

COMPREHENSIVE WATER RESOURCE MANAGEMENT PLAN

CITY OF MONTICELLO, MN

NOVEMBER 2019

Prepared for:
City of Monticello
505 Walnut St #1
Monticello, MN 55362

WSB PROJECT NO. R-014044-000



WATER RESOURCE MANAGEMENT PLAN

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For:

THE CITY OF MONTICELLO, MINNESOTA

NOVEMBER 2019

PREPARED BY



CERTIFICATION

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Minnesota.



Heather Nelson PE

Reg. No. 45801

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SECTION 1

1. EXECUTIVE SUMMARY

1.1. Water Resources Management Plan Purposes

This Water Resources Management Plan (WRMP) serves as a comprehensive planning document to guide the City of Monticello in conserving, protecting, and managing its surface water resources. The City will use the WRMP as a guide to reach goals related to water quality, volume reduction, and flood management. This plan meets the requirements detailed in Minnesota Statutes 103B and Minnesota Rules 8410, administered by the Minnesota Board of Water and Soil Resources. This plan is also consistent with the goals and policies of the state and local watershed planning requirements. This plan may be periodically amended to remain current with local practices and policies and revisions to the City's MS4 Permit. The purpose of the water management program is to:

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

1.2. Executive Summary

The Monticello Water Resource Management Plan is divided into eight 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 Establishment of Goals and Policies** outlines the City's goals and policies pertaining to water management.
- **Section 4 Assessment of Problems and Corrective Actions** presents the City's water management related problems and issues and a current assessment of surface water management.
- **Section 5 Implementation Program** presents the implementation program for Monticello, which includes defining responsibilities, prioritizing, and listing the program elements.
- **Section 6 Financial Considerations** outlines the continued administration of this plan with respect to plan updates and amendments.
- **Section 7 Amendment Procedures**
- **Section 8 Glossary**

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1.3. Personnel Contacts

To implement this plan, a coordinated water resource management approach must be used. This approach utilizes the services of staff personnel within the City and surrounding communities.

The primary implementation responsibility will lie with the appropriate staff members at the City. Outlined below are the names, addresses, and telephone numbers for personnel having responsibilities for overseeing or implementing various aspects of the Storm Water Management Plan.

City of Monticello
City Administrator
Jeff O'Neill
505 Walnut St., Suite #1
Monticello, MN 55362
(763) 271-3211

City of Monticello
City Engineer/Public Works Director
Matt Leonard
505 Walnut St., Suite #1
Monticello, MN 55362
(763) 271-3271

1.4. Water Resource Related Agreements

The City has no water resource-related agreements other municipalities or counties. However, a portion of the city discharges to County Ditch 33 which Wright County has jurisdiction over. Discharges proposed to the county ditch need to follow the procedures set forth by the ditch authority, Wright County Board of Directors.

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2. LAND AND WATER RESOURCE INVENTORY

As required in Minnesota Rules Section 8410.0060, this section of the plan provides a general description and summary of the climate, geology, superficial topography, surface and ground water resource data, soils, land use, public utilities services, water-based recreation, fish and wildlife habitat, unique features, scenic areas, and pollutant sources. This section also identifies where detailed information can be obtained for many of these areas of concern.

2.1. Climate and Precipitation

2.1.1. Climate

The climate within Wright County is described as a humid continental climate with moderate precipitation, wide daily temperature variations, warm humid summers and cold winters. The total average annual precipitation is approximately 30 inches, of which approximately one-third occurs in the months of June, July, and August. The annual snowfall average is about 54 inches. Average monthly temperature, precipitation, and snowfall are shown in **Table 1**.

2.1.2. Precipitation

Rainfall frequency estimates are used as design tools in water resource projects. In 2013, the National Oceanic Atmospheric Administration (NOAA) published the Atlas 14 Precipitation-Frequency document that showed an increase in rainfall intensity and design storms from the previous Technical Paper 40 precipitation values. Selected rainfall frequencies for Monticello are listed in **Table 2**.

Storm sewer, storm inlet flow, and culvert flow calculations within the City use the 10-year and 100-year 24-hour rainfall events for design. Additional precipitation information for the area can be obtained from the [NOAA website](#).

2.2. Geology and Topographic Information

2.2.1. Geology:

The City of Monticello is in northwestern Wright County (**Figure 1**). Total area within the corporate limits including the orderly annexation area is approximately 20 square miles. The northern boundary of the City is the Mississippi River.

There is no geologic atlas for Wright County and, therefore, geomorphologic information is lacking. Information from the County Soil Survey indicates that the County consists of outwash plains, gently rolling to steep hills, and many marshes and lakes due to the glaciation of the area.

Information from the Wright County Local Water Management Plan (1997) indicates the City of Monticello is underlain with Eau Claire sandstone and Mount Simon sandstone. The Mount Simon-Hinckley aquifer is also located in Monticello. This aquifer is at approximately elevation 800 feet within the City.

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Table 2-1: Average Monthly Temperature, Precipitation, and Snowfall Data for Minneapolis/St. Paul Metropolitan Area

Month	Average Temperature °F	Precipitation (in.)	Snowfall (in.)
January	15.6	0.90	12.2
February	20.8	0.77	7.7
March	32.8	1.89	10.3
April	47.5	2.66	2.4
May	59.1	3.36	0.1
June	68.8	4.25	0
July	73.8	4.04	0
August	71.2	4.30	0
September	62.0	3.08	0
October	48.9	2.43	0.6
November	33.7	1.77	9.3
December	19.7	1.16	11.9
Annual Average: 46.2		Total: 30.6	Total: 54.4

Source: State Climatology Office for the Minneapolis/St. Paul Airport

Table 2-2: Atlas 14 Rainfall Frequencies

Recurrence Interval (yrs)	24-hr Rainfall Depth (in)	Chance of Occurring in a Given Year
1	2.43	99%
2	2.84	50%
5	3.57	20%
10	4.22	10%
25	5.20	4%
50	6.58	2%
100	6.87	1%

Source: NOAA

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2.2.2. Topography:

The topography of the City can be described as gently rolling, with steeper areas near the Mississippi River. Storm water runoff from the City of Monticello is generally directed to the north to the Mississippi River. The specific drainage patterns which depict topography for areas within the City are shown on the subwatershed delineation map referred to as **Figure 2**. As can be observed from the subwatershed delineation map, the City of Monticello is divided into many small watersheds. The lowest point in the City is approximately 900-feet above sea level. The highest point is approximately 1,180 feet above sea level. The subwatershed delineations utilized City topographical mapping, storm sewer as-builts, aerial photos, and field investigations.

2.3. Surface Water Resource Data

Available surface water resource data within the City is summarized in this section. Detailed information has been included either in the appendices to this report or has been identified by reference.

The hydrologic system of the City consists of wetlands, streams, and major water bodies as outlined below.

2.3.1. Wetlands

Wetland inventories have been completed by the U.S. Fish and Wildlife Service as published on the National Wetland Inventory Maps and by the Minnesota Department of Natural Resources as published in their Protected Waters Inventory. These wetland inventories will be utilized to assist in determining if a wetland is present on a given parcel of property within the City. The National Wetland Inventory (**NWI**) and Department of Natural Resources Public Waters Inventory (PWI) maps are shown on **Figures 3 and 4**.

2.3.2. Major Bodies of Water

The primary water body that conveys and stores water within and through the City is the Mississippi River. Other water bodies that store and convey water within and through the City and the Orderly Annexation area include Pelican, Cedar, North, Bertram, Long, Mud and First Lakes, Otter Creek, various wetlands, and Wright County Ditches. More information about these water bodies is included in various portions of this section.

2.3.3. Hydrologic Modeling (Water Quantity)

The City's hydrologic/hydraulic system consists of the Mississippi River, ponds, wetlands, storm sewer pipe systems and Wright County Ditches. The City is divided into 10 subwatershed areas, which are shown on **Figure 2**. A HydroCAD based hydrologic/hydraulic computer model has been developed for the following subwatersheds:

- a) Industrial Park area
- b) Meadow Oaks area
- c) Trunk Highway 25 area
- d) Klein Farms area

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- e) Mississippi River
- f) Hart Boulevard area
- g) Otter Creek
- h) Wright County Ditch #33
- i) Bertram Lake
- j) Miscellaneous (Gilchrist & Pelican Lake)

The hydrologic/hydraulic modeling effort quantifies the 100-year rainfall event, peak discharge rates, storage requirements, other pertinent hydrologic/hydraulic information for storm water retention areas, and trunk storm water conveyance systems within the City. The hydrologic/hydraulic modeling results are included in **Appendix A**.

Figure 5a, 5b, and 5c show the existing regional ponds and future ponding areas within the city.

2.4. Flood Insurance Studies

A Federal Emergency Management Agency (FEMA) Flood Insurance Study (FIS) was completed for areas within the City in 1979. The Flood Insurance Study consisted of a study report, a set of floodway and floodplain delineation maps and a set of Flood Insurance Rate Maps (FIRM) maps. This study provides the basis for floodplain management regulations and is included in **Appendix B**.

The FIRMs are available on the FEMA website for download. The floodplain boundaries for the City of Monticello are shown in **Figure 6**.

2.5. Water Quality Data

2.5.1. Overview

Water quality data for the City can be obtained from the Minnesota Pollution Control Agency (MPCA). **Figure 7** shows the location of MPCA monitoring sites within the City. The Mississippi River is the only water body within the City that is listed as impaired by the MPCA. The section of the Mississippi River that flows through the City is impaired for fecal coliform, PCBs and mercury in fish tissue.

2.5.2. Water Quality Modeling Data

To provide additional information on existing and future water quality within the City, an urban water quality model was developed in 2006. The P8 Urban Catchment Model was developed to predict the movement of stormwater runoff pollutants within the City. The 2006 P8 model was not updated with this Plan update.

The results of the P8 water quality modeling effort are available in **Appendix C**. Additional information on the model can be found in the 2006 Monticello Water Resources Management Plan.

2.6. Floodplain Management and Shoreland Regulations

The City of Monticello has developed Floodplain Management Regulations. A copy of these

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ordinances can be found in **Appendix D**. These regulations generally prohibit uses or activities within the floodplain that include structures or fill or that obstruct flood flows or cause increased flood elevations.

The City has developed a shoreland management ordinance as part of the City Code and currently implements DNR guidelines as part of development agreements.

2.7. Groundwater Appropriations

Within the City, groundwater wells serve the City and private water needs. Each of these wells has a groundwater appropriation permit from the DNR. Information on the DNR permit number for each well, its location, permitted volume, and number of gallons withdrawn each year is available at the DNR website. **Figure 8** shows the locations of the DNR permitted ground water appropriation sites within the City.

2.8. Groundwater Resource Data

Groundwater modeling was performed as part of the Wellhead Protection Plan in 2015. This information can be found on the City's website. **Figure 9** shows the location of the DWSMA as well as the ERA areas within the DWSMA.

Other available information is contained within the Wright County Soil Survey and the Wright County Local Water Management Plan (LWMP). The soil survey indicates that groundwater depth is generally greater than 10 feet but can be as shallow as 2-3 feet. The Wright County LWMP indicates that the Mount Simon-Hinckley aquifer is located within the City at approximately elevation 800 feet. The depth to the water table is approximately 20-40 feet.

2.9. Soils Information

The City of Monticello consists mostly of Estherville, Hubbard, and Wadena Soils Association. This association consists of nearly level and undulating soils on plains terraces. The soils in this association are generally sandy and are underlain with sand and gravel deposited by glacial melt water. The hydrologic soil classification map is shown in **Figure 10**. The four soil classifications and their design infiltration rates from the Minnesota Stormwater Manual are defined as follows:

Group A – These soils have high infiltration rates even when thoroughly wetted. The design infiltration rates range from 0.8-1.63 inches per hour. These soils consist chiefly of deep, well drained to excessively drained sands and gravel. Group A soils have a high rate of water transmission, therefore resulting in a low runoff potential.

Group B – These soils have moderate infiltration rates ranging from 0.3-0.45 inches per hour when thoroughly wetted. Group B soils consist of deep moderately well to well drained soils with moderately fine to moderately coarse textures.

Group C – These soils have slow infiltration rates at 0.2 inches per hour when thoroughly wetted. Group C have moderately fine to fine texture.

Group D – These soils have very slow infiltration rates up to 0.06 inches per hour when thoroughly wetted. Group D soils are typically clay soils with high swelling potential, soils with high permanent water table, soils with a clay layer at or near the surface, or shallow soils over nearly impervious material.

A majority of the City consists of Estherville-Hubbard-Wadena association. This association is the one outwash plain soil in Wright County. The associations soil occurs on nearly level

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and undulating outwash plains and terraces located on the Mississippi River. These soils contain mostly Group A soils.

The remainder of the City consists of Hayden-Lester-Peat and Hayden-Dundas- Peat associations. The Hayden-Lester-Peat soils are on very steep, irregular slopes intermixed with many lakes and wetlands. The soils are formed in material derived from loamy glacial till high in calcium content. The Hayden- Dundas-Peat soils are gently rolling with many flat and depressional areas. The soils were formed from loamy glacial till and have a fine textured subsoil. The associations contain a mixture of Group B and D soils

Additional information on the geology and soil for the City is included in the Wright County Soil Survey.

2.10. Land Use and Public Utilities Services

The City of Monticello land use practices include residential, commercial, industrial, and public and private open space areas. **Figure 11** is a representation of the land use districts for the City.

Public utility services available for lands within the City have been described in several of the City's utility studies. More detailed information on land uses and utilities within the City of Monticello is available in the City's GIS system.

2.11. Public Areas for Water Based Recreation and Access

Water-based recreational opportunities within the City are limited to the Mississippi River in the form of boating, fishing and hiking. The Mississippi River is also a State Canoe Route operated by the DNR Division of Trails and Waterways. Additional opportunities will be considered as the City grows into the Orderly Annexation Area.

2.12. Fish and Wildlife Habitat

The City of Monticello provides habitat for a variety of mammals, reptiles, birds, amphibians, and insects. Maintenance of habitat for wildlife species is important in maintaining ecological stability in Monticello's natural areas. A Natural Resource Inventory and Assessment for Monticello was performed in 2008 that identified existing natural resources, inventoried these resources and assessed the quality of the areas. This full report can be found on the City of Monticello's website https://www.ci.monticello.mn.us/index.asp?SEC=9AF55B49-F75F-4603-BF18-B4B51AB330E3&Type=B_BASIC

According to the DNR Natural Heritage database, there are occurrences of rare and natural communities within the City limits. This data indicates there is a variety of unique fish and wildlife habitat within the City, much of which is located along the Mississippi River. The areas identified as rare and natural communities include Oak Savannah and Flood Plain Forest.

2.13. Pollutant Source Locations

Figure 12 shows the approximate locations of a variety of sites that are listed with MPCA as a possible pollutant source. Specific details of each site can be obtained from the MPCA.

Other potential pollutant sources include industrial, commercial, residential, and other highly impervious land uses. Stormwater runoff from these land uses could carry pollutants into the stormwater system as nonpoint source pollution, especially if there are direct inlets into the storm sewer system that do not drain first into a stormwater pond. Facilities within these land use types may be covered by a National Pollutant Discharge Elimination System (NPDES) General

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Industrial Stormwater Permit, which requires preparation of stormwater pollution prevention plans to prevent nonpoint source pollution.

2.14. NPDES Phase II

The Minnesota Pollution Control Agency (MPCA) implemented the National Pollutant Discharge Elimination System (NPDES) Phase II Stormwater Program in March 2003. Monticello's application for permit coverage was renewed in 2013. Phase II requires municipal separate storm sewer systems (MS4's) in urban areas with populations over 10,000 and under 100,000 to obtain an NPDES permit. Permits for construction sites greater than 1 acre will also be required as part of the Phase II permit.

Many of the goals and policies discussed in this local surface water management plan are directly related to requirements listed in the NPDES program. As a result, the implementation section of this plan repeatedly references items listed in the City's SWPPP, the SWPPP is available under separate cover. The 2018 Annual Report can be found in **Appendix E**.

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3. ESTABLISHMENT OF GOALS AND POLICIES

The City of Monticello has developed several goals and policies that conform to the overall purpose that is specified in Minnesota Statutes Section 103B.201. These goals and policies have been developed to complement County, Regional or State goals and policies.

These goals and policies have also been developed to preserve and use natural water storage and retention systems in order to:

1. Limit public capital expenditures that are necessary to control excessive volumes and rates of runoff.
2. Improve water quality.
3. Prevent erosion of soil into surface water systems.
4. Promote ground water recharge.
5. Protect and enhance fish and wildlife habitat and water recreational facilities.
6. Secure the other benefits associated with the proper management of surface water.

The goals and policies that the City has developed address issues related to water quantity, water quality, recreation, fish and wildlife, enhancement of public participation, information and education, public ditch system management, ground water management, wetland management and soil erosion management. Outlined below are the goals and policies that have been developed for each of the above areas of concern. Specific stormwater requirements and guidelines can be found in the City's Design Manual (**Appendix F**).

3.1. Water Quantity

Goal:

Limit public capital expenditures that are necessary to control excessive volumes and rates of runoff.

Policies:

1. The City prohibits activities within the 100-year floodplain unless compensatory floodplain mitigation is provided at a 1:1 ratio by volume and it is demonstrated by suitable calculations that the 100-year floodplain will not be impacted. In addition, no filling within the designated floodway of a drainage channel shall be allowed.
2. Future discharge rates from new development and redevelopment will at a minimum not exceed the existing discharge rates, or rates, which would interfere with sensitive downstream uses. Discharge rates shall be consistent with the discharge rates outlined within the City's hydraulic/hydrologic model.
3. The City prefers to provide rate control through the use of regional storm water retention systems versus site-by-site retention systems.
4. In the event that the City will not be providing a regional system, storage of the runoff from the 100-year, 24-hour storm event is required.
5. Drainage calculations must be submitted meeting the requirements of the Design Manual to demonstrate adequate rate control, storage, and infiltration are provided as part of any development applications prior to the issuance of any building or grading permit.

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6. The critical rainfall event will be defined as the event that requires the greatest storm water storage volume in a storage facility. These facilities include lakes, ponds, and their outlets.
7. New storm sewer systems and stormwater facilities shall be designed to meet the requirements in the Design Manual.
8. Drainage and utility easements will be designated for all detention facilities, including access for maintenance of the outlet structure and to the facility in general.
9. The City will utilize natural ponding areas, such as wetlands and lakes, for the impoundment and treatment of surface water runoff as appropriate.
10. The City intends to use both designated and non-designated areas to store storm water runoff. Non-designated areas include general depressions, areas lacking easements, low points, and streets where structures and/or property is not damaged and any inundation that occurs will only be temporary in nature.
11. Available storage volume of landlocked areas shall be established by estimating the water surface elevation resulting from a 100-year, 10-Day runoff (7.2 inches), and saturated or frozen soil conditions (Curve Number=100).
12. Emergency overflows or outlets to drainage systems will be provided to any landlocked area if the available storm water storage capacity is inadequate to prevent flooding of residences and if the available downstream conveyance system capacity is adequate to accept additional flow.
13. The City will encourage the development of enhanced infiltration practices wherever it is practical. The City will not maintain private infiltration areas. Maintenance of private infiltration area will be the responsibility of the Homeowners Association or landowner.
14. The City will require that a maintenance plan that includes procedures for maintenance and funding be submitted prior to approval of private infiltration basins.
15. The City of Monticello will perform maintenance measures to assure proper function of the city-owned drainage systems as outlined in the Storm Water Pollution Prevention Plan (SWPPP).
16. The minimum lowest opening building elevation for new or redevelopment shall meet the criteria outlined in the Design Manual.

