consumption and aquatic recreation. The pollutants or stressors that have been identified as causing these impairments are:

- Mercury in fish tissue
- PCB in fish tissue
- Fecal Coliform

The absence of a waterbody from the 303(d) list does not necessarily mean the waterbody is meeting its designated uses. It may be that it has either not been sampled or there is not enough data to make an impairment determination. Additionally, where mercury is identified as a stressor, the TMDL approach will be regional in nature as mercury is most commonly an air-borne pollutant.

City of Mendota Heights Actions: It remains to be seen how the TMDL issues will be resolved for the Minnesota River and the Mississippi River. Each river's basin encompasses a significant portion of the state of Minnesota. It remains to be seen whether the TMDLs for the rivers will be implemented basin-wide or along specific reaches

4.1.3. Lower Mississippi River Watershed Management Organization (LMRWMO)

The LMRWMO has assessed the water quality of select lakes and ponds within its jurisdiction. It was noted in the LMRWMO Watershed Management Plan (WMP) that, generally, additional water quality data needs to be collected. The LMRWMO WMP noted that water quality assessments should be performed on Roger's Lake in Mendota Heights. According to the WMP, this lake formerly supported a public swimming beach and is popular among local residents for panfish fishing. Water quality monitoring data should be collected to classify the lake and watch trends. Interstate Valley Creek and Augusta Lake are also noted as a resource of concern for water quality problems.

In 2014, LMRWMO completed a Watershed Restoration and Protection Strategy (WRAPS) Report that includes water quality data for Lake Augusta and Rogers Lake, a TMDL for Lake Augusta. The WRAPS Report can be found at LMRWMO's website.

4.1.4. Lower Minnesota River Watershed District (LMRWD)

Within the LMRWD's WMP, there is an emphasis on assessing water quality within the Minnesota River. Water quality assessment data is available for the Minnesota River and many of its tributary streams within the WMP.

4.2. Water Quantity Assessments

4.2.1. City Assessments

Since the City prepared its 2006 Water Resources Management Plan (WRMP), no new water quantity assessments have been conducted. This does not mean that the City has not been addressing new water quantity issues, only that these have not been significant enough in scope to warrant mention in this SWMP.

4.2.2. Lower Mississippi River Watershed Management Organization (LMRWMO)

In its WMP, the LMRWMO assessed intercommunity surface water management issues that the watershed should resolve. In addition, the LMRWMO Plan requires that member cities prioritize shoreland areas for restoration. Item 4 in Table 6.1 shows that the City plans to allocate funds to address issues of shoreland erosion along Interstate Valley Creek, the priority area, for bank stabilization projects. **Table 4.2** summarizes these issues, which are related to flooding and erosion.

Table 4.2
Erosion and Flooding Issues Related to the City of Mendota Heights

Name	Location	Issue	Status
Interstate Valley Creek Watershed	Interstate Valley Creek north of Marie Avenue. Watershed includes Inver Grove Heights, Sunfish Lake, Mendota Heights, and West St. Paul	Erosion	Ongoing issue which has been addressed in some select locations. Additional stream bank stabilization projects will likely be needed.

4.2.3. Lower Minnesota River Watershed District (LMRWD)

Figure 5 shows the Mendota Heights drainage system in some detail. One of the primary discharges from this system occurs through a 54-inch pipe into the Minnesota Department of Transportation (MnDOT) system adjacent to and under Trunk Highway 13. The highway system carries MnDOT and Mendota Heights runoff water into the Quarry Island fen, as indicated by the flow arrows on **Figure 5**. The Quarry Island fen lies within the jurisdiction of the LMRWD and the district is considering whether to pursue a detailed assessment and monitoring program for this fen. Regardless of what the watershed does toward studying the area, it is highly likely that the LMRWD and DNR will pursue a project to reroute this drainage around the fen and into Gun Club Lake. The City and MnDOT are likely to be financial participants in this project when it becomes a reality. The City's share of the project cost could be substantial. Given this, the implementation section of this SWMP includes an item for the Quarry Island fen storm drainage project with an unknown date for implementation

4.3. System Description

This subsection describes the surface water management system for the City of Mendota Heights. The SWMP area was organized into four major topographic watersheds:

- Interstate Valley Creek Watershed
- Ivy Falls Creek Watershed
- Mississippi River Bluffs Watershed
- Gun Club Lake Watershed

The Interstate Valley, Ivy Falls Creek, Mississippi River Bluff, and Gun Club Lake topographic watersheds generally lie within the LMRWMO jurisdiction.

Each major watershed was divided into drainage districts. The drainage districts are generally drawn to encompass all drainage to a particular pond, wetland, or lake. The City's 1993 Plan identified 14 major drainage districts. To simplify the modeling nomenclature and allow easier cross referencing between the model and **Figure 5**, drainage districts within this SWMP carry the

suffix of one of the four major topographic watersheds. **Table 4.3** provides a summary of the cross references between the 1993 Plan's districts and the major watershed suffix used in this SWMP.

Table 4.3
Drainage Districts and
Areas within the City of Mendota Heights

Drainage District	Abbreviation	Acres
Rogers Lake	IV	475
Southeast	IV	506
Friendly Marsh	IV	654
East Marie	IV	331
West Marie	IV	209
Lower Interstate Valley	IV	829
Ivy Falls Creek	IF	434
East Highway 13	MB	35
Central Highway 13	MB	121
West Highway 13	MB	228
Augusta Lake	GC	442
Minnesota River Bluffs	GC	176
Industrial Park	IP	473
I-494	GC	285
Highway 110	MB	206
South Highway 13	GC	131

The following sections describe each drainage district in detail. **Figure 5** in **Appendix A** includes areas for the subwatersheds within each major watershed. **Appendix E** includes the pond data.

4.3.1. Interstate Valley Creek Watershed (IV)

The Interstate Valley Creek Watershed consists of all areas that drain to the point where Trunk Highway (TH) 13 crosses Interstate Valley Creek. The watershed's total area is approximately 4,224 acres, of which 3,004 acres are in Mendota Heights, 414 acres are in West St. Paul, 676 acres are in the City of Sunfish Lake (including the 234-acre Sunfish Lake Watershed, which is landlocked), and 130 acres are in Inver Grove Heights.

Interstate Valley Creek is an intermittent stream that begins near the intersection of TH 110 and TH 149 (Dodd Road) at the outflow point of a large wetland (Friendly Marsh). The creek flows northward under TH 110 through a 72-inch reinforced concrete pipe (RCP) culvert. From TH 110 the creek flows 1.9 miles through Valley Park before discharging to the Mississippi River. The creek flows through culverts at Marie Avenue, at a bicycle path crossing downstream of Marie Avenue, and at Lilydale Road.

Because of its relatively large size, the portion of the Interstate Valley Creek Watershed within Mendota Heights is divided into six drainage districts.

Rogers Lake Drainage Subwatershed

The Rogers Lake Drainage Subwatershed is nearly fully developed. This district consists of Rogers Lake and the area that drains to the lake. Rogers Lake is the district's major hydrologic feature. The lake consists of two basins which are divided by Wagon Wheel Trail. A 73-inch span arch pipe culvert connects the two basins. The outlet of Rogers Lake is via a 30-inch RCP that connects to a storm sewer system that discharges to the Friendly Marsh District, as shown on **Figure 5**.

West of I-35E, the land use is predominantly single-family residential, while east of I-35E a large part of the upland in this area consists of the Mendakota Country Club golf course. Single-family homes and schools exist in the district south and east of Rogers Lake. A small area south of the lake and adjacent to I-35E is undeveloped but planned as office/industrial land use.

Southeast Drainage Subwatershed

The Southeast Drainage Subwatershed mostly consists of single-family homes. Within Sunfish Lake and Inver Grove Heights, 693 acres are tributary to the Southeast Drainage Subwatershed though 234 acres of this tributary area is actually landlocked by Sunfish Lake. This drainage flows from the City of Sunfish Lake into the Southeast Drainage Subwatershed through two separate culverts under County Road 63 (Delaware Avenue). Drainage from this district flows to the Friendly Marsh Drainage Subwatershed.

Friendly Marsh Drainage Subwatershed

The Friendly Marsh Drainage Subwatershed is generally located south of TH 110 and west of Delaware Avenue. Open space is a significant land use in this district due to the presence of the Dodge Nature Center. Single-family residential is the other predominant land use. This district receives drainage from approximately 301 acres in the cities of Sunfish Lake and West St. Paul via two culverts under Delaware Avenue. Water from the Rogers Lake and the Southeast Drainage Subwatershed also discharges into the Friendly Marsh Drainage Subwatershed. The subwatershed discharges to the Lower Interstate Valley Drainage Subwatershed. Friendly Marsh is a ditched wetland that serves as the headwaters to Interstate Valley Creek.

West Marie Avenue Drainage Subwatershed

This watershed is located along Marie Avenue, generally west of I-35E. The predominant land use is single- and multiple-family residential. This watershed discharges to the Lower Interstate Valley Drainage Subwatershed.

East Marie Avenue Drainage Subwatershed

The East Marie Avenue Drainage Subwatershed is located along Marie Avenue east of Interstate Valley Creek. Marie Creek flows through this district. The predominant land use is single-family residential. Drainage from approximately 169 acres in West St. Paul is tributary to this drainage subwatershed. The stormwater runoff from the East Marie Avenue Drainage Subwatershed discharges to the Lower Interstate Valley Drainage Subwatershed.

Lower Interstate Valley Drainage Subwatershed

Significant open areas exist along Interstate Valley Creek and at two golf courses located in this subwatershed. Drainage from 57 acres in West St. Paul enters this subwatershed as well as from the Friendly Marsh, West Marie Avenue, and East Marie Avenue Drainage Subwatersheds. The predominant drainage feature in this district is Interstate Valley Creek, which runs northward adjacent to I-35E. Interstate Valley Creek discharges to the City of Lilydale and then to the Mississippi River.

4.3.2. Ivy Falls Creek Watershed (IF)

The Ivy Falls Creek Watershed resides within the cities of Mendota Heights and West St. Paul. The City of West Paul has approximately 274 acres tributary to Ivy Falls Creek. The

predominant land use is single-family residential. The northern portion of the Somerset Country Club golf course lies in this watershed.

Ivy Falls Creek is an intermittent stream that begins in Somerset Golf Course. The streambed drops approximately 180 feet along its 3,000-foot length from Dodd Road to TH 13, including a 50-foot drop at Ivy Falls. Because of this steep gradient, erosion has occurred along the creek.

4.3.3. Mississippi River Bluffs Watershed (MB)

This watershed consists of the various small drainage routes along the Mississippi River bluffs. These drainage routes discharge water to culverts under TH 13 to the City of Lilydale. Areas that drain to either Interstate Valley Creek or to Ivy Falls Creek are not included in this watershed. The drainages in this watershed have similar features; they all include a small area above the bluffs which then drains down the bluffs to ditches and culverts along TH 13. Because of the steep slopes in this watershed, the water flows quickly and erosion and flooding problems exist in some of these drainage routes. The watershed is divided into four drainage subwatersheds.

West Highway 13 Drainage Subwatershed

The West Highway 13 Drainage Subwatershed runs along the south side of TH 13 from the City of Mendota Heights border with the City of Mendota east to I-35E. The drainage discharges through six culverts beneath TH 13 to Lilydale. Approximately 20 acres of this drainage subwatershed are in Lilydale.

Central Highway 13 Drainage Subwatershed

The Central Highway 13 Drainage Subwatershed is located between the Ivy Falls Creek and Interstate Valley Creek watersheds, south of TH 13. Discharge from this subwatershed occurs through two culverts beneath TH 13.

East Highway 13 Drainage Subwatershed

The East Highway 13 Drainage Subwatershed is located at the northern tip of Mendota Heights. Approximately 25 acres of West St. Paul is tributary to the district. The drainage from this subwatershed discharges to Lilydale through an 18-inch culvert under TH 13.

Highway 110 Drainage Subwatershed

The Highway 110 Drainage Subwatershed drains through a series of ditches and ponds before discharging to the Mississippi River via a culvert that passes through the City of Mendota. The eastern extent of this drainage subwatershed is approximately at the intersection of Highway 110 and Victoria Road.

4.3.4. Gun Club Lake Watershed (GC)

This watershed is in the west part of the City and includes all of the area in Mendota Heights that is within the LMRWMO and part of the area which is within the LMRWD. This watershed has five drainage subwatersheds.

Lake Augusta Drainage Subwatershed

This subwatershed consists of land that drains to Lake Augusta. Open space is the predominant land use because of the presence of Resurrection Cemetery. Industrial/office and single-family land uses are also present. Lake Augusta is landlocked, so no surface discharge occurs from the lake. Mendota Heights and the LMRWMO will work toward determining whether an outlet to Lake Augusta is necessary

Industrial Park Drainage Subwatershed

Most of the Industrial Park Drainage Subwatershed is zoned for industrial/office land use. The 30-acre Lake LeMay is the subwatershed's only major water body and is located in the northwest portion. Lake LeMay discharges to the Industrial Park storm sewer system via a 30-inch pipe that crosses under Highway 55. The outlet pipe is designed such that when water levels in Lake LeMay are below the normal water level (NWL), runoff collected by the 30-inch outlet pipe flows to Lake LeMay and not to the Industrial Park. When water levels are above the NWL, flows are routed to the Industrial Park.

The water from the drainage subwatersheds discharges through a 54-inch storm sewer to an open channel in a ditch. The ditch drains to a 66-inch culvert under TH 13 where it again flows in an open channel, and ultimately discharges to Gun Club Lake. With the exception of Lake LeMay, little stormwater storage is available in the Industrial Park Drainage Subwatershed.

Interstate 494 Drainage Subwatershed

This subwatershed district is the stretch of I-35E south of Wagon Wheel Trail. The major land use in the subwatershed is industrial/office. The runoff from this drainage subwatershed flows to the I-494 drainage system that ultimately discharges to the Minnesota River.

Minnesota River Bluff Drainage Subwatershed

This subwatershed consists of land with several drainage routes that discharge into the Minnesota River. All surface drainage in this subwatershed discharges to culverts under the Chicago and North Western Transportation Company railroad tracks. There are approximately 22 culverts under the 1.5 miles of railroad track bordering the subwatershed. Land use in this drainage subwatershed includes open space within Fort Snelling State Park, wooded bluff slope, industrial/office, highway, cemetery, and single-family residential.

South Highway 13 Drainage Subwatershed

This subwatershed is generally located along TH 13 and Highway 55, between the Minnesota River Bluff and Industrial Park Drainage Subwatersheds. This subwatershed combines its discharge flow with flows from the Industrial Park Drainage Subwatershed at the MnDOT pond located near the intersection of TH 13 and I-494. The discharge ultimately flows to Gun Club Lake.

4.4. Hydrologic Modeling Discussion

There was a modeling effort completed for the 2006 LSWMP that consisted of converting the 1993 WRMP model to the more user friendly HydroCAD modeling software, and to update the model to current conditions of the City.

The 2006 HydroCAD model was updated for this 2018 SWMP to accommodate for the new National Oceanic and Atmospheric Administration (NOAA) Atlas 14 Precipitation Frequency Estimates by defining additional stage/area and overflow routes so that the 100-year Atlas 14 rainfall can be run within the model without exceeding defined storage or outlets. **Table 4.3** shows the Atlas 14 rainfall depths that shall be used for project reviews and stormwater design. Additionally, drainage areas and land use descriptions were reviewed and corrected when discrepancies appeared. The updated hydrologic model is summarized in **Appendix E**. HydroCAD stormwater runoff hydrographs are calculated in accordance with SCS TR-20 methodology. Hydrograph routing through channels and detention basins is performed using the Dynamic-Storage-Indication method. For compliance with the MS4 permit, the City is required to develop a method to ensure that its water quality ponds function according to design. A P8 Urban Catchment Model was created and the results can be found in **Appendix E**.

Table 4.3
Atlas 14 Rainfall Depths

Storm Event	Rainfall Depth (Inches)
2-year, 24-hour	2.81
10-year, 24-hour	4.19
100-year, 24-hour	7.47

SECTION 5

5. GOALS AND POLICIES

5.1. Purpose

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

The goals of Mendota Heights' SWMP are consistent with the goals of the LMRWMO and the LMRWD, while addressing the more specific and changing needs of the City. This plan is an update to the 2006 Water 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 LMRWMO, LMRWD, 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 SWPPP to effectively manage its stormwater system and be in conformance with the NPDES MS4 Program. Refer to **Appendix B** for the most recent version of the City SWPPP.

5.2. Background

The City completed its first comprehensive plan in 1960. The City has most recently updated its comprehensive plan in 2010 with its 2030 Comprehensive Plan. The 2030 Comprehensive Plan reiterated the goals of the previous plan, while also strengthening the City's traditions and development philosophy. Open spaces and parks are deeply ingrained in the City of Mendota Heights and its comprehensive plan, and surface waters play a large role in many of those assets.

Specific to the goals and policies of this SWMP is the following policy statement from the 2030 Comprehensive Plan:

> *"Work with local and regional partners to conserve, protect and enhance the region's vital natural resources."*

The 2018 Mendota Heights SWMP expands upon the goals and objectives provided in the 2030 Comprehensive Plan, the 2006 LSWMP, and the updated Third Generation LMRWD and LMRWMO Water Management Plan.

5.3. City of Mendota Heights SWMP Goals and Policies

5.3.1. *Water Quantity*

5.3.1.1. Goal

Prevent flooding from surface flows while reducing, to the greatest extent practicable, the public capital expenditures necessary to control excessive volumes and rates of runoff.

5.3.1.2. Policies

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

2. Trunk storm sewers shall be designed with capacity for 100-year ponded outflows plus 10-year directly connected flows.

3. In addition to the 10-year and 100-year ponded flow primary capacity, the conveyance system shall provide capacity in excess of the 100-year event in the form of overland overflow routes or adequate surface storage volume. This surface storage volume consists of storage in street low points, within ditches, or in other transient ponding areas.

4. Proposed runoff from development and redevelopment projects shall meet or decrease peak discharge rates for the 10-year and 100-year storm events. Additionally, capacity of downstream drainage systems must be considered, and shall not exceed existing capacities.

5. 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.

6. 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, 7.2-inch 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, the Midwest and Southeast 3 (MSE3) distribution, published by the Natural Resources Conservation Service, is recommended. For shorter duration critical events, other distributions may be used with the approval of the City Engineer.

Regarding Water Quantity policies 1, 2, 3, 4, and 5—for systems designed and implemented prior to the 1993 WRMP, conveyance capacity and storage requirements may not meet these requirements. These policy statements in no way imply that the City intends to unilaterally upgrade these systems.

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

8. The amount of impervious surface increase on projects shall be reduced to the greatest extent possible for development and redevelopment projects in accordance with Low Impact Development (LID) techniques. A narrative shall be provided that addresses the consideration of LID techniques in development and redevelopment impervious surface design.

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

    a) All drainage studies or feasibility studies, whether by a watershed organization 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 watershed organization.

10. 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 shorelines subject to slope failure and shoreline damage should not be in contact with floodwaters for extended periods of time.

    b) The capacity of proposed outlets to formerly landlocked basins should not be so small as to cause extended duration of High Water Levels (HWLs) that would result 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 or the right to augmented storage within the basin has been secured through purchase or easement, except in cases where adverse impacts to vegetation would occur. 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, or property values.

    d) Critical event analysis of landlocked basins shall include the 10-day, 7.2-inch runoff event and back to back 24-hour, 100-year events.

11. 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, a 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.

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

13. Adjacent to channels, creeks, and ravines freeboard will also be two feet from the 100-year critical event elevation.

14. Work with the DNR and watershed organizations on cooperative and collaborative projects in the public lands below the river bluffs.

Discussion: This policy is essentially a blanket policy covering the many subject areas for which goals have been developed. The City of Mendota Heights understands that its drainage system has the potential to damage ecologically sensitive areas below the bluffs in Fort Snelling State Park. The City envisions the State or watershed organizations as the lead on such projects.

15. New storm sewers and open channels shall be designed using a technical method approved by the MPCA Stormwater Manual such as the Rational Method or HydroCAD . Runoff Coefficient "C" shall be in accordance with the guidelines provided in the MnDOT's Drainage Manual.

16. A hydrograph method based on sound hydrologic theory shall be used to analyze runoff rates and high water levels for proposed development and redevelopment projects.

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

18. 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, and tree trenches. Additionally, drainage and utility easements shall be dedicated for redeveloped stormwater management features and existing stormwater management features on redevelopment sites.

Refer to the most up to date LMRWD and LMRWMO Rules on their websites.

5.3.2. *Water Quality*

5.3.2.1. Goal

Work with LMRWMO, LMRWD, and neighboring communities to maintain and/or enhance the water quality of Mendota Heights' lakes, wetlands, streams, and other water resources.

5.3.2.2. Policies

1. Given that the soils underlying the City have higher than typical infiltration capacity, infiltration is the preferred means of protecting water quality. Mendota Heights requires that stormwater infiltration facilities include sufficient water quality pretreatment (to NPDES and watershed standards) to preserve the function of these facilities. Wellhead protection areas must also be reviewed when considering infiltration.

2. Apply the MPCA's Minimal Impact Design Standards (MIDS) to new developments within the City.

    a) All new developments that create new impervious surfaces shall endeavor to retain 1.1 inches of runoff from the net increase of impervious area. The City of Mendota Heights recommends consideration of the Flexible Treatment Options Approach through MIDS. However, the City does not adopt MIDS. As an MS4, the City of Mendota Heights is required to achieve no net increase in loadings for TSS, TP, and water volume as a result of development and redevelopment activities. The City does not believe it can uniformly expect these results on individual developments and would rather manage this responsibility across the entirety of the MS4 and not on an individual

development basis. This is why practical implementation and not adoption of MIDS is preferred.

b) If a development or redevelopment site exceeds 1 acre of disturbance and is not able to retain 1.1 inches of runoff, they shall be required to meet a 50% phosphorus reduction based on existing conditions.

3. Utilize, where feasible and possible, regional stormwater detention facilities to enhance water quality by removing sediment and nutrients from runoff.

4. Support water quality monitoring efforts being undertaken by the LMRWMO and LMRWD.

5. Wherever practical, new water quality ponds will be designed and constructed to provide a water quality treatment volume equivalent to the runoff from a 2.5-inch rainfall event, or the requirements of the NPDES construction site permit, whichever leads to higher treatment capacity. In some cases, other BMPs will be used in conjunction with water quality ponds. In such cases performance of the water quality system shall be no less than the performance of a single pond designed under the 2.5-inch criterion.

6. 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.

7. Outlet skimming will be required in all ponds. Skimming shall occur for up to the 5-year, 24-hour event.

8. Utilize the MPCA's Twin Cities Metropolitan Area Chloride Management Plan to reduce chloride pollution by effectively managing salt use.

Refer to LMRWD and LMRWMO Rules on the watersheds' websites for the most up to date version.

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 of 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 inlets and outlets for aesthetics.

3. Mendota Heights shall seek to coordinate with the 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 DNR comments on development proposals adjacent to DNR public waters and public water wetlands. As part of its implementation plan the City will adopt a shoreland protection ordinance.

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

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 water resources.

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

   - Raise awareness of the problem and solutions
   - Promote community ownership of the all surface water features
   - Recognize responsible parties and actions to date
   - 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.

4. Report progress of meeting SWMP goals to LMRWMO and LMRWD annually.

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 (WHPPs) identify areas of groundwater recharge that require protection, the City shall work with the MDH and neighboring communities in developing adequate protection measures

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 Mendota Heights obtains its potable water from the St. Paul Water Utility. The neighboring communities of Eagan and Inver Grove Heights have separate municipal water systems, but neither community has identified a 10-year well capture zone that overlaps into Mendota Heights. Inver Grove Heights has yet to prepare a WHPP so it remains to be seen whether Mendota Heights will be affected by a 10-year capture zone for Inver Grove Heights' wells. Since Mendota 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 Mendota 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 of the WCA.

5.3.6.2. Policies

1. Act as the local government unit responsible for enforcing the WCA enacted in1991.

2. Discourage wetland disturbance. Wetlands must not be drained or filled, wholly or partially, unless replaced by restoring or creating wetland areas of equal public value, as permitted by the WCA.

3. Up to one-half acre of "debit" wetland (filled or drained) will be allowed to be replaced through wetland "credit" in a bank which is located outside of Mendota Heights' city limits, but State and County governments are exempt from this policy (M.S. 103G.222 (e)).

4. Restrict clearing and grading 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.

5. Require that a wetland assessment 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.

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

7. Require an average 15-foot buffer of natural vegetation above the 100-year HWL or NWL around lakes, streams and wetlands.

Refer to LMRWMO and LMRWD Rules and Standards on their websites for Wetland Management Policies within the City. The 2006 LSWMP included a Wetland Management Plan. The Wetland Management Plan was not updated as a part of this SWMP, but the 2006 version can be found in **Appendix F**.

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 control the erosion from drainage ways within the City.

5.3.7.2. Policies

The City's Stormwater Management, Illicit Discharge, Soil Erosion and Sedimentation Ordinance includes temporary and permanent erosion and sediment control standards 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.

Note: Title 12, Chapter 1, Article D, Section 11 (12-1D-11) of the Mendota Heights City Code defines permitted uses within Floodway and Floodplain Districts. Chapter 2 controls development adjacent to wetlands lakes and channels that are not a FEMA-designated floodplain or floodway. Additionally, the City will be preparing a shoreland ordinance, similar to the Minnesota DNR model ordinance that will further define limitations to development along shoreland and non-federally regulated floodplain areas.

5.3.9. *Mendota 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. Policies

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

2. The City will actively inspect and properly operate, maintain, and repair its stormwater 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 outlines the frequency of these activities. 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. *Financial Management*

5.3.10.1. Goal

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

5.3.10.2. Policies

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

   - Meet the requirements of its NPDES permit.
   - Provide for the maintenance of ponds and outfall structures.
   - Conduct repairs to the system.
   - Update its system planning efforts.
   - Implement rainwater gardens or other water quality retrofits.

2. Use other funding sources including land sale proceeds, partner with watershed organizations, State Aid funds, grants, among other things to pay for the implementation activities, when available and appropriate.

5.3.11. *Individual Sewage Treatment Systems (ISTS)*

5.3.11.1. Goal
Ensure that ISTS that remain in the City do not constitute an environmental hazard.

5.3.11.2. Policy
Where ISTS are known to be failing and pose an imminent environmental hazard, the City will take the necessary steps to see that these systems are repaired or eliminated.

Background: Within Mendota Heights are approximately 40 ISTS. The City has an ISTS ordinance equivalent to that of Dakota County whereby property owners provide pump and inspection records to the City.

SECTION 6

6. IMPLEMENTATION PROGRAM

6.1. General

The Implementation Plan section of the Mendota Heights SWMP describes those activities and programs the City might develop to improve its surface water management program. Since Mendota Heights is largely developed, capital outlay for the trunk sewer system has already occurred so future outlay will be for upgrades and replacement. Typically, costs for upgrade and replacement would be borne by either the stormwater utility fund or would be recovered through direct assessment. Given this, a typical financing mechanism developed in most SWMPs, an area charge, is not a part of the Mendota Heights SWMP.

Table 6.1 contains a comprehensive list of the MS4 activities and projects, programs, and studies that make up the City of Mendota Heights implementation program for the next seven years (2017-2023). 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 a yearly basis.

This section 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. 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 Mendota Heights.

6.3. Operation and Maintenance

6.3.1. *Activities*

A stormwater system is a major investment for the City of Mendota Heights—both in terms of initial capital cost and in terms of ongoing maintenance costs—with meeting ongoing maintenance costs being the City's current challenge. Typically, system maintenance is funded by the City's stormwater utility and through the general fund.

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 brings more ponds (and other BMPs) into the system, the City 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 storm water utility.

The management of stormwater ponds is facilitated by creation of a geographical information system (GIS) database for all stormwater system infrastructure. The City is continuing to map its system in this software by providing data for all pipes 12 inches and larger, most private and government pipes, and pond numbering. This move to GIS to track stormwater system infrastructure represents a strong step toward an interactive mapping system. Ultimately, via its stormwater management database the City could reference its maintenance records, videotapes, and maintenance costs for the stormwater system using interactive mapping. The City's NPDES permit calls for an incremental approach to mapping the existing storm sewer system.

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

Basin Outlets

A key issue with stormwater basins is ensuring that the outlets perform at design capacity. Inspection and maintenance of basin outlets address the following:

- The area around outlets is kept free and clear of debris, litter, and heavy vegetation.
- Trash guards are installed and maintained over all inlets to prevent clogging of the downstream storm sewer.
- Trash guards are inspected at least once a year, typically in the spring, to remove debris that may clog the outlet. Problem areas are addressed more frequently, as required.
- Emergency overflow outlets are provided for all ponds when possible. These are kept clear of debris, equipment, and other materials and properly protected against erosion

Basin Inlets

Inspection and maintenance of basin inlets address the following:

- Inlets are inspected for erosion.
  - Where erosion occurs near an inlet, energy dissipaters or riprap are installed.
- Inlets are inspected for sediment deposits, which can form at the inlets due to poor erosion practices upstream.
  - Where sediment deposits occur, these are removed to ensure design capacities of storm sewers entering the basin are maintained.

Side Slopes

Inspection and maintenance of basin side slopes address the following:

- Side slopes are kept well-vegetated to prevent erosion and sediment deposition into the basin. Severe erosion alongside slopes can reduce the quality of water discharging from the basin and require the dredging of sediments from the basin.
- Noxious weeds are periodically removed from around basins.
- Some basins located in highly developed areas require mowing. If mowing is performed, a buffer strip of 25 feet or more adjacent to the NWL is typically maintained. This provides filtration of runoff and protects wildlife habitat.

Illicit Dumping and Discharges

Inspection for and maintenance because of illicit dumping and discharges into basins address the following:

- Basins are periodically inspected for evidence of illicit dumping or discharges. The most common of these is dumping of yard waste into the basin.
- Where found, illicit material is removed, and signs are posted as needed prohibiting the dumping of yard waste.
- Water surfaces are inspected for oil sheens. These can be present when waste motor oil is dumped into upstream storm sewers.
- Skimmer structures are installed as needed at outlet structures to prevent oil spills and other floatable material from being carried downstream.
- Skimmer structures are periodically inspected for damage, particularly from freeze-thaw cycles.

Sediment Buildup

Inspection for and maintenance because of sediment buildup in basins address the following:

- Basins are inspected to determine if sediment buildup is causing significant loss of storage capacity from design levels. Excessive sediment buildup significantly reduces the stormwater treatment efficiency of water quality ponds.
- Sediment removal is performed where excessive sediment buildup has occurred. As a general guideline, ponds require dredging every 15 to 20 years. When effective, forebays are provided these may require more frequent cleaning (approximately five to seven year cycles) but tend to produce less material and have the effect of extending the maintenance cycle of ponds to as much as every 30 years.

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 to clean out the structure.

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 repairs would become increasingly costlier. The erosion of channels is accelerated when the channels 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 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 re-grouted 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 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 one sweeping operation per year. Spring sweeping begins in 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.

Mendota Heights does not allow residents to rake leaves into the street for municipal pick up. Dakota 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 Dakota 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.

6.3.9. *Detection of Illicit Connections*

Mendota Heights has modified its ordinance to prohibit the dumping of hazardous material into the stormwater system. During routine inspection for inlet grates, outfalls, and other portions of the stormwater system, City staff also look for evidence of illicit discharge, dry weather flow (indicating possible sanitary sewer connections), sedimentation, and other non-point source pollution problems.

The City has started the process of mapping its storm sewer outfalls and integrating this mapping with inspection data. This effort will be concurrent with the overall storm sewer mapping effort required by the City's NPDES permit.

6.4. Education and Outreach

6.4.1. *General*

Education can play an important role in any effort to implement a surface water 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, 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 should also 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.
- Implementing deicing education and outreach for residents and business owners, and by encouraging involvement in the MPCA's Twin Cities Metropolitan Area Chloride Management Plan by using their WMAt.
- Maintaining detention basin/stormwater management pond performance and system operability.
- Planning for and managing of projects to enhance pollutant removal performance, wetland quality, among other items.
- 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 BMP 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, 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, incorporation of stormwater mitigation into capital improvement projects, and regulatory jurisdictions).
- The objectives 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, internal newsletters, and 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. As part of the SWMP effort, staff will also be trained in the use of the City's stormwater management model.

6.4.3. *City Residents*

In order to obtain the necessary political and economic support for a successful SWMP implementation, it is vital to inform City residents about basic stormwater management and water quality concepts, policies and recommendations in the SWMP, and the progress of stormwater management efforts.

Through the City's quarterly newsletter, the Heights Highlites, the City keeps residents informed of stormwater and other environmental issues particularly regarding volunteer opportunities, proper lawn care practices, and recycling and hazardous waste management information. The City website is a clearing house for information on stormwater management and will be updated to provide stormwater management articles, contact numbers for reporting illicit discharges, and other stormwater related complaints. In the near term, the City will also be providing educational brochures for residents in the City Hall lobby. These brochures will most often be from other organizations but may also be produced by the City.

The City has incorporated innovative stormwater management practices into both municipal and private development projects. In the future, the City will use these projects to highlight the benefit of certain stormwater management practices. It is important that residents know about these projects (including how they were funded) so that they have an awareness that the City is working for the public interest in protecting high priority resources and that dedicated financial resources such as revenue from the stormwater utility are being put to work.

The City and Dakota County co-sponsor a Wetland Health Evaluation Program which samples and documents the plant, frog, and invertebrate communities found in local wetlands following techniques developed by the MPCA. Information from this survey is available to City residents on the MPCA website.

The City partners with the Metropolitan Council Environmental Services Lake Monitoring and Citizen-Assisted Monitoring Program (CAMP) program, in which residents voluntarily monitor lakes, contributing to a comprehensive database that allows cities, counties, and watershed management organization to better manage and protect these lakes.

6.4.4. *Developers*

The SWMP is designed to provide the official policy direction that City staff and the City Council desire to guide stormwater mitigation for new and redevelopment projects. New construction in Mendota Heights is limited since there is limited land left to develop. Redevelopment, though, will likely occur on a regular basis.

The information contained within this plan is disseminated to developers and their

consulting engineers as early as possible in the development review process. In this way, developers know what is expected of them and can consider the requirements in their initial assessments of the site as well as incorporate the necessary BMPs in any subsequent designs. Much of the necessary information is disseminated to the developers in an information packet as part of the development submittal information they receive from the City.

While dissemination of information is valuable, there is no substitute for a meeting between key City staff and the developer as early as possible in the review process. This helps define expectations for submittals, clarify regulatory compliance issues, and provide additional detailed guidance. Developers are encouraged to do this as soon as possible after they have reviewed the SWMP information and thought about how it applies to their site.

6.5. Financing and the Stormwater Utility

6.5.1. *Current Status – Summary*

The City of Mendota Heights implemented a stormwater utility in 1993. The current quarterly residential charge is $12.00 per residential unit and according to **Table 6.2** for other land uses. The quarterly residential charge is expected to increase to $16.50 per residential unit in 2018.

Table 6.2
Storm Water Utility Rates

Property Type	Current Rate $/Acre
Business/Industrial	$121.80 ≥ 1 acre $60.90 < 1 acre
Cemetery/Golf	$10.15
Institutional	$40.60

6.5.2. *The Stormwater Utility into the Future*

To ensure that Storm Water Utility (SWU) funding keeps pace with increase in municipal maintenance responsibilities, the City should plan for the costs to conduct periodic pond maintenance. Limited data on maintenance activities has been developed by watershed management organizations. A review of this data suggests an annual maintenance budget of $1,250 per acre-foot of wet volume or $4,350 per acre of surface at NWL. Either parameter is relatively easy to track. This $1,250 per acre-foot maintenance item can be translated into a per household cost by virtue of the fact that one acre-foot is sufficient pond wet volume for 20 acres of residential development. Assuming two and a half units per gross acre, then $1,250 per year is spread among 50 units or $25 per unit per year.

Maintenance activities that involve the disposal of stormwater pond sediment have become a high cost project due to the presence of chemicals such as polycyclic aromatic hydrocarbons (otherwise known as PAHs) in stormwater runoff. The City will continue to follow guidance from the MPCA on this issue, but it is anticipated that costs for stormwater pond maintenance activities will increase in the future.

The current residential rate is $12.00 per unit per year. The current charges provide approximately $150,000 per year in revenue of which only a fraction has been used for

pond maintenance. As the City's maintenance responsibilities grow the stormwater utility funding also needs to grow to keep pace.

Mendota Heights is a regulated MS4 under the Phase II NPDES Permit. There is a cost associated with preparing an NPDES permit and the associated SWPPP. Some estimate cities the size of Mendota Heights will spend $50,000 every five years for permit preparation. For Mendota Heights, it is reasonable to assume that $10 per household will be spent every five years – adding $2 per year to the individual household's stormwater utility bill.

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. The USEPA has estimated that the financial commitments that City's will make may total $10 per household per year while others place this figure at $20. Since many of the activities identified by the SWPPP may already be funded (like street sweeping and pond maintenance) the $20 figure is probably too high. For the purposes of planning increases in SWU collection, **Table 6.3** summarizes the additional stormwater utility charges identified above.

Table 6.3
Future Storm Water Utility Funding

Item	Annual Charge to Single Residential Unit	Quarterly Charge to Single Residential Unit
Current commitments	$18.20	$4.50
Future pond maintenance	$32.50	$8.10
NPDES permit and SWPPP	$2.60	$0.65
NPDES permit compliance	$13.00	$3.25
Total	**$66.30**	**$16.50**

6.6. Ordinance Implementation

The City of Mendota Heights has updated their ordinance to include:

- Stormwater Management
- Illicit Discharge
- Soil Erosion and Sedimentation

This will be the City's method of instituting their site review and permitting process, and includes the submission requirements, review procedure, and enforcement policies.

By incorporating site review and comments on temporary and permanent erosion control along with illicit discharge and stormwater management, there is no need to have a separate grading permit and/or stormwater management permit. Grading and erosion control review can occur in the context of the stormwater management review and permitting process.

The ordinance references the City's Land Disturbance Guidance document (**Appendix D**), which defines the technical erosion control, sediment control, and stormwater management guidelines required to be met.

6.7. Watershed Implementation Priorities

6.7.1. *Lower Mississippi River Watershed Management Organization*

Gun Club Lake Watershed
Key Scope Items: Lake Augusta Alum Treatment

1. Continue to monitor Lake Augusta alum treatment from 2017.

Ivy Falls Creek, Interstate Valley Creek, and West/Central/East Highway 13 Watersheds
Key scope items: Ivy Hills Pond, Golf Course Pond, diversion to wetlands at Ivy Falls Creek and Interstate Valley Creek mouths, Dodge Nature Center wetland modifications, erosion problems north of Marie Avenue, Highway 110 and Dodd Road redevelopment, include benefits of Mayfield Heights diversion.

1. Water quality modeling was completed in 2003.
2. Feasibility study was completed in 2004.
3. Design and construction, based on results of feasibility study; start 2018-2032.

Interstate Valley Creek
Key scope item: Baseflow restoration and channel stabilization. Some work was completed on streambank erosion in 2006, but additional work is needed.

1. Feasibility study; start in 2018.
2. Design and construction, based on results of feasibility study; start in 2018 or later.

Key scope item: Address erosion problems in Interstate Valley Creek, north of Marie Avenue.

1. Feasibility study; start in 2018.
2. Design and construction, based on results of feasibility study; start in 2018 or later.

Rogers Lake
1. Stormwater BMPs upstream of Rogers Lake; part of the 2014 WRAPS study; anticipated to start in 2020.
2. Education and outreach; part of the 2014 WRAPS study; anticipated to start in 2020.

6.7.2. *Lower Minnesota River Watershed District*

In its 2011 Third Generation Watershed Management Plan, the District currently has no Capital Involvement Projects (CIP) directly partnering with the City, however their Gully Erosion Projects encompasses all LGUs, and will be aimed at constructing bluff stabilization projects in areas identified as having severe erosion, which could include portions of the City's bluffs.

6.8. City of Mendota Heights Implementation Priorities

Table 6.1 lists the implementation priorities for the City of Mendota Heights. A tentative timetable is included with the table. Many of the City's priorities revolve around improvements to existing stormwater infrastructure.

6.9. NPDES Permit

In 2003, the MPCA required the City to submit an NPDES Permit Application to minimize the discharge of stormwater runoff pollutants and authorize stormwater discharge from the City's MS4.

The City will use funds generated from its SWU as the primary funding mechanism for its

implementation program including; maintenance, repairs, capital projects, studies, etc. It is anticipated that the SWU will generate approximately $400,000 per year. If funds from this utility fee do not cover necessary costs, the City will consider adjusting the SWU 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.

6.10. Plan Revision and Amendments

The City may need to revise this SWMP to keep it current. Any significant amendments that are made to the plan must be submitted to the LMRWD and LMRWMO for review and approval before adoption by the City. The City anticipates updating the Implementation Plan annually. These changes will be submitted to the Watershed Commissions 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 Administrator. 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 Mendota Heights may also revise/amend the plan in response to City-identified needs. This SWMP is intended to be in effect for 10 years (implementation program outlines cost/activities for seven years) per state statute. The SWMP will be revised/updated at that time, to the extent necessary.

TABLE 6.1

SURFACE WATER MANAGEMENT IMPLEMENTATION PLAN

No.	Project Description	Possible Funding Sources	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Comments
1	**Annual O&M:** includes street sweeping, maintenance of sump manholes and catchbasins, storm sewer inspection, maintenance of open channels and ravines, pond vegetation maintenance, minor pond sediment removal activities, facility rent, software, MS4 reporting, rain garden projects, surface water treatment, legal publications, membership dues and part time salaries.	Stormwater Utility/Street Utility	$ 152,274.00	$ 156,842.22	$ 161,547.49	$ 166,393.91	$ 171,385.73	$ 176,527.30	$ 181,823.12	$ 187,277.81	$ 192,896.15	$ 198,683.03	See Section 6.3
2	**Education & Outreach:** includes the education of City staff on basic understanding of the SWMP, education and outreach to residents via brochues and news of stormwter BMP projects, and education for developers to help them make informed decisions on stormwater management during design, construction and post-construction	Stormwater Utility/Street Utility/ Staff Time	$ 5,000.00	$ 5,000.00	$ 5,000.00	$ 5,000.00	$ 5,000.00	$ 5,000.00	$ 5,000.00	$ 5,000.00	$ 5,000.00	$ 5,000.00	See Section 6.4; See Section 4.1.1 for specific emphasis on Chloride Management and pet waste management.
3	**Pond Maintenance:** includes feasibility and construction for major pond sediment removal activities combined with other pond improvements such as outlet repair/updates, vegetation management, and potential water quality enhancements	Stormwater Utility/Grant Funding	$ 90,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	See Section 6.3
4	**IVC Streambank Repairs:** Starting at TH110 and Dodd Road, streambank requires armoring heading to the north, multiple areas have eroded.	Stormwater Utility/Grant Funding		$ 120,000.00	$ 50,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	$ 100,000.00	See Table 4.2
5	**541 Marie Ave - Outlet Repair:** Salvage and reinstall existing outlet	Stormwater Utility/Grant Funding	$ 20,000.00										See Table 4.2
6	**Cherokee Heights Culvert Repair:** partnership with the City of St. Paul to repair existing culvert	Stormwater Utility/Grant Funding	$ 100,000.00										See Table 4.2
7	**South Plaza Drive/Mendakota Court Rehabilitation:** Storm sewer and stormwater BMPs to be incorporated into City street project. Evaluate potential undersized storm sewer	Stormwater Utility/Street Utility	$ 50,000.00										See City CIP
8	**Avanti/Twin Circle Rehabilitation:** Storm sewer and stormwater BMPs to be incorporated into City street project including 12 rain gardens	Stormwater Utility/Street Utility	$ 75,000.00										See City CIP
9	**Dodd Road Trail:** Drainage Improvements	Stormwater Utility/Grant Funding		$ 80,000.00									See City CIP
10	**Wesley Neighborhood Rehabilitation:** Storm sewer and stormwater BMPs to be incorporated into City street project	Stormwater Utility/Street Utility		$ 25,000.00									See City CIP
11	**CenterPoint/Commerce Rehabiltation:** Storm sewer and stormwater BMPs to be incorporated into City street project	Stormwater Utility/Street Utility			$ 50,000.00								See City CIP
12	**Lake Augusta Erosion Repairs, BMP Construction, Lake Outlet Evaluation**	Stormwater Utility/Grant Funding			$ 150,000.00								See Section 4.3.4
13	**Rogers Lake Subwatershed Assessment:** Work with LMRWMO to use the WRAPS study completed by LMRWMO in 2014 to assess and provide feasible BMP opportunities upstream of Rogers Lake.	Stormwater Utility/Grant Funding			$ 25,000.00								Section 6.7.1; LMRWMO 2014 WRAPS Study; LMRWMO Plan - Item 8 Table 6.1
14	**Sylvandale Neighborhood Rehabilitation:** Storm sewer and stormwater BMPs to be incorporated into City street project	Stormwater Utility/Street Utility				$ 50,000.00							See City CIP
15	**Brompton/London Rehabiltation:** Storm sewer and stormwater BMPs to be incorporated into City street project	Stormwater Utility/Street Utility				$ 50,000.00							See City CIP