3.2. Water Quality

Goal:

Maintain or improve the quality of water in lakes, streams, rivers and wetlands within or immediately downstream of the City.

Policies:

1. New and redevelopment projects must meet the water quality requirements outlined in the Design Manual.

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2. The City prefers regional storm water treatment basins versus site-by-site treatment systems, where available.
3. Design recommendations for stormwater ponds and other water quality BMPs can be found in the Design Manual and the Minnesota Stormwater Manual.
4. The City will follow the Storm Water System Maintenance Plan outlined in the SWPPP, which includes maintenance of storm manholes, trap manholes, catch basins, storm sewer pipe, pond inlets, and pond outlets.
5. The City will sweep all the City streets as outlined in the SWPPP.
6. The City will continue to implement the City's Public Education Program. More information regarding the education program can be found in the SWPPP.
7. The City will continue to work cooperatively with Wright County to implement the household hazardous waste disposal program and educate residents on the proper disposal of household hazardous waste.
8. The City will promote and encourage all properties adjacent to lakes, streams, wetlands, and ponds to establish a vegetative buffer strip consisting of native non-mowed vegetation.
9. The City will eliminate known illegal connections to the City's storm water conveyance system.
10. The City will work with neighboring municipalities to require rate control and treatment prior to the discharge of storm water across municipal boundaries.

3.3. Recreation, Fish and Wildlife

Goal:

Protect and enhance recreational facilities, fish, and wildlife habitat.

Policies:

1. The City will cooperate with the Minnesota Department of Natural Resources, the Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and other appropriate agencies in promoting public enjoyment and protecting fish, wildlife, and recreational resources in the City.
2. The City will encourage landowners to maintain wetlands and open space areas for the benefit of wildlife.

3.4. Enhancement of Public Participation, Information, and Education

Goal:

Educate and inform the public on pertinent water resource management issues and increase public participation in water management activities.

Policies:

1. The City will continue to implement an education program, which utilizes the following medium:

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city newsletters, community access cable TV, individual mailings and the city website www.ci.monticello.mn.us/.

2. The City will implement public education as identified in the SWPPP.

3.5. Public Ditch Systems

Goal:

Provide a mechanism through which public ditch systems will be managed.

Policies:

1. The City will coordinate storm water management design and management with Wright County SWCD as these public ditches are converted to municipal storm water system conveyances.

3.6. Groundwater

Goal:

To coordinate activities and/or manage surface water runoff to the degree necessary to meet requirements for ground water protection or management as required by Wright County, Minnesota Pollution Control Agency, the Minnesota Department of Health, and the Department of Natural Resources.

Policies:

1. Cooperate with state and regional agencies on ground water monitoring, inventorying, or permitting programs.
2. The City of Monticello will encourage the development of alternative stormwater management methods including vegetated swales and infiltration practices provided these methods do not contaminate ground water.
3. The City will cooperate with the Department of Health to ensure that all unsealed or improperly abandoned wells within the City are properly sealed. Technical requirements for the abandonment of these wells will be in conformance with the local and state regulations.
4. The City will sweep the streets twice annually and more often in sensitive areas.
5. The City of Monticello has developed a wellhead protection plan in accordance with State requirements. The goals and objectives developed within this plan are continually being implemented throughout the City. A copy of the Drinking Water Supply Management Area (DWSMA) included as **Figure 9**.

3.7. Wetlands

Goals:

The City will protect wetlands in conformance with the requirements of the Wetland Conservation Act.

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Policies:

1. The City will act as the Local Government Unit (LGU) for wetland management duties in conformance with the Wetland Conservation Act.
2. The City will promote and encourage all properties adjacent to lakes, streams, wetlands, and ponds to establish a vegetative buffer strip consisting of native non-mowed vegetation.
3. The City will follow the adopted wetland buffer ordinance that dedicates a vegetative buffer strip requirement for all new developments and redevelopments.
4. The City will not allow any burning, filling, or draining of an existing wetland without the City's expressed written approval.
5. The City shall manage shore areas in accordance with the current shoreland management ordinance.

3.8. Erosion

Goals:

To prevent the degradation of storm water facilities due to excessive soil erosion and sedimentation.

Policies:

1. The City requires the submission and approval of erosion control and grading plans that meet the requirements of the Design Manual and NPDES standards prior to the issuance of any grading or building permits.
2. The City has adopted the Minnesota Pollution Control Agency's (MPCA) Best Management Practices as guidelines for erosion and sedimentation control.
3. The City will continue its erosion and sediment control inspection program for all new development and redevelopment projects within the City in accordance with MPCA NPDES Phase II permit and the City SWPPP.
4. The City will sweep the streets as outlined in the SWPPP.
5. The City shall require stabilization guidelines to be used around ponds experiencing erosion due to water elevation fluctuations.

SECTION 4

4. ASSESSMENT OF PROBLEMS AND CORRECTIVE ACTIONS

Outlined below is an assessment of existing and potential water resource related problems and a description of all non-structural, structural, and/or programmatic solutions to the problems. Also included below is a description of the corrective actions the City of Monticello could take to address the problems identified.

4.1. Lake and stream water quality

1. General water quality concern of the Mississippi River.

CORRECTIVE ACTION

- a. Work to reduce pollutants entering the Mississippi River which has an approved TMDL for Hg in fish and needs TMDL for fecal coliform and PCB in fish.
2. TMDL Requirements.

CORRECTIVE ACTION

- a. Reduce sediment and phosphorus loading to the Pelican Lake subwatershed which has an approved TMDL for Nutrients.

4.2. Flooding and storm water rate control concerns within the City.

1. The City of Monticello recognizes that flooding of the streets can occur during heavy rainfall events.

CORRECTIVE ACTION

- a. Identify and construct new storm water conveyances and diversionary routes as part of redevelopment projects, where applicable.
2. The City of Monticello recognizes the application of the Atlas 14 rainfall intensities have identified several areas where the required 2 feet of freeboard between pond HWL and structure low openings is not met.

CORRECTIVE ACTION

- a. Identify areas of low, moderate, and high risk for potential flooding. Monitoring these areas during higher rain events. The city will look into possible solutions including additional storage or outlet pipe modifications if problems persist.

4.3. Flooding or storm water rate control concerns between the City and adjoining communities.

1. Address the current discharge rates from the City of Monticello with the in-place joint power agreements with Wright County.
2. Evaluate the need of the City to increase/decrease storm water discharge rates across its municipal border.

CORRECTIVE ACTION

- a. Review the need of agreements with Wright County and Monticello Township relative to how they plan to provide adequate rate control and treatment for storm water runoff leaving their community and entering the City of Monticello.

SECTION 4

4.4. Impacts of water quantity or quality management practices on recreational opportunities.

1. The City has not experienced impacts to recreational opportunities as the result of water quantity or quality impacts.

4.5. Impacts of storm water quality on fish and wildlife resources.

1. The water quality in the Mississippi River have impacted fish and wildlife resources.

CORRECTIVE ACTION

- a. Work with Federal, State, and local agencies to improve the water quality of the Mississippi River.

4.6. Impacts of soil erosion on water quality and water quantity.

1. During significant rainfall events, soil erosion has carried sediment to water bodies within the City. Sediment deposits reduce the depth of water and degrade the quality of water within a basin.

CORRECTIVE ACTION

- a. Implement the goals, policies, capital improvement program, and studies outlined within this Water Resource Management Plan.
- b. Implement the City's NPDES Phase II Program.
- c. Implement the City's SWPPP to remove sediment deltas at stormsewer inlets and outlets.

4.7. General impact of land use practices and in particular land development and land alteration on water quality and quantity.

1. If left unchecked, urbanization will result in increased storm water runoff rates and volumes. Land development and land use practices within the City have the potential to affect both water quality and quantity.

CORRECTIVE ACTION

- a. Implement the goals, policies, capital improvements programs and studies outlined within this Water Resource Management Plan.
- b. Implement the NPDES Phase II Program and enforce the City Ordinances.

4.8. The adequacy of existing regulatory controls to manage or mitigate adverse impacts on public waters and wetlands.

1. The City of Monticello has adequate floodplain, river corridor, shoreland zoning, and illicit discharge ordinances in place to manage and mitigate adverse impacts on public waters and wetlands. A copy of these ordinances is in **Appendix D**

CORRECTIVE ACTION

- a. The City will implement the NPDES Phase II Program and enforce the City ordinances.

SECTION 4

- b. The City inspects and maintains outfalls, sediment basins, ponds, and other BMPs consistent with its MS4 permit.
- c. The City will continue to act as the Local Government Unit (LGU) for wetland management in conformance with the Wetland Conservation Act.

4.9. The adequacy of programs to limit soil erosion and corresponding water quality degradation.

- 1. The City's stormwater management ordinance contains erosion control provisions.
- 2. The City has developed a SWPPP. A copy of the SWPPP can be found at City Hall.

CORRECTIVE ACTION

- a. The City will implement and annually update/review the SWPPP.
- b. Implement the goals, policies, capital improvements programs and studies outlined within this Water Resource Management Plan.

4.10. The adequacy of capital improvement programs to correct problems relating to water quantity, water quality management, fish and wildlife habitat, public waters and wetland management, and recreational opportunities.

- 1. The capital improvement projects outlined within this plan and the general operating procedures of the City are sufficient to address water resource related concerns. However, the Stormwater Utility Fund may not be an adequate funding source by itself to allow for the implementation of the capital improvements projects.

CORRECTIVE ACTION

- a. The City will review the needs for stormwater capital improvements on a regular basis and adjust its fees accordingly.
- b. The City will actively seek outside grant funding and assistance to help in the implementation of these projects.

4.11. Identification of potential problems which are anticipated to occur within the next 20 years based on growth projections and planned urbanization.

- 1. The City recognizes that increased development will increase the volume of runoff directed to the current storm water storage and conveyance systems within the City.

CORRECTIVE ACTION

- a. The implementation of this Water Resource Management Plan will address water quantity, quality, and maintenances issues associated with future development.

SECTION 5

5. IMPLEMENTATION PRIORITIES/IMPLEMENTATION PROGRAM

The City of Monticello has developed a Comprehensive Water Resource Management Plan that reflects the needs and concerns of the City Council, City Staff, citizens, and the funding capabilities of the City. A prioritized listing of the studies, programs, and capital improvements that have been identified as necessary to respond to the water resource needs within the City is outlined on the following tables. The City anticipates implementing - at least to some extent - the regulatory programs, studies or improvements identified within this plan within the next 10 years.

To meet various water resource needs throughout the City, Capital Improvement Projects have been identified based on hydrologic modeling and City input. **Table 5-1** identifies Capital Improvement Projects anticipated to improve current issues as well as estimated costs for improvements. Project locations are shown on **Figure 13**.

In addition to the identified Capital Improvement Projects, hydrologic modeling indicates areas where pond HWLs appear to encroach on freeboard on existing homes. Low opening elevations were estimated adjacent to ponds based on LiDAR information. A flood elevation is the elevation of a building adjacent to a pond, minus two feet of freeboard. Called out as freeboard concerns/watch areas, the specific ponds are shown on **Figure 13**. Ponds with freeboard concerns are classified as minor or major watch areas if the model indicates that water infringes upon or exceeds the available freeboard respectively

As development occurs throughout the city, flow rates will be controlled based on additional storage and outlet devices as indicated in the hydrologic model. Future modifications are labeled as *Future Pond Improvements as Development Occurs* on **Figure 13**. The subwatershed tables in **Appendix A** indicate proposed storage and outlets to be considered as development occurs.

Table 5-1 contains Storm Water Capital Improvement Projects (CIP), **Table 5-2** contains Storm Water Management Programs (SMP). The costs associated with these items reflect year 2019 construction costs and do not take into account inflation. These costs include a 10% contingency and 25% for indirect costs, which include legal, engineering, administration and financing costs. Land or easement acquisition costs are not included. These tables are for planning and budgeting purposes and are considered rough estimates. It is anticipated that these cost estimates will be reviewed annually and updated as needed.

TABLE 5-1									
City of Monticello									
CAPITAL IMPROVEMENT PROJECTS									
Capital Improvement Projects				Proposed Expenses for Year					
No.	Project Description	Cost Estimate ¹	Potential Funding Sources	2020	2021	2022	2023	2024	2025-2029
CIP-1	IP-01D AGLORIOUS CHURCH POND	\$460,000	Trunk Storm Fee	\$460,000					
CIP-2	HB06 CHELSEA/FALLON AVE POND EXPANSION	\$1,340,000	Trunk Storm Fee						\$1,340,000
CIP-3	HB07 OUTLET CONTROL MODIFICATION CHELSEA RD	\$40,000	Trunk Storm Fee				\$40,000		
CIP-4	POND OUTLET FOR BASIN TH-01	\$1,000,000	Trunk Storm Fee			\$1,000,000			
CIP-5	OC11B MBC POND D CONSTRUCTION	\$560,000	Trunk Storm Fee		\$560,000				
CIP-6	OC11D MBC POND A CONSTRUCTION	\$480,000	Trunk Storm Fee						\$480,000
CIP-7	OC11C KARLSBURGER POND OUTLET MODIFICATION	\$120,000	Trunk Storm Fee				\$120,000		
CIP-8	MR21D OUTLET TO PRAIRIE RD LANDLOCKED AREA	\$340,000	Trunk Storm Fee					\$340,000	
		\$4,340,000	TOTAL	\$460,000	\$560,000	\$1,000,000	\$160,000	\$340,000	\$1,820,000

1) Cost estimates provided are for planning purposes only, and are subject of change as projects are studied, designed, and constructed. Estimates are 2019 construction numbers.

TABLE 5-2

City of Monticello

STORMWATER MANAGEMENT PROGRAMS

Storm Water Management Programs				Proposed Expenses for Year					
No.	Project Description	Cost Estimate ^{1, 2}	Potential Funding Sources	2020	2021	2022	2023	2024	2025-2029
SMP-1	Continue to perform LGU responsibility for the Wetland Conservation Act.	\$50,000	Utility fund	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$25,000
SMP-2	Develop a program to prioritize inspection and maintenance of existing BMPs	\$31,000	Utility fund	\$13,000	\$2,000	\$2,000	\$2,000	\$2,000	\$10,000
SMP-3	Develop and implement an education program for key audiences.	\$50,000	Utility fund; grants	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$25,000
SMP-4	Implement the Storm Water System Maintenance Plan and the NPDES Phase II SWPPP (includes street sweeping, maintenance of drainageways and ditches, etc.)	\$300,000	Utility fund	\$30,000	\$30,000	\$30,000	\$30,000	\$30,000	\$150,000
SMP-5	Pond Maintenance Projects	\$800,000	Utility fund		\$200,000		\$200,000		\$400,000
SMP-6	Undertake wetland restoration projects as opportunities are available.	\$30,000	Utility fund; grants	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$15,000
		\$1,261,000	TOTAL	\$56,000	\$245,000	\$45,000	\$245,000	\$45,000	\$625,000

1) Cost estimates provided are for planning purposes only, and are subject of change as projects are studied, designed, and constructed. Estimates are 2019 construction numbers.

2) The City's cost for these programs are subject to change based on the availability of grant money and cost-sharing.

SECTION 6

6. FINANCIAL CONSIDERATIONS

Implementation of the proposed regulatory controls, programs and improvements that are identified in this plan will have a financial impact on the City of Monticello. To establish how significant this impact will be, a review of the means and ability of the City to fund these controls, programs, and improvements is necessary. Toward this end, please find outlined below a listing of various sources of revenue that the City will endeavor to implement the water resource management efforts outlined in this plan.

<u>DESCRIPTION OF FUNDING SOURCE</u>	<u>REVENUE GENERATED</u>
1. Revenue generated by City's Storm Water Trunk and Ponding Fees (2019 rates)	Trunk Storm Sewer Base Fee: \$3,985 (net acre) Alternate Ponding Area – Residential \$4,083/acre Alternate Ponding Area – Commercial \$8,185/acre Alternate Ponding Area – Industrial \$9,564/acre
2. Revenue generated by the City's Stormwater Utility Fee (2019 rate) for maintenance of the system.	Stormwater Utility Fee - \$1/unit/month
3. Special assessments for local improvements made under the authority granted by Minnesota Statutes Chapter 429.	Variable depending on activities undertaken
4. Grant monies that may be secured from various local, regional, County, State, or Federal agencies. This would include MnDOT, MPCA, the DNR, and others.	Variable depending on activities undertaken
5. Tax abatement	Variable depending on activities undertaken

The revenue from the Storm Water Trunk and Ponding Fee will assist in the implementation of this Plan. However, the City will seek outside funding sources to assist in implementation.

SECTION 7

7. AMENDMENT PROCEDURES

It is the intention of the City of Monticello to have this Comprehensive Water Resource Management Plan reviewed and approved by the appropriate agencies. Once approved, no significant changes to this plan can be facilitated without the approval of the proposed revisions. Significant changes to the local plan shall be made known to the following parties:

1. Director of Public Works/City Engineer
2. City Manager, Mayor and City Council

Following notification of the above parties, they shall have 60 days to comment on the proposed revisions. Failure to respond within 60 days constitutes approval.

Minor changes to the Plan shall be defined as changes that do not modify the goals, policies, or commitments expressly defined in this plan by the City. Adjustment to subwatershed boundaries will be considered minor changes provided that the change will have no significant impact on the rate or quality in which storm water runoff is discharged from the City boundaries. Minor changes to this plan can be made by the staff at the City without outside review. It is the intention of the City that this Plan be updated by the year 2029 unless significant changes to the plan are deemed necessary prior to that date.

SECTION 8

8. GLOSSARY

1% CHANCE RAINFALL EVENT	A rainfall event that has a 1 % chance of being equaled or exceeded during any given year.
ALLUVIUM	Material, such as sand, silt, or clay, deposited on land by streams.
AQUIFER	A formation, group of formations, or part of a formation that contains enough saturated permeable material to yield significant quantities of water.
ARTESIAN AQUIFER	An aquifer which is bounded above and below by formations of impermeable material or relatively impermeable material.
BEDROCK	The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.
BUFFER	An upland area adjacent to a wetland that is covered with natural vegetation and experiences little to no human impact such as mowing or fertilizing. The buffer starts at the delineated wetland edge.
CONVEYANCE SYSTEM	A surface water transport system that may include rivers, streams, man-made channels, grass waterways, storm water sewers, culverts, and other man-made control structures.
CRITICAL EVENT STORM	When comparing the 1%, 24-hour high water level and discharge rate to the 1%, 10-day high water level and discharge rate, the event that produces the highest high water level and discharge rate is defined as the critical event storm.
DRIFT (GLACIAL)	Rock material transported by glacial ice or material deposited by streams from glaciers.
EUTROPHIC	A condition where a body of water has reduced level of dissolved oxygen producing an increased level of plant life. A water body with a Trophic State Index from 51 to 70.
FLOODPLAIN	A nearly level alluvial plain that borders a river or stream and is subject to flooding unless protected artificially.
GEOMORPHOLOGY	The geologic study of the configuration and evolution of land forms.