No.	Project Description	Possible Funding Sources	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Comments
16	**Rogers Lake Subwatershed BMP and Education Outreach Program**	Stormwater Utility/Grant Funding				$ 100,000.00							Section 6.7.1; LMRWMO 2014 WRAPS Study; LMRWMO Plan - Item 8 Table 6.1
17	**Victoria Curve Reconstruction:** Storm sewer and stormwater BMPs to be incorporated into City street project	Stormwater Utility/Street Utility					$ 50,000.00						See City CIP
18	**Friendly Hills Neighborhood Rehabilitation:** Storm sewer and stormwater BMPs to be incorporated into City street project	Stormwater Utility/Street Utility						$ 100,000.00					See City CIP
19	**Curly's/Valley View Rehabilitation:** Storm sewer and stormwater BMPs to be incorporated into City street project	Stormwater Utility/Street Utility							$ 50,000.00				See City CIP
20	**Lake Augusta Outlet:** Install lift Station to control lake elevation	Stormwater Utility/Grant Funding							$ 350,000.00				See Section 4.3.4
21	**Tilsens Neighborhood Rehabilitation:** Storm sewer and stormwater BMPs to be incorporated into City street project	Stormwater Utility/Street Utility								$ 50,000.00			See City CIP
22	**Carmen Lane/Dakota Drive/Waters Drive:** Storm sewer and stormwater BMPs to be incorporated into City street project	Stormwater Utility/Street Utility									$ 50,000.00		See City CIP
	Total		$ 492,274.00	$ 486,842.22	$ 541,547.49	$ 571,393.91	$ 426,385.73	$ 481,527.30	$ 786,823.12	$ 442,277.81	$ 447,896.15	$ 403,683.03	

APPENDIX A

Figures

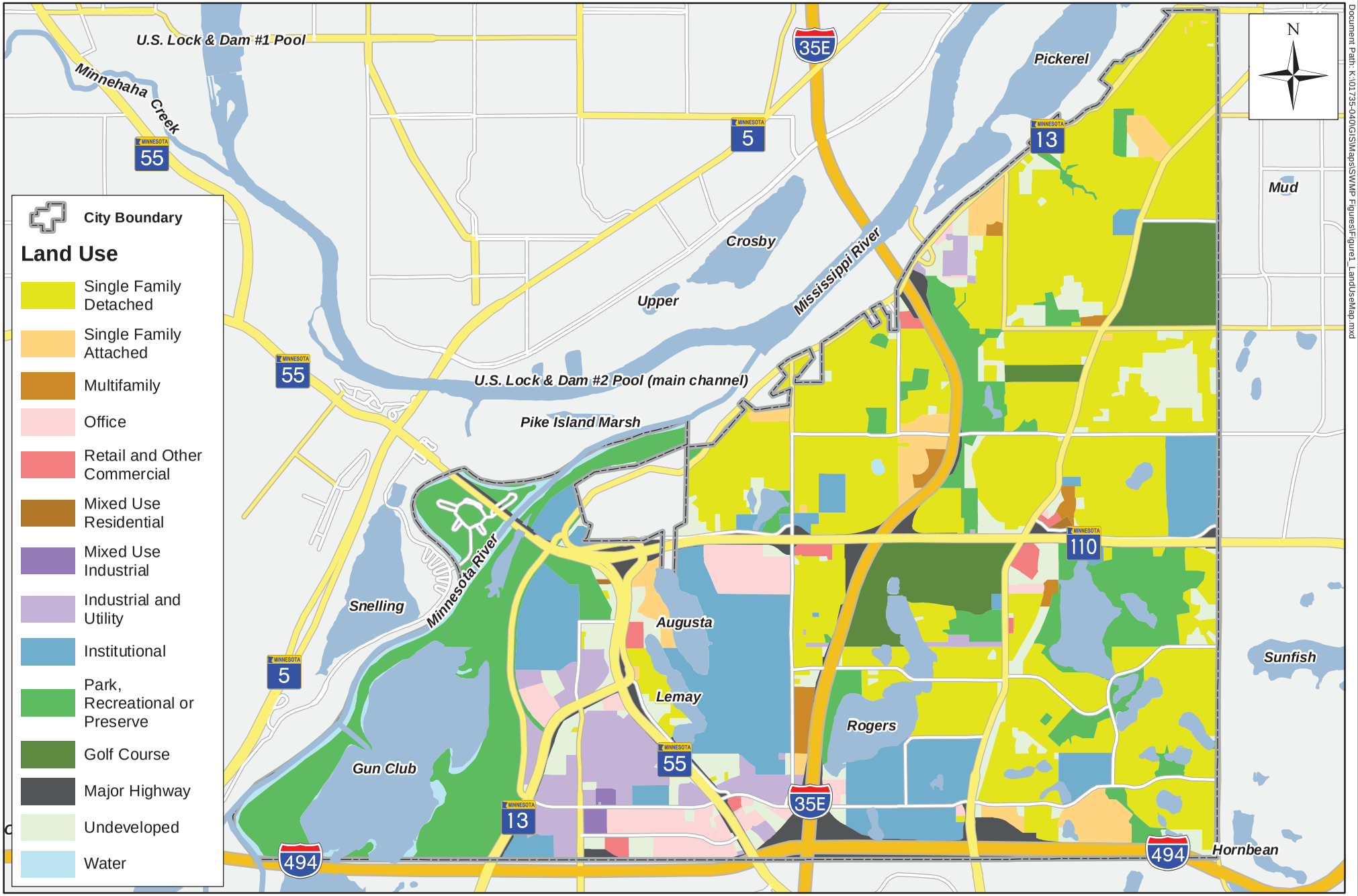

Figure 1: Land Use
Mendota Heights SWMP
Mendota Heights, MN

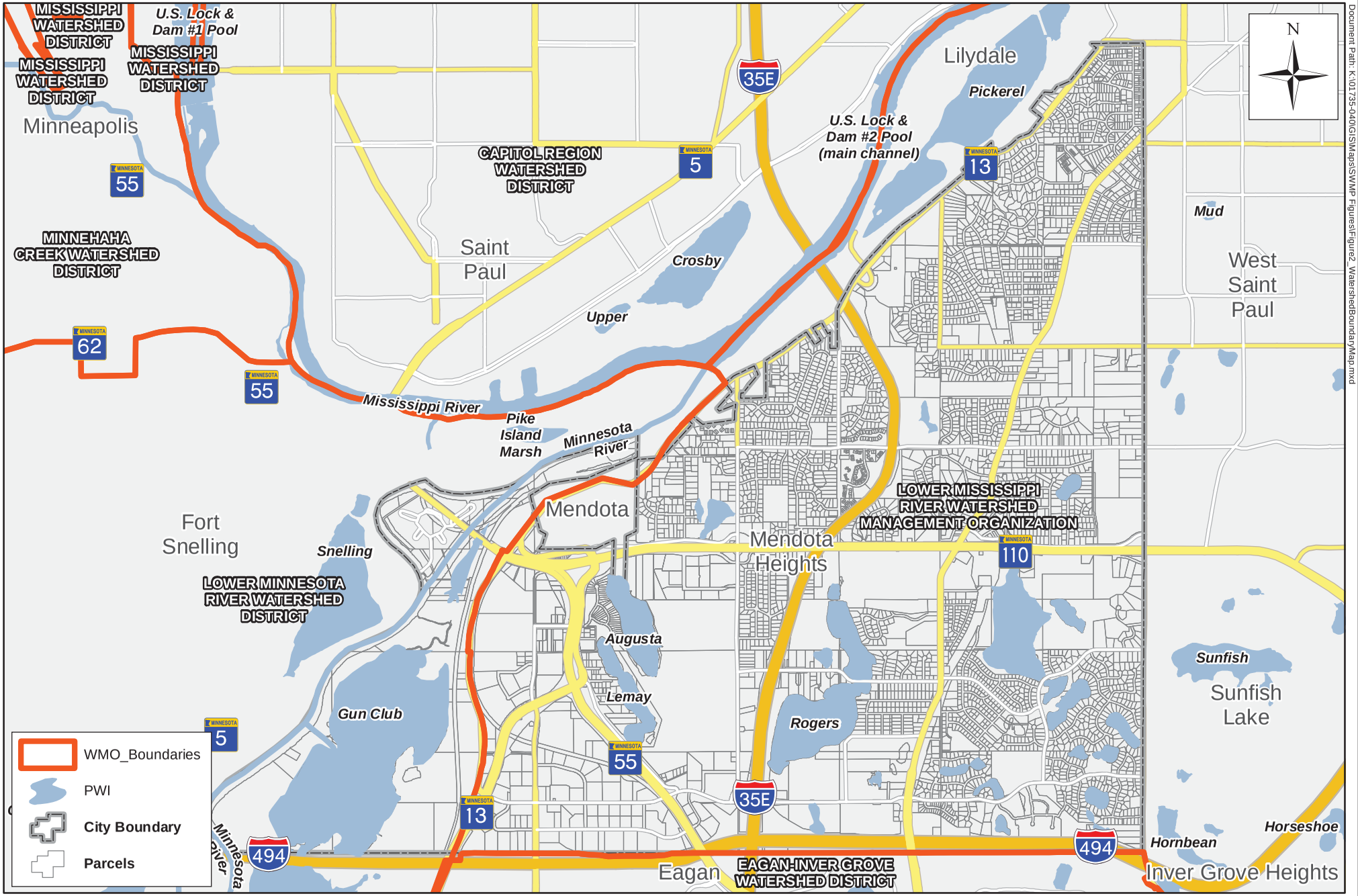

Figure 2: Watershed Boundaries
Mendota Heights SWMP
Mendota Heights, MN

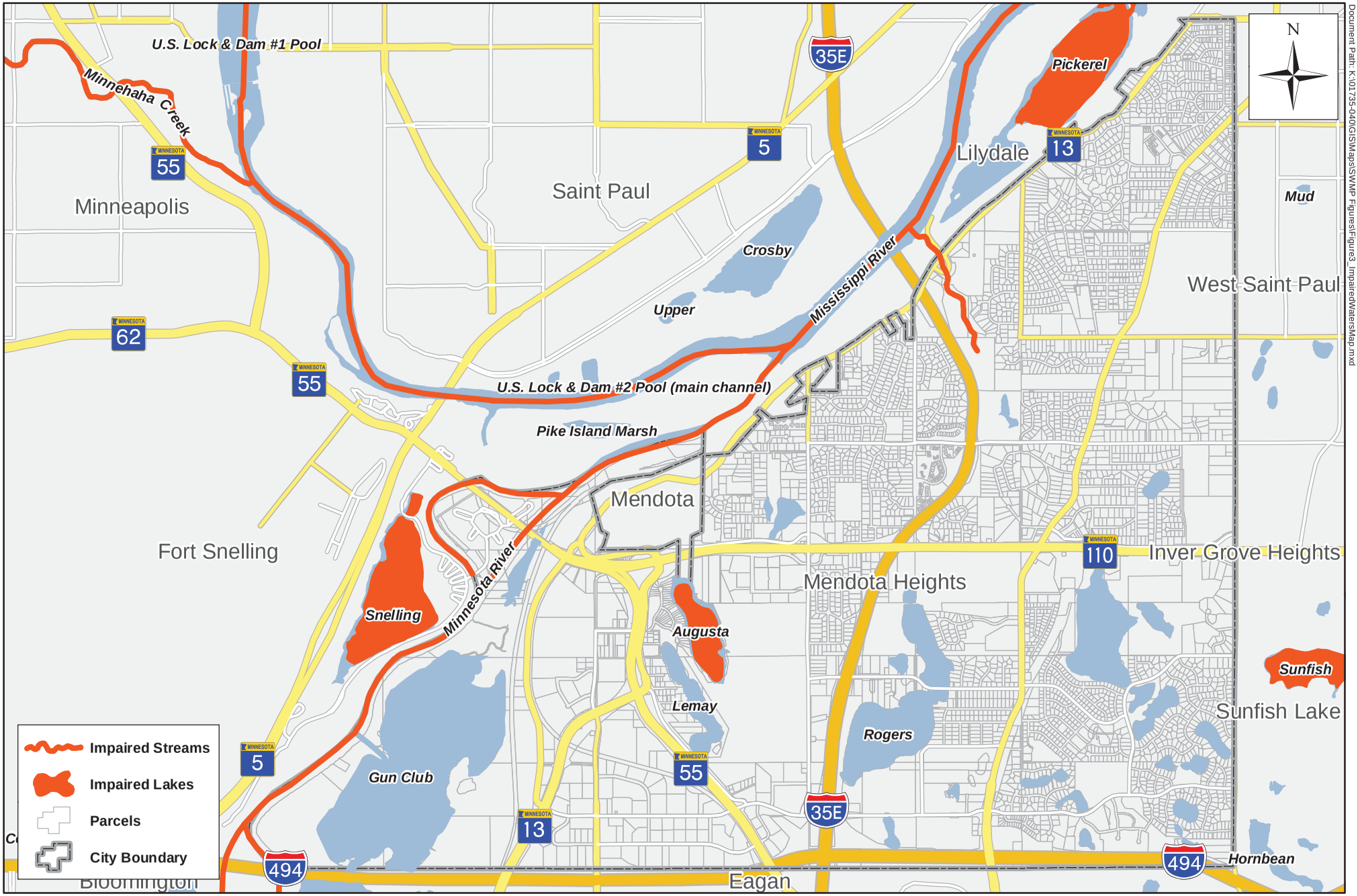

Figure 3: Impaired Waters
Mendota Heights SWMP
Mendota Heights, MN

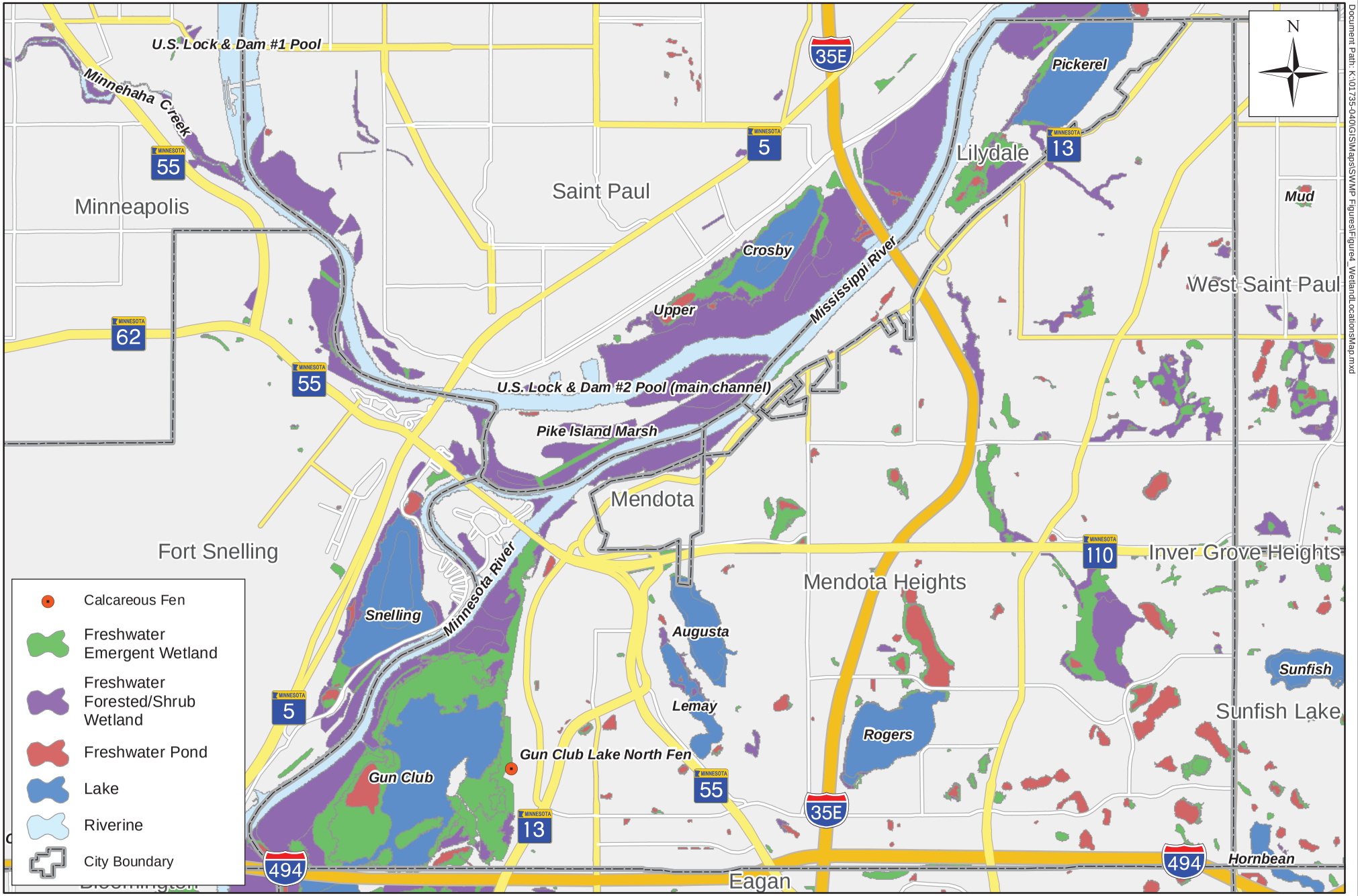

Figure 4: Wetland Locations
Mendota Heights SWMP
Mendota Heights, MN

0 3,200 Feet

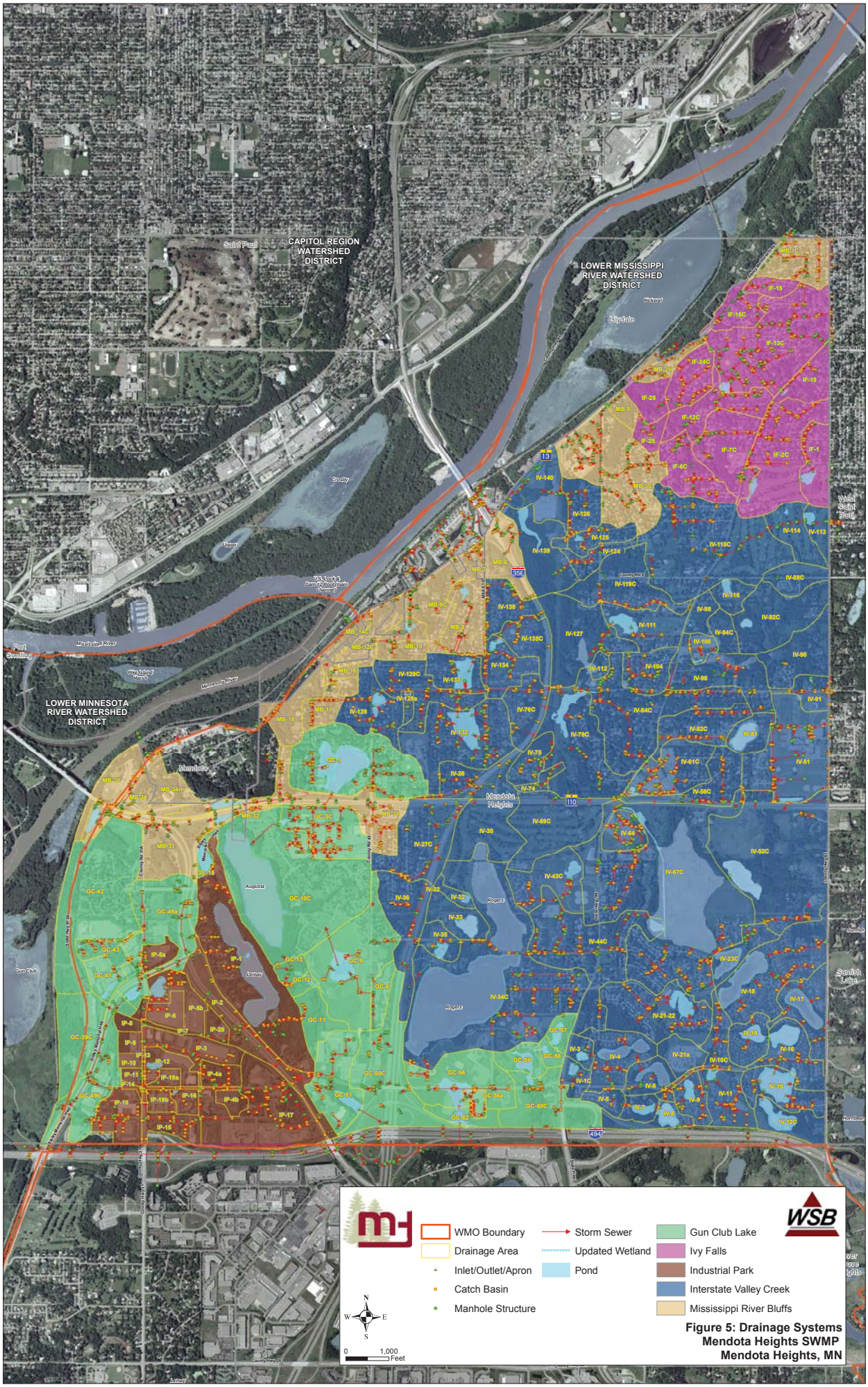

Figure 5: Drainage Systems
Mendota Heights SWMP
Mendota Heights, MN

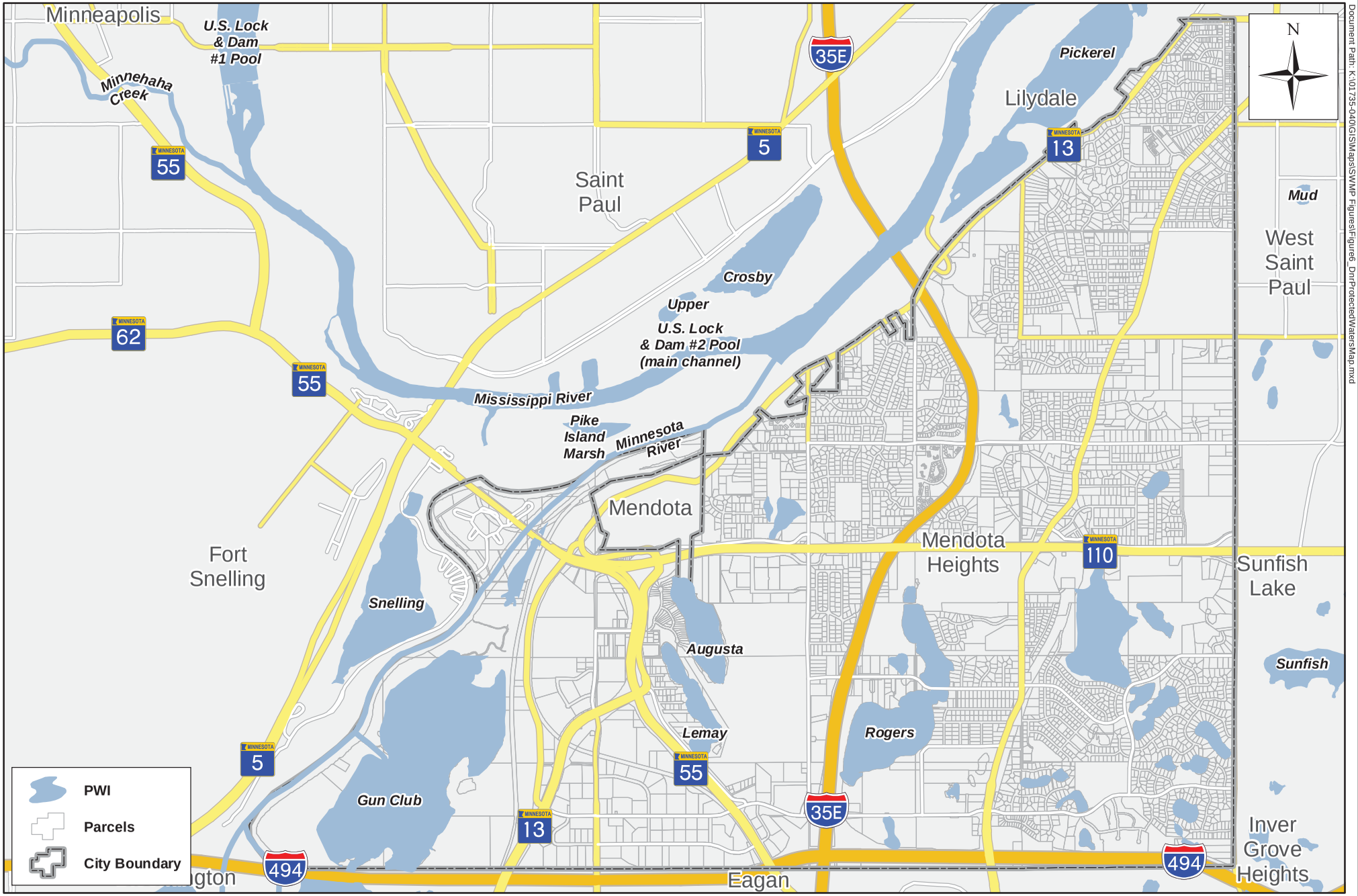

Figure 6: DNR Protected Waters
Mendota Heights SWMP
Mendota Heights, MN

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: Mendota Heights *County: Dakota
(city, county, municipality, government agency or other entity)

*Mailing address: 1101 Victoria Curve

*City: Mendota Heights *State: MN *Zip code: 55118

*Phone (including area code): 651-452-1850 *E-mail: permits@mendota-heights.com

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

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

*Title: Assistant City Engineer

*Mailing address: 1101 Victoria Curve

*City: Mendota Heights *State: MN *Zip code: 55118

*Phone (including area code): 651-452-1850 *E-mail: ryanr@mendota-heights.com

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: John Mazzitello
(This document has been electronically signed)

Title: Public Works Director/City Engineer Date (mm/dd/yyyy): 12/30/2013

Mailing address: 1101 Victoria Curve

City: Mendota Heights State: MN Zip code: 55118

Phone (including area code): 651-452-1850 E-mail: johnrm@mendota-heights.com

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
Lower Mississippi River WMO, JPA Provides Cablecast program, etc.	1,2,3,4,5
Gun Club Lake WMO (recently abolished JPA which included Eagan and Inver Grove Heights)	1,2,3,4,5
City of West St. Paul – Joint Staff training on Good House Keeping Practices	3,6
Dakota County SWCD, cooperative relationship, blue thumb, etc.	1,2,3,4,5

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.*

Also see our website @ www.mendota-heights.com. Under "Engineering" & "Storm Water Management" there are links to non-MS4partners and other sotrm water information.

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: _____

   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:

   Mendota Heights City Code, Title11, Chapter 6, Section 7

   Direct link:

   http://www.sterlingcodifiers.com/codebook/index.php?book_id=668

   ☒ 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:

Mendota Heights City Code Tittle 11, Chapter 6, Section 6

Direct link:

http://www.sterlingcodifiers.com/codebook/index.php?book_id=668

☒ 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:

City code cannot fully be enforced without the adopted supplemental documents including the "Land Disturbance Guidance Document", "Surface Water Management Plan" and project specific approved SWPPP.

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:

The city will update its Land Disturbance Guidance Document and Surface Water Management Plan to be as stringent as identified in the NPDES Permit within 12 months of permit coverage.

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:

Mendota Heights City Code Title 11, Chapter 6, Section 8

Direct link:

http://www.sterlingcodifiers.com/codebook/index.php?book_id=668

☒ 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 ☐ Yes ☒ No

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.

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:

Mendota Heights is currently in the process of revising its Surface Water Management Plan to comply with the expanded areas of the city that will now be within the Lower Mississippi River WMO. The city intends to complete this update by 12/31/2014. It is undetermined if mitigation standards will be allowed. Items checked "no" as outlined in B.2 and B.3 will be updated for compliance with the MS4 permit within 12 months of permit coverage.

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:

   The city will develop/adopt written Enforcement Response Procedures within 12 months of permit coverage.

B. Describe your ERPs:

In general practice the citys intent to to achieve compliance without having to initiate ERP Procedures. The first step is typically a verbal conversation about the issue. If this first step is not enough a Notice of Violation and potential stop work order is issued. Depending on the severity, frequency and urgency of the violation the city may issue a fine, perform the corrective work ourselves or if necessary pursue criminal or civil actions.

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

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

The Mendota Heights Storm Sewer System is available in CAD, PDF, and GIS formats. The electronic database is updated annualy at a minimum.

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's educational program consists of a wide range of activities to educated city residents, community groups, business owners, city staff, elected officials, developers, and contractors on a wide range of water resources and stormwater management topics. The city will evaluate its education program annually and make updates as needed. The city does not anticipate the need for new BMPs, rather current BMPs will be refined and update as necessary to meet permit requirements.

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
Quarterly Newsletter – Heights Highlights	Number of articles, number mailed
City Website – Storm water page	Implement tracking feature
Educational Brochures	Number Distributed
Annual Public Meeting	Number attended
Storm Drain Stenciling	Number Stenciled
Pagel Pond Signs	Number Posted
Water Quality Monitoring Program	Met Council CAMP, Dakota County WHEP
Public Input on Capital Improvements	Number attended to meetings
Cable access programs	Supported through LMRWMO, number times aired

BMP categories to be implemented	Measurable goals and timeframes

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

   Public Works Director/City Engineer

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 holds an annual public meeting to review program details and program progress with the public. The meeting also provides an opportunity for the public to give input and/or ask questions. The meeting is noticed in the local paper following applicable public notice requirements and broadcast on the local cable access station. The city takes into consideration both written and verbal forms of public input at the meeting and throughout the year. The city maintains a phone line for use by the public to report illicit discharges, report stormwater noncompliance concerns, and/or provide input, give comments, and/or ask questions about the MS4 program.

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**
Telephone and email hotline	Track number of issues reported, respond accordingly
Volunteer opportunities	Post opportunities on the city website, newsletter, etc.
Annual meeting	Number attended, comments received
Local cable	Broadcast public meetings, run storm water related programs
SWPPP availability	Available online and at city hall

BMP categories to be implemented	**Measurable goals and timeframes**

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:

   Citzen input can be generated through phone, email, fax, meetings, mail, etc…The communication is typically logged in an Xcel file for future reference. Input submitted at public meetings will be recorded on the permanent minutes.

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

   Public Works Director/City Engineer

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 Mendota Heights has personnel available on a normal working day basis and voice mail and email for residents to report illicit discharges, construction site sedimentation and erosion violations, other storm water related issues and to provide comments on the SWPPP. City staff keeps records of these complaints, and responds to the calls as needed. The City has an illicit discharge detection and enforcement ordinance in place that outlines in more detail the City's approach to identifying, addressing, and preventing these discharges to storm sewer. In general, when a complaint comes in, City staff will review the site, take photographs, and leave a notice or send a letter giving the owner a certain number of days to correct the problem. More urgent steps are taken if the violation is serious and/or needs immediate attention. Violators are advised that if they fail to comply, the City will correct the problem and they will be charged.

   The City maintains and annually updates a storm water system and inventory map. The map is currently maintained in AutoCAD and GIS formats and includes storm water conveyance system, ponds, water bodies, wetlands, structural pollution control devices, and outfalls. The City conducts regular inspections of its storm water system and conducts site specific inspections as reports are received. The city completes dry weather inspections of, at a minimum, 20% of the storm sewer system outfalls, as well as pond inlets and outlets each year. City staff is watchful for signs of illicit discharges while conducting daily activities. The city addresses ISTS inspections through the Dakota County Program.

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 ☒ Yes ☐ No

reporting illicit discharges for further investigation.

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 result in an illicit discharge. ☒ Yes ☐ No

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:

In several cases the procedures are in place but may not be entirely written, or may involve written policies and procedures from multiple departments/documents. For example, spills are typically incorporated into the city Emergency Response Plan as it would be redundant to include under the storm water ordinance. The various relevant procedures will be brought together into one place and included within the City's Surface Water Management Plan. Procedures will be completed within 12 months of coverage. If it is considered necessary, changes will be incorporated into the City ordinance.

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 Map	Continually update, ongoing
Ordinance	Update and enforce, number of permits/sites
Site Inspections	Track the source and enforce as necessary, number inspected.
Site plan review	Ensure safe guards and hazardous are in place prior to construction
Training	Annual staff training to assist in identification of hazards.
Reporting hotline	Maintain accessibility to the public and other agencies to report issues.

BMP categories to be implemented	**Measurable goals and timeframes**
Receipt and consideration of Noncompliance reports	Develop written procedures

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:

   An electronic and hard-copy list of illicit discharges is kept up to date. It needs to be modified to ensure that it includes all the information required by the Permit. Record-keeping procedures and modified forms will be developed in accordance with the Permit requirements.

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

Public Works Director/City Engineer

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 City of Mendota Heights has an established program and policies that effectively control construction site stormwater and provide for the necessary inspection and enforcement measures. The city's procedures for site plan review include review and approval by city staff and/or consultant. The city currently inspects construction sites to review compliance with code and permit requirements. The city's ordinance also requires contractors to conduct regular site and rainfall inspections.

   The city maintains a phone number (business hours but has voicemail) and email on their website for the public to provide input, report noncompliance and/or other construction site stormwater information 24 hours a day.

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.

   City ordinance states coverage must be obtained through the MPCA but does not specify the specific permit number.

   The city has a site plan review process; however, there are currently no written procedures for this process. The City will update its site plan review process to include written procedures, notifications, and documentation requirements in accordance with permit requirements. This effort will be completed within 12 months of the date permit coverage is extended.

   The city has a process for the receipt and consideration of construction site noncompliance reports and other stormwater related input; however, there are currently no written procedures for this process. The city will update its program for receipt and consideration of pubic stormwater reports to include written procedures in accordance with permit requirements. This effort will be completed within 12 months of the date permit coverage is extended.

   The city has a process for site inspections; however, there are currently no written procedures for this process. The city will update its current site inspection process to include written procedures and documentation requirements inaccordance with permit requirements.

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
Ordinance	Enforce, Review and Update as needed
Site plan Review	Number reviewed, comments issued. Ongoing.
Site Inspections	Number inspected, number in violation.
Hot line/Email reporting	Maintain log and follow up actions
Education	Distribute Land Disturbance guidance document to builders and non-exempt building permits.
Wetland Permit Program	Number issued

BMP categories to be implemented	Measurable goals and timeframes
Noncompliance standards	Number received

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

   Public Works Director/City Engineer

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:

   The City has ordinances which establish requirements for post construction stormwater management. The City currently requires that drainage design and stormwater management meet the standards and specifications within the Surface Water Management Plan, Land Disturbance Guidance document and city ordinance and be approved by the City Engineer.

   The city's procedures for site plan review include review and approval by city staff and/or consultant.

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 has a site plan review process; however, there are currently no written procedures for this process. The City will update its site plan review process to include written procedures in accordance with permit requirements. This effort will be completed within 12 months of the date permit coverage is extended.

   The city currently does not allow for mitigation provisions to meet post construction stormwater requirements. The city will review its current requirements and assess whether or not to add mitigation provisions in accordance with permit requirements. This effort will be completed within 12 months of the date permit coverage is extended.

   The city will develop or update existing regulatory mechanisms to provide for the establishment of legal mechanisms between the city and owners and operators responsible for long-term maintenance of privately owned and operated structural BMPs in accordance with permit requirements. This effort will be completed within 12 months of the date permit coverage is extended.

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**
Ordinance	Update as necessary
Site Plan Review	Review for compliance with city regulations
Educational materials	Distribute Land Disturbance guidance document with building permits and to developers
Wetland permit Program	Number issued
Structural/Non-structural BMP's	Number/type constructed

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:

   Public Works Director/City Engineer

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 following practices are implemented throughout the City facilities:

   Storage of salt under shelter roofs

   Recycling of used oil

   Readily accessible materials for spill and accident clean up at facilities

   Conduct vehicle maintenance in covered garages.

   The city conducts regular inspections of its storm water system. Staff inspects, at a minimum, 20% of the storm sewer system outfalls, as well as pond inlets and outlets each year. The city conducts regular inspections and maintenance on the entire storm sewer system as needed.

   The city currently inspects material stockpiles and handling areas on an annual basis.

   The city implements a street sweeping program for vehicle safety, pedestrian safety, water quality, and environmental reasons. Street sweeping is conducted twice annually.

   The city currently records system inspection and significant maintenance efforts in a paper format. The city is exploring options to purchase an asset management system for developing a detailed for tracking BMPs, condition of system components, and inspection and maintenance efforts

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:

   The City will develop a facilities inventory to include city-owned facilities which contribute pollutants to stormwater discharges in accordance with permit requirements . This effort will be completed within 12 months of the date permit

coverage is extended.

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**
Training	Complete annual training effort generally in conjunction with the City of West St. Paul.
Street Sweeping	Spring and fall sweeping. Track hours & miles.
Inspection	Inspect 20% of ponds and outfalls annually.
Sump Manholes	Cleaned annually
Equipment maintenance program	Number trained, number vehicles inspected
Lawn Maintenance Program	Improved buffer strips in city parks, mow clippings into lawn, etc.

BMP categories to be implemented	**Measurable goals and timeframes**
Asset Management Software	The city is currently talking to several vendors on purchasing a software program.

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:

Within 12 months of extendeded permit coverage, inspection procedures and the training program/schedule already in place will be updated to reflect new Permit requirements. Within the same time frame, procedures and a schedule for determining TP and TSS treatment effectiveness of stormwater ponds will be developed. These will be documented in the Surface Water Management Plan which the City will be updating.

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

Public Works Director/City Engineer

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

11-6-7: ILLICIT DISCHARGE AND CONNECTION:

A. Objectives: The objectives prevent the introduction of pollutants to the stormwater system by any user, to prohibit illicit connections and discharges to the stormwater system, and to establish authority to carry out all inspection, surveillance and monitoring procedures necessary to ensure compliance with this chapter.

B. Discharge Prohibitions:

1. Prohibition Of Illegal Disposal And Dumping Of Substances And Materials: No person shall throw, deposit, place, leave, maintain, or store any substance upon any street, alley, sidewalk, storm drain, inlet, catch basin conduit or drainage structure, business place or upon any public or private plot of land, so that the same might be or become a pollutant, except if secured within a container or bag or contained within a lawfully established waste disposal facility.

   No person shall intentionally dispose of grass, leaves, dirt or landscape material into a water resource, buffer, street, road, alley, catch basin, culvert, curb, gutter, inlet, ditch, natural watercourse, flood control channel, canal, storm drain or any fabricated natural channel.

2. Prohibition Of Illicit Discharges: No person shall discharge or cause to be discharged into the stormwater system or watercourses 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.

a. The commencement, execution or continuance of discharge of pollutants to the stormwater system is prohibited except as follows: water line flushing or other potable water sources, landscape irrigation or lawn watering, diverted stream flows, groundwater infiltration to storm drains, uncontaminated pumped groundwater, foundation or footing drains (not including active groundwater dewatering systems), crawl space pumps, air conditioning condensation, springs, noncommercial washing of vehicles, natural riparian habitat or wetland flows, firefighting activities, and any other water source not containing pollutants.

b. Discharges specified in writing by the authorized enforcement agency as being necessary to protect public health and safety are allowed.

c. Dye testing is an allowable discharge, but requires a verbal notification to the authorized enforcement agency prior to the time of the test.

d. The prohibition shall not apply to any nonstormwater 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, Minnesota pollution control agency, or other 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 stormwater system.

3. Prohibition Of Illicit Connections: The construction, use, maintenance, or continued existence of such connections that intentionally convey nonstormwater to the stormwater system is prohibited. 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.

A person is considered to be in violation of this chapter if the person connects a line conveying wastewater to the stormwater system, or allows such a connection to continue.

No person shall connect or convey water from floor drains to the storm sewer system.

C. Discharge Prevention:

1. Discharge Prevention Requirements: Any property owner within the city shall comply with the following requirements to prevent discharges:

a. No person shall leave, deposit, discharge, dump, or otherwise expose any chemical or septic waste in an area where discharge to a street, storm sewer system, or surface water body may occur. This prohibition shall apply to actual discharges as well as the potential for discharge from, for example, a septic system in a location where emergency overflow could discharge to a street, surface water body, or storm sewer system.

b. Individual sewage treatment systems must be maintained in order to prevent failure. No part of any individual sewage treatment system requiring on land or inground disposal of waste shall be located in an area where effluent could immediately or gradually reach a body of water due to the existing physical characteristics of the site or the system.

c. Recreational vehicle sewage shall be disposed of at a proper sanitary waste facility. Waste must not be discharged in an area where drainage to streets or storm sewer system may occur.

d. Water in swimming pools must sit for seven (7) days without the addition of any chlorine to allow for evaporation of the chlorine before it is discharged.

e. Runoff of water from residential properties shall be minimized to the maximum extent practicable. Paved areas must be swept prior to wash down activity. Runoff water from the washing down of paved areas on commercial or industrial properties is prohibited unless necessary for health or safety purposes and is not in violation of any other applicable regulations.

f. Mobile washing companies, such as carpet cleaning and mobile vehicle washing services, shall dispose of any wastewater to the sanitary sewer system. Wastewater shall not be discharged to the streets or storm sewer system.

g. Objects such as motor vehicle parts that contain grease, oil or other hazardous substances and unsealed receptacles containing hazardous materials shall not be stored in areas susceptible to runoff. Any machinery or equipment that is to be repaired or maintained in areas susceptible to runoff shall be placed in a confined area to contain any leaks, spills, or discharges.

h. Debris and residue shall be removed, as required below:

(1) All motor vehicle parking lots and private streets shall be swept, at a minimum of once a year in the spring, to remove debris. Such debris shall be collected and disposed of properly.

(2) Fuel and chemical residue or other types of potentially harmful material, such as animal waste, garbage or batteries shall be removed as soon as possible and disposed of properly. Household hazardous waste must be disposed of through the county collection program or at any other authorized disposal site. Household hazardous waste shall not be placed in a trash container.

D. Industrial Activity Discharges To The Storm Sewer System:

1. Any person subject to an industrial activity NPDES stormwater discharge permit shall comply with all provisions of such permit. Proof of compliance with said permit may be required in a form acceptable to the city prior to allowing of discharge to the storm sewer system.

2. All facilities that have stormwater discharges associated with industrial activity must adhere to the following requirements: Any person responsible for a property or premises, which is, or may be, the source of an illicit discharge may be required to implement, at said person's expense, additional structural and nonstructural BMPs to prevent the further discharge of pollutants to the storm sewer system. These BMPs shall be part of a stormwater pollution prevention plan (SWPPP) as necessary for compliance with requirements of the NPDES permit.

E. Suspension Of Stormwater System Access:

1. Suspension Due To Illicit Discharges In Emergency Situations: The city may, without prior notice, suspend stormwater system discharge access to a person when such suspension is necessary to stop an actual or threatened discharge which presents or may present imminent or substantial danger to the environment, or to the health or welfare of persons, or to the stormwater system or waters of the United States. If the violator fails to comply with a suspension order issued in an emergency, the authorized enforcement agency may take such steps as deemed necessary to prevent or minimize damage to the stormwater system or waters of the United States, or to minimize danger to persons. If authorized enforcement agency takes steps to prevent or minimize damage to the stormwater system or waters of the United States, or to minimize danger to persons, the city may bill the property owner and/or operator, or lien the subject property for the cost of the action.

2. Suspension Due To The Detection Of Illicit Discharge: Any person discharging to the stormwater system in violation of this chapter may have their stormwater system access terminated if such termination would abate or reduce an illicit discharge. The city will notify a violator of the proposed termination of the violator's stormwater system access. The violator may petition the city for a reconsideration and hearing. A person is committing an offense and is subject to misdemeanor enforcement if the person reinstates stormwater system access to premises terminated pursuant to this chapter without the prior approval of the city.

F. Monitoring Of Discharges:

1. The city shall be allowed to enter and inspect facilities and properties subject to regulation under this chapter as often as may be necessary to determine compliance with this chapter and for the purposes of inspection, sampling, examination, and the performance of any additional duties as defined by state and federal law that relate to the discharge of stormwater. If a person does not wish

to allow the city to enter a building to conduct the required activity, he or she may retain a private inspector to conduct the activity. The private inspector must have credentials that are acceptable to the city. The private inspector shall provide the city with the relevant samples, test results, reports or any other information that is being requested.

2. The city shall have the right to establish on any permitted facility such devices as are necessary in the opinion of the authorized enforcement agency solely to conduct monitoring and/or sampling of the facility's stormwater discharge.

3. The city has the right to require the discharger to install monitoring equipment to ensure discharge is in compliance with MPCA standards. The facility's sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition by the discharger at its own expense.

4. Any temporary or permanent obstruction to safe and easy access to the facility to be inspected and/or sampled shall be promptly removed by the owner or operator at the written or oral request of the city and shall not be replaced. The costs of clearing such access shall be borne by the owner or operator.

5. Unreasonable delays in allowing the city access to a permitted facility is a violation of a stormwater discharge permit and of this chapter. A person who is the owner and/or operator of a facility with an NPDES permit to discharge stormwater associated with industrial activity commits an offense if the person denies the city reasonable access to the permitted facility for the purpose of conducting any activity authorized or required by this chapter.

G. Requirement To Prevent, Reduce, And Control Stormwater Pollutants By The Use Of Best Management Practices:

1. Owner Responsibility: The owner or operator of any property shall provide, at owner/operator's expense, reasonable protection from accidental discharge of prohibited materials or other wastes into the municipal stormwater system or watercourses through the use of structural and nonstructural best management practices (BMPs). Further any person responsible for a property or premises, which is, or may be, the source of an illicit discharge, may be required to implement, at said person's expense, additional structural and nonstructural BMPs to prevent the further discharge of pollutants to the stormwater system. These BMPs are listed in the stormwater pollution prevention plan (SWPPP) and the Minnesota pollution control agency's current BMPs, and are necessary for compliance with requirements of the NPDES permit and chapter 6 of the city's surface water management plan (SWMP).