SECTION 8

HWL	High Water Level. The highest water level achieved in a pond is predicted by the 100-year critical event model.
HYDRAULIC	Involving, moved, or operated by a fluid, especially water, under pressure.
HYDROGRAPH	A plot of streamflow against time.
HYDROLOGIC BOUNDARY	The boundary defining watershed or subwatershed units.
HYDROLOGY	The science concerned with waters of the earth, their occurrence, distribution, and circulation; their physical and chemical properties; and their reaction to the environment.
MEAN	Average. The sum of the magnitudes of all items of a set, divided by the items.
NWL	Normal Water Level. The lowest controlling elevation of the pond.
100-YEAR FLOOD PLAIN	That flood plain associated with a storm that has a 1 percent chance of being equaled or exceeded during any year (100-year recurrence interval). Usually calculated assuming a rainfall event of 24 hours in duration.
ORDINARY HIGH WATER MARK(OHWM)	The boundary of protected waters as defined in Minnesota Statutes.
OUTWASH	Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by glacial melt water.
OUTWASH PLAIN	A land form of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.
P8	"Program for Predicting Polluting Particle Passage through Pits, Puddles, and Ponds." This computer program is used for water quality monitoring within subwatersheds.
PARENT MATERIAL	The unconsolidated organic and mineral material in which soil forms.
PERMEABILITY	A characteristic of soil that enables water to move downward through the profile. Measured in inches per hour.
MAJOR STORM WATER STORAGE FACILITY	A facility which can provide flood protection for the critical 1% chance storm event.

SECTION 8

NVGD	National Vertical Geodetic Datum. The nationwide reference surface for elevations.
PROTECTED WATERS AND WETLANDS	Those waters of the state identified as Public Waters or Wetlands under Minnesota Statutes. Generally, all lakes and Type 3, 4, and 5 wetlands as identified in the Department of Interior Circular 39, Wetlands of the United States, 1971. Public wetlands are generally those 10 or more acres in size in unincorporated areas, or 2.5 or more acres in size in incorporated areas.
SOIL ASSOCIATION	A group of soils geographically associated in a characteristic repeating pattern defined and delineated as a single map unit.
SUBWATERSHED	A minor drainage unit and a hydrologic component of a watershed.
SURFICIAL MATERIAL	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.
TILL	Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.
TILL PLAIN	An extensive flat to undulating area underlain by glacial till.
TROPHIC STATE INDEX	A numeric index for lakes that rates the water quality of the lakes from a scale of 0 to 100 based on algal biomass. The index number can be calculated from any of several parameters, including Secchi disc transparency, chlorophyll, and total phosphorus.
WATER APPROPRIATIONS	Waters of the state that are appropriated in excess of 10,000 gallons per day and/or 1 million gallons/year. A permit from the DNR is required for this type of activity.
WATERSHED	All lands which are enclosed by a continuous hydrologic drainage divide and lie upslope from a specified outlet point.

FIGURES

Figures

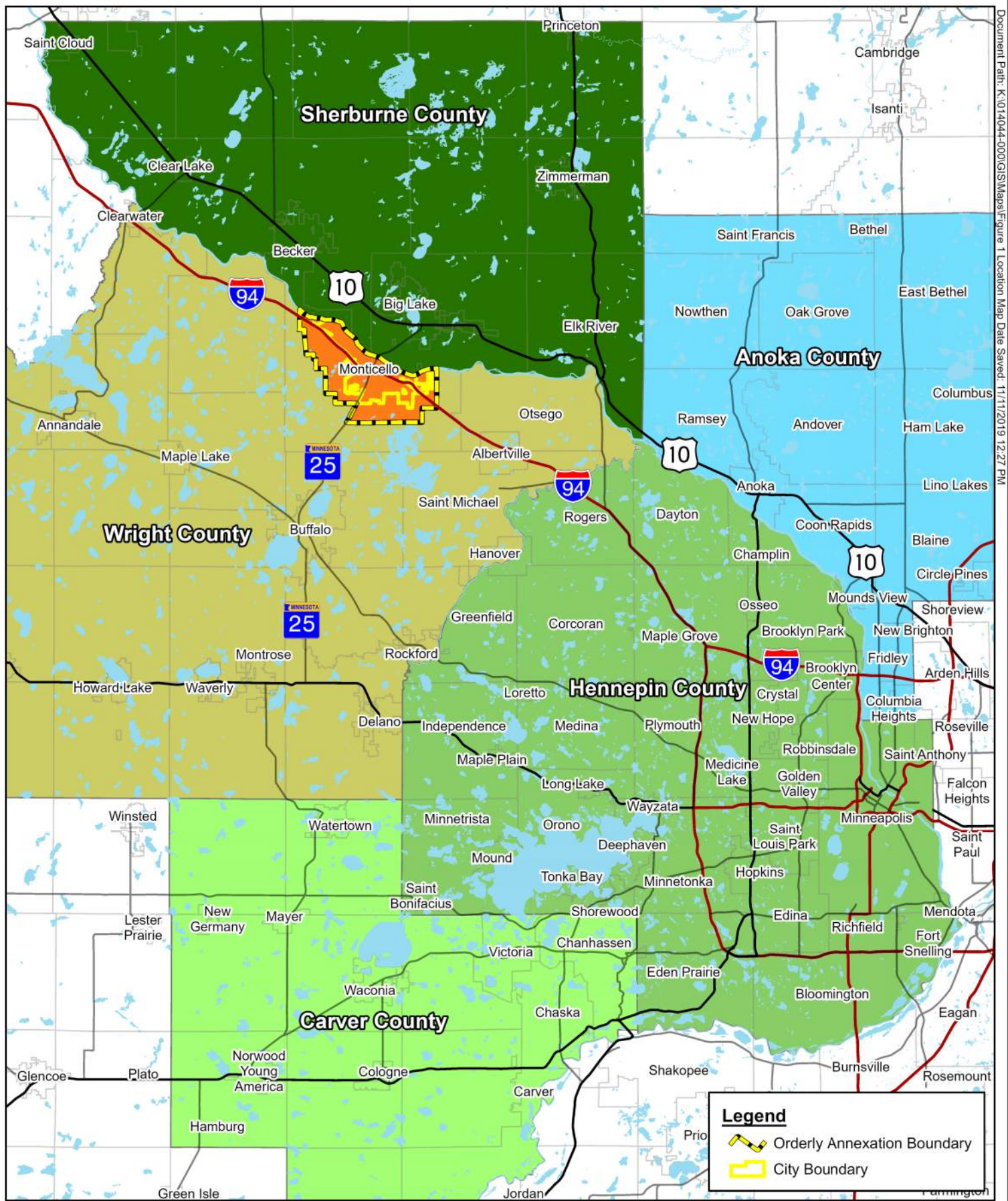


Figure 1 - City of Monticello Location Map
 Water Resource Management Plan
 City of Monticello, Minnesota
 November, 2019

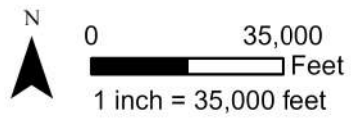
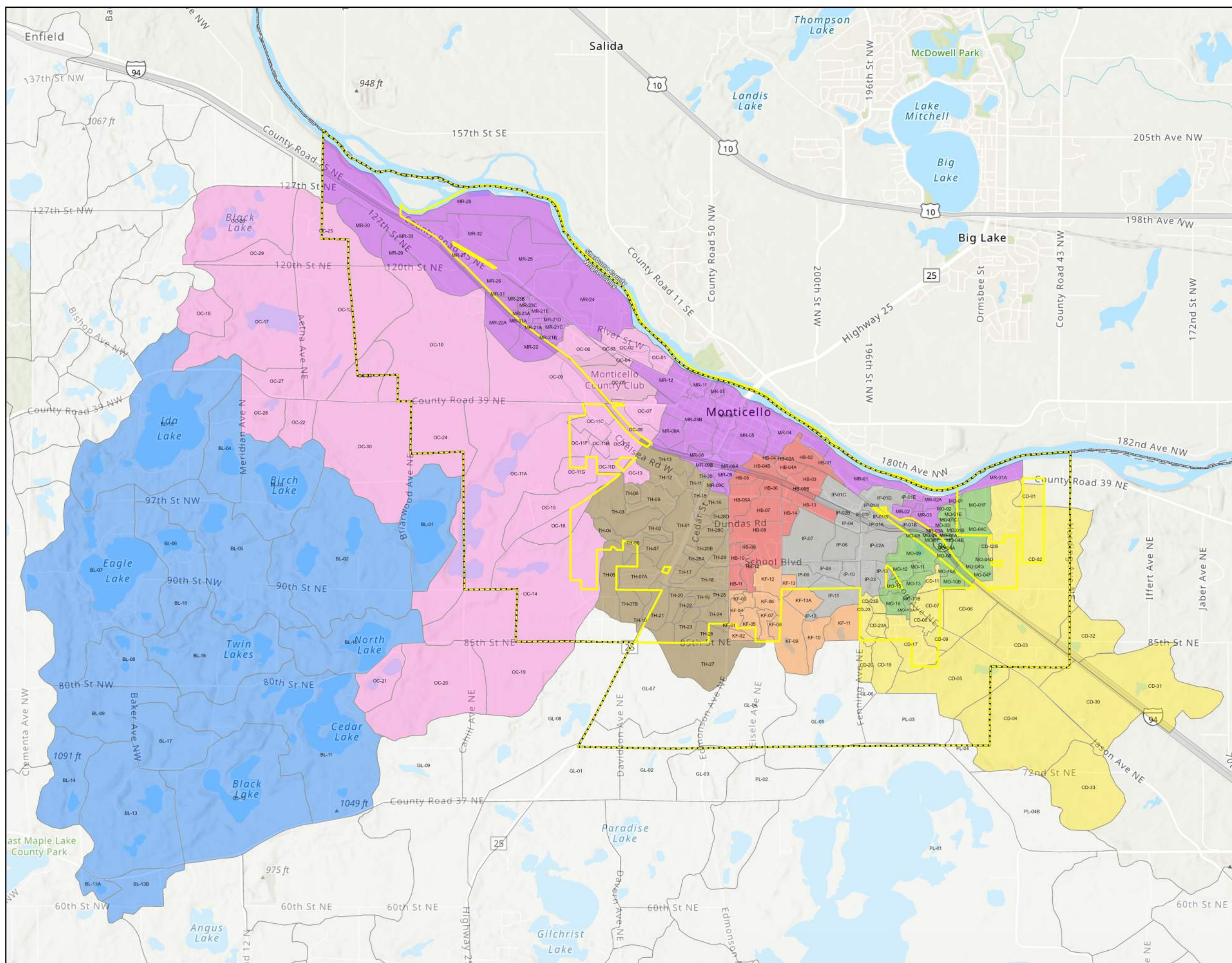


Figure 2 Subwatershed Delineation Map

Water Resource Management Plan
City of Monticello, Minnesota

November, 2019

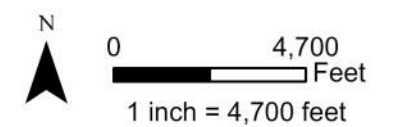


Boundaries

- Orderly Annexation Boundary
- City Boundary

Subwatersheds

- CD
- MO
- MR
- IP
- KF
- HB
- TH
- OC
- BL
- Misc.





**Figure 3
National Wetland
Inventory Map**

Water Resource Management Plan
City of Monticello, Minnesota

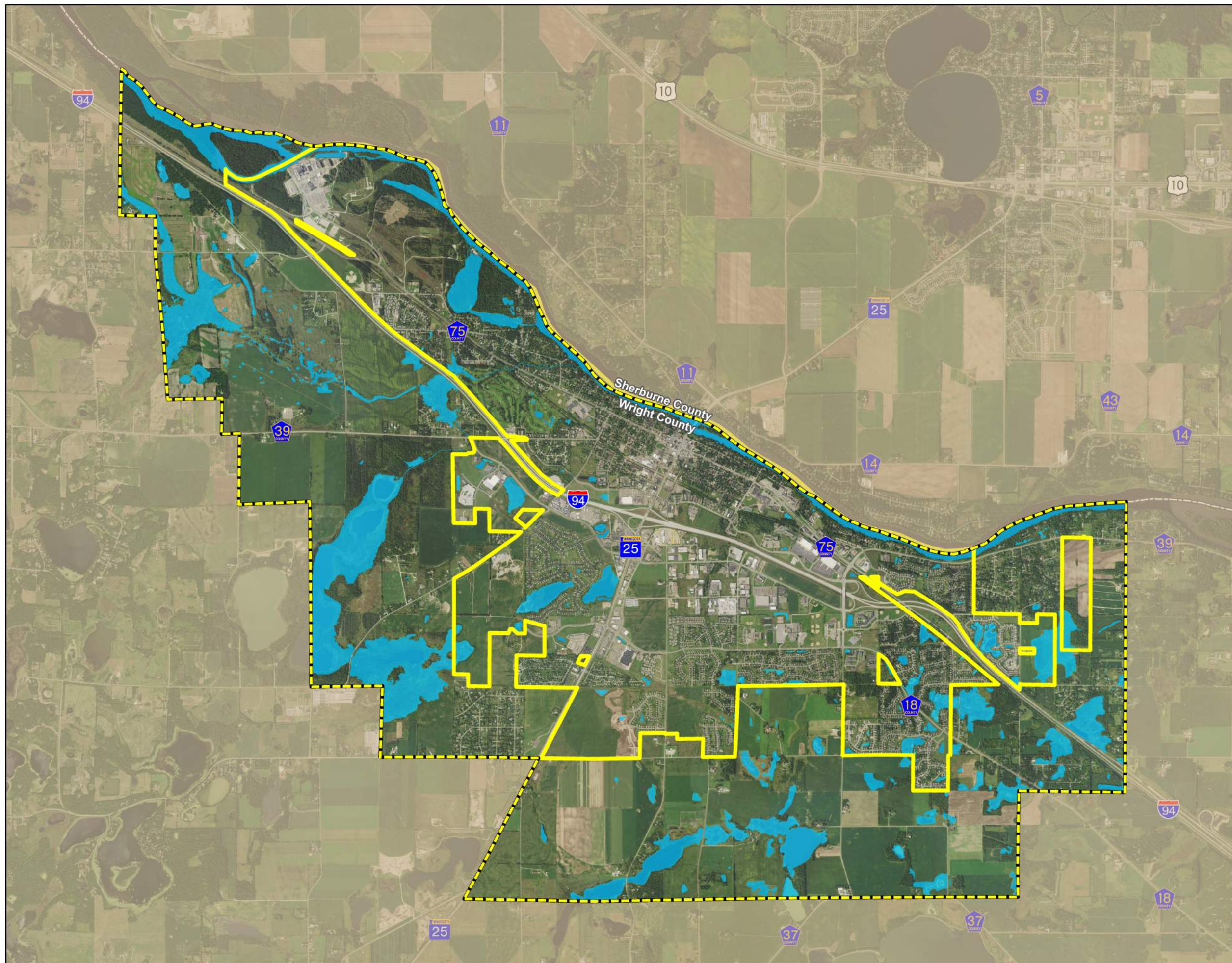
November, 2019

Boundaries

-  Orderly Annexation Boundary
-  City Boundary

Legend

-  National Wetland Inventory





**Figure 4
MnDNR Public
Waters/Wetlands and
Public Ditches Map**



Water Resource Management Plan
City of Monticello, Minnesota

November, 2019

Boundaries

-  Orderly Annexation Boundary
-  City Boundary

Legend

-  MnDNR Public Waters
-  MnDNR Public Ditches

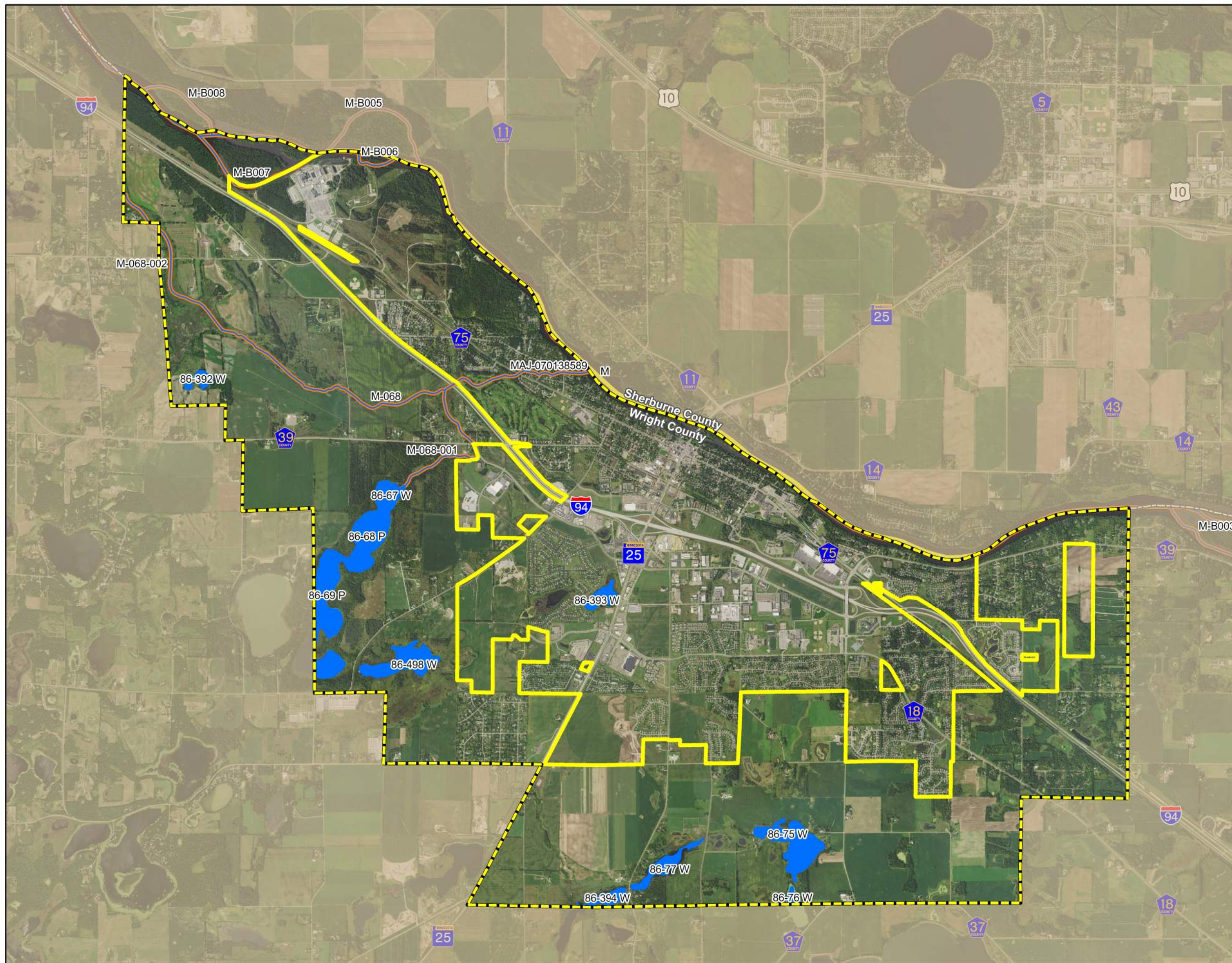




Figure 5a
Existing and Future
Pond Inventory and
Subwatershed Map



Water Resource Management Plan
City of Monticello, Minnesota

November, 2019

Boundaries

-  Orderly Annexation Boundary
-  City Boundary

Legend

-  Existing Pond Inventory
-  Future Pond Improvements
- MR-01** Subwatershed ID
- 100 Pond ID