H. Watercourse Protection:

1. Owner Responsibility: Every owner of a property through which a watercourse passes, or such person's lessee, shall keep and maintain that part of the watercourse within their property free of trash, debris, excessive vegetation, and other obstacles that would pollute, contaminate, or significantly impact the flow of water through the watercourse. All owners or lessees shall maintain existing privately owned structures within or adjacent to a watercourse, so that such structures will not become a hazard to the use, function, or physical integrity of the watercourse.

I. Notification Of Spills:

1. Notwithstanding other requirements of law, as soon as any person responsible for a facility, vehicle or operation, or responsible for emergency response for a facility or operation has knowledge of any known or suspected release of materials of any amount which are resulting or may result in illicit discharges or pollutants discharging into the stormwater system, watercourse, or waters of the United States, said person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release. In the event of such a release of hazardous materials said person shall immediately notify the city and other emergency response agencies of the occurrence via emergency dispatch services.

   In the event of a release of nonhazardous materials, said person shall notify the city in person or by phone no later than the beginning of the next business day.

   If the discharge of prohibited materials emanates from a commercial or industrial establishment or vehicle, the owner or operator of such establishment or vehicle shall also retain a written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least ten (10) years, or longer if required by other regulatory authority. (Ord. 421, 2-3-2009)

11-6-6: CONSTRUCTION SITE STORMWATER RUNOFF AND EROSION CONTROL:

A. Purpose: The purpose of this section is to establish regulation of land disturbing activities, preservation and enhancement of the natural environment by reducing sedimentation in streams, lakes, stormwater systems and other waterways, protection of the quality of surface water resources, preserve and protection of wildlife habitat, restore sites to reduce the negative environmental effects of land disturbing activities, provide effective practices for erosion and sedimentation control, and to comply with local, state and federal regulations.

B. Scope: Except where an exemption applies, any person proposing a land disturbing activity or whose land constitutes a land disturbing activity within the city shall apply to the city for the approval of a stormwater pollution prevention plan. No land shall be disturbed until the plan is approved by the city and conforms to the standards set forth herein.

C. Stormwater Management Permit Required:

1. Review And Approval: No person shall grade, fill, excavate, store, dispose of soil and earth materials, or perform any other land disturbing or land filling activity without first submitting a stormwater pollution prevention plan for review and approval by the city and obtaining a permit as required in this section and the requirements of section 11-6-8, "Postconstruction Stormwater Runoff", of this chapter. If the applicability requirements of this section or section 11-6-8 of this chapter apply the stormwater pollution prevention plan submittal needs only to meet the requirements of that section. The stormwater management permit is not a replacement for a conditional use permit as required in this code or a wetlands permit as required in section 12-2-6 of this code, or the requirements of the critical area district as required in title 12, chapter 3 of this code nor is it a replacement for a watershed district permit or a state NPDES permit.

2. General Exemptions: Land disturbing activities, which meet all the following criteria are exempt from the requirements of this section:

a. The disturbed or filled area is five thousand (5,000) square feet or less in area; and

b. The volume of soil or earth material stored or moved is fifty (50) cubic yards or less; and

c. No drainageway is blocked or has its stormwater carrying capacities or characteristics modified; and

d. The activity does not take place within one hundred feet (100') by horizontal measurement from the top of the bank of a watercourse, the ordinary high water mark of a water body, or the ordinary high water mark of a wetland associated with a watercourse or water body. The activity does not take place within an established 100-year floodplain; and

e. Not considered part of a larger common plan of development.

3. Categorical Exemptions: Notwithstanding the requirements of this code, the following activities are exempt from the permit requirements:

a. Emergency activities necessary to prevent or alleviate immediate dangers to life or property.

b. Activities that are under the regulatory jurisdiction of an authorized state or federal agency.

c. General farming, gardening and nursery activities.

d. Residential construction activity limited to:

(1) Additions to the existing structure,

(2) Landscaping and landscaping structures, and

(3) Construction of a garage. (Ord. 421, 2-3-2009)

D. Submission Requirements For A Stormwater Management Permit:

1. Application Items: Application for a stormwater management permit shall include submittal of stormwater pollution prevention plan which shall include:

a. Application form and fee.

b. Narrative describing temporary erosion and sediment control, permanent stabilization, pollution prevention and permanent stormwater management.

c. Site map and grading plan.

d. Temporary erosion and sediment control plan meeting the requirements of the city's land disturbance guidance document.

e. Permanent stabilization plan meeting the requirements of the city's land disturbance guidance document.

f. Permanent stormwater management measures meeting the requirements outlined in section 11-6-8 of this chapter and the city's land disturbance guidance document.

g. Work schedule.

h. Cost estimate.

i. Landscape plan showing proposed landscape improvements (plantings, seeding, sod, etc.) if applicable to the project application.

j. Lighting/photometric plan displaying proposed exterior lighting, to include light fixture type, height, and foot-candle coverage if applicable to the project application.

k. The city may require the applicant to submit additional information or data it determines necessary to complete its review. Submittals determined by the city to be incomplete or otherwise unacceptable for the purposes of this chapter shall be returned to the applicant for correction and resubmittal. (Ord. 431, 2-1-2011)

2. Fees: All applications shall be accompanied by a permit fee. Fees for permits shall be fixed and determined by the city council, adopted by ordinance and uniformly enforced. Such permit fees may, from time to time, be amended by city council ordinance. A copy of the ordinance setting forth currently in effect permit fees shall be kept on file by the city and shall be open to inspection during regular business hours.

E. Review Procedure:

1. Process: City staff will review each complete application for a stormwater management permit to determine its conformance with the provisions of this chapter. Within ten (10) working days of receiving an application, city staff will identify if additional materials are required to complete a permit application and within sixty (60) days of receiving an application, city staff shall approve, approve with conditions, or deny a stormwater management permit application.

2. Appeal: An applicant may appeal a decision of denial of a permit under this section which shall be made under the manner prescribed in section 11-6-11 of this chapter.

3. Site Review: Once a permit is granted, city staff shall inspect the property for:

a. Erosion control compliance with this code;

b. Permit conditions and site plans prior to the onset of construction; and

c. Permit conditions and site plans throughout project construction.

4. Stop Work Order: The city reserves the right to issue a stop work order for any violation of this chapter, or noncompliance with permit conditions, observed during site inspection. Stop work order shall remain in effect until identified violations or noncompliant issues have been corrected.

F. Form Of Security: Before a permit is issued, the city may require the permittee to post security in a form acceptable to the city equal to one hundred twenty five percent (125%) of the cost estimate stated in the application and agreed by the city to be the cost of the work to be done under the permit. The security may take the form of cash in United States currency or an irrevocable letter of credit issued by a financial institution in a form acceptable to the city.

1. Release Of Security:

a. Provided no action has been taken by the city to recover all or a part of the security before that determination has been made, any security deposited with the city to guarantee performance of the grading and erosion control work shall be released to the person holding the permit upon determination by the city that the conditions of the permit have been satisfactorily performed.

b. Provided no action has been taken by the city to recover all or part of the security filed by the permittee before that date, securities held to ensure the successful completion of an interim or final plan shall be released to the permittee either one year after termination of the permit or when a final plan is submitted for the unimproved site, whichever is later.

G. Suspension Of Permit: In enforcing the permit:

1. The city may suspend the permit and issue a stop work order as provided under subsection E4 of this section. Upon receipt of a stop work order, the permittee shall cease all work on the work site except for work necessary to remedy the cause of the suspension.

2. The permittee may request a reinstatement of a suspended permit upon correction of the causes for suspension and, if the conditions of the permit have been complied with in full, the city shall reinstate the permit.

3. If the permittee fails or refuses to cease work as required under subsection E4 of this section, the city shall revoke the permit.

4. The city shall not reinstate a revoked permit but shall proceed to act against the security as provided in subsection H of this section.

5. Work performed without a permit is a violation of this chapter and is subject to misdemeanor enforcement.

H. Action Against Security: The city may act against the appropriate security if any of the following conditions exist:

1. The permittee stops performing the land disturbing activities or filling, and abandons the work site prior to completion of permanent site stabilization.

2. The permittee fails to conform to the stormwater pollution prevention plan as approved, and has had its permit revoked as provided in subsection G of this section.

3. The techniques utilized for temporary or permanent stabilization fail within one year of installation or before the final plan is implemented for the site or portion of the site, whichever comes later.

4. The city determines that its actions are necessary to prevent excessive erosion from occurring on the site, or to prevent nuisance conditions from occurring on adjacent or nearby properties.

The city shall use funds recovered from the security to reimburse the city for all direct and indirect costs incurred in doing the remedial work undertaken by the city or private contractor under contract with the city. (Ord. 421, 2-3-2009)

11-6-8: POSTCONSTRUCTION STORMWATER RUNOFF:

A. Objectives: The objectives of this section are to establish minimum stormwater management requirements and controls to protect and safeguard the general health, safety, and welfare of the public residing in watersheds within this jurisdiction. This section seeks to meet that purpose through the following objectives:

1. Reduce stormwater runoff rates and volumes, soil erosion and nonpoint source pollution, wherever possible, through stormwater management controls and to ensure that these management controls are properly maintained and pose no threat to public safety;

2. Control stormwater runoff from development and redevelopment to reduce flooding, silt deposits and stream bank erosion, and maintain the integrity of stream channels;

3. Control nonpoint source pollution caused by stormwater runoff from development; and

4. Control the total annual volume of surface water runoff which flows from any specific site following development.

B. Applicability: The rules of applicability are as set forth in section 11-6-6, "Construction Site Stormwater Runoff And Erosion Control", of this chapter.

C. Stormwater Pollution Prevention Plan:

1. Stormwater Pollution Prevention Plan Required For All New Developments And Redevelopments: No application for development or redevelopment will be approved unless it includes a stormwater pollution prevention plan detailing how runoff and associated water quality impacts resulting from the development will be controlled or managed and contains the submission materials identified in subsection 11-6-6D of this chapter. 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 pollution prevention plan(s) shall be referred for comment to interested agencies, and any comments must be addressed in a final stormwater pollution prevention plan. This final plan must be signed by a licensed professional engineer (PE) of the state of Minnesota.

2. Design Of Stormwater Facilities: The stormwater pollution prevention plan shall meet the design requirements outlined in the city's land disturbance guidance document.

3. Maintenance Of Existing Stormwater Facilities: Any stormwater facility in existence prior to the adoption date hereof shall be maintained by the owner of the stormwater facility and in a manner to conform to design standards for that facility. Any redevelopment of the stormwater facility shall require that the facility meet current stormwater design standards as set forth in the city's land disturbance guidance document.

   The thresholds for maintenance are triggered once sediment deposits reach a point greater than is

allowed under the design standard criteria, or such deposits begin to have a substantial effect on the water quality or holding capacity of the pond.

4. Inspection Of Stormwater Facilities: Inspection programs shall be established on a regular basis, including, but not limited to, an inspection in accordance with the schedule defined in the MPCA MS4 permit section V, part 6.b or more often if deemed necessary to ensure proper functioning of the stormwater management facility. Inspections are the responsibility of the owner of the stormwater facility and must be completed by a certified erosion control specialist in the state of Minnesota hired for that purpose. Inspection results must be completed and submitted to the city in accordance with the schedule defined in the MPCA MS4 permit section V, part 6.b from the completion of development or from the adoption date hereof for a preexisting stormwater facility.

   Inspections may include, but are not limited to: reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in drainage control facilities; and evaluating the condition of drainage control facilities and other stormwater treatment practices.

   All new and existing stormwater management facilities must undergo, at a minimum, an inspection in accordance with the schedule defined in the MPCA MS4 permit section V, part 6.b to document maintenance and repair needs and ensure compliance with the requirements of this chapter and accomplishment of its purposes. This maintenance may include: removal of silt, litter and other debris from all catch basins, inlets and drainage pipes; grass cutting and vegetation removal; and necessary replacement of landscape vegetation. Any maintenance needs found must be addressed in a timely manner, as determined by the city. The inspection and maintenance requirement may be increased as deemed necessary to ensure proper functioning of the stormwater management facility.

D. Maintenance Covenants: Maintenance of all stormwater management facilities shall be ensured through the creation of a formal maintenance covenant that must be approved by the city and recorded at the Dakota County recorder's office prior to final plan approval. As part of the covenant, a schedule shall be developed for when and how often maintenance will occur to ensure proper function of the stormwater management facility. The covenant shall also include plans for periodic inspections to ensure proper performance of the facility between scheduled cleanouts.

   The owner/operator shall show in the maintenance covenant how it will utilize best management practices (BMPs) to prevent discharge of pollutants into the stormwater system. These BMPs are listed in the city's stormwater pollution prevention plan (SWPPP) and the most current Minnesota pollution control agency BMP standards, the state of Minnesota stormwater manual and are necessary for compliance with requirements of the NPDES permit and the city's local surface water management plan. The threshold for maintenance is triggered once sediment deposition reaches a point greater than is allowed under the design standard criteria, or such deposition begins to have a substantial effect on the water quality or holding capacity of the pond.

E. Right Of Entry For Inspection: When any new drainage control facility is installed on private property, or when any new connection is made between private property and a public stormwater system, the property owner shall grant to the city the right to enter the property at reasonable times and in a reasonable manner for the purpose of inspection. This includes the right to enter a property when the city has a reasonable basis to believe that a violation of this chapter is

occurring or has occurred, and to enter when necessary for abatement of a public nuisance or correction of an ordinance violation.

F. Records Of Installation And Maintenance Activities: Parties responsible for the operation and maintenance of a stormwater management facility shall make records of the installation, inspections, and of all maintenance and repairs, and shall retain the records for at least ten (10) years. These records shall be made available to the city during inspection of the facility and at other reasonable times upon request. (Ord. 421, 2-3-2009)

11-6-10: ENFORCEMENT:

A. Violation: Any action, failure to act or land use practice that would impair water quality if allowed to continue, shall constitute a public nuisance condition and be treated as a misdemeanor under this code.

B. Notice Of Violation: Whenever the city finds that a person has violated any section of this chapter or failed to meet a requirement of this chapter, the city shall order compliance by written notice of violation to the responsible person. Such notice may require:

1. Monitoring, analyses and reporting;

2. Elimination of illicit discharges or connections;

3. Abatement of pollution and hazards;

4. Restoration of affected property;

5. Remediation of violation;

6. Payment of a fine to cover administrative and remediation costs;

7. Loss of any posted securities;

8. Implementation of source control or treatment BMPs; and

9. Other actions as deemed necessary by the city.

If abatement of a violation and/or restoration of affected property is required, the notice shall set forth a deadline within which such remediation or restoration must be completed. The notice shall further advise that, should the violator fail to remediate or restore within the established deadline, the work will be done by the city or other local governmental unit or a contractor and the expense thereof shall be charged to the violator.

C. Failure To Maintain Practices: If a responsible party fails or refuses to meet the requirements of the maintenance covenant, the city, after reasonable notice, may correct a violation of the design standards or maintenance needs by performing all necessary work to place the facility in proper working condition. In the event that the stormwater management facility becomes a danger to public safety or public health, the city shall notify the party responsible for maintenance of the stormwater management facility in writing. Upon receipt of that notice, the responsible person shall have thirty (30) days to effect maintenance and repair of the facility in an approved manner. After proper notice, the city may assess the owner(s) of the facility for the cost of repair work, and any penalties and the cost of the work shall be a lien on the property, or prorated against the beneficial users of the property, and may be placed on the tax bill and collected as ordinary taxes by the county. (Ord. 421, 2-3-2009)

11-6-11: APPEAL OF NOTICE OF VIOLATION:

Any person receiving a notice of violation may appeal the determination of the city. The notice of appeal must be received within five (5) days from the date of the notice of violation. Hearing on the appeal before the appropriate authority or designee shall take place within thirty (30) days from the date of receipt of the notice of appeal. The decision of the city or the local government unit or designee shall be final. (Ord. 421, 2-3-2009)

11-6-12: ENFORCEMENT MEASURES AFTER APPEAL:

If the violation has not been corrected pursuant to the requirements set forth in the notice of violation, or, in the event of an appeal, within five (5) working days of the decision of the city or local government unit upholding the decision of the authorized enforcement agency, then representatives of the authorized enforcement agency shall enter upon the subject private property and are authorized to take any and all measures necessary to abate the violation and/or restore the property. It shall be unlawful for any person, owner, agent or person in possession of any premises to refuse to allow the government agency or designated contractor to enter upon the premises for the purposes set forth above. (Ord. 421, 2-3-2009)

11-6-13: COST OF ABATEMENT OF THE VIOLATION:

Within thirty (30) days after abatement of the violation, the owner of the property will be notified of the cost of abatement, including administrative costs. The property owner must file any objection to the amount of the assessment in writing with the city within thirty (30) days. If the amount due is not paid within a timely manner, as determined by the decision of the city, or by the expiration of the time in which to file an appeal, the costs shall become a special assessment against the property and shall constitute a lien on the property for the amount of the assessment. Any person violating any of the provisions of this chapter shall become liable to the city by reason of such violation. (Ord. 421, 2-3-2009)

11-6-14: INJUNCTIVE RELIEF:

It shall be unlawful for any person to violate any provision or fail to comply with any of the requirements of this chapter. If a person has violated or continues to violate the provisions of this chapter, the authorized enforcement agency may petition for a preliminary or permanent injunction restraining the person from activities which would create further violations or compelling the person to perform abatement or remediation of the violation. (Ord. 421, 2-3-2009)

11-6-15: COMPENSATORY ACTION:

In lieu of enforcement proceedings, penalties, and remedies authorized by this chapter, the authorized enforcement agency may impose upon a violator alternative compensatory action, such as storm drain stenciling, attendance at compliance workshops, creek cleanup, and similar programs. (Ord. 421, 2-3-2009)

11-6-16: VIOLATIONS DEEMED A PUBLIC NUISANCE:

In addition to the enforcement processes and penalties provided, any condition caused or permitted to exist in violation of any of the provisions of this chapter is a threat to public health, safety, and welfare, and is declared and deemed a nuisance, and may be summarily abated or restored at the

violator's expense, and/or a civil action to abate, enjoin, or otherwise compel the cessation of such nuisance may be taken. (Ord. 421, 2-3-2009)

11-6-17: CRIMINAL PROSECUTION:

Any person who has violated or continues to violate this chapter shall be liable to criminal prosecution to the fullest extent of the law. The authorized enforcement agency may recover all attorney fees, court costs, and other expenses associated with enforcement of this chapter, including sampling and monitoring expenses. (Ord. 421, 2-3-2009)

11-6-18: REMEDIES NOT EXCLUSIVE:

The remedies listed in this chapter are not exclusive of any other remedies available under any applicable federal, state or local law and it is within the discretion of the authorized enforcement agency to seek cumulative remedies. (Ord. 421, 2-3-2009)

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

MS4 Pond, Wetland, and Lake Inventory Form

Municipal Separate Storm Sewer System (MS4) Program

Doc Type: Plans/Specifications/Maps

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	X Coordinate (Longitude) Decimal Degrees
City of Mendota Heights	12/30/2013	GC-P1a	Wetland	City Hall Pond West	44.8863	-93.1488
City of Mendota Heights	12/30/2013	GC-P1b	Pond	City Hall Pond East	44.8863	-93.1488
City of Mendota Heights	12/30/2013	GC-P5	Pond	Yorkton Pond	44.8824	-93.1547
City of Mendota Heights	12/30/2013	GC-P8	Pond	Lexington Apartment Pond	44.8722	-93.1465
City of Mendota Heights	12/30/2013	GC-P9	Pond	Cemetery Pond	44.8732	-93.1465
City of Mendota Heights	12/30/2013	GC-P10	Lake	Lake Augusta	44.8785	-93.1568
City of Mendota Heights	12/30/2013	GC - P11	Pond			
City of Mendota Heights	12/30/2013	GC-P15	Pond	GC-P15	44.8803	-93.1619
City of Mendota Heights	12/30/2013	GC-P41	Pond	Commerce Drive Pond #2 & 3	44.8715	-93.1706
City of Mendota Heights	12/30/2013	GC-P43	Pond	Bitminous Roadways	44.8744	-93.1728
City of Mendota Heights	12/30/2013	GC-P49d	Pond	MNDOT Pond "D"	44.8715	-93.1681
City of Mendota Heights	12/30/2013	GC-P49c	Pond	Commerce Drive Pond #1	44.8733	-93.1680
City of Mendota Heights	12/30/2013	GC-P49b	Pond	South Acacia	44.8765	-93.1649
City of Mendota Heights	12/30/2013	GC-P50C	Pond	Hillside Gables	44.8690	-93.1457
City of Mendota Heights	12/30/2013	GC-P51	Pond	Freeway Interchange	44.8646	-93.1486
City of Mendota Heights	12/30/2013	GC-P56	Pond	Towsignant Pond	44.8649	-93.1391
City of Mendota Heights	12/30/2013	GC-P56a	Pond	Ice Arena	44.8649	-93.1383
City of Mendota Heights	12/30/2013	GC-P57	Wetland	Visitation P57	44.8691	-93.1302
City of Mendota Heights	12/30/2013	GC-P58	Wetland	Visitation P58	44.8679	-93.1313
City of Mendota Heights	12/30/2013	GC-P59	Wetland	Visitation Pond	44.8671	-93.1330
City of Mendota Heights	12/30/2013	GC-P62	Pond	GC - P62	44.8637	-93.1390
City of Mendota Heights	12/30/2013	IF-P1	Pond	Somerset #1	44.9045	-93.1078
City of Mendota Heights	12/30/2013	IF-P1a	Pond	Somerset CC	44.9042	-93.1069
City of Mendota Heights	12/30/2013	IF-P4	Pond	Sommerset #2	44.9039	-93.1127
City of Mendota Heights	12/30/2013	IF-P21	Pond	Ivy Park Pond	44.9101	-93.1152
City of Mendota Heights	12/30/2013	IF-P15	Pond	Sutcliff Pond	44.9163	-93.1135

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	X Coordinate (Longitude) Decimal Degrees
City of Mendota Heights	12/30/2013	IF-P16	Pond	MnDOT 13 Pond	44.9137	-93.1171
City of Mendota Heights	12/30/2013	IF-P18	Pond	Burr Oak Pond	44.9102	-93.1096
City of Mendota Heights	12/30/2013	IP-P1	Lake	Lemay Lake	44.873	-93.1574
City of Mendota Heights	12/30/2013	IP-P1b	Pond	Augusta Shores	44.8789	-93.1609
City of Mendota Heights	12/30/2013	IP-P1c	Pond	Lemay Lake Road	44.8688	-93.1547
City of Mendota Heights	12/30/2013	IP-P1d	Wetland	Lemay Lake Wetland	44.8701	-93.1556
City of Mendota Heights	12/30/2013	IP-P2	Pond	Waters Drive	44.8688	-93.1588
City of Mendota Heights	12/30/2013	IP-P4	Pond	Cordon Blue	44.866	-93.1616
City of Mendota Heights	12/30/2013	IP-P5	Pond	Warehouse Pond	44.8719	-93.1658
City of Mendota Heights	12/30/2013	IP-P12	Pond	JES Pond	44.8669	-93.1661
City of Mendota Heights	12/30/2013	IP-P16	Pond	Business Park	44.8652	-93.1633
City of Mendota Heights	12/30/2013	IP-17a	Pond	Vet Pond	44.8645	-93.1546
City of Mendota Heights	12/30/2013	IP-17b	Pond	Radiology Pond	44.8645	-93.1582
City of Mendota Heights	12/30/2013	IP-17C	Pond	Northland Ponds	44.8634	-93.1577
City of Mendota Heights	12/30/2013	IV-P2	Pond	Westview Pond	44.8668	-93.1288
City of Mendota Heights	12/30/2013	IV-P3	Pond	Hazel Pond	44.8676	-93.1280
City of Mendota Heights	12/30/2013	IV-P4	Pond	Pagel Pond	44.8681	-93.1238
City of Mendota Heights	12/30/2013	IV-P5	Pond	Monet Pond	44.8651	-93.1251
City of Mendota Heights	12/30/2013	IV-P6	Pond	Bridgeview Pond	44.8668	-93.1212
City of Mendota Heights	12/30/2013	IV-P7	Pond	Arbor Pond	44.8642	-93.1227
City of Mendota Heights	12/30/2013	IV-P8	Pond	Brookfield Pond	44.8639	-93.1204
City of Mendota Heights	12/30/2013	IV-P9	Pond	Lockwood Pond	44.8656	-93.1184
City of Mendota Heights	12/30/2013	IV-P11	Pond	Kensington Park	44.8664	-93.1165
City of Mendota Heights	12/30/2013	IV-P12	Pond	Southeast Ponds	44.8636	-93.1108
City of Mendota Heights	12/30/2013	IV-P12b	Wetland	Southeast Ponds	44.8623	-93.1071
City of Mendota Heights	12/30/2013	IV-P12c	Wetland	Southeast Ponds	44.8635	-93.1079
City of Mendota Heights	12/30/2013	IV-P15	Pond	Owens Pond	44.8659	-93.1109
City of Mendota Heights	12/30/2013	IV-P16	Pond	King Pond	44.8690	-93.1095
City of Mendota Heights	12/30/2013	IV-P17	Pond	Delaware Pond 1	44.8710	-93.1084
City of Mendota Heights	12/30/2013	IV-P18	Pond	Copperfield Pond	44.8729	-93.1137
City of Mendota Heights	12/30/2013	IV-P19	Pond	Hagstrom Pond	44.8690	-93.1126
City of Mendota Heights	12/30/2013	IV-P21a	Pond	ISD 197 Friendly Hills	44.8687	-93.1199
City of Mendota Heights	12/30/2013	IV-P22	Pond	Friendly Hills	44.8711	-93.119
City of Mendota Heights	12/30/2013	IV-P24	Pond	Darsow Pond	44.8738	-93.1149

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	X Coordinate (Longitude) Decimal Degrees
City of Mendota Heights	12/30/2013	IV-P26	Pond	35E/110 MNDOT	44.8840	-93.1375
City of Mendota Heights	12/30/2013	IV-P32	Pond	Golf Course	44.8776	-93.1385
City of Mendota Heights	12/30/2013	IV-P33	Pond	N. Wagon Wheel	44.8759	-93.1380
City of Mendota Heights	12/30/2013	IV-P39	Lake	N. Rogers Lake (IV-P39)	44.8769	-93.1353
City of Mendota Heights	12/30/2013		Lake	S. Rogers Lake (IV - P39)	44.871	-93.1392
City of Mendota Heights	12/30/2013	IV-P39c	Pond	Golf Course	44.8806	-93.1371
City of Mendota Heights	12/30/2013	IV-P39d	Pond	S. Wagon Wheel	44.8746	-93.1375
City of Mendota Heights	12/30/2013	IV-P39e	Wetland	Rogers L. Marsh	44.8733	-93.1422
City of Mendota Heights	12/30/2013	IV-P39f	Pond	I.O.S. Pond	44.8733	-93.1421
City of Mendota Heights	12/30/2013	IV-P35	Pond	Rogers Park	44.8745	-93.1407
City of Mendota Heights	12/30/2013	IV-P36	Pond	35-E Pond	44.8721	-93.1436
City of Mendota Heights	12/30/2013	IV-P44	Pond	Mendakota Pond	44.8795	-93.1287
City of Mendota Heights	12/30/2013	IV-P50	Pond	F.M. Pond	44.8759	-93.1214
City of Mendota Heights	12/30/2013	IV-P51	Pond	Sibley H.S. Pond	44.884	-93.1094
City of Mendota Heights	12/30/2013	IV-P57	Pond	Dodge N.C. Pond	44.8793	-93.1142
City of Mendota Heights	12/30/2013	IV-P57b	Pond	Delaware Pond 2	44.8809	-93.1074
City of Mendota Heights	12/30/2013	IV-P57c	Pond	Glen Toro	44.8779	-93.1078
City of Mendota Heights	12/30/2013	IV-P57d	Pond	Glen Toro 2	44.8767	-93.1077
City of Mendota Heights	12/30/2013	IV-P63	Pond	MNDOT POND	44.8845	93.1235
City of Mendota Heights	12/30/2013	IV-P63b	Pond	Village Pond	44.8858	93.1204
City of Mendota Heights	12/30/2013	IV-P64	Pond	McDonalds Pond	44.8826	-93.1234
City of Mendota Heights	12/30/2013	IV-P64b	Pond	Plaza Pond	44.8819	-93.1225
City of Mendota Heights	12/30/2013	IV-P68	Wetland	Friendly Marsh	44.8786	-93.1191
City of Mendota Heights	12/30/2013	IV-P74	Pond	Lower Crown Point	44.8859	-93.1296
City of Mendota Heights	12/30/2013	IV-P75	Pond	Upper Crown Point	44.8878	-93.1309
City of Mendota Heights	12/30/2013	IV-P110	Pond	Valley Marsh	44.8903	-93.1292
City of Mendota Heights	12/30/2013	IV-P81	Pond	Warrior Pond	44.8881	-93.1134
City of Mendota Heights	12/30/2013	IV-P83	Pond		44.8867	-93.1214
City of Mendota Heights	12/30/2013	IV-P109	Pond		44.8908	-93.1273
City of Mendota Heights	12/30/2013	IV-P89	Wetland	Marie Marsh	44.8976	-93.1099
City of Mendota Heights	12/30/2013	IV-P90	Wetland	Marie Marsh	44.8915	-93.1076
City of Mendota Heights	12/30/2013	IV-P91	Pond	Kern Pond	44.8931	-93.1106

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	X Coordinate (Longitude) Decimal Degrees
City of Mendota Heights	12/30/2013	IV-P93	Wetland	Marie Marsh	44.8951	-93.1133
City of Mendota Heights	12/30/2013	IV-P93b	Pond		44.8935	-93.1128
City of Mendota Heights	12/30/2013	IV-P96a	Pond	Marie/Dodd	44.892	-93.1161
City of Mendota Heights	12/30/2013	IV-P96b	Pond	Hidden Creek #2	44.8911	-93.1199
City of Mendota Heights	12/30/2013	IV-P98	Wetland		44.8951	-93.1183
City of Mendota Heights	12/30/2013	IV-P100	Pond	Hidden Creek #1	44.8927	-93.1178
City of Mendota Heights	12/30/2013	IV-P104	Pond	Sutton/Marie Pond	44.8913	-93.1242
City of Mendota Heights	12/30/2013	IV-P111	Pond	Bachelor Ave Pond/Par 3	44.8952	-93.1244
City of Mendota Heights	12/30/2013	IV-P112	Pond	Valley Park Pond	44.8922	-93.1271
City of Mendota Heights	12/30/2013		Pond	Thompson Pond	44.9018	-93.1078
City of Mendota Heights	12/30/2013	IV-P114	Pond	Somerset #3	44.9016	-93.1104
City of Mendota Heights	12/30/2013	IV-P115	Pond	Wentworth Park	44.8995	-93.1219
City of Mendota Heights	12/30/2013	IV-P116	Pond	Wentworth Pond	44.8975	-93.1151
City of Mendota Heights	12/30/2013	IV-P125	Pond	Park Place Pond	44.9001	-93.1283
City of Mendota Heights	12/30/2013	IV-P126	Pond	Cherry Hills Pond	44.9041	-93.1296
City of Mendota Heights	12/30/2013	IV-P128	Pond	Lex./Marie Ave.	44.8903	-93.1463
City of Mendota Heights	12/30/2013	IV-P129a	Pond	Faro Pond	44.8907	-93.1436
City of Mendota Heights	12/30/2013	IV-P132	Pond	Burrows Pond	44.8887	-93.1386
City of Mendota Heights	12/30/2013	IV-P132b	Pond	Burrow Storm Pond	44.8878	-93.1378
City of Mendota Heights	12/30/2013	IV-P133	Pond	Marie Pond	44.8918	-93.1384
City of Mendota Heights	12/30/2013	IV-P134	Pond	Victoria Pond	44.8937	-93.1360
City of Mendota Heights	12/30/2013	IV-P139	Pond	Ravine Pond	44.9020	-93.1335
City of Mendota Heights	12/30/2013	MB-P3Ca	Pond	Summit #1	44.9062	-93.1279
City of Mendota Heights	12/30/2013	MB-P3Cb	Pond	Summit #2	44.9064	-93.1293
City of Mendota Heights	12/30/2013	MB-P8	Pond	Lilac Lane Pond	44.8974	-93.1383
City of Mendota Heights	12/30/2013	MB-P10	Pond	Mayfield Heights	44.8948	-93.1435
City of Mendota Heights	12/30/2013	MB-P16	Pond	Kingsley Pond	44.8919	-93.1504
City of Mendota Heights	12/30/2013	MB-P17	Pond	Val's Addition	44.8910	-93.1509
City of Mendota Heights	12/30/2013	MB-P31	Pond		44.8835	-93.1606
City of Mendota Heights	12/30/2013	MB-P31b	Pond		44.8845	-93.1474
City of Mendota Heights	12/30/2013	MB-P32	Pond		44.8826	-93.1605
City of Mendota Heights	12/30/2013	MB-P33	Pond		44.8828	-93.1716

APPENDIX C

System Design Guidelines

1. CONVEYANCE AND STORAGE SYSTEM CONCEPTS

1.1. Storm Sewer and Channels

In the Mendota Heights SWMP stormwater model, a combination of storm sewer and channels has been used to transport simulated stormwater runoff. A complete system consists of a complex web of trunks, manholes, lateral lines, overland drainage ways, catch basin leads, catch basins, pond inlets and outlets, and many other items.

Proper design of a storm sewer system requires that all sewer lines be provided with access through manholes for maintenance and repair operations. Generally, spacing of manholes should be no greater than 400 feet. Intervals on larger diameter lines can be increased when the pipes are sufficiently large for a person to physically enter the storm sewer pipe for maintenance operations. Regardless of sewer size, manholes should normally be provided at all junction points and at points of abrupt alignment or grade changes.

Although lateral systems are designed for the 10-year storm event, their performance must be analyzed for storms exceeding the design storm. Lateral and trunk pipes will surcharge when the design storm is exceeded. During surcharging, the pipes operate as closed conduits and become pressurized with different pressure heads throughout the system. Low areas that are commonly provided with catch basins become small detention ponds often performing like pressure relief valves with water gushing out of some locations. For this reason, it is extremely important to ensure that these low areas have an acceptable overland drainage route with proper transfer capacity.

At a minimum, ponding on streets must meet all of the requirements of the 100-year design criteria. For safety reasons, the maximum depth should not exceed two feet at the deepest point and the lowest ground at adjacent building elevation should be at least one and a half feet above the elevation to which water could rise before overflowing through adjacent overland routes.

All storm sewer facilities, especially those conveying large quantities of water at high velocities, should be designed with efficient hydraulic characteristics. Manholes and other structures at points of transition should be designed and constructed to provide gradual changes in alignment and grade. Pond outlet control structures should be designed to allow water movement in natural flow line patterns, to minimize turbulence, to provide good self-cleaning characteristics, and to prevent damage from erosion.

Intake structures should be liberally provided at all low points where stormwater collects and at points where overland flow is to be intercepted. Inlet structures are of special importance, since it is a poor investment to have an expensive storm sewer line flowing partially full while property is being flooded due to inadequate inlet capacity. Intake grates and opening should be self-cleaning and designed to minimize capacity reduction when clogged with twigs, leaves, and other debris.

Effective energy dissipation devices or stilling basins to prevent stream bank or channel erosion at all stormwater outfalls should be provided. The following recommendations should be kept in mind when designing an outlet:

- Inlet and outlet pipes of stormwater ponds should be extended to the pond NWL whenever possible.
- Outfalls with velocities of less than four feet per second (fps) that project flows

downstream into the channel in a direction 30 degrees or less from the normal channel axis generally do not require energy dissipaters or stilling basins, but do require riprap protection.

- Where an energy dissipater is used, it should be sized to provide an average outlet velocity of less than four fps, unless riprap is also used. In the latter case, or when discharge occurs at NWL of a pond, the average outlet velocity should not exceed six fps.
- Where outlet velocities exceed six 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.
- In the case of discharge to channels, riprap should be provided on all outlets to an adequate depth below the channel grade and to a height above the outfall or channel bottom. It should be placed over a suitably graded filter material and filter fabric to ensure that soil particles do not migrate through the riprap and reduce its stability. Riprap should be placed to a thickness at least two and a half times the mean rock diameter so as 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.
- Overland drainage routes where velocities exceed six fps should be reviewed by the City Engineer and approved only when suitable stabilization measures are proposed.

Open channels and swales are recommended where flows and small grade differences prohibit the economical construction of an underground conduit and in areas where open channel type drainage will enhance the aesthetic qualities of a development. Whenever possible, a minimum slope of two percent should be maintained in unlined open channels and overland drainage routes. Slopes less than two percent and greater than one percent are difficult to construct and maintain and may require an underdrain system. Slopes less than one percent should not be allowed. Side slopes should be a maximum of 4:1 (horizontal to vertical) with gentler slopes being desirable. Where space permits, slopes should be cut back to match existing grade.

In general, the flatter the channel side slopes and the more meandering the channel alignment the more natural the channel will appear. Natural looking channels use significantly more space than common ditches. One method of providing this space is to incorporate greenway corridors over the channel area.

Rock riprap should be provided at all points of juncture between two open channels and where storm sewer pipes discharge into a channel. The design velocity of an open channel should be sufficiently low to prevent erosion of the bottom. Riprap or concrete liners should be provided in areas where high velocities cannot be avoided. Periodic cleaning of an open channel is required to ensure that the design capacity is maintained. Therefore, all channels should be designed to allow easy access for equipment.

Sanitary sewer manholes that could be subject to temporary inundation, due to their proximity to ponds, channels, or roadway low points, should be equipped with watertight castings. Precautions should be taken during construction to prevent the entrance of stormwater into the sanitary sewer. When access is required at all times, sanitary manholes located near ponding areas should be raised above the 100-year HWL. If access is not required, water tight castings should be installed. Future storm drainage construction should include provisions for improving the water tightness of nearby sanitary sewer manholes. All newly constructed sanitary manholes in the vicinity of ponding areas and open channels described in this report should be waterproof.

1.2. Ponds

Stormwater ponding areas are an essential part of any storm drainage system. These

areas provide locations where stormwater flows can be reduced to provide flood protection for downstream areas. The effective use of ponding areas enables the installation of outflow storm sewers and channels with reduced capacities, since the duration of the design storm is effectively increased over the total time required to fill and empty ponds. Smaller capacity trunk storm sewer and channels provide a cost savings to the City. The use of ponds to control stormwater runoff rates is a recent phenomenon. Historically, older cities have piped stormwater directly to the nearest large receiving water or river. Continued use of this practice has both cost and regulatory implications. In terms of cost, few cities have the funds necessary to build pipes that provide 100-year protection to properties. In fact, the older cities that have historically piped all their stormwater find that the systems they constructed provide nowhere near the 100-year protection found in newer cities that have used ponds. In terms of the regulatory control, many direct discharges (without ponding) to waters of the state are precluded. At present, even direct discharges to wetlands that are not considered waters of the state are regulated through the NPDES construction permit.

Cost and regulatory considerations aside, well designed ponds:

1. Improve water quality
2. Recharge the groundwater table
3. Provide aesthetic, recreational and wildlife benefits

Ponds improve stormwater quality by allowing nutrients and sediments carried by runoff to settle before discharge to important receiving waters. Groundwater recharge is increased by restricting the outflow rate from a pond, thus allowing more water to infiltrate into the soil. Careful planning of ponds can enhance a development's appeal and still provide efficient stormwater management. In fact, lots with pond frontage command a higher price than lots without.

To provide proper protection for adjacent property, the design storm for ponding areas is the maximum flood elevation obtained from analyzing 100-year critical events of different duration. Regardless the duration of the critical event, a Type II, 24-hour, 100-year rainfall event must also be analyzed. The lowest exposed elevations of structures that are adjacent to ponds should be certified by the builder during basement construction to ensure adequate freeboard.

Runoff determinations for pond design vary from those for storm sewer calculations. The critical storm for storm sewer design is the short, high intensity storm, whereas the critical storm for pond design is often of longer duration, since water is being stored for longer periods of time and released at a slower rate.

The use of HydroCAD computer modeling in the analysis of the ponding system has allowed for the efficient review of complicated routing patterns, each comprised of several ponds. The pond storage and outflow rates, adjusted by lag time, were determined by the HydroCAD program for all the ponds identified in this Plan. The lag time is significant as it represents the attenuation of peak flows at each pond and generally shows that the peaks are not occurring at the same time. This implies that the direct runoff to a pond has generally passed through to the downstream trunk system before the inflow of large volumes of runoff from upstream ponds.

2. 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.

2.1. 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. Composted decay around ponds, and
3. Fertilizers and other chemicals from farming practices, impervious surfaces, or lawn care.

Identification of the source and implementation of reasonable control measures can minimize the degradation of Mendota 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. Inspections should be conducted by the City to verify that the erosion control practices have been installed and maintained properly. Even with extensive erosion control practices, sediment and airborne particulates will continue to enter surface waters of the City.

The importance of erosion control measures during construction cannot be overemphasized. The BMPs recommended in the MPCA Protecting Water Quality in Urban Areas should be followed for all developments. 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 settling ponds to treat the runoff from their grading sites. These ponds 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, these temporary sedimentation basins should meet the requirements set forth in the NPDES general permit for construction activities. When the outlet for a siltation basin, either permanent or temporary, is located below the normal water surface, the basin can also serve to confine floating solids that may otherwise enter a downstream pond or lake. This practice is typically referred to as skimming. If a hazardous material such as fuel oil were to spill, a skimmer structure would retain it within the basin and thus isolate it for easy access and prompt cleanup. Skimmer structures should be used for all constructed ponds upstream of wetlands, lakes, rivers and streams. For constructed ponds that discharge into other constructed ponds, skimmer structures are not as important.

Ideally, some sort of solids removal system should be installed wherever a storm sewer outlets into a pond. In certain cases, settling chamber (sump) type catch basins or manholes can be provided for storm sewers that discharge into ponds. These can provide effective removal of sand and gravel, which may be flushed into the storm sewer from streets and highways, but are ineffective in the removal of finer particles such as silts and clays. Use of this type of catch basin or manhole should be limited to those areas where regular maintenance is practical and to where the sump can be realistically expected to intercept sand from winter sanding operations and gravel from driveways and construction sites.

Of late a concern regarding West Nile virus and mosquito breeding habitat has called into question the use of sump manholes. The latest data suggests that many different breeding environments exist for the mosquitoes that carry the virus including ponds, wetlands, catch basins, and manholes. Obviously, eliminating these elements of the system is not feasible. Though they should be used sparingly, sump manholes should not be prohibited due to a concern over West Nile virus.

It bears repetition that a solids removal structure must be regularly maintained if it is to remain effective. Since maintenance is the controlling factor in the long term performance of sediment control measures, ponds are recommended over sump manholes. Sump manholes, if numerous, often go without maintenance. An individual pond requires more maintenance time than a sump, but system maintenance time goes down when ponds are the preferred method of sediment removal as long as pond slopes and benching allow access by maintenance equipment. For this reason sump manholes should be limited to storm sewer lines discharging directly to wetlands, lakes, rivers, streams, ravines, and constructed channels and should be avoided upstream of constructed ponds. In all cases, the location, type, and number of sediment control structures must be established at the time of final design of that portion of the storm sewer system. Maintenance of the system is discussed further in Section 6.

Even with the best and most expensive solids removal system, contamination of ponds and lakes will occur unless particular attention is paid to those activities that occur after development of a site. Developers must utilize the BMPs to minimize erosion during the mass grading phase of construction. But property owners must also use care in the development and maintenance of their lawns and open areas. Debris is frequently raked from lawns into gutters; from there, if it is not removed, it washes into the storm sewer system.

Generally speaking, water quality ponding within a development has to treat storm water to the level required by the downstream receiving water body and its attendant management strategy. This SWMP calls for detention pond design according to the design program developed by William Walker. At a minimum, though, detention ponds should contain wet volume equivalent to the runoff from a 2.5-inch rainfall over their tributary area. Occasionally, with small plats (of five acres of less), water quality ponding cannot be constructed to the extent required by the SWMP without severely hampering the site development or destroying other habitat such as upland grasslands and forests.

In such cases, it is within the City’s discretion to reduce the required water quality ponding and/or require other methods such as filtration swales or filter beds.

APPENDIX D

Land Disturbance Guidance Document

Land Disturbance Guidance Document

Mendota Heights, Minnesota

May 10, 2018

Project Number: 1735-04

WSB

Land Disturbance Guidance Document

Title Sheet
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The following requirements shall be considered as the Land Disturbance Guidance Document as defined in Title 14 Chapter 1 of the Mendota Heights City code: Stormwater Management, Illicit Discharge, Soil Erosion, and Sedimentation. The requirements below are meant to serve as a general guideline and do not account for all possible site conditions or situations.

Additional measures may be necessary to meet the intent of the Mendota Heights city code. It is the obligation of the owner and designer to consider all factors contributing to erosion, flooding, and water quality impairments on the project site and include appropriate Best Management Practices for minimizing erosion and providing permanent stormwater runoff management.