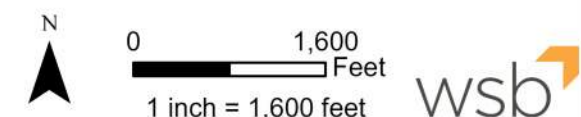
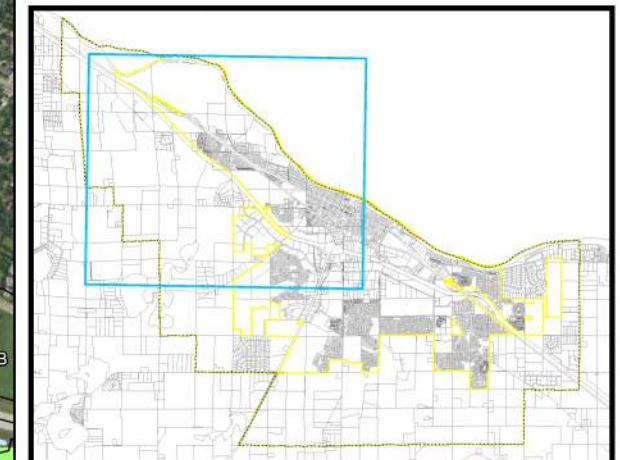
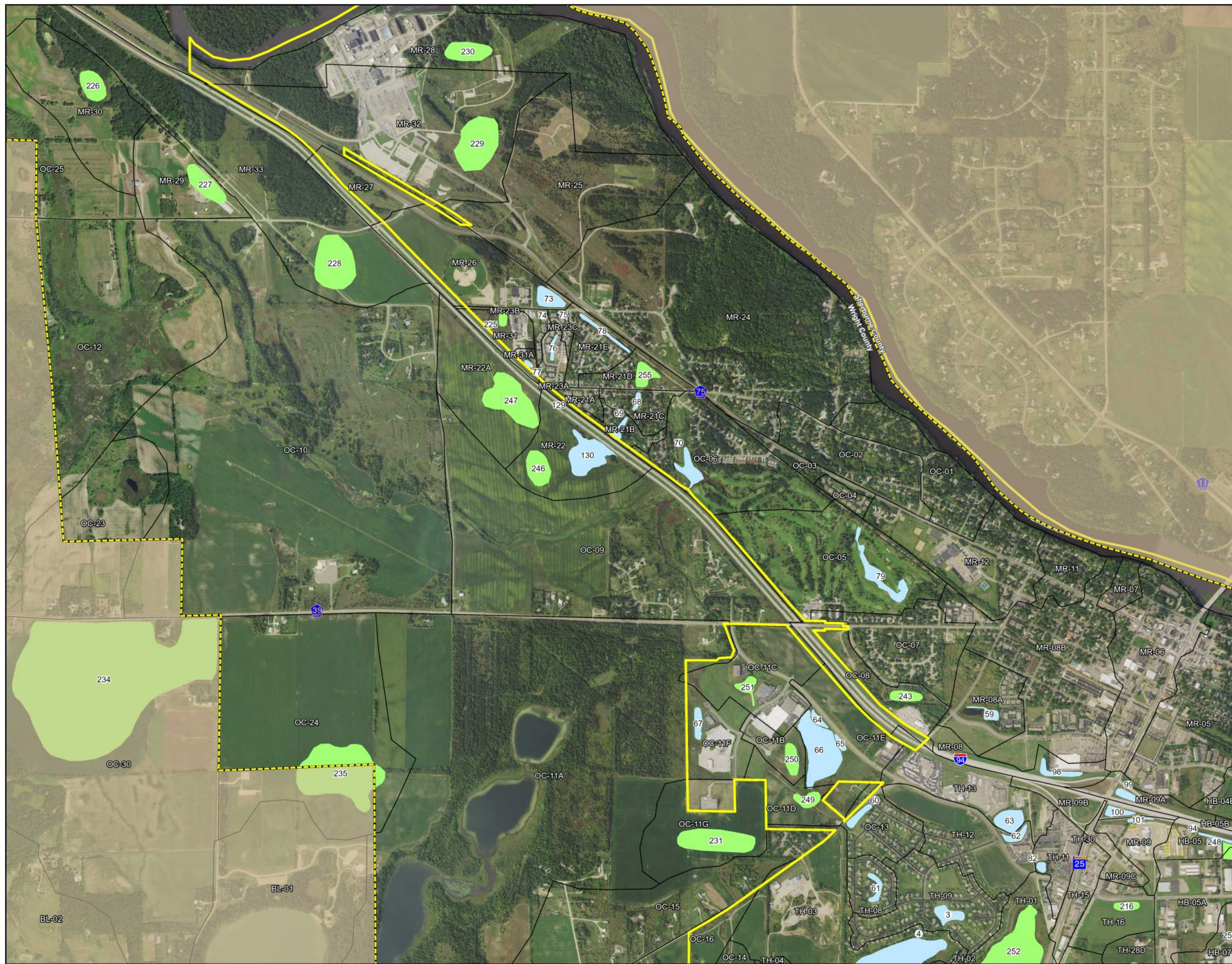
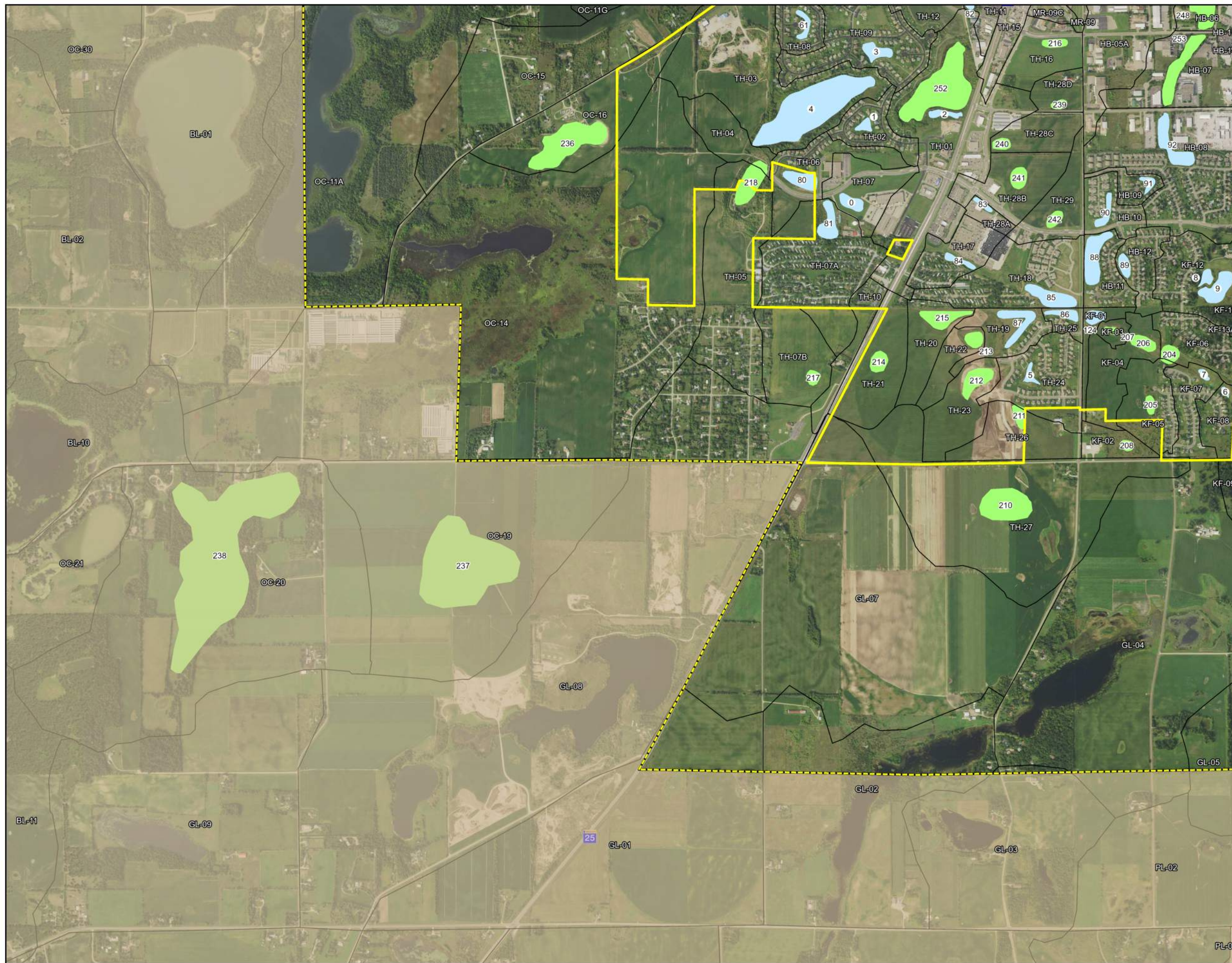




Figure 5b
Existing and Future
Pond Inventory and
Subwatershed Map

Water Resource Management Plan
 City of Monticello, Minnesota



November, 2019



Boundaries

-  Orderly Annexation Boundary
-  City Boundary

Legend

-  Existing Pond Inventory
-  Future Pond Improvements
- MR-01** Subwatershed ID
- 100 Pond ID

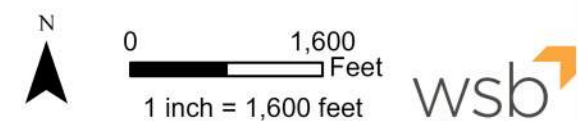
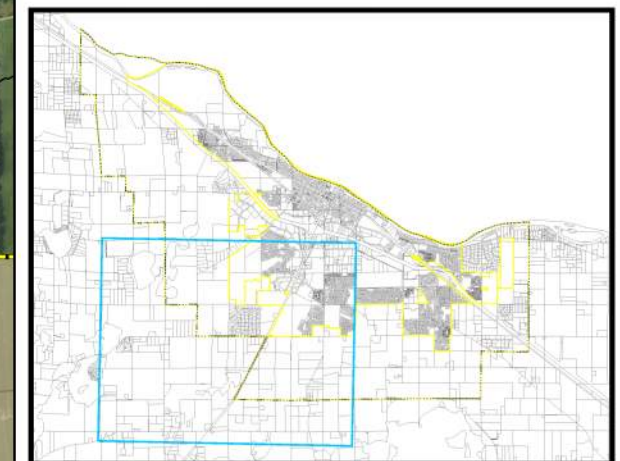




Figure 5c Existing and Future Pond Inventory and Subwatershed Map



Water Resource Management Plan
City of Monticello, Minnesota

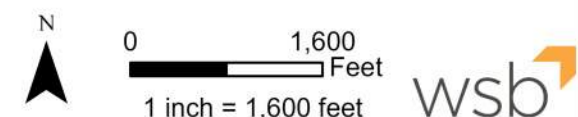
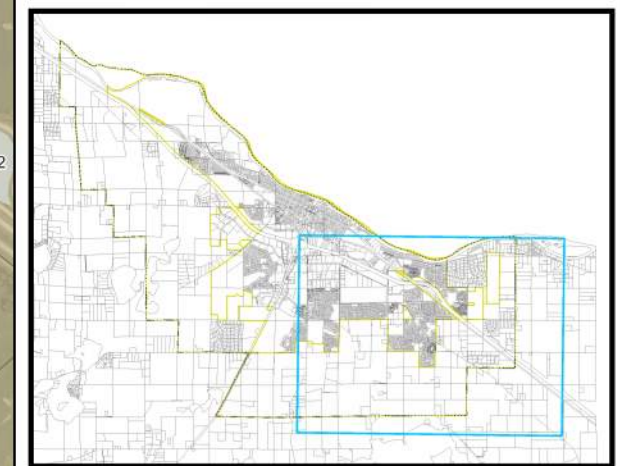
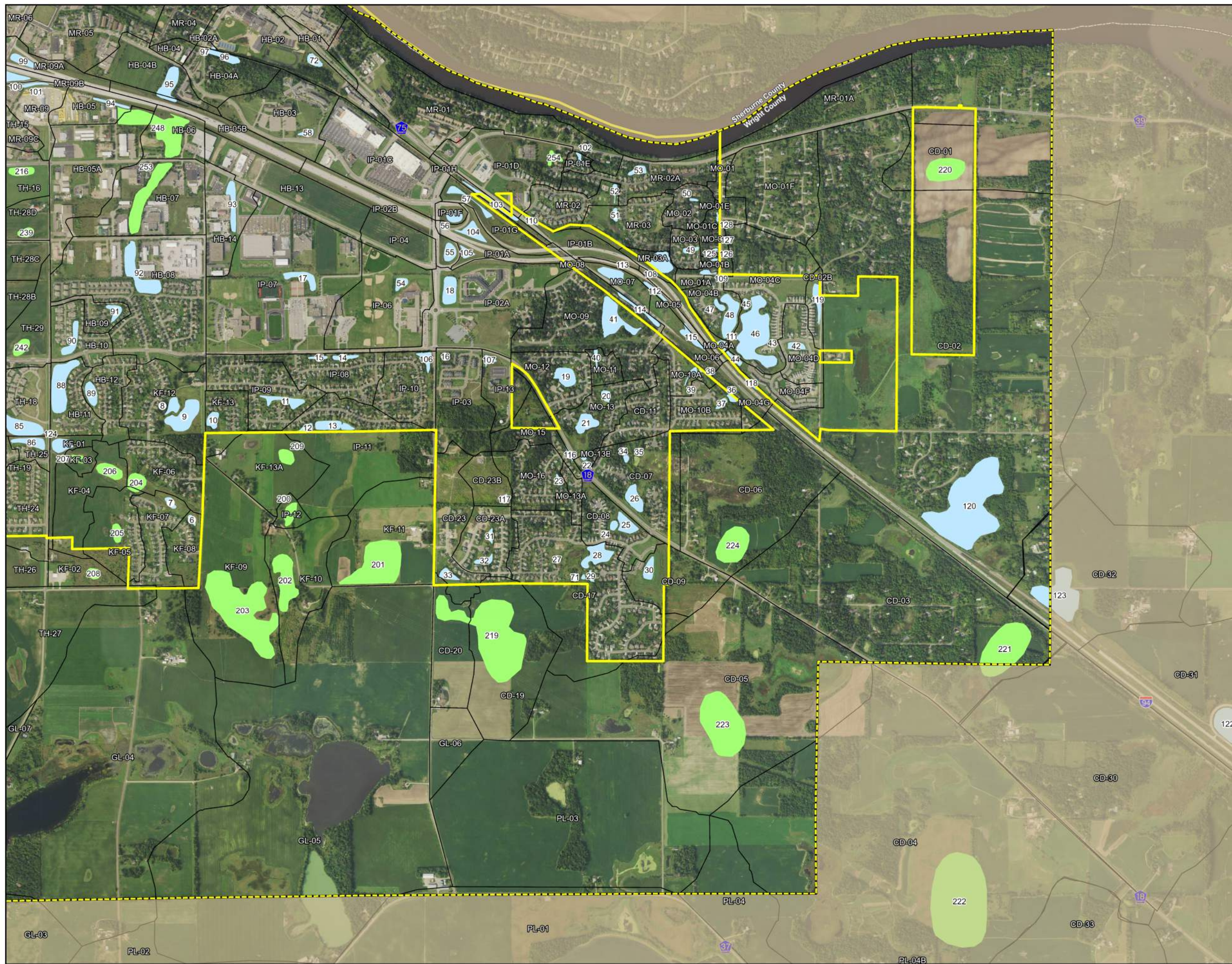
November, 2019

Boundaries

-  Orderly Annexation Boundary
-  City Boundary

Legend

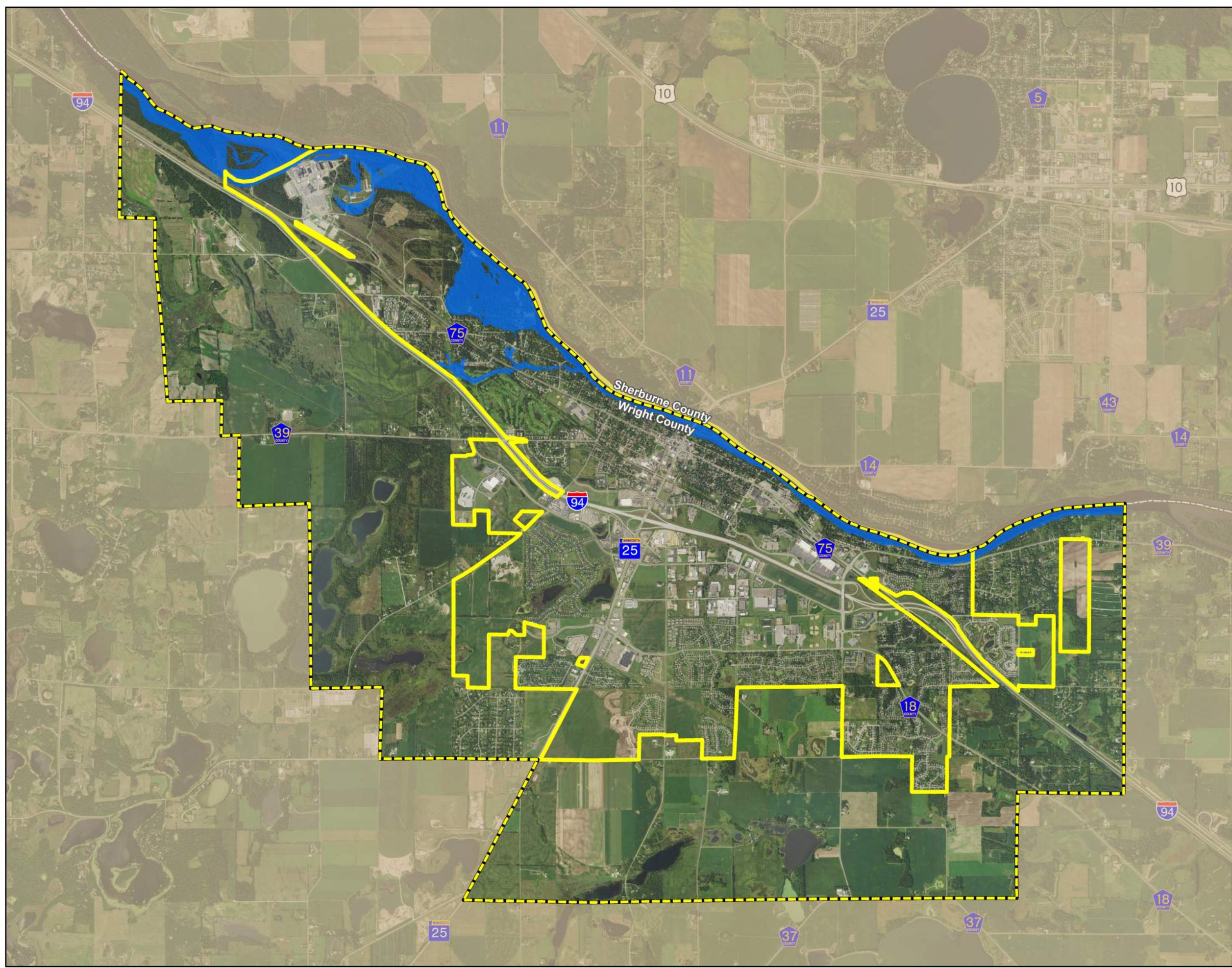
-  Existing Pond Inventory
-  Future Pond Improvements
- MR-01** Subwatershed ID
- 100 Pond ID





**Figure 6
FEMA Floodplain
Boundary Map**

Water Resource Management Plan
City of Monticello, Minnesota

November, 2019



Boundaries

-  Orderly Annexation Boundary
-  City Boundary

Legend

-  100-Year Floodplain

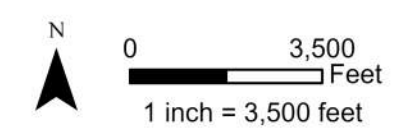




Figure 7 Water Quality Monitoring Locations Map

Water Resource Management Plan
City of Monticello, Minnesota





November, 2019

Boundaries

-  Orderly Annexation Boundary
-  City Boundary

Legend

Water Quality Station Type

-  Stream Biology Station
-  Permitted Discharger
-  Lake Monitoring Station
-  Stream Chemistry Station

Information obtained from the Minnesota
Pollution Control Agency. Pins indicate
MPCA surface water monitoring locations.

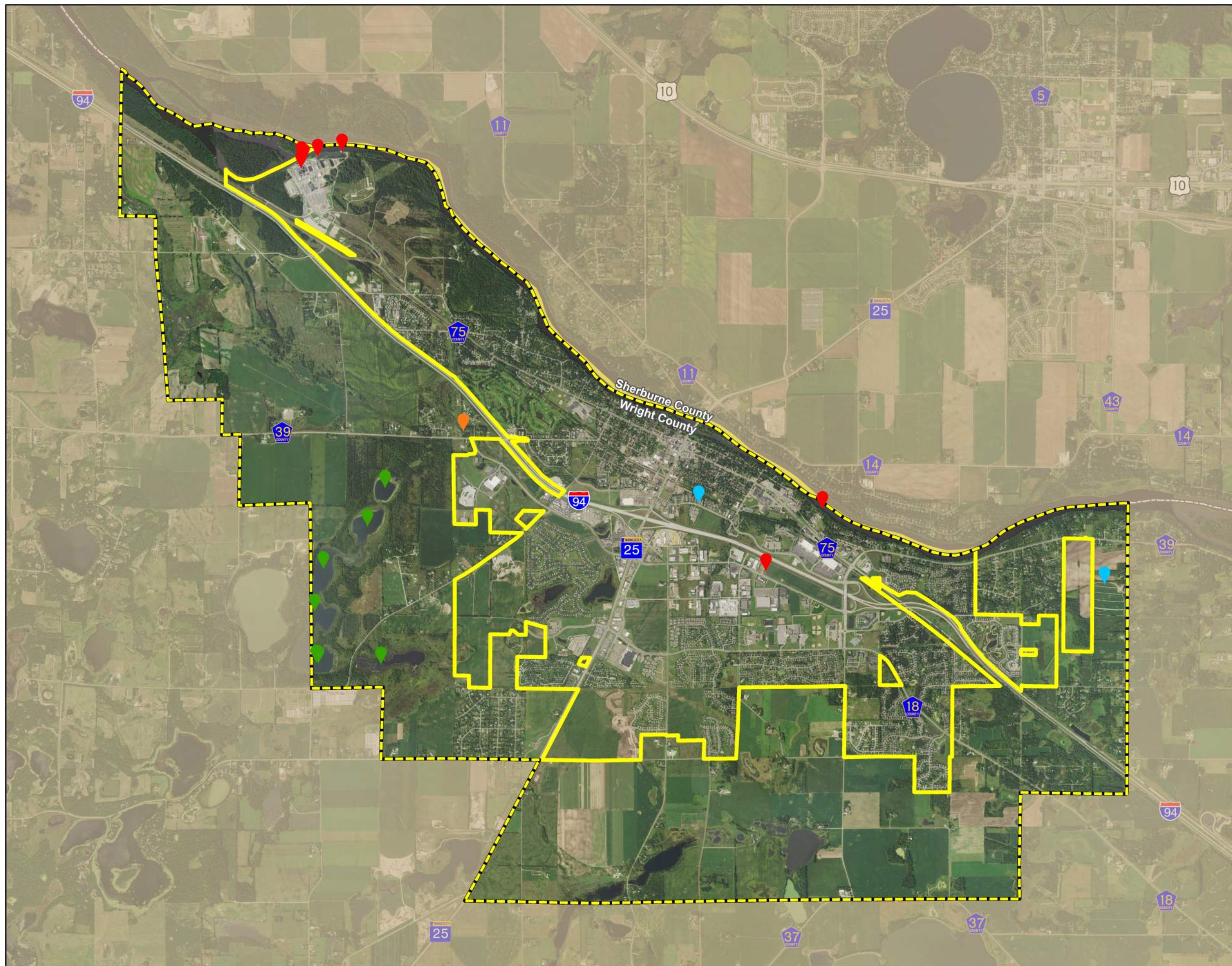




Figure 8
MnDNR Groundwater
Appropriation Locations Map

Water Resource Management Plan
City of Monticello, Minnesota

November, 2019

Boundaries

-  Orderly Annexation Boundary
-  City Boundary

Legend

Groundwater Appropriation Use

-  Agricultural Irrigation Well
-  Non-Crop Irrigation Well
-  Power Generation Well
-  Water Supply Well

Information obtained from the Minnesota Department of Natural Resources. The circles represent point locations and type of issued Minnesota Water Use permits.

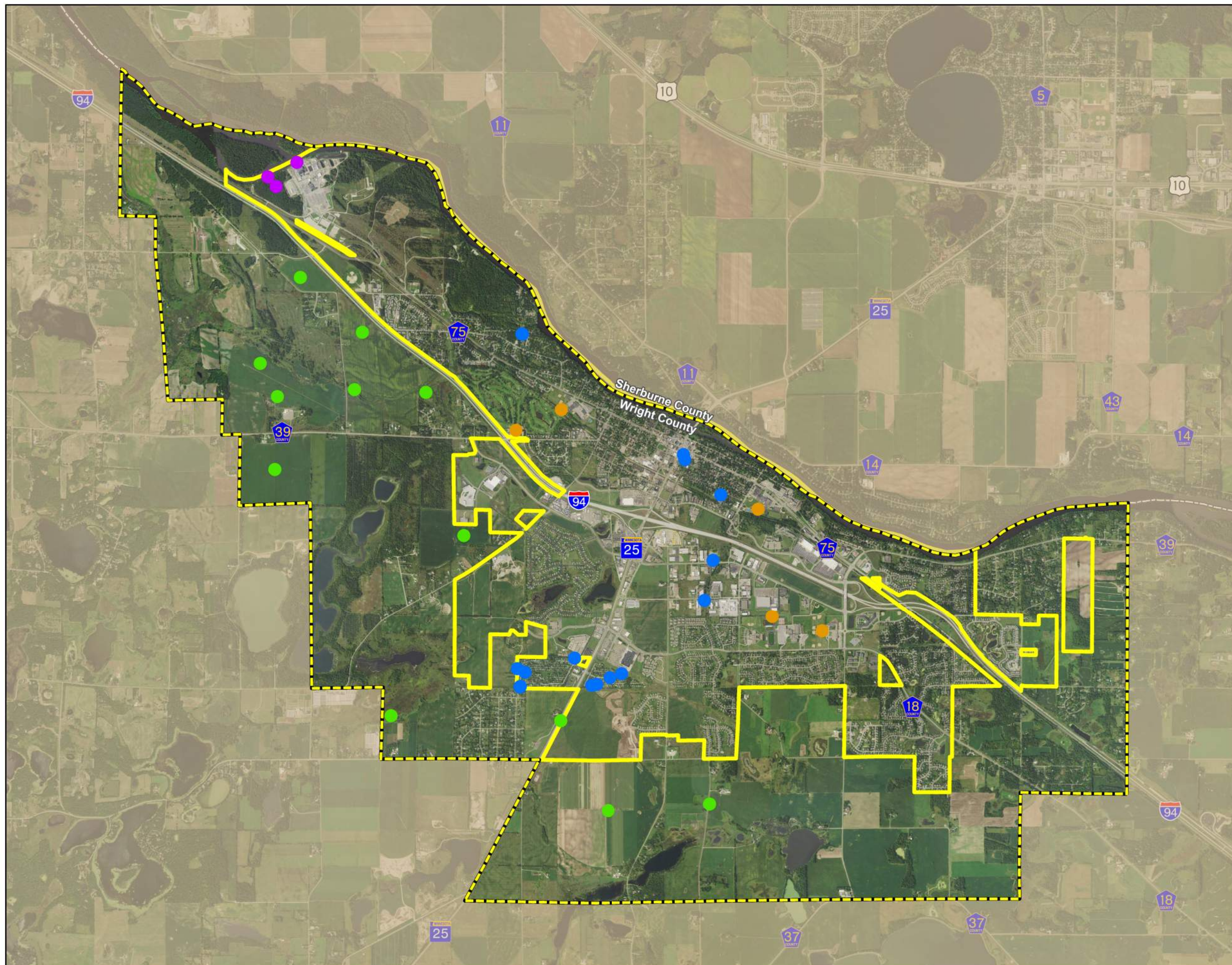




Figure 9
MDH ERA and DWSMA
Location Map

Water Resource Management Plan
City of Monticello, Minnesota

November, 2019

Boundaries

-  Orderly Annexation Boundary
-  City Boundary

Legend

-  ERA
-  DWSMA

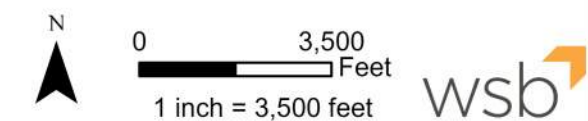
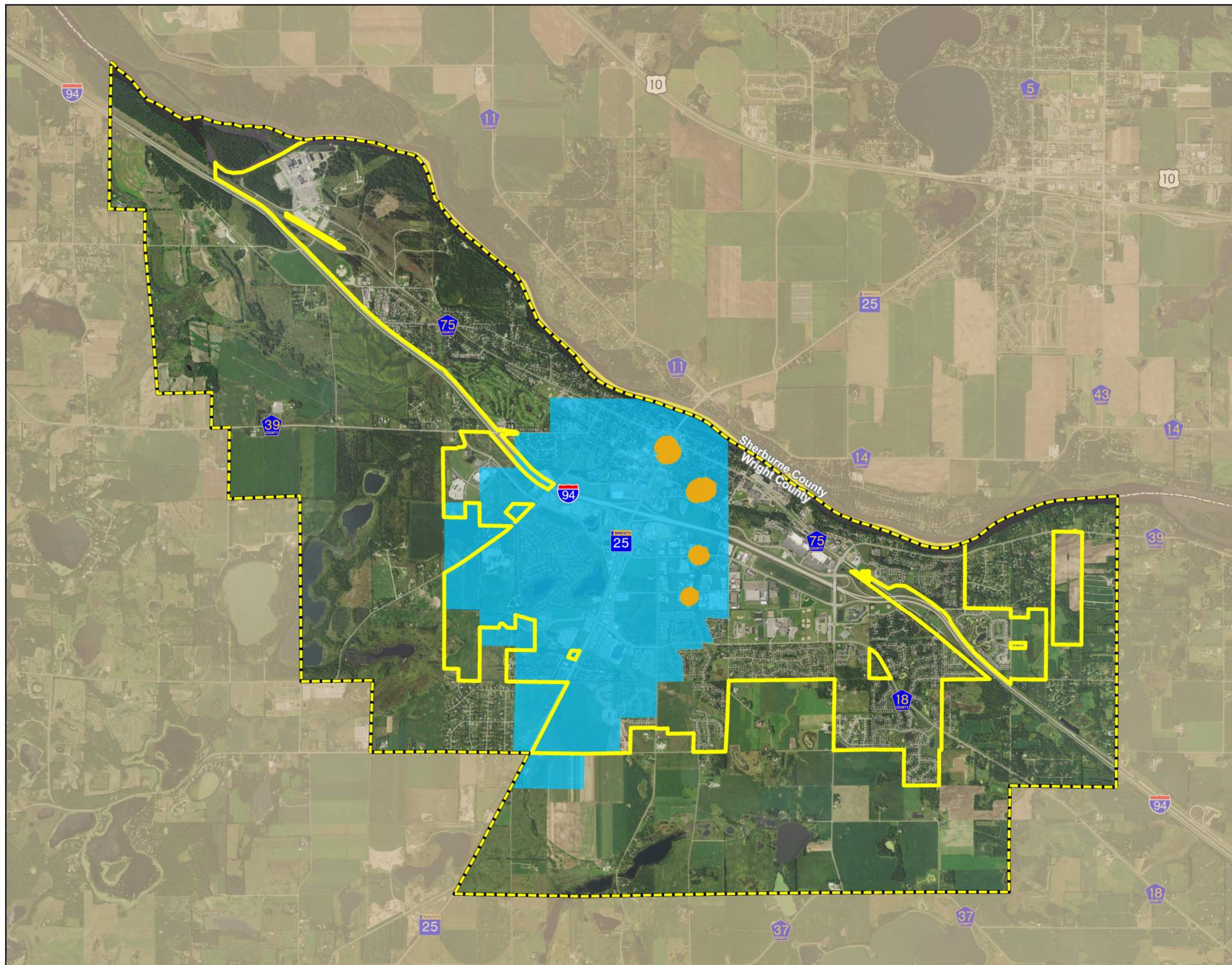




Figure 10
Hydrologic Soil Groups








Water Resource Management Plan
City of Monticello, Minnesota

November, 2019

Boundaries

-  Orderly Annexation Boundary
-  City Boundary

Hydrologic Group

-  **A** - These soils have high infiltration rates even when thoroughly wetted. The infiltration rates range from 0.80 to 1.63 inches per hour. These soils consist chiefly of deep, well drained to excessively drained sands and gravel. These soils have a high rate of water transmission, therefore resulting in a low runoff potential.
-  **A/D** - These soils perform as A soils in drained areas but have a very slow infiltration rate when thoroughly wet.
-  **B** - These soils have a moderate infiltration rate ranging from 0.30 to 0.45 inches per hour when thoroughly wetted. These soils consist of deep moderately well to well drained soils with moderately fine to moderately coarse textures.
-  **B/D** - These soils perform as B soils in drained areas but have a very slow infiltration rate when thoroughly wet.
-  **C** - These soils have an infiltration rate of 0.2 inches per hour when thoroughly wetted.
-  **C/D** - These soils perform as C soils in drained areas but have a very slow infiltration rate when thoroughly wet.
-  **Waterbody**

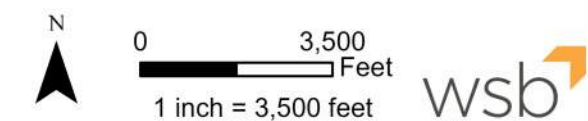
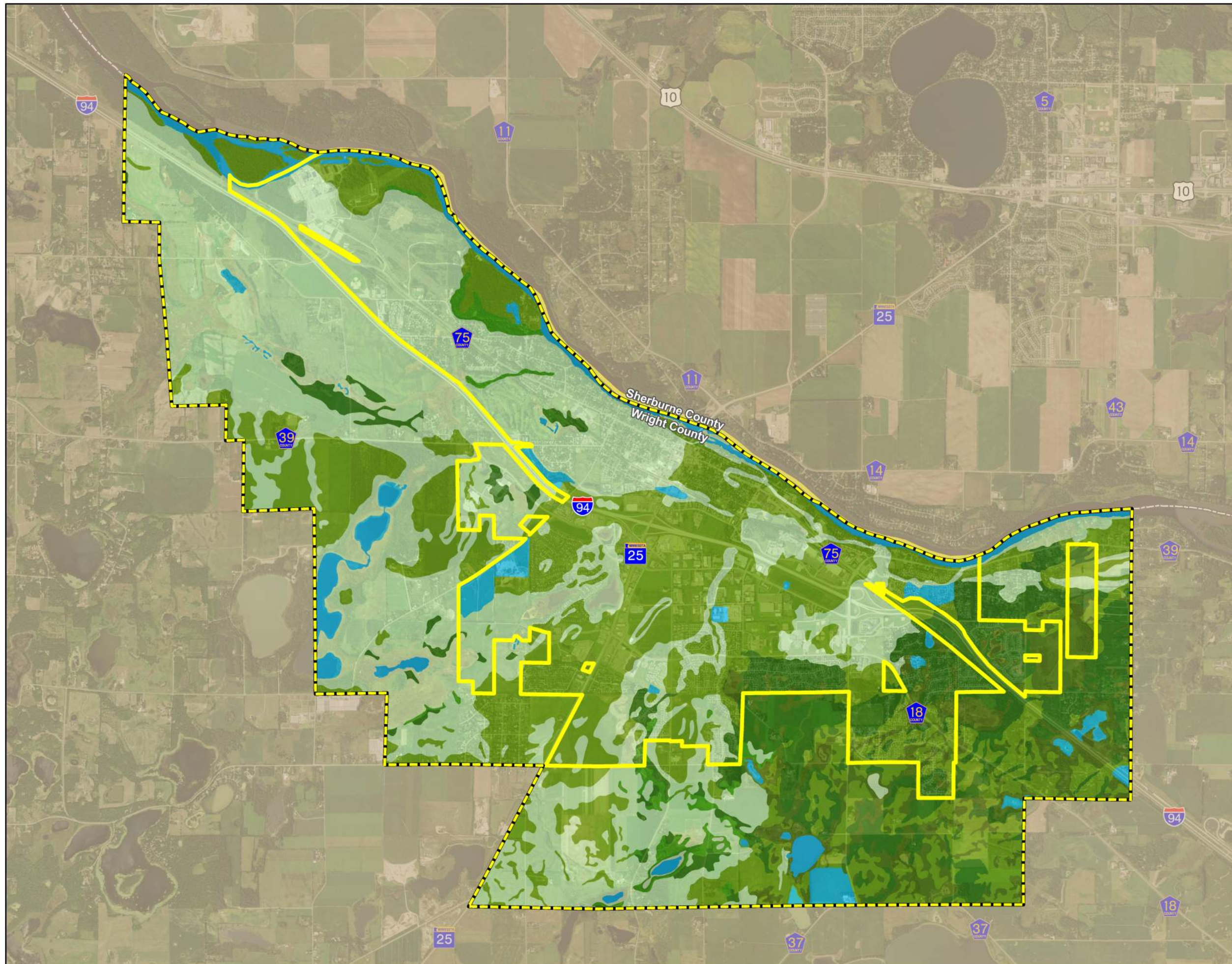




Figure 11
Land Use Map

Water Resource Management Plan
City of Monticello, Minnesota

November, 2019

Boundaries

-  Orderly Annexation Boundary
-  City Boundary

Legend

Future Land Use

-  Places to Live
-  Places to Shop
-  Places to Work
-  Places to Recreate
-  Downtown
-  Places for Community
-  Urban Reserve
-  Infrastructure