1.0 Construction Site Stormwater Runoff Control

1.1 Erosion Control and Prevention Practices

a. 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. The Permittee must minimize the need for disturbance of portions of the project that have steep slopes. For those sloped areas which must be disturbed, the Permittee must use techniques such as phasing and stabilization practices designed for steep slopes (e.g., slope draining and terracing).

b. All exposed soil areas (including stockpiles) 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. For Public Waters that the Minnesota Department of Natural Resources has promulgated “work in water restrictions” during specified fish spawning time frames, all soil areas that are within 200 feet of the water’s edge, and drain to these waters must complete the stabilization activities within 24 hours during the restriction period.

c. 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.

d. The normal wetted perimeter of a temporary or permanent drainage ditch that drains water for the project site or diverts water around the project must be stabilized 200 lineal feet from the property edge or from a discharge point to a surface water. Stabilization must occur within 24 hours of connection to surface waters. Applying mulch, hydromulch, tackifier, polyacrylamide or similar erosion prevention practices is not acceptable stabilization in any part of a temporary or permanent drainage ditch or swale.

e. Pipe outlet must have temporary or permanent energy dissipation within 24 hours before connecting to surface water.

f. When possible, all slopes must be graded in such a fashion so that tracking marks made from heavy equipment are perpendicular to the slope.

g. 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:

    i) Areas with slopes that area less than 3:1 must be seeded and mulched within 14 days of the area not being actively worked.

    ii) 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.

    iii) All seeded area must be either mulched and disc anchored, hydro- mulched, or covered by erosion control blanket to reduced erosion and protect 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.

iv) 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.

v) 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.

vi) 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.

vii) Restoration of disturbed wetland areas shall be accomplished using an approved seed mixture and application rate.

h. 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.

i. 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.

1.2 Sediment Control Practices

a. 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 in accordance with Section 1.7.

b. 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.

c. There shall be no unbroken slope length greater than 75 feet with a grade of 3:1 or steeper.

d. 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.

e. 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.

f. A 50-ft natural buffer or (if a buffer is infeasible on the site) provide redundant sediment controls when a surface water is located within 50 feet of the project's earth disturbances and stormwater flows to the surface water. Natural buffers are not required adjacent to road ditches, judicial ditches, county ditches, stormwater conveyance channels, storm drain inlets, and sediment basins.

g. Vehicle tracking of sediment from 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 maintained entrances throughout the construction building until a paved driveway is install.

h. Sediment that has washed or tracked from site by motor vehicles or equipment shall be cleaned from paved surfaces throughout the duration of construction.

i. Silt fence or other approved sediment control devices must be installed in all areas as shown on the SWPPP.

j. 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.

k. 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***

l. Dust control measures, such as application of water must be performed periodically due to weather, construction activity, and/or as directed by the City.

m. 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.

n. 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.

o. All sediment control measures shall be used and maintained for the duration of the project until final stabilization has been achieved accordance with Section 1.7. If construction operations or natural events damage or interfere with any erosion control measures, they must be restored to serve their intended function.

p. 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.

q. Restrict clearing and grading within 20 feet of an existing wetland, lake, or stream boundary to provide for a protective buffer strip of natural vegetation.

1.3 Temporary Sediment Basins

a. 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 10 acres and it drains to one common area. The basins shall be designed and constructed according to the following requirements:

   i) 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 1800 cubic feet of storage below the outlet pipe from each acre drained to the basin.

   ii) 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.

   iii) 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.

   iv) 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.

   v) 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.

vi) 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 theyhave been removed or relocated based on the projects restoration progress.
vii) Basins designed to be used for permanent stormwater management shall be brought back to their original design contours as defined in Section 1.7.

1.4 Dewatering and Basin Draining

a. 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.
b. 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.

1.5 Inspections and Maintenance

a. The Permittee shall be responsible for inspecting and maintenance of the BMPs
b. The Permittee must routinely inspect the construction project once every 7 days during active construction and within 24 hours of a rainfall event of 0.5 inches or greater in 24 hours.
c. 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
    i) Date and time of inspection.
    ii) Name of person(s) conducting the inspections.
    iii) Findings of inspections, including recommendations forcorrective actions.
    iv) Corrective actions taken (including dates, times, and the party completing the maintenance activities).
    v) Date and amount of all rainfall events 0.5 inches or greater in 24 hours.
    vi) Documentation of changes made to SWPPP.
d. 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.
e. 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.
f. All silt fences must be repaired, replaced, or supplemented when they become nonfunctional or the sediment reaches 1/3 of the height of the fence. These repairs shall be made within 24 hours of discovery, or as soon as field conditions allow access.
g. 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.
h. 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 re-stabilize the areas where sediment removal results in exposed

soil. The removal and stabilization shall take place within 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.

i. 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.

j. 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.

k. 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).

l. 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.

1.6 Pollution Management Measures/Construction Site Waste Control

a. The Permittee must implement the following pollution prevention management measures on the site.

   i) 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.

   ii) 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.

   iii) 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.

   iv) The City of Mendota Heights prohibits discharges of any material other than storm water, 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.

1.7 Final Stabilization

a. The Permittee must ensure final stabilization of the project. Final stabilization can be achieved in one of the following ways.

b. 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;

   i) All drainage ditches, constructed to drain water from the site after construction is complete, must be stabilized to preclude erosion; and

   ii) 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

iii) 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.

c. For residential construction only, final stabilization has been achieved when:

i) Temporary erosion protection and down gradient perimeter control for individual lots has been completed and the residence has been transferred to the homeowner.

ii) The Permittee must distribute the MPCA **"**homeowner factsheet**"** to the homeowner so the homeowner is informed for the need, and benefits, of final stabilization.

1.8 Training:

Training is required for those that are responsible for preparation of the SWPPP, management of the construction site and inspections.

a. 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.

b. 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.

2.0 Stormwater Management Design Standards

2.1 Storm Sewer

a. Provide for overflow routes to drain low points along streets or lot lines to ensure a freeboard of 2' from the lowest ground adjacent to building and the calculated 100-year storm HWL elevation. Design criteria verifying the adequacy of the overland drainage route capacity is required calculated 100-year storm HWL elevation. Design criteria verifying the adequacy of the overland drainage route capacity is required.

b. The storm sewer alignment shall follow the sanitary sewer and watermain alignment where practical with a minimum of 10' of separation. Storm sewer placed along the curb alignment shall be along the curb opposite the watermain to maintain the 10' separation.

c. Catch basins shall be located on the tangent section of the curb at a point 3' from the point of curve. Mid-radius catch basins will not be allowed. Also, catch basins shall be designed to collect drainage on the upstream side of the intersection.

d. The maximum spacing between manholes is 400'.

e. Manhole steps will be aligned and over the downstream side of the manhole. Steps within manholes will be:
    i) 1" +/- Horizontal Alignment
    ii) 1" +/- Vertical Alignment per latest OSHA Standards

f. Any connections to existing manholes or catch basins shall be core drilled or the opening cut out with a concrete saw. No jack hammering or breaking the structure with a maul is permitted. Also, all connections to an existing system will require a manhole for access.

g. To the greatest extent possible, manholes shall be placed in paved surfaces outside of wheel paths, (3' and 9' off centerline) or other readily accessible areas.

h. Minimum pipe size shall be 12" diameter.

i. Aprons or flared end sections shall be placed at all locations where the storm sewer outlets a ponding area. All inlet/outlet flared end sections shall be furnished with hot dipped galvanized trash guards. All trash guard installations will be subject to approval by the City Engineer. The last three pipe joints from the flared end section shall be tied together.

j. Riprap and filter blanket shall be placed at all outlet flared end sections.

k. The placement of the riprap shall be by hand. The minimum class of riprap shall be MnDOT 3601.2, Class III. A design criterion justifying the size and amount of riprap is required. Geotextile material is not allowed for filter aggregate where ice action along the shore line may tear the geotextile.

l. The invert elevations of the pond inlet flared end sections shall match the NWL of the pond. Submerged outlets will only be allowed at the discretion of the City Engineer.

m. If the storm sewer is to be installed less than 10' deep within private property, the easement shall be a minimum of 20' wide with the pipe centered in the easement. If the storm sewer is 10' deep or greater, then the easement shall be twice as wide as the depth or as required by the City.

n. Junction manholes should be designed to limit the hydraulic head increase by matching hydraulic flow lines and by providing smooth transition angles.

o. In the development of any subdivision or ponding area, the developer and/or property owner is responsible for the removal of all significant vegetation (trees, stumps, brush, debris, etc.) from any and all areas which would be inundated by the designated controlled Normal Water elevation (NWL) of any required ponding easement as well as the removal of all dead trees, vegetation, etc., to the High Water Level (HWL) of the pond.

p. Outlet control structures from ponding areas are required as directed by the City. Location and appearance of outlet structures shall be subject to City approval and may require landscape screening.

q. Sump manholes with 3-foot sumps shall be constructed as the last structure that is roadway accessible prior to discharge to any waterbody.

r. Inlets should be placed and located to eliminate overland flow in excess of 1,000 feet on minor streets, or a combination of minor streets and swales, and 600 feet on collector

streets and arterials. Additionally, inlets should be located such that 3 cfs is the maximum flow at the inlet for the 10-year design storm.

2.2 Outlet and Inlet Pipes

a. Inlet and outlet pipes of stormwater ponds should be extended to the pond normal water level whenever possible.
b. Outfalls with velocities less than 4 feet per second (fps) that project flows downstream into the channel in a direction 30 degrees or less from the normal channel axis generally do not require energy dissipaters or stilling basins, but do require riprap protection.
c. Where an energy dissipater is used, it should be sized to provide an average outlet velocity of less than 4 fps, unless rip rap is also used. In the latter case, or when discharge occurs at NWL of a pond, the average outlet velocity should not exceed 6 fps.
d. Where outlet velocities 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.
e. In the case of discharge to channels, rip rap should be provided on all outlets to an adequate depth below the channel grade and to a height above the outfall or channel bottom. It should be placed over a suitably graded filter material and filter fabric to ensure that soil particles do not migrate through the rip rap and reduce its stability. Rip rap should be placed to a thickness at least 2.5 times the mean rock diameter so as to ensure that it will not be undermined or rendered ineffective by displacement. If rip rap is used as protection for overland drainage routes, grouting may be recommended.

2.3 Channels and Overland Drainage

a. Overland drainage routes where velocities exceed 6 fps should be reviewed by the City Engineer and approved only when suitable stabilization measures are proposed.
b. 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 pipe.
c. Whenever possible, a minimum slope of 2% should be maintained in unlined open channels and overland drainage routes. Slopes less than 2% and greater than 1% are difficult to construct and maintain and may require an underdrain system. Slopes less than 1% are not allowed for lot drainage and channels designed primarily for conveyance.
d. Minimum grade for lot drainage swales and lot grading shall be 2% or greater.
e. Maximum length for drainage swales shall be 300 feet or a total of eight lots draining to a point, or as approved by the City Engineer.
f. Channel side slopes should be a maximum of 4:1 (horizontal to vertical) with gentler slopes being desirable. Where space permits, slopes should be cut back to match existing grade.
g. Rock rip rap should be provided at all points of juncture between two open channels and where storm sewer pipes discharge into a channel.
h. The design velocity of an open channel should be sufficiently low to prevent erosion of the bottom. Rip rap or concrete liners should be provided in areas where high velocities cannot be avoided.
i. Periodic cleaning of an open channel is required to ensure that the design capacity is maintained. Therefore, all channels should be designed to allow easy access for equipment.

2.4 Ponds

a. Maximum allowed pond slopes are 3:1, though 4:1 slopes are preferred. Pond slopes steeper than 4:1 shall have erosion control blanket installed immediately after finish grading. In residential areas slopes no steeper than 4:1 shall be allowed. 3:1 slopes may be allowed in “maintained” areas as approved by the City Engineer. 3:1 slopes are not allowed for road fill sections adjacent to water bodies.
b. 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:
    i) Cross slope no steeper than 10:1

ii) Minimum width 10 feet
iii) Located from pond NWL to one foot below pond NWL

c. All constructed ponds and wetland mitigation areas shall have a maintenance access bench around sufficient perimeter to provide access to all inlets and outlets. At a minimum the maintenance bench should extend around 50% of the basin perimeter.
d. Elevation separations of buildings with respect to ponds, lakes, streams, and storm water features shall be designed as follows:
    i) The lowest ground elevation adjacent to homes and buildings must be a minimum of two feet above the calculated 100-yr HWL or 1.5 feet above the EOF, whichever criteria leads to the higher elevation.
    ii) Landlocked lakes and wetlands require either 1) a five-foot separation between basin HWL and lowest ground elevation adjacent to building or 2) a three-foot separation between basin HWL for back to back 100- year storms and the lowest ground elevation adjacent to building or 3) three-foot separation between the highest known or recorded basin elevation in the case of large wetlands and lakes and lowest ground elevation adjacent to building. Whichever of the three methods yields the highest allowable ground at building elevation should be the one used.
e. Drainage easements for ponds, lakes, wetlands, streams etc. shall encompass an area to one foot (vertical) above the calculated 100-year HWL.
f. Maximum pond wet volume depth is 8 feet; minimum wet volume depth is 3 feet.
g. Flood bounce is defined as the vertical difference between pond NWL and pond HWL. Flood bounce shall not exceed 6 feet except in the case of regional basins, as defined by the City Engineer.
h. All ponds shall have outlet skimming for up to the 5-year event.
i. All ponds shall be graded to one-foot below design bottom elevation. This “hold down” allows sediment storage until such time as site restoration is complete.
j. The top berm elevation of ponds shall be a minimum of 1.5 feet above the 100- year pond HWL.
k. 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.
l. Seeding around ponds should be MnDOT standard mix 33-261 or BWSR equivalent.

3.0 Stormwater Management Performance Measures

3.1 Volume Management

a. For development and redevelopment projects, the performance benchmark for runoff volume reduction, otherwise known as abstraction, is a volume equivalent to 1.1 inches of runoff off all new impervious surfaces. Allowable BMPs for abstracting runoff volume and methods for calculating abstraction are:
   i) Infiltration benches adjacent to constructed ponds
   ii) Rainwater gardens or infiltration areas separate from ponds such as depressed medians or grassed areas adjacent to parking lots and buildings
   iii) Pervious pavement or pavers
   iv) Vegetated swales
   v) Constructed wetlands
   vi) Underground storage with infiltration
   vii) Underground storage with water recycling for irrigation
   viii) Green roofs

b. For public linear projects these standards shall apply only to newly created impervious surfaces that exceed 10,000 square feet.

c. The amount of impervious surface increase on projects shall be reduced to the greatest extent possible for development and redevelopment projects in accordance with Low Impact Development (LID) techniques. A narrative shall be provided that addresses the consideration of LID techniques in development and redevelopment impervious surface extents.

d. For all infiltration calculations the infiltration rates in Table 3.1 shall be assumed. As an alternative, percolation tests can be conducted and submitted to determine the actual rate of infiltration after subgrading is complete.

Table 3.1 Infiltration Rates (Source: Minnesota Stormwater Manual)

Hydrologic	Soil	Corresponding Unified Soil	Infiltration
A	Gravel, sand, sandy gravel, silty gravel, loamy sand, sandy loam	GW - Well-graded gravel or well-graded gravel with sand GP - Poorly graded gravel or poorly graded gravel with sand GM – silty gravels, silty sandy gravels SW – well-graded gravelly sands	1.63
		SP – gap-graded or uniform sands, gravelly sands	0.8
B	Loam, silt loam	SM - Silty sand or silty sand with gravel	0.45
		ML - Silts, very fine sands, silty or vlayey fine sands	0.3
C	Sandy clay loam	ML – silts, very fine sands, silty or clayey fine sands	0.2
D	Clay, clay loam, silt clay loam, sandy clay, silt clay	GC – clayey gravels, clayey sandy gravels SC – clayey sands, clayey gravelly sands CL - Low plasticity clays, sandy or silty clays OL – organic silts and clays of low plasticity CH - Fat clay or fat clay with sand or gravel or gravelly fat clay OH - Organic clay or organic clay with sand or gravel or gravelly organic clay	.06

e. Infiltration areas shall be designed to infiltrate water in 48 hours.

f. Infiltration areas shall not be constructed in karst or fractured bedrock areas, nor should they be constructed adjacent to steep slopes.
g. Infiltration practices shall be left off-line until the upgradient drainage areas are stabilized.
h. The volume management standard is waived in areas of known soil contamination or for developments where the potential for spills makes infiltration inadvisable.
i. Infiltration areas shall not have a 100-year design storm flood bounce that exceeds 3 feet.
j. Pretreatment, in the form of forebays or filter strips, shall be considered for all infiltration areas.
k. For infiltration benches adjacent to ponds the following standards apply:
    i) Benches shall have slopes no steeper than 6:1 over the proposed infiltration zone. A slope of 10:1 is preferred.
    ii) Benches may be excavated and backfilled with sand or sandy topsoil to provide additional storage volume for infiltration without violating the 3 foot flood bounce requirement.
l. Porous pavement or pavers shall be considered pervious surface for the purposes of infiltration calculations.
m. Porous pavement or pavers are considered sufficient to infiltrate water off impermeable surfaces at a ratio of 5:1 (impermeable surface area to porous pavement area).

3.2 Water Quantity

a. At a minimum, proposed peak runoff rate from development and redevelopment project shall maintain or decrease existing flow rates for the 2, 10, and 100-year 24-hour rainfalls.

Table 3.2. Storm Events

Event	*Rainfall/Snowmelt depth (inches)*
2-year, 24 hour	*2.81*
10-year, 24 hour	*4.19*
100-year, 24 hour	*7.47*
100-year, 10 day snowmelt	*7.2*

b. A Rate Control Plan shall be developed for projects that disturb one or more acre of land. Public Linear Projects shall be exempt from developing a Rate Control Plan unless the project creates 10,000 square feet or more of new impervious surface. Rate Control Plan shall include the following items:
    i) Delineation of the subwatersheds contributing runoff from off-site, and proposed and existing watersheds on-site.
    ii) Delineation of existing on-site wetlands, shoreland, and/or floodplain areas. Any removal or disturbance of streambank and shoreland vegetation should be identified and avoided. Any unavoidable removal or disturbance to this vegetation must be addressed and mitigated
    iii) Stormwater runoff volume and rate analyses for existing and proposed conditions
    iv) Administrative items included in Section 4.0
    v) A narrative describing existing and proposed rate control for the site.

    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 2-hour, 6-hour, 12-hour, or 24 hour rainfall events or the 10-day, 7.2- inch snowmelt runoff event.
c. 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 7.2-inch 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 MSE 3 distribution should be used. For shorter duration critical events other distributions may be used with the approval of the City Engineer.

d. All drainage system analyses and designs shall be based on proposed full development land use patterns.
e. 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):
    i) Three feet above the HWL determined by modeling back to back 100- year, 24-hour events,
    ii) Three feet above the highest known water level, or
    iii) Five feet above the HWL determined by modeling a single 100-year, 24- hour event.
f. 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.
g. 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.
h. Adjacent to channels, creeks, and ravines freeboard will also be 2 feet to the 100-year critical event elevation.

3.3 Water Quality

a. Storm water treatment facilities constructed in Mendota Heights shall be designed according to the standards reflected in the MPCA publication Protecting Water Quality in Urban Areas, the State of Minnesota Stormwater Manual, and the design criteria from the National Urban Runoff Program.
b. A 50% reduction in total phosphorous based on existing conditions must be shown for all development, redevelopment and public linear projects that exceed 1 acre of disturbed land, unless the requirements in Table 3.3 call for increased treatment capacity. Reduction in total phosphorus can be achieved using methods approved by the State of Minnesota Stormwater Manual, including but not limited to: infiltration, biofiltration/filtration, or stormwater ponds.
c. In any case, the standard identified above that leads to the highest treatment capacity is the one required of any specific development.

4.0 Submittal Requirements

All grading, erosion control, and site restoration work should be done in accordance with the most recent additions of the MnDOT Standard Specifications for Highway Construction and the MPCA's Protecting Water Quality in Urban Areas. All projects within the City that disturb 5,000 square feet or more of land and are not exempt by the City's ordinance are required to show the following:

1. The developer shall obtain all regulatory agency permits and approvals including those from the MPCA for "General Storm Water Permit for Construction Activity."
2. Contact information for the engineering firm, developer, and owner.
3. Show City of Mendota Heights' project number on the Plan.
4. Signature of company responsible for erosion and sediment control plan preparation, implementation, and maintenance.
5. Show all erosion prevention and sediment control measures are compliant with Section 1.
6. Show first floor and basement walkout elevations.
7. A location map indicating the vicinity of the site.
8. Two-foot contour information extending a minimum of 200 feet beyond the property boundary that shows features such as buildings, structures, walls, trees, or fences and any hydrologic features such as wetlands, ponds, lakes, and streams that are wholly or partially encompassed by the project perimeter.
9. Two-foot contour information shall include the following:
    a. Existing contours
    b. Proposed contours
    c. Contour labeling
10. Directional arrows to indicate the site and lot drainage directions.
11. Details on existing wetlands, lakes, streams etc.
    a. NWL and 100-year design storm HWL
    b. Ordinary high water level, if available, for wetlands within the site
    c. Whether waterbodies are DNR protected
    d. Wetland delineations for wetlands on the site
12. Information on individual lots including:
    a. Type of structure (i.e. walkout or rambler)
    b. Lowest ground elevation adjacent to building walkout and lookout window elevations
    c. Existing and proposed lot corner spot elevations
    d. Proposed mid-point side lot spot elevations
    e. Proposed spot elevations at any high points or drainage breaks
    f. Proposed spot elevations where drainage swales intersect lot lines
    g. Proposed spot elevations where drainage and utility easements intersect with lot lines
    h. The benchmark utilized for elevation determination.
13. All easements and outlots, existing and proposed
14. If retaining walls are needed, submit detailed plans and specifications that show type and height of retaining wall. Retaining walls will not be allowed within the City's easements, unless approved with the overall subdivision grading plan.
15. All adjacent plats, parcels, property lines, section lines, streets, existing storm drains and appurtenances, and underground utilities (public and private).
16. Grading and clearing limits: details of topsoil removal, topsoil stockpiling, and topsoil re-spreading.

All development or redevelopment projects that disturb one acre or more of land or increase net impervious surface must submit the following:

1. A narrative description of existing and proposed conditions and stormwater management performance criteria evaluated for the project.
2. Drawings showing existing and proposed drainage boundaries, including watersheds contributing runoff from off-site.
3. EOF elevations and directions of flow for all street and rear yard catch basins, parking areas,

ponds, wetlands, lakes, streams, swales, etc.