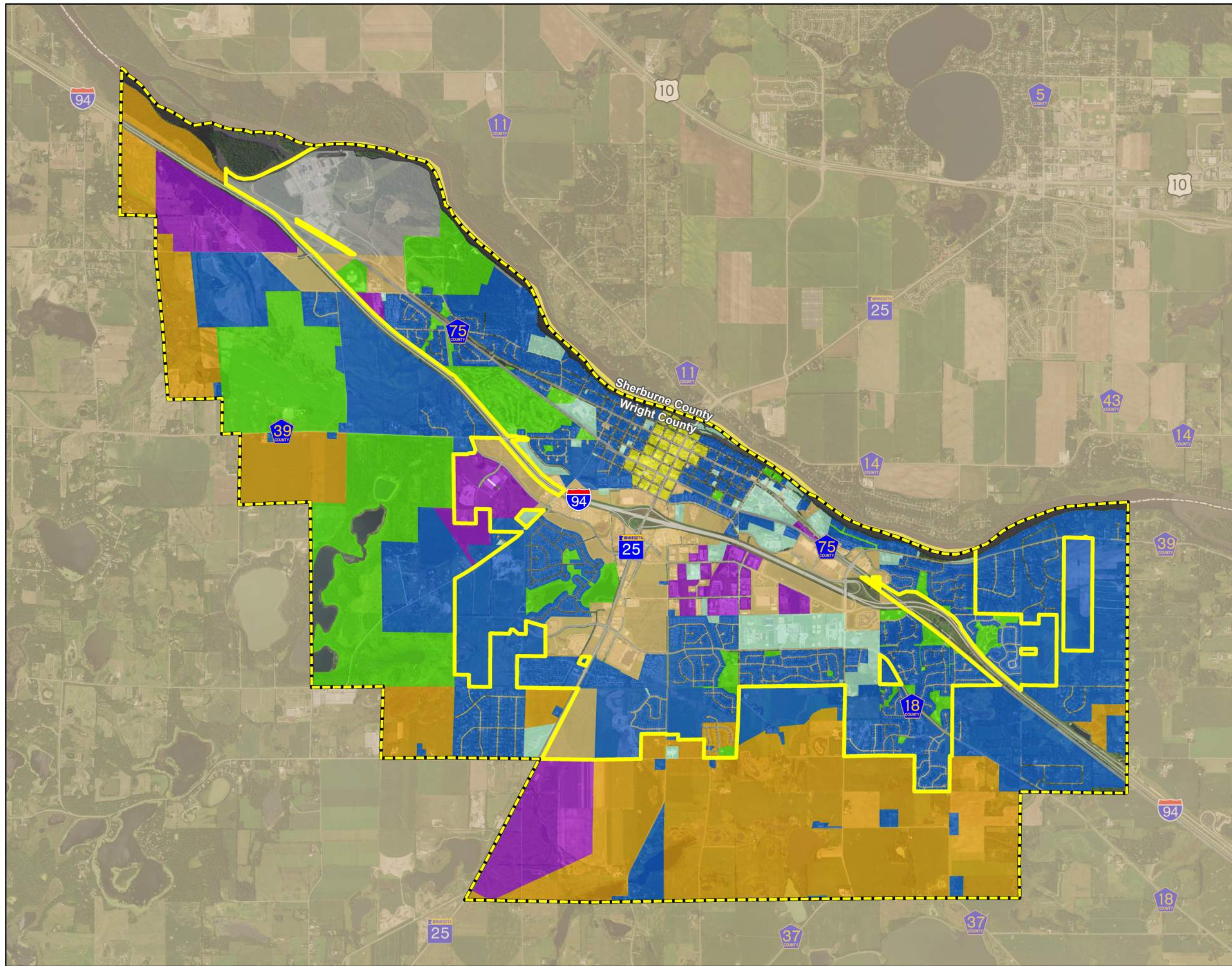




Figure 12 MPCA Pollutant Sources Location Map

Water Resource Management Plan
City of Monticello, Minnesota

November, 2019

Boundaries

-  Orderly Annexation Boundary
-  City Boundary

Legend

Pollutant Source

-  Aboveground or Underground Tanks
-  Air Quality
-  Feedlots
-  Hazardous Waste
-  Industrial Stormwater
-  Investigation and Cleanup
-  Solid Waste
-  Multiple Programs

Investigation and cleanup includes petroleum remediation leak sites, brown fields, and site assessments.

Multiple programs may include any of the pollutant source types listed in the legend.

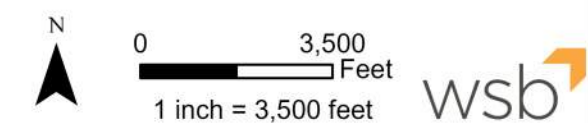
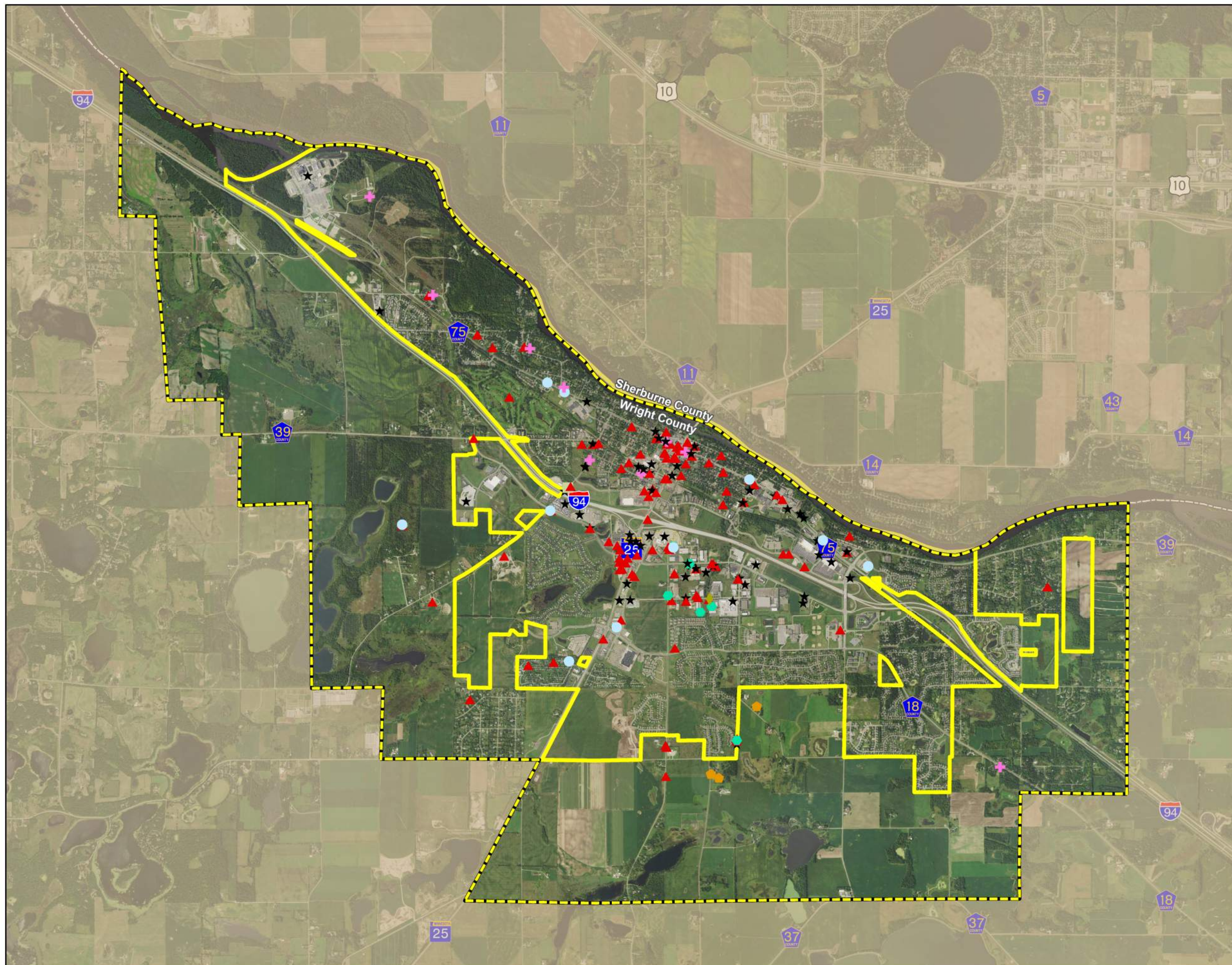




Figure 13 CIP Locations, Identified Watch Areas, and Future Pond Improvements Map






Water Resource Management Plan
City of Monticello, Minnesota

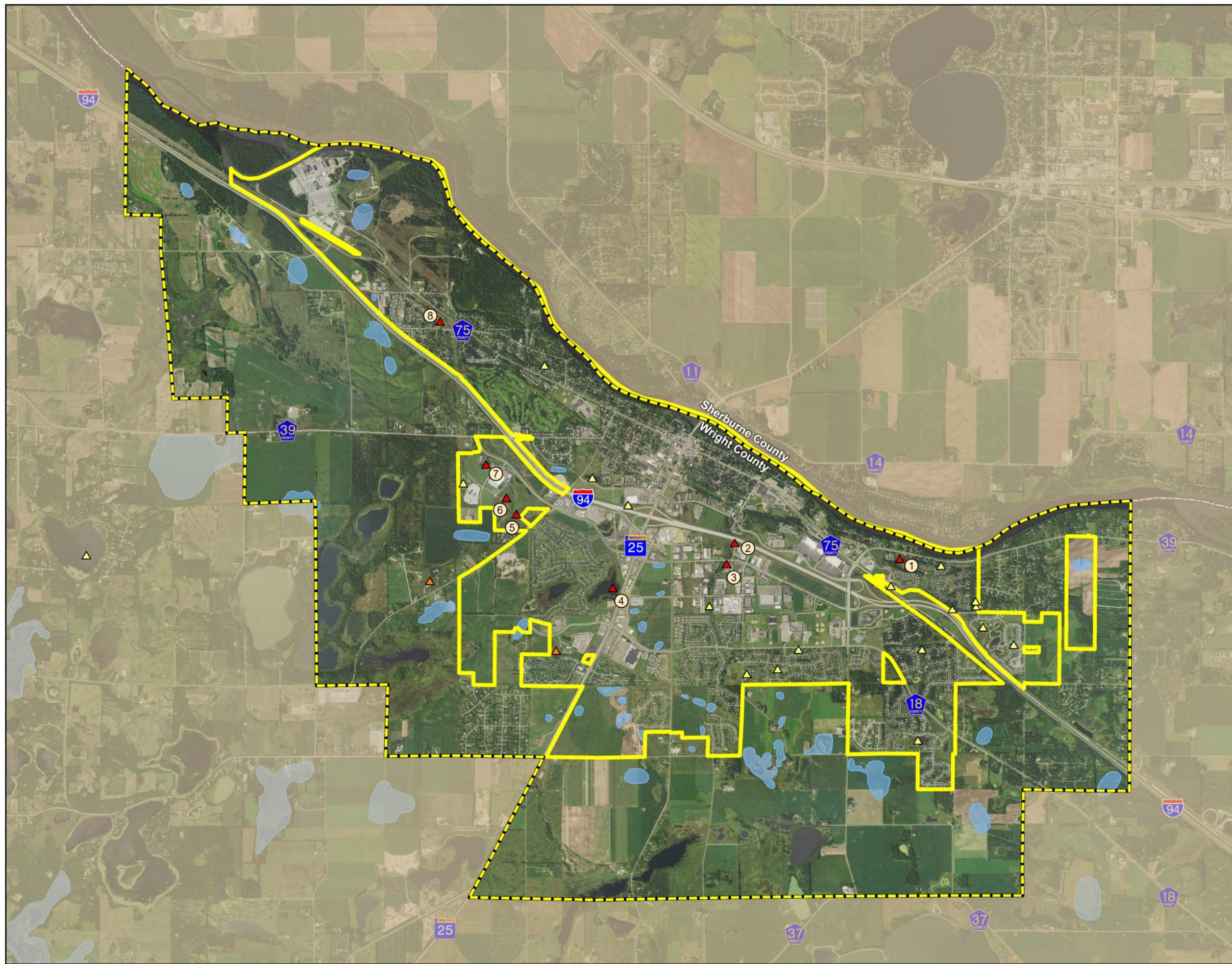
November, 2019

Boundaries

-  Orderly Annexation Boundary
-  City Boundary

Legend

-  Identified Project Location
-  Major Watch Area - HWL Exceeds 2' of Freeboard
-  Minor Watch Area - HWL Within 2' of Freeboard
-  CIP Project Identification Number
-  Future Pond Improvements as Development Occurs



APPENDIX

Appendix A

INTRODUCTION

The result of the hydrologic modeling effort for the City of Monticello is summarized in the following tables. This analysis was carried out using information from a number of different sources that have varying degrees of accuracy. As a result, the information summarized in the following tables must be considered approximate.

It is recommended that a more detailed and site specific analysis be carried out for new development or redevelopment activities within the City. It is further recommended that the information contained in the following tables be updated periodically in order to provide the City with up-to-date information on the hydrologic systems within the City.

This appendix also contains a list of definitions. These definitions describe the information used to create the model and are contained in each column of the hydrologic summary tables.

HYDROLOGIC INFORMATION FOR THE CITY OF MONTICELLO

SUBWATERSHED NAME

The subwatershed name indicates the area shown on the Subwatershed Delineation Map. The letter generally specifies a group of subwatersheds that connect to a common outlet or lake. The abbreviations used in the following tables and the watershed to which they correspond are:

IP	Subwatershed tributary to Industrial Park area
MO	Subwatershed tributary to Meadow Oaks area
TH	Subwatershed tributary to Trunk Highway 25 area
KF	Subwatershed tributary to Klein Farms South area
MR	Subwatershed tributary to Mississippi River
HB	Subwatershed tributary to Hart Boulevard area
CD	Subwatershed tributary to Wright County Ditch #33
OC	Subwatershed tributary to Otter Creek
BL	Subwatershed tributary to Bertram Lake
MISC	Subwatershed tributary away from the Mississippi River

SUBWATERSHED DRAINAGE AREA

A subwatershed area is defined as the area that drains directly to a particular pond or major drainage way. The subwatershed boundaries were determined using available LiDAR contour mapping. The boundaries should be considered approximate due to the limited availability or accuracy of the contour mapping and the possibility of alteration by new construction or storm sewer projects.

TIME OF CONCENTRATION (T_c)

The time of concentration represents the longest travel time for a drop of water to reach a discharge point in a watershed.

CURVE NUMBER (CN)

The runoff curve number accounts for many major factors in hydrologic modeling. The major factors that determine the curve number are the hydrologic soil group, the type of cover present in the watershed, land use in the watershed, and antecedent moisture conditions. Other factors affecting the curve number are whether impervious surface areas outlet directly to the drainage system or whether the flow spreads over pervious areas before entering the drainage system. Highly developed urban areas with a greater percentage of impervious surface area are characterized with higher curve numbers. Rural area with land uses of rural residential and agricultural typically will have lower curve numbers. Curve numbers have a typical range of 40 to 98.

PEAK RUN-OFF RATE

This is the rate water is shed from a particular drainage area. It is equivalent to the inflow rate of a storm water treatment basin.

RUNOFF VOLUME

This is the volume of water that is shed from a particular drainage area. The volume of water for a particular watershed is dependent on the subwatershed CN and storm event precipitation.

POND NWL

The normal water level (NWL) of the pond is the lowest controlling elevation. It is usually taken as the invert of the outlet structure or the pump control elevation and is the elevation that the pond will drain down to after a rainfall event. The NWL does not reflect the lowest elevation that may be attained naturally by infiltration, evaporation or transpiration.

POND HWL

The highest water level achieved in a pond as predicted by the hydrologic/hydraulic model for an Atlas 14 100-year event. The model assumes that the pond elevation is equal to the NWL at the beginning of the storm event. The HWL is affected by the accuracy of the data such as drainage area, storage capacity, outlet description and condition, and runoff factors and has not been field calibrated. The actual or observed HWL could be affected by land use, etc. All of these factors should be reviewed when HWL is considered critical.

PEAK OUTFLOW FROM POND

The maximum discharge rate from a pond through the outlet. This normally occurs when the pond is at the HWL and it assumes the full efficiency of the outlet structure. The peak outflow rate for subwatersheds without ponding areas is based on the flowing full capacity of the discharge pipe from that subwatershed.

POND OUTLET

The diameter of pipe or type of structure which provides an outlet from a subwatershed or storm water storage basin.

RECOMMENDED 100-YEAR HWL

The highest water level for the purposes of establishing minimum building floor elevations for a pond based on the Atlas 14 100-year event hydrologic/hydraulic analysis. This elevation is recommended for ponding areas and is not representative of actual conditions without full implementation of the model parameters.

APPROXIMATE OVERFLOW ELEVATION

The elevation at which the pond would overland overflow if the storage capacity is exceeded. This approximate elevation was determined from LiDAR contour mapping.

EXISTING LOW BUILDING ELEVATION

This elevation was determined from LiDAR contour mapping and does not indicate low-floor or basement elevations. These elevations should be considered approximate due to possible inaccuracies in the mapping and buildings that have been constructed after the mapping was completed. A detailed field survey is required to obtain the actual low building elevation.

REQUIRED STORAGE

The volume of water required to be retained in order to reduce the peak runoff rate to the peak outflow from the pond. This volume of water is stored in a storm water retention basin between the NWL and the HWL.

AVAILABLE STORAGE

The storm water storage which is currently available within a subwatershed in the form of natural wetlands and depressions. These storage values are estimates taken from LiDAR contour mapping or available plans for proposed ponds.

1-YEAR EVENT

A rainfall event that has a 100% chance of occurrence in a given year. The information in this table was obtained from a hydrologic/hydraulic model that utilized the Soil Conservation Service TR-20 Hydrograph Routing procedure. The 1-year event assumed a 2.41 inch, MSE 3 distribution, 24-hour duration rainfall event.

100-YEAR EVENT

A rainfall event that has a 1% chance of occurrence in a given year. The information in this table was obtained from a hydrologic/hydraulic model that utilized the Soil Conservation Service TR-20 Hydrograph Routing Procedure. The Atlas 14 100-year event assumed a 6.87 inch, MSE 3 distribution, 24-hour duration rainfall event.

FLOOD ELEVATION

The elevation two feet below the low opening of a house adjacent to a ponding area. The approximate elevation was determined from LiDAR contour mapping. Two feet represents adequate freeboard in the City of Monticello.

**CITY OF MONTICELLO
COMPREHENSIVE WATER RESOURCE MANAGEMENT PLAN
BERTRAM LAKE WATERSHED**

SUB-WATERSHED NUMBER	POND ID	AREA (AC)	Tc (MIN)	CN	DIRECT PEAK RUNOFF RATE (CFS)	POND NWL FEET	POND OUTLET	OUTLET ELEVATION FEET	APPROXIMATE OVERFLOW ELEVATION FEET (a)	LOW BUILDING ELEVATION FEET (a)	100-YR HWL FEET	PEAK DISCHARGE (CFS)	100-YR PEAK STORAGE (AC-FT)	COMMENTS
BL-01		297.3	28	73	1054.1	934.0	Weir (E)	934.0		940.0	934.7	47.6	82.1	Bertram Lake
BL-02		860.5	29	73	3035.7	938.0	18" RCP (E)	938.0		958.0	950.9	28.2	276.1	Wetland Area
BL-03		374.9	100	71	546.6	962.0	18" RCP (E)	962.0	967.0	964.5	963.1	2.6	120.1	Birch Lake
BL-04		210.8	20	71	854.6	964.0	18" RCP (E)	964.0		968.0	965.4	3.8	62.3	Wetland Area
BL-05	233	583.3	35	71	1727.0	968.0	18" RCP (P)	968.0	968.0	974.0	969.1	31.4	153.2	Existing storage, proposed outlet
BL-06	244	192.3	24	71	714.3	968.0	18" RCP (P)	968.0		980.0	970.1	6.4	85.3	Existing storage, proposed outlet
BL-07		980.6	28	71	3339.1	970.0	18" RCP (E)	970.0		974.0	971.4	6.8	302.0	Eagle Lake
BL-08		214.1	27	71	735.6	988.0	18" RCP (E)	988.0		1000.0	990.6	8.9	59.2	Wetland Area
BL-09		280.2	30	58	558.0	996.0	18" RCP (E)	996.0		1000.0	997.4	3.7	51.2	Wetland Area
BL-10		346.7	17	69	1431.8	966.0	Weir (E)	967.0			967.4	5.7	135.1	North Lake
BL-11		911.6	35	71	2699.0	966.0	24" RCP (E)	966.0			967.3	7.4	285.0	Cedar Lake
BL-12	245	768.9	25	71	2774.1	968.0	18" RCP (P)	968.0		974.0	969.9	5.6	306.4	Black Lake, proposed outlet
BL-13		597.3	34	71	1816.0	972.0	18" RCP (E)	972.0	978.9	984.0	977.9	13.9	199.2	Wetland Area
BL-13A		43.2	18	77	220.0	1016.0	Overflow	1019.0			1019.1	0.7	15.1	Wetland Area
BL-13B		133.4	21	71	531.0	1006.0	18" RCP (E)	1006.0			1007.4	2.2	38.5	Wetland Area
BL-14		225.9	25	71	811.3	1030.0	Weir (E)	1033.0		1040.0	1033.5	20.6	55.3	Wetland Area
BL-15		849.4	35	66	2136.0	969.0	18" RCP (E)	969.0		972.0	969.9	1.7	218.3	Ida Lake
BL-16		480.2	22	71	1871.6	972.0	18" RCP (E)	972.0			974.2	3.6	141.4	Twin Lakes
BL-17		228.9	26	71	798.5	988.0	18" RCP (E)	988.0		1004.0	991.1	10.6	59.7	Wetland Area
BL-18	232	107.5	37	58	188.8	972.0	18" RCP (P)	972.0		988.0	978.1	17.9	12.5	Existing storage, proposed outlet
TOTAL AREA		8687.0										229.1	2658.3	

(a) The overflow elevation and low building elevations should be considered approximate, detailed field surveys are required to obtain actual elevations

(P) -PROPOSED OUTLET

(E) - EXISTING OUTLET

**CITY OF MONTICELLO
COMPREHENSIVE WATER RESOURCE MANAGEMENT PLAN
COUNTY DITCH #33 WATERSHED**

SUB-WATERSHED NUMBER	POND ID	AREA (AC)	Tc (MIN)	CN	PEAK RUNOFF RATE (CFS)	POND NWL FEET	POND OUTLET	OUTLET ELEVATION FEET	APPROXIMATE OVERFLOW FEET (a)	EXISTING LOW BUILDING ELEVATION FEET (a)	RECOMMENDED 100 YR. HWL FEET	PEAK DISCHARGE CFS	100-YR PEAK STORAGE AC-FT	COMMENTS
CD-01	220	34.3	30	72	114.6	912.0	15" RCP (P)	912.0			914.6	6.0	7.4	Proposed Pond
CD-02	120	636.6	60	72	1374.5	936.0	36" RCP (E)	936.0			940.3	69.5	148.7	Existing Pond/Wetland
CD-02A						924.0	36" RCP (E)	924.0			926.6	35.2	145.2	Existing Wetland
CD-02B	119	7.2	24	81	33.9	930.0	Overflow	935.0		938.0	933.2	0.9	2.2	Existing Pond with No Outlet Pipe
CD-03	221	245.7	60	72	530.5	942.0	24" RCP (P)	942.0	947.0		947.8	50.0	54.2	Proposed Pond
CD-03A						938.0	24" RCP (E)	938.0		942.0	940.5	11.2	39.9	Existing Wetland
CD-04	222	471.5	50	72	1159.0	950.0	15" RCP (P)	950.0	954.0		955.2	69.7	109.4	Proposed Pond
CD-04A						946.0	18" RCP (E)	946.0			948.8	5.7	60.0	Existing Wetland
CD-05	223	271.8	40	72	763.6	952.0	15" RCP (P)	952.0			958.5	17.6	69.1	Proposed Pond
CD-05A						944.0	15" RCP (E)	944.0			947.0	4.5	37.3	Existing Wetland
CD-06	224	110.5	30	72	369.4	950.0	15" RCP (P)	950.0			955.7	9.2	27.0	Proposed Pond
CD-06A						942.0	24" RCP (E)	942.0		954.0	949.4	18.4	20.2	Existing Wetland
CD-07	26, 34, 35	47.1	20	72	196.6									Tributary to CD-06A Existing Wetland
CD-08	24, 25	23.0	15	72	111.4	954.0	15" RCP (E)	954.0	961.0	964.0	961.4	14.6	20.7	Existing Pond
CD-09	30	31.2	20	72	130.2	961.4	15" RCP (E)	961.4	967.0	968.0	965.9	9.7	6.0	Existing Pond
CD-11		18.9	15	72	91.6									Tributary to CD-06A Existing Wetland
CD-17	27, 28, 29, 71	106.9	65	78	256.2	965.0	15" RCP, 12" RCP (E)	965.0, 965.3	969.0	970.0	969.2	20.6	31.3	Rolling Woods Wetland
CD-19	219	74.6	60	65	128.3	960.0	15" RCP (P)	960.0			963.4	15.2	26.1	Existing storage, proposed outlet
CD-20		29.9	45	72	78.4									Tributary to CD-19 Storage
CD-23	33	31.7	29	72	108.5	968.5	12" RCP (E)	968.5	975.0	980.0	975.9	31.7	10.4	Existing Pond
CD-23A	31, 32	23.0	25	72	85.4	976.1	27" RCP (E)	976.1		984.0	979.7	30.4	3.5	Existing Pond
CD-23B	117	12.7	19	72	54.1	998.9	12" HDPE (E)	998.9	1009.0		1008.3	10.1	1.6	Existing Pond
CD-30		250.0	85	30	8.5	952.0	Overflow	959.0			952.7	0.0	4.0	Existing Wetland
CD-31	121, 122	340.0	100	30	10.9	956.0	Overflow	959.0			956.5	0.0	5.4	Existing Pond with No Outlet Pipe
CD-32	123	130.5	75	30	4.7	938.0	Overflow	941.0			938.4	0.0	2.1	Existing Pond with No Outlet Pipe
CD-33		274.0	90	30	9.2	956.0	Overflow	964.0			956.6	0.0	4.3	Existing Wetland
TOTAL AREA		3171.2										430.0	835.9	

(a) The overflow elevation and low building elevations should be considered approximate, detailed field surveys are required to obtain actual elevation

(P) -PROPOSED OUTLET

(E) - EXISTING OUTLET

**CITY OF MONTICELLO
COMPREHENSIVE WATER RESOURCE MANAGEMENT PLAN
HART BOULEVARD WATERSHED**

SUB-WATERSHED NUMBER	POND ID	AREA (AC)	Tc (MIN)	CN	PEAK RUNOFF RATE (CFS)	POND NWL FEET	POND OUTLET	OUTLET ELEVATION FEET	APPROXIMATE OVERFLOW FEET (a)	EXISTING LOW BUILDING ELEVATION FEET (a)	POND 100 YR HWL FEET (b)	PEAK DISCHARGE CFS	100-YR PEAK STORAGE (AC-FT)	COMMENTS
HB-01		6.5	20	72	27.3									No storage available. Discharges directly to storm sewer.
HB-02	72	46.1	30	68	136.3	916.4	60" RCP, 10 FT Weir (E)	916.4			924.9	231.9	13.6	Middle School Basin
HB-02A	97	1.0	15	85	6.5	929.5	3-36" RCP (E)	929.5	932.9		933.7	198.6	0.2	NE Quad of Washington and Fallon
HB-03	58	39.4	30	81	164.2	945.3	18" RCP (E)	945.3			952.9	38.9	7.1	Hart Boulevard Industrial Area Pond
HB-04		4.6	15	73	22.9									Area NW of Washington and 7th St. No storage identified.
HB-04A	96	23.5	15	70	107.5	931.0	3-30" CMP, 3-27" RCP (E)	931.0	936.0		935.0	198.4	1.8	Pipe crossings under railroad tracks.
HB-04B	95	26.1	30	72	87.2	934.9	60" RCP (E)	934.9	941.0	943.0	940.7	173.1	2.2	60" RCP at S end of Washington
HB-05	94	17.6	35	88	76.6	952.0	42" CMP (E)	952.0	957.0	958.0	955.8	66.5	0.9	Twin Cities Staffing pond and proposed ditch regrade
HB-05A		54.4	45	88	204.4									To Proposed Regional Pond
HB-05B		19.2	75	89	52.0									To Proposed Regional Pond
HB-06	248	18.8	15	85	122.0	933.0	54" RCP, 36" ORIFICE (P)	938.4		954.0	949.2	107.4	42.2	Proposed 36" orifice for 54" RCP I-94 crossing. Proposed Regional Pond expansion.
HB-07	253	51.8	30	85	233.6	939.2	30" CMP (P)	939.2		954.0	950.9	79.1	21.2	Storage between Chelsea Rd and Dundas Rd. Proposed 30" pipe replace the current 54" pipe.
HB-08	92	100.0	75	79	222.6	946.5	48" RCP (E)	946.5		953.0	951.8	86.7	18.5	Klein Farms 1st Addition Basin
HB-09	91	9.1	15	73	45.3	948.0	30" RCP (E)	948.0		956.0	950.5	25.3	1.0	Klein Farms 2nd Addition Basin
HB-10	90	18.3	15	75	96.0	950.1	12" RCP (E)	950.1		957.0	953.8	7.9	3.6	Klein Farms 2nd Addition Basin
HB-11	88	20.1	33	77	72.1	944.0	12" RCP (E)	950.6		956.0	947.7	1.9	5.6	Klein Farms 3rd Addition Infiltration Basin
HB-12	89	19.0	15	74	97.2	946.0	12" RCP (E)	952.0		956.0	952.2	1.2	5.2	Klein Farms 3rd Addition Infiltration Basin
HB 13		39.5	20	75	178.9									North Chelsea Industrial, Tributary to Proposed Regional Pond
HB 14	93	26.0	30	81	108.7	948.6	18" RCP (E)	948.6		956.0	952.3	30.6	4.7	Flows W under Fallon Ave
TOTAL AREA		541.0										1247.4	127.8	

(a) The overflow elevation and low building elevations should be considered approximate, detailed field surveys are required to obtain actual elevations

(P) -PROPOSED OUTLET

(E) - EXISTING OUTLET

**CITY OF MONTICELLO
COMPREHENSIVE WATER RESOURCE MANAGEMENT PLAN
INDUSTRIAL PARK WATERSHED**

SUB-WATERSHED NUMBER	POND ID	AREA (AC)	Tc (MIN)	CN	DIRECT PEAK RUNOFF RATE (CFS)	POND NWL FEET	POND OUTLET	OUTLET ELEVATION FEET	APPROXIMATE OVERFLOW ELEVATION FEET (a)	LOW BUILDING ELEVATION FEET (a)	100-YR HWL FEET	PEAK DISCHARGE (CFS)	100-YR PEAK STORAGE (AC-FT)	COMMENTS
IP-01A	105	16.3	7	89	149.3	944.0	42" RCP (E)	942.0	947.0		944.8	101.8	0.4	A1 Storage in Interchange
IP-01A	104					936.0	42" RCP (E)	940.8	943.0		940.9	4.1	5.6	A2 Storage in Interchange
IP-01B	110	12.8	100	68	17.0	948.0	18" RCP (E)	948.0	951.0	952.0	951.2	16.9	0.1	Ditch Storage
IP-01C		52.9	30	81	220.9									Home Depot and Target, Tributary to IP-01G Storage
IP-01D	254	44.9	35	77	156.7	902.5	54" RCP (E)	902.5			908.3	144.3	17.1	A Glorious Church Pond
IP-01E	102	3.3	26	72	11.8	902.6	12" RCP (E)	902.6	909.0	908.0	904.6	4.8	0.3	River Mill Drive Storage
IP-01F	56	4.0	7	89	36.4	934.0	24" RCP (E)	938.3	945.0		936.3	0.5	1.4	Storage in Interchange
IP-01G	57	17.1	7	61	79.1	932.0	42" RCP (E)	941.0			940.1	3.6	21.0	Storage in Interchange
IP-01H	103	5.4	7	67	31.0	938.1	42" RCP (E)	938.1	949.0		943.3	138.3	1.5	Ditch storage between rail road and CSAH 75
IP-02A	18	66.8	46	72	170.5	937.7	30" RCP (E)	937.7	951.0	949.0	945.0	117.6	19.5	Monticello Crossings Pond
IP-02B	55	20.9	20	87	121.3	934.0	24" RCP (E)	936.5	943.0		939.7	23.6	5.2	Infiltration Basin in Interchange
IP-03	16	34.8	34	64	82.7	954.9	15" RCP (E)	954.9	960.5	975.0	962.6	58.3	4.4	Fenning Ave/Jason Ave Pond
IP-04		17.2	25	88	90.3									Tributary to IP-02A Storage
IP-06	54	52.2	28	72	179.9	943.0	12" RCP (E)	943.0	951.0	956.0	950.9	42.4	9.9	Middle School Pond
IP-07	17	118.1	60	78	299.2	947.1	21" RCP (E)	947.1		960.0	955.6	31.9	29.6	High School Pond
IP-08	14, 15	27.4	45	72	71.9	954.6	12" RCP (E)	954.6	961.0	962.0	960.6	8.4	10.3	Cardinal Hills Basin S of School Blvd
IP-09	11	33.6	45	72	88.1	955.8	12" RCP (E)	955.8		962.0	960.6	5.2	7.3	Cardinal Hills Basin S of Eider Lane
IP-10	106	26.5	20	61	75.6	952.0	12" RCP (E)	954.0	957.0	963.0	958.5	58.8	5.1	Infiltration Basin SW of School Blvd and CSAH 118
IP-11	12, 13	74.2	45	61	132.4	958.0	12" RCP (E)	958.0		965.0	962.2	4.4	14.1	Cardinal Hills Basin S of Mallard Lane
IP-12	200	5.2	15	74	26.6	967.0	12" RCP (P)	967.0			969.7	5.6	0.7	Depression NE of 85th St
IP-13	107	16.6	24	69	58.1	973.0	21" RCP (E)	973.0	981.0	982.0	979.2	24.7	1.1	United Methodist Church Storage
TOTAL AREA		650.2										795.2	154.7	

(a) The overflow elevation and low building elevations should be considered approximate, detailed field surveys are required to obtain actual elevations

(P) -PROPOSED OUTLET

(E) - EXISTING OUTLET

**CITY OF MONTICELLO
COMPREHENSIVE WATER RESOURCE MANAGEMENT PLAN
KLEIN FARMS WATERSHED**

SUB-WATERSHED NUMBER	POND ID	AREA (AC)	Tc (MIN)	CN	DIRECT PEAK RUNOFF RATE (CFS)	POND NWL FEET	POND OUTLET	OUTLET ELEVATION FEET	APPROXIMATE OVERFLOW ELEVATION FEET (a)	LOW BUILDING ELEVATION FEET (a)	100-YR HWL FEET	PEAK DISCHARGE (CFS)	100-YR PEAK STORAGE (AC-FT)	COMMENTS
KF-01	124	8.1	20	72	34.0	943.0	15" Orifice - 30" RCP (E)	943.0	955.0	956.0	952.7	19.3	2.9	Existing Pond
KF-02	208	12.6	20	72	52.6	960.0	6" Orifice (P)	960.0			965.1	2.1	2.7	Proposed Storage
KF-03	207	4.7	15	72	22.8	950.0	21" RCP (P)	950.0			953.5	17.5	0.6	Proposed Storage Expansion and Outlet Structure
KF-04	206	29.1	45	72	76.3	948.0	18" RCP (P)	948.0			953.9	21.2	7.7	Proposed Storage Expansion and Outlet Structure
KF-05	205	29.4	30	72	98.3	946.0	8" Orifice (P)	950.0			955.4	4.6	6.5	Proposed Infiltration Basin
KF-06	204	26.5	20	72	110.6	942.0	15" Orifice (P)	942.0	951.0		951.3	24.6	11.7	Proposed Storage Expansion and Outlet Structure
KF-07	7	21.4	20	72	89.3	948.0	24" RCP (E)	948.0	953.0	956.0	951.8	25.0	5.1	Existing Pond
KF-08	6	13.7	20	72	57.2	947.5	24" RCP (E)	947.5	955.0	956.0	951.8	27.3	1.3	Existing Pond
KF-09	203	99.7	51	74	253.6	952.0	12" Orifice (P)	952.0			955.2	10.5	35.0	Offsite wetlands and undeveloped area outside city, proposed outlet
KF-10	202	45.4	25	73	173.1	954.0	10" Orifice (P)	954.0	955.0		955.9	51.1	7.4	Offsite wetlands and undeveloped area outside city, proposed outlet
KF-11	201	62.9	25	72	233.4	963.8	8" Orifice (P)	963.8			966.7	5.0	15.4	Offsite wetlands and undeveloped area outside city, proposed outlet
KF-12	8, 9	43.7	35	74	140.9	948.3	12" RCP (E)	948.3		954.0	951.0	3.6	15.7	Existing Pond
KF-13	10	15.8	20	69	60.9	950.2	12" RCP (E)	950.2	955.0	956.0	954.3	5.2	2.4	Existing Pond
KF-13A	209	37.8	55	72	86.5	948.0	6" Orifice (P)	952.0			952.4	4.6	8.4	Proposed Storage
TOTAL AREA		450.8										221.4	122.9	

(a) The overflow elevation and low building elevations should be considered approximate, detailed field surveys are required to obtain actual elevations