4. Hydrologic and hydraulic calculations for the 2-year, 10-year, and 100-year 24- hour (MSE3distribution) rainfall event and the critical 100-year event.
5. Provide detailed hydrologic/hydraulic calculations verifying location and capacity adequacy of all overland drainage routes.
6. Show removal of all trees and brush below the controlled water level that will be impacted from existing and newly created ponding areas.
7. Show or define access routes for maintenance purposes to all inlets or outlets at ponding areas (must be no more than 10 percent grade at two percent cross slope and no less than 10-feet-wide).
8. A note for all silt fence to be installed by the contractor and inspected by the City prior to any site work.
9. A Rate Control Plan if required by Section 3.2.b

Projects that include storm sewer and water quality treatment facilities are required to show the following:

1. The developer shall obtain all regulatory agency permits and approvals necessary for the proposed construction such as DNR, USACE, or MPCA.
2. Drainage calculations shall be submitted to show the sizing of pipe, ponds, emergency overflow spillways, and catch basin interception analysis.
3. Show or define access routes for maintenance purposes to all manholes outside the public right-of-way and inlets or outlets at ponding areas (eight percent maximum grade, two percent cross slope, and ten-feet-wide). Access easements shall be dedicated at the time of final platting to provide this access.
4. The developer and/or engineer upon the completion of the construction of a designated ponding area is required to submit an as-built record plan of the ponding area certifying that the pond constructed meets all design parameters as set forth in this SWMP and its updates.

APPENDIX E

Stormwater Modeling Development and Results

1. PURPOSE AND GOALS

The purpose of updating the City's stormwater models to Atlas 14 is to determine the threshold of concern regarding Atlas 14 high water levels and policies to guide the City's response to areas where flooding has been identified. Another priority for the City is to have a P8 Urban Catchment water quality model.

2. PROCEDURES AND METHODS

The 2006 HydroCAD model was updated for this 2017 Surface Water Management Plan to accommodate for the new National Oceanic and Atmospheric Administration (NOAA) Atlas 14 Precipitation Frequency Estimates. The updated HydroCAD model was used to develop a P8 Urban Catchment Model.

3. HYDRAULIC ANALYSIS

3.1 HydroCAD

The City of Mendota Heights provided the following HydroCAD models:

- Gun Club Lake Watershed (includes 42 subwatersheds and 22 stormwater ponds)
- Ivy Falls Creek and Mississippi Bluffs Watershed (44 subwatersheds and 16 stormwater ponds)
- Interstate Valley Creek Watershed (includes 118 subwatersheds and 66 stormwater ponds)

The models include unique subwatershed IDs that correspond to a unique pond name. Figure 1 shows each of the subwatershed areas and corresponding ponds. The overall modeled drainage and stormsewer network is also represented.

The City also provided a GIS database containing stormsewer information that was used to update the model. Pond outlet data, where available, was incorporated into the HydroCAD model.

The following Atlas 14 storm events were used for the HydroCAD modeling effort:

- 2 year, 24 hour storm event = 2.81 inches
- 10 year, 24 hour storm event = 4.19 inches
- 100 year, 24 hour storm event = 7.47 inches

The storm events were obtained from NOAA and use an MSE Type 3 distribution. Drainage areas, CN values and Tc values were included in the models provided. The updated model included reviewing and correcting drainage area boundaries and land use information when discrepancies were found between the model and on-the-ground conditions. There were very few areas that were modified. The primary objective of modifying the HydroCAD model was to have the ability to model the larger Atlas 14 storm events. This included updating pond

stage/volume rating curves, along with adding overflow elevations and routing. GIS software and Lidar data were used for determining this information.

3.2 P8

The updated HydroCAD model was used to develop a corresponding P8 model for each of the drainage areas. A discussion of the parameters used in the P8 model is provided below. P8 parameters not discussed were left at the default setting. P8 version 3.5 was used for the modeling.

- Time Steps Per Hour (Integer) – 4. Selection was based upon the number of time steps required to reduce the continuity errors greater than two percent.
- Minimum Inter-Event Time (Hours) – 10. The selection of this parameter was based upon evaluation of storm hydrographs to determine which storms should be combined and which storms should be separated to accurately depict runoff from the pond's watershed. It should be noted that the average minimum inter-event time for the Minneapolis area is 6.
- Snowmelt Factors—Melt Coef (Inches/Day-Deg-F) – 0.06. This coefficient is within the lower end of the recommended range and was selected to minimize the disparity between observed and predicted snowmelt (i.e., the coefficient lessens the number of inches of snow melted per day and increases the number of snowmelt runoff days).
- Snowmelt Factors – Scale Factor for Max Abstraction – 1. This factor controls the quantity of snowmelt runoff (i.e., controls losses due to infiltration). Selection was based upon the factor that resulted in the closest fit between modeled and observed runoff volumes.
- Particle File Selection – NURP50.PAR. The NURP 50 particle files was found to most accurately predict phosphorus loading.
- Air Temperature File Selection – MSP4999.tmp. The temperature file was comprised of temperature data from the Minneapolis-St. Paul International Airport during the period from 1949 through 1999.
- Depression Storage – 0.02 inches (assumed, based on average watershed slope).

The surface area and dead storage volume of each detention pond was determined using GIS software and Lidar data. Pond outlet and stage/discharge information was taken from the updated HydroCAD model. Infiltration was assumed only for ponds that appear to be dry, or are known to have a normal water level lower than the outlet elevation.

GIS software was used to determine the directly connected and indirectly connected impervious areas for each of the modeled ponds (devices). WinSLAMM land use descriptions and the associated watershed fractions were applied to each of the subwatershed areas to determine a composite area for indirectly and directly connected impervious areas. Pervious area curve number values were taken from the updated HydroCAD model. An impervious runoff coefficient of 98 was used in the model. The water surface area for each of the ponds was routed to each device separately, assuming that the entire water area was directly connected with zero loading to each pond. It was assumed that all of the directly connected impervious areas were not swept.

4 Results

HydroCAD and P8 results are summarized in Table E.1 included in this appendix. Output data is grouped by drainage area and tabulated for each individual subwatershed.

Pond Data & Modeling Results

Pond	Drainage Area (ac)			NWL (ft)	Outlet	Updated Outlet	Discharge Rate (cfs)			100-year HWL (ft)	Name/PWI?	Pond Type (dry basin or wet pond)	Annual Loading		% Removal		Removal	
	Direct	Ponded	TOTAL				2 year	10 year	100 year				TP (lb/yr)	TSS (lb/yr)	TP (lb/yr)	TSS (lb/yr)	TP (lb/ac/yr)	TSS (lb/ac/yr)
GUN CLUB LAKE																		
GC-P1	80.9	0.0	80.9	891.7	18" rcp		0.7	2.8	8.3	894.1	Unnamed	wet	107.1	33200.2	68.5	97.4	0.91	399.7
GC-P5	44.3	80.9	125.2	875.0	user defined	added EOF	18.4	59.4	176.4	882.4	no	wet	69.6	21572.3	22.8	64.5	0.13	111.1
GC-P10	183.0	232.5	415.6	832.5	none		0.0	0.0	0.0	835.7	Lake Augusta	wet	135.0	41896.7	0.0	0.0	0.00	0.0
GC-P8	12.7	0.0	12.7	880.0	user defined and weir	added EOF	21.1	41.8	84.5	881.2	no	wet	11.5	3559.4	39.2	70.6	0.35	197.9
GC-P9	86.3	12.7	99	859	12" rcp and weir	yes	19.6	85.2	327.0	861.8	no	wet	53.5	16633.2	54.6	86.4	0.30	145.2
GC-P11	21.0	0.0	21.0	862*	user defined and weir		6.6	19.1	48.8	867.6	no	dry	23.7	7357.5	25.0	58.0	0.28	203.6
GC-P12	5.1	21.0	26.1	862*	user defined		0.0	0.0	0.0	867.6	no	dry	6.5	2014.9	88.7	94.3	0.22	72.9
GC-P13	8.3	0.0	8.3	858*	12" rcp and weir	yes	3.2	3.7	4.8	861.9	no	dry	10.2	3153.7	34.9	67.1	0.43	255.0
GC-P57	9.4	0.0	9.4	894.4	weir		1.0	4.5	20.4	895.4	no	wet	13.3	4138.8	58.1	88.0	0.82	387.9
GC-P58	6.3	9.4	15.7	896.0	weir		0.0	0.0	0.0	895.4	no	wet	8.8	2725.7	32.9	71.2	0.18	123.8
GC-P59	15.28	15.68	30.96	881.54	user defined and weir	added EOF	5.5	12.6	31.1	886.7	Unnamed	wet	23.1	7197.7	51.4	89.8	0.38	208.8
GC-P56	56.5	5.9	62.4	858.0	24" rcp and weir		33.9	35.9	44.0	873.1	Unnamed	wet	11.0	3412.3	48.8	81.4	0.09	44.5
GC-P62	12.89	62.4	75.29	852*	user defined and weir	added EOF	39.4	53.0	72.5	857.1	Unnamed	dry	18.8	5821.4	19.4	53.2	0.05	41.1
GC-P51	47.2	0.0	47.2	852.0	user defined and weir		4.7	17.8	38.3	857.7	no	wet	64.1	19881.9	55.2	86.1	0.75	362.4
GC-P43	9.3	0.0	9.3	824.0	18" rcp		1.5	6.2	14.1	827.5	no	wet	12.9	4012.0	54.6	84.9	0.76	366.3
GC-P41	19.3	0.0	19.3	842.0	12" rcp		6.5	8.2	10.7	847.6	no	wet	27.4	8487.2	34.3	67.2	0.49	294.9
GC-P56a	5.9	0.0	5.9	873.5	12" rcp and weir		6.2	7.6	34.1	879.2	no	wet	7.7	2393.4	31.8	64.0	0.42	259.6
GC-P15	6.5	0.0	6.5	838*	user defined and weir		0.0	0.0	0.0	840.5	no	dry	9.9	3057.7	97.2	100.0	1.48	470.4
GC-P49a	72.0	0.0	72.0	841.0	18" rcp and weir	yes; added EOF	7.9	12.2	187.5	849.7	no	wet	105.5	32711.7	41.1	73.7	0.60	334.8
IV CREEK																		
IV2	11.0	0.0	11.0	892.04	12" rcp	yes	1.1	3.4	4.5	894.19	no	wet	76.6	24706.5	73.4	42	5.11	943.3
IV3	8.9	11.0	19.9	891.50	15" rcp	yes	0.6	2.9	7.0	893.02	no	wet	13.1	4232.2	72.7	40.6	0.48	86.3
IV4	36.8	29.6	66.4	873.05	15" rcp	yes	0.2	1.2	4.2	875.10	Unnamed	wet	47.1	15212.4	91.9	50.4	0.65	115.5
IV5	9.7	0.0	9.7	894.40	18" rcp	yes	0.2	1.0	6.1	895.49	no	wet	7.7	2484.4	38.5	69.2	0.31	177.2
IV6	18.3	66.4	87.4	872.23	24" rcp	yes	0.2	1.1	5.2	873.26	Unnamed	wet	29.9	9654.6	88.2	31.8	0.30	35.1
IV7	11.1	0.0	11.1	877.20	18" rcp	yes	0.1	0.7	4.5	878.42	no	wet	9.6	3093.8	96.1	69.6	0.83	194.0
IV8	16.2	11.1	27.3	875.00	21" rcp	yes	0.4	1.5	7.5	876.65	Unnamed	wet	21.1	6820.6	96.6	63.7	0.75	159.1
IV9	16.3	0.0	16.3	878.80	18" rcp	yes	0.5	2.5	10.3	880.48	no	wet	13.3	4270.4	97.4	71.2	0.79	186.5
IV11	30.0	0.0	30.0	865.56	24" rcp	yes	1.7	8.3	23.8	869.03	no	wet	17.1	5501.7	87.1	58.7	0.50	107.6
IV18	100.7	764.6	865.3	842	weir	yes	8.42	37.98	158.19	842.86	Unnamed	wet	34.7	11174.2	91.3	24.5	0.04	3.2
IV12	25.0	0.0	25.0	863.75	15" rcp		14.7	14.8	15.1	872.44	Unnamed	wet	55.7	17922.4	83.6	61.7	1.86	442.3
IV15	31.7	25.0	56.7	854.70	18" rcp		0.4	1.9	6.3	857.26	Unnamed	wet	21.4	6885.6	96.4	60.8	0.36	73.8
IV16	34.0	77.6	111.6	854.20	18" rcp	yes	0.5	2.2	9.1	855.68	Unnamed	wet	25.2	8105	95	43.6	0.21	31.7
IV19	20.9	0.0	20.9	854.80	18" rcp		0.0	0.0	1.0	855.73	Unnamed	wet	5.8	1873.9	99.9	74	0.28	66.3
IV17	35.4	522.5	557.9	850.59	24" rcp	yes	2.2	5.2	14.5	852.35	Unnamed	wet	32.4	10386.1	90.7	38.7	0.05	7.2
IV24	0	965.4	965.4	837	2-59x36 rcpa	yes	7.65	35.43	150.02	840.85	Unnamed	wet	0	0	51.9	2.4	0.00	0.0
IV51	82.3	0	82.3	900.15*	2-42" rcp and weir	yes	42.06	103.2	202.87	906.69	no	dry	111.4	35968.8	52.6	19.8	0.71	86.5
IV22	63.9	16.4	80.3	845.00	user defined		5.8	21.6	88.2	847.19	no	wet	27.8	8985	97.6	71.6	0.34	80.1
48" Huber	19.8	80.3	100.1	840.00	user defined		22.6	51.0	115.7	845.75	no	NA	0	0	0	0	0.00	0.0
IV26	33.1	0.0	33.1	804.00	user defined		5.4	15.0	40.6	891.78	no	wet	62.9	20318.7	99.4	73.9	1.89	453.6
IV57	154.6	390.0	544.6	850.00	user defined		65.9	180.2	518.6	850.88	Unnamed	wet	159.7	51463.6	90.5	62.2	0.27	58.8
IV33	18.1	0.0	18.1	875.00	user defined		3.7	12.8	40.3	875.38	Unnamed	wet	21.6	6972.4	98.5	72.7	1.18	280.1
65" I35E	58.8	0.0	58.8	888.00	user defined		29.0	72.9	175.7	893.17	no	NA	103.1	33288.9	0	0	0.00	0.0
IV61C	0.0	91.7	91.7	864.00	24" rcp	new pond added to model	0.0	0.0	4.0	865.15	no	dry	0	0	20.9	5.7	0.00	0.0
IV39	152.2	322.9	475.1	872.20	30" rcp	yes	0.7	2.4	8.8	873.76	Rogers Lake	wet	0	0	94.1	23.6	0.00	0.0
IV32	6.5	0.0	6.5	874.50	user defined		0.6	3.9	16.0	874.57	no	wet	2.2	703.4	98.9	72.6	0.33	78.6
IV63	41.3	50.4	91.7	846.66	36" rcp		40.1	94.1	264.7	858.61	no	wet	50.5	16297.1	45.2	15.2	0.25	27.0
IV81	17.3	0.0	17.3	926.40	12" rcp	yes	0.1	0.6	2.4	927.34	Unnamed	wet	168.9	54585.2	94.1	67.9	9.19	2142.4
IV36	47.4	0.0	47.4	872.88	24" rcp		3.8	13.6	24.8	878.06	no	wet	88.5	28593	86.3	57.8	1.61	348.7
IV68	263.6	2137.5	2401.1	824.80	user defined and weir		138.4	184.4	247.9	837.43	Unnamed	wet	278.3	89803	92.1	40	0.11	15.0
IV44	40.4	0.0	40.4	879.00	user defined		2.5	3.2	4.4	884.55	no	wet	39.5	12747.8	90.4	62.6	0.88	197.5
IV35	14.1	0.0	14.1	874.00	user defined		1.3	6.1	28.4	874.74	no	wet	23.7	7640.2	96.5	70.3	1.62	380.9
IV50	95.3	515.5	610.8	832.00	user defined		28.8	72.5	238.2	834.49	Unnamed	wet	130.4	42085.5	75.5	32.2	0.16	22.2
IV110	139.3	2578.8	2718.1	809.60	2 55x88 arches		217.8	419.0	658.9	817.61	no	dry	221.5	71463	20.2	2.4	0.02	0.6
IV83	33.1	17.3	50.4	862.30	30" rcp, 2 weirs		13.6	41.4	116.3	869.58	no	dry	51.3	16577.6	38	6.7	0.39	22.0
IV21A	16.4	0.0	16.4	863.2*	18" rcp		9.5	14.8	22.6	861.80	no	dry	17.4	5616.8	60	27.8	0.64	95.2
IV74	6.2	0.0	6.2	820.5*	12" rcp		2.4	5.3	8.8	826.42	no	dry	8.1	2611.4	53	20.7	0.69	87.2
IV75	16.9	0.0	16.9	820.5*	12" rcp, weir		4.4	13.1	79.6	824.43	no	dry	25.5	8224.8	55.8	22.7	0.84	110.5
IV104	24.3	0	24.3	824.70	user defined		3.37	10.09	73.02	827.71	no	wet	37.5	12122.5	84.7	56	1.31	279.4
IV112	5.2	34.7	39.9	806.0*	weir		2.7	9.0	37.7	807.06	Unnamed	dry	16	5156.3	48.4	17	0.19	22.0
IV89	17.8	0.0	17.8	941.0*	user defined		0.7	2.1	5.2	943.58	no	wet	4	1260.7	99.3	72.8	0.22	51.6
IV91	15.5	169.3	184.8	952.82	24" rcp	yes	16.2	25.0	39.1	958.40	no	wet	13	4189.4	76.8	47.7	0.05	10.8
IV109	97.0	402.9	499.9	810.10	60" rcp and user defined		54.2	198.6	662.4	816.60	no	wet	138.7	44783.1	70.9	36.7	0.20	32.9
IV90	37.1	184.8	221.9	932.0*	weir	yes	8.7	40.9	111.0	932.55	no	dry	8.6	2755.8	54	22.5	0.02	2.8

**dry basin bottom elevation*

Pond	Drainage Area (ac)			NWL (ft)	Outlet	Updated Outlet	Discharge Rate (cfs)			100-year HWL (ft)	Name/PWI?	Pond Type (dry basin or wet pond)	Annual Loading		% Removal		Removal	
	Direct	Ponded	TOTAL				2 year	10 year	100 year				TP (lb/yr)	TSS (lb/yr)	TP (lb/yr)	TSS (lb/yr)	TP (lb/ac/yr)	TSS (lb/ac/yr)
IV CREEK																		
IV111	34.7	0.0	34.7	857.40	12" rcp	yes	1.0	4.2	5.8	861.97	no	wet	32.5	10477.2	84.1	55.1	0.79	166.4
IV100	8.1	0.0	8.1	896.00	12" rcp and weir		0.6	2.6	6.0	898.98	no	wet	10.9	3507.5	89.2	61.4	1.19	264.6
IV93	57.9	17.8	75.7	931.00	user defined		1.0	2.5	4.6	934.08	no	wet	73.7	23781.9	96.5	69.7	0.94	219.0
IV113	12.2	56.6	68.8	954.80	36'' rcp		2.2	4.2	43.8	959.46	no	wet	2.5	793.8	98.6	72	0.04	8.3
MARIE CREEK CULVERT	49.4	329.24	378.64	870.6	2 - 36'' rcps	yes	23.44	90.92	287.45	874.76	no	wet	47.2	15209.3	26.9	3.7	0.03	1.5
IV114	25.3	68.8	94.1	938.25	36" rcp and weir	yes	2.97	12.84	74.75	939.46	no	wet	5.7	1827.4	91.7	58.4	0.06	11.3
IV98	11.8	0.0	11.8	911.0*	user defined		0.4	1.7	5.9	912.81	no	dry	17.3	5587.8	96.1	88.8	1.41	420.5
IV118	134.8	106.6	241.4	876.50	user defined and weir		0.0	22.2	294.8	880.93	no	wet	128	41297	85.4	56.4	0.45	96.5
IV116	12.5	0.0	12.5	926.00	user defined and weir		0.4	1.5	4.2	927.61	no	wet	2.4	755.5	99.2	72.4	0.19	43.8
IV125	16.1	0.0	16.1	845.00	15'' rcp and weir	yes	4.7	8.8	14.7	849.96	no	wet	37.9	12226.1	70.9	40.1	1.67	304.5
IV126	23.8	16.1	39.9	804.0*	8'' cmp and weir	yes	0.8	3.3	52.8	810.39	no	dry	64.6	20874.6	78.5	56.6	1.27	296.1
IV139	0.0	3742.9	3742.9	723.0*	user defined and weir		318.7	605.4	1520.8	766.59	no	dry	254.7	82200.5	6.9	0.6	0.00	0.1
IV64	17.7	0.0	17.7	828.60	6'' rcp and weir		1.8	43.4	132.1	837.60	no	wet	15.4	4956.9	90.3	62.4	0.79	174.8
Ivy Falls and Miss Bluffs																		
IF 4	73.7	226.4	300.1	917	user defined and weir	yes	35.0	141.8	393.8	921.47	no	wet	76	23596.4	44.2	78.8	0.11	61.96
IF 1	27	199.4	226.4	957.35	user defined and weir	yes	57.1	97.6	147.3	964.38	no	wet	28.3	8782.8	59.2	89.4	0.07	34.68
IF 21	107.7	126.6	234.3	892	user defined and weir	yes	75.9	175.1	631.8	903.91	no	wet	157.3	48786.6	25.1	56.3	0.17	117.23
IF 15	10.7	0	10.7	941.63*	12'' rcp and weir	yes	4.6	11.1	50.0	946.61	no	dry	16.5	5117.5	7.8	35.2	0.12	168.35
IF 16	19.3	10.7	30	925.0*	12" rcp and weir	yes	6.5	22.7	117.1	930.38	no	dry	30.3	9395.2	7.7	31.5	0.08	98.65
IF 18	22	0	22	968.7*	12'' cmp and weir	yes	2.4	6.1	119.6	973.65	no	dry	34.3	10645.4	57.4	78.4	0.89	379.36
MB 8	34.2	0	34.2	835.4*	user defined and weir		0.0	0.0	17.5	845.35	no	dry	53.1	16469	96.1	99.3	1.49	478.18
MB 10	22.2	0	22.2	847.93	6'' cmp and weir	yes	0.5	0.7	2.5	856.06	no	wet	34.9	10833.2	42.4	74.9	0.67	365.50
MB 17	15.6	0	15.6		12" rcp and weir	yes	2.9	6.7	67.4	893.43	no	dry	24.3	7548.6	14.5	45.8	0.23	221.62
MB 16	4.1	0	4.1		6'' rcp and weir	yes	1.8	2.1	19.8	890.20	no	dry	2.3	724	42.6	51.5	0.24	90.94
MB 31	62.6	0	62.6	860*	24'' rcp and weir		3.4	13.0	23.3	866.40	no	dry	113.7	35243.4	89.4	97	1.62	546.10
MB 32	7.2	62.6	69.8	860*	24'' rcp		3.4	12.7	23.1	863.33	no	dry	12.7	3945	95.4	99.4	0.17	56.18
MB 33	60.9	69.8	130.7	788	30'' rcp		4.1	16.8	38.4	793.12	no	wet	84.2	26120.4	53.5	84.4	0.34	168.67