(P) -PROPOSED OUTLET

(E) - EXISTING OUTLET

**CITY OF MONTICELLO
COMPREHENSIVE WATER RESOURCE MANAGEMENT PLAN
MEADOW OAKS WATERSHED**

SUB-WATERSHED NUMBER	POND ID	AREA (AC)	T _c (MIN)	CN	DIRECT PEAK RUNOFF RATE (CFS)	POND NWL FEET	POND OUTLET	OUTLET ELEVATION FEET	APPROXIMATE OVERFLOW ELEVATION FEET (a)	LOW BUILDING ELEVATION FEET (a)	100-YR HWL FEET	PEAK DISCHARGE (CFS)	100-YR PEAK STORAGE (AC-FT)	COMMENTS
MO-01		11.7	25	57	24.5		36" RCP (E)							Direct tributary to Gillard Ave storm sewer trunk line
MO-01A	109	4.8	15	57	13.4	933.9	15" RCP (E)	933.9		940.0	937.8	8.8	0.1	Existing storage west of Gillard
MO-01B	125	0.9	10	43	1.1	941.0	12" CMP (E)	941.0		944.0	942.3	3.5	0.1	Existing storage west of Gillard
MO-01C	126	3.8	20	44	3.5	941.5	15" CMP (E)	941.5		944.0	942.6	4.3	0.2	Existing storage west of Gillard
MO-01D	127	0.9	10	57	3.0	941.6	15" CMP (E)	941.6		946.0	943.5	6.9	0.0	Existing storage west of Gillard
MO-01E	128	1.8	10	57	6.0	946.8	15" CMP (E)	946.8		951.0	948.1	4.9	0.0	Existing storage west of Gillard
MO-01F		51.7	45	72	135.6									Tributary to Gillard Ave storm sewer trunk line
MO-02	50	11.7	20	73	50.3	940.0	15" RCP (E)	940.0		948.0	945.3	16.0	1.3	River Forest Development - North Pond
MO-03	49	7.5	20	73	32.3	940.0	15" RCP (E)	940.0	945.0	946.0	942.8	8.6	1.2	River Forest Development - South Pond
MO-04A	111	8.9	45	72	23.3	932.8	30" RCP (E)	932.8	937.0		937.9	68.3	2.3	Existing Pond
MO-04B	47, 48	15.1	14	81	93.5	929.5	18" RCP (E)	929.5		938.0	936.3	32.9	14.8	Existing Pond
MO-04C	43, 45, 46	57.9	60	76	140.0	932.1	30" RCP (E)	932.1		938.0	935.8	36.6	52.9	Existing Pond
MO-04D	42	17.3	24	81	82.1	930.8	15" RCP (E)	930.8		940.0	938.2	13.3	3.6	Existing Pond
MO-04F	44	13.7	28	81	59.1	929.5	18" RCP (E)	929.5	937.0		937.7	42.2	3.6	Existing Pond
MO-04G	118	12.1	40	72	34.1	938.2	15" RCP (E)	938.2	945.0		945.9	29.1	1.2	Existing Pond
MO-05	112	6.8	15	85	44.1	940.8	18" CPP (E)	940.8			943.1	7.5	1.5	Ditch storage utilized in MnDOT Right of Way
MO-06	115	11.7	20	85	65.7	939.0	30" RCP (E)	939.0	945.0		945.1	47.2	2.1	Ditch storage utilized in MnDOT Right of Way
MO-07	113	9.0	45	73	24.3	944.0	Overflow	949.0			948.2	1.9	1.9	Depression storage in MnDOT Right of Way
MO-08	114	8.4	45	72	21.9	945.9	18" RCP, 24" RCP (E)	945.9, 946.5			946.5	21.8	0.1	Ditch storage between railroad and CSAH 75
MO-09	41	55.6	45	79	174.8	942.1	18" RCP, 24" RCP (E)	942.1, 942.9		950.0	946.1	30.0	20.0	Meadow Oaks Basin S of railroad
MO-10A	38, 39	10.6	15	75	55.6	948.9	15" RCP (E)	948.9			952.5	9.4	1.7	Parkside Second West Pond
MO-10B	36, 37	20.5	15	75	107.6	946.7	15" RCP (E)	946.7			951.8	10.7	3.6	Parkside Second SE Pond
MO-11	40	6.6	15	71	31.3	952.0	12" RCP (E)	949.5	958.8	961.0	959.9	38.4	3.3	Meadow Oaks Pond
MO-12	19	24.4	20	71	99.0	955.1	12" RCP (E)	955.1			957.7	4.1	5.1	Briar Oaks Pond
MO-13	20, 21	24.3	25	69	82.5	959.3	12" RCP (E)	959.3	961.0	964.0	961.8	33.9	9.9	Meadow Oaks/Briar Oaks Pond
MO-13A		6.2	15	75	30.0									Tributary to MO-13B storage
MO-13B	22	2.2	11	72	12.6	960.6	8" Orifice - 15" RCP (E)	960.6	965.0	968.0	965.8	32.2	0.7	Oakridge Drive Pond
MO-15	116	16.8	43	72	44.7	963.5	12" RCP (E)	963.5	971.0	974.0	968.7	37.9	0.3	Troy Marquette Drive and Wildwood Way Infiltration Pond
MO-16	23	24.5	20	72	102.3	966.0	15" RCP (E)	966.0	973.0		973.5	20.6	4.0	Troy Marquette Drive and Wildwood Area Pond
TOTAL AREA		447.5										570.8	135.6	

(a) The overflow elevation and low building elevations should be considered approximate, detailed field surveys are required to obtain actual elevations

(P) -PROPOSED OUTLET

(E) - EXISTING OUTLET

**CITY OF MONTICELLO
COMPREHENSIVE WATER RESOURCE MANAGEMENT PLAN
MISSISSIPPI RIVER WATERSHED**

SUB-WATERSHED NUMBER	Pond ID	AREA (AC)	Tc (MIN)	CN	PEAK RUNOFF RATE (CFS)	POND NWL FEET	POND OUTLET	OUTLET ELEVATION FEET	APPROXIMATE OVERFLOW FEET (a)	EXISTING LOW BUILDING ELEVATION FEET (a)	100-YR HWL FEET	PEAK DISCHARGE CFS	100-YR PEAK STORAGE AC-FT	COMMENTS
MR-01		82.5	20	65	274.7									Area tributary to river from CSAH 39 and Mississippi River Drive
MR-01A		43.7	40	72	122.7									Direct Tributary Area to Mississippi River
MR-02	52	18.5	15	70	84.5	905.7	18" RCP (E)	905.7	909.0	913.0	910.3	90.9	2.2	North Mill Trail Pond
MR-02A	53	27.7	20	72	115.7	901.0	36" RCP (E)	901.0		907.0	906.2	63.8	6.9	Riverview Drive/River Mill Drive Pond
MR-03	51	25.0	22	68	88.9	906.7	15" RCP (E)	906.7	911.0	915.0	913.0	60.0	1.9	South Mill Trail Pond
MR-03A	108	6.9	15	65	27.0	939.0	15" RCP (E)	939.0		942.0	941.1	5.8	0.7	Mill Trail Lane Storage
MR-04		84.9	30	74	299.8									Area tributary to Ramsey and Washington Street storm sewer
MR-05		117.0	44	74	326.6									Area tributary to Cedar and New Street storm sewer
MR-06		74.6	44	89	286.6									Area tributary to Walnut Street storm sewer
MR-07		9.4	20	84	51.8									Area tributary to Linn Street storm sewer
MR-08	98	24.1	65	83	64.8	936.0	12" RCP (E)	936.0	949.0	950.0	949.0	11.5	5.2	Kmart Pond
MR-08A	59	39.4	30	71	128.0	926.6	30" RCP (E)	926.6	931.0	932.0	931.0	39.8	5.0	Village Apartment Pond
MR-08B		127.5	40	72	358.3									Area tributary to Maple Street storm sewer
MR-09	101	18.9	45	88	71.0	946.0	42" RCP (E)	946.0	949.0	955.0	950.1	102.6	1.2	I-94 and TH-25 Interchange Pond
MR-09A	99	15.3	37	85	61.1	939.0	24" RCP (E)	939.0	943.0	949.0	945.2	156.9	2.4	I-94 and TH-25 Interchange Pond
MR-09B	100	17.6	25	89	93.9	944.0	43.8" W x 26.6" H Arch (E)	944.0	947.0		948.1	122.0	5.2	I-94 and TH-25 Interchange Pond
MR-09C		10.4	25	92	57.5									Area tributary to I-94 and TH-25 Interchange
MR-11		22.3	20	60	61.0									Area tributary to Minnesota Street storm sewer
MR-12		72.7	65	61	100.9									Area tributary to Chestnut Avenue storm sewer
MR-21A	129	7.3	15	72	35.2	920.7	15" RCP (E)	920.7		928.0	925.0	8.6	0.9	Existing Pond, To proposed culvert under railroad and CSAH 75
MR-21B	69	11.0	20	57	26.1	918.0	24" RCP (E)	918.0		922.0	919.4	7.6	1.0	Existing Pond, To proposed culvert crossing under railroad and CSAH 75
MR-21C	68	14.6	25	57	30.7	914.0	24" RCP (E)	915.9	921.0	920.0	917.1	9.0	1.7	Infiltration Basin, To proposed culvert crossing under railroad and CSAH 75
MR-21D	255	17.3	25	57	36.3	916.0	30" RCP (P)	916.0		922.0	919.9	33.4	8.0	Infiltration Basin, Proposed culvert crossing under railroad and CSAH 75
MR-21E	78	21.2	20	57	50.3	915.8	24" RCP (E)	915.8	925.0	926.0	923.0	31.9	2.2	Existing Pond, To proposed culvert crossing under railroad and CSAH 75
MR-22	130	57.1	45	63	110.6	918.6	24" RCP (E)	918.6			920.1	10.6	1.7	Existing Storage, Culvert under I-94
MR-22	246					920.0	18" RCP (P)	920.0			923.7	16.8	7.3	Proposed Storage sized to reduce downstream flooding issues
MR-22A	247	67.2	45	61	119.9	928.0	12" RCP (P)	932.0	935.0		932.7	9.4	10.1	Proposed Infiltration Basin
MR-23A	76	9.3	16	57	24.9	920.0	18" RCP (E)	922.5		928.0	924.6	0.9	1.2	Infiltration Basin
MR-23B	74	5.8	15	57	16.1	920.0	15" RCP (E)	922.8	927.0	928.0	925.2	7.5	0.4	Infiltration Basin
MR-23C	75	3.8	25	57	8.1	918.0	12" RCP (E)	921.3	925.0	928.0	924.8	7.1	0.7	Infiltration Basin
MR-24		301.1	85	64	387.2	904.0	24" CMP (E)	904.0	904.5		906.4	142.7	36.7	Tributary Area to Mississippi River
MR-25		137.0	40	50	143.0									Tributary Area to Mississippi River
MR-26	73	67.9	80	50	44.3	922.0	24" RCP (E)	922.8	925.0	928.0	925.4	35.5	3.7	Infiltration Basin NW of River Street and railroad tracks
MR-27		25.2	20	87	146.3									Tributary to MR-32 storage
MR-28		248.0	60	56	287.2									Tributary Area to Mississippi River
MR-28A	230	50.0	15	88	340.2	910.0	36" RCP (P)	910.0			915.4	74.7	16.5	Proposed Pond - Industrial

**CITY OF MONTICELLO
COMPREHENSIVE WATER RESOURCE MANAGEMENT PLAN
MISSISSIPPI RIVER WATERSHED**

SUB-WATERSHED NUMBER	Pond ID	AREA (AC)	Tc (MIN)	CN	PEAK RUNOFF RATE (CFS)	POND NWL FEET	POND OUTLET	OUTLET ELEVATION FEET	APPROXIMATE OVERFLOW FEET (a)	EXISTING LOW BUILDING ELEVATION FEET (a)	100-YR HWL FEET	PEAK DISCHARGE CFS	100-YR PEAK STORAGE AC-FT	COMMENTS
MR-29	227	45.2	20	81	235.1	942.0	12" RCP (P)	942.0			945.7	5.6	13.6	Proposed Pond
MR-30	226	53.5	20	72	223.3	940.0	12" RCP (P)	940.0			944.8	5.8	12.4	Proposed Pond
MR-31	225	14.4	30	64	36.7	940.0	12" RCP (P)	944.0			946.8	6.1	1.9	To MR-23B Pond, Proposed Infiltration Basin
MR-31A	77	4.1	15	55	10.4	936.0	24" RCP (E)	936.0			937.5	7.5	0.1	Existing Storage, Culvert under I-94
MR-32	229	181.8	40	82	652.4	914.0	24" RCP (P)	914.0			922.0	64.4	55.9	Proposed Pond
MR-33	228	229.0	40	68	569.2	940.0	18" RCP (P)	940.0			946.7	15.0	57.9	Proposed Pond
TOTAL AREA		2410.1										1153.2	264.4	

(a) The overflow elevation and low building elevations should be considered approximate, detailed field surveys are required to obtain actual elevations

(P) -PROPOSED OUTLET

(E) - EXISTING OUTLET

**CITY OF MONTICELLO
COMPREHENSIVE WATER RESOURCE MANAGEMENT PLAN
OTTER CREEK WATERSHED**

SUB-WATERSHED NUMBER	POND ID	AREA (AC)	Tc (MIN)	CN	DIRECT PEAK RUNOFF RATE (CFS)	POND NWL FEET	POND OUTLET	OUTLET ELEVATION FEET	APPROXIMATE OVERFLOW ELEVATION FEET (a)	LOW BUILDING ELEVATION FEET (a)	100-YR HWL FEET	PEAK DISCHARGE (CFS)	100-YR PEAK STORAGE (AC-FT)	COMMENTS
OC-01		48.3	14	72	238.7									Otter Creek to Mississippi River
OC-02		48.1	35	72	146.7	907.0	Box Culvert (E)	907.0	917.0	914.0	915.2	770.6	11.4	Otter Creek
OC-03		9.8	10	72	56.7									To Otter Creek storage in OC-06
OC-04		6.6	10	57	22.3									To Otter Creek storage in OC-06
OC-05	79	109.2	60	65	187.7	916.0	36" RCP (E)	916.0	925.0	928.0	926.0	161.2	8.9	Monticello Country Club
OC-06	70	82.2	45	75	234.1	913.9	Box Culvert (E)	913.9		924.0	921.0	751.1	15.6	Otter Creek
OC-07		56.0	20	61	161.9									Tributary to Golf Course - OC-05 storage
OC-08	243	43.4	25	82	205.0	924.0	12" Orifice (P)	930.0			933.9	8.6	12.8	Proposed Infiltration Basin
OC-09		276.5	23	77	1227.9	917.2	2-84" RCP (E)	917.2	925.0	928.0	924.1	539.1	23.3	Otter Creek
OC-10		646.4	132	53	362.5	935.0	36" RCP (E)	935.0	939.0	944.0	940.4	107.1	94.9	Otter Creek
OC-11A		907.4	37	82	3435.2	930.0	3-48" RCP (E)	930.0			932.9	91.7	341.1	Long, Mud, and First Lakes
OC-11B	250	15.9	10	87	125.4	931.0	24" RCP (P)	931.0	936.0		934.0	22.7	5.3	Proposed Pond A
OC-11C	251	56.7	120	85	102.6	926.4	21" RCP (P)	926.4	934.0	935.0	933.1	30.5	16.6	Karlsburger Pond with Proposed Outlet Modification, High Tc value (auxiliary) to match Business Park Model HWL
OC-11D	249	23.6	7	82	194.7	935.0	18" RCP (P)	935.0	939.0		938.6	17.9	5.8	Proposed Pond D, Low Tc value (auxiliary) to match Business Park Model HWL
OC-11E	64, 65, 66	57.9	325	79	42.1	930.0	24" RCP (E)	930.0	935.2		932.9	14.4	28.6	Chelsea Pond, High Tc value (auxiliary) to match Business Park Model HWL
OC-11F	67	32.5	375	86	24.7	930.0	6" Orifice - 18" RCP (E)	930.0		936.5	936.2	14.4	13.6	Walker Pond, High Tc value (auxiliary) to match Business Park Model HWL
OC-11G	231	66.9	30	82	285.1	950.0	12" RCP (P)	950.1			957.3	10.2	20.0	Proposed Storage
OC-12		586.1	60	78	1484.7	945.5	Overflow	945.6		950.0	946.6	82.3	172.8	Wetland
OC-13	60	28.0	30	77	106.9	950.0	12" RCP (E)	950.0			954.7	5.5	6.9	Groveland Pond
OC-14		758.3	31	72	2464.0	934.0	24" RCP (E)	934.0			937.5	19.2	231.9	Wetland
OC-15		148.8	75	67	235.1	938.0	Overflow	950.0	950.0	942.0	945.4	9.2	32.2	Wetland
OC-16	236	73.2	39	82	268.3	940.0	18" RCP (P)	947.0		950.0	946.0	6.8	23.7	Infiltration Basin
OC-17		518.1	48	72	1294.2	950.0	18" RCP (E)	950.0		960.0	952.2	10.3	163.8	Kelly Meyer State Wildlife Management Area
OC-18		113.0	15	58	323.3	970.0	Overflow	971.3			971.5	1.4	21.4	Wetland Area
OC-19	237	290.5	32	72	939.1	970.0	15" RCP (P)	975.0			977.3	26.3	70.4	Existing storage, proposed outlet
OC-20	238	438.0	29	76	1662.7	952.0	15" RCP (P)	952.0		965.0	957.3	8.3	148.5	Existing storage, proposed outlet
OC-21		108.0	26	72	390.5	982.0	18" RCP (E)	982.0		988.0	983.6	5.9	28.6	Wetland Area
OC-22		79.3	28	61	189.5	950.0	18" RCP (E)	950.0			956.9	12.5	10.8	Wetland Area
OC-23		130.4	30	71	424.3	944.0	Overflow	949.0		960.0	949.1	0.3	43.8	Wetland Area

**CITY OF MONTICELLO
COMPREHENSIVE WATER RESOURCE MANAGEMENT PLAN
OTTER CREEK WATERSHED**

SUB-WATERSHED NUMBER	POND ID	AREA (AC)	Tc (MIN)	CN	DIRECT PEAK RUNOFF RATE (CFS)	POND NWL FEET	POND OUTLET	OUTLET ELEVATION FEET	APPROXIMATE OVERFLOW ELEVATION FEET (a)	LOW BUILDING ELEVATION FEET (a)	100-YR HWL FEET	PEAK DISCHARGE (CFS)	100-YR PEAK STORAGE (AC-FT)	COMMENTS
OC-24	235	236.0	55	61	363.5	960.0	18" RCP (P)	960.0			965.5	27.9	34.6	Existing storage, proposed outlet
OC-25		243.7	25	74	955.9	942.0	18" RCP (E)	945.0		950.0	945.7	2.0	251.2	Wetland Area
OC-26		387.8	30	71	1261.8	950.0	18" RCP (E)	950.0		954.0	951.2	3.1	267.7	Black Lake
OC-27		88.1	36	58	157.4	950.0	18" RCP (E)	952.0		964.0	953.8	8.6	21.7	Wetland Area
OC-28		119.4	21	71	465.0	960.0	18" RCP (E)	960.0		974.0	962.1	9.9	28.4	Wetland Area
OC-29		74.2	19	63	234.2	950.0	18" RCP (E)	950.0	955.0	957.0	953.5	12.5	11.1	Wetland Area
OC-30	234	498.6	40	61	950.7	960.0	18" RCP (P)	960.0		968.0	962.0	49.5	75.5	Existing storage, proposed outlet
TOTAL AREA		7406.9										2840.9	2242.9	

(a) The overflow elevation and low building elevations should be considered approximate, detailed field surveys are required to obtain actual elevations

(P) -PROPOSED OUTLET

(E) - EXISTING OUTLET

**CITY OF MONTICELLO
COMPREHENSIVE WATER RESOURCE MANAGEMENT PLAN
TRUNK HIGHWAY 25 WATERSHED**

SUB-WATERSHED NUMBER	POND ID	AREA (AC)	T _c (MIN)	CN	DIRECT PEAK RUNOFF RATE (CFS)	POND NWL FEET	POND OUTLET	OUTLET ELEVATION FEET	APPROXIMATE OVERFLOW ELEVATION FEET (a)	LOW BUILDING ELEVATION FEET (a)	100-YR HWL FEET	PEAK DISCHARGE (CFS)	100-YR PEAK STORAGE (AC-FT)	COMMENTS
TH-01	2, 252	127.2	40	75	388.0	931.0	Lift Station - 10 CFS Limit	931.0		950.0	944.1	10.0	227.3	Landlocked Pond, Proposed Lift Station
TH-02	1	19.8	25	77	83.8	943.0	18" RCP (E)	949.0		955.0	950.6	9.2	4.5	Infiltration Basin
TH-03	4	122.3	25	76	504.7	936.2	18" RCP (E)	936.2		950.0	939.6	9.5	87.7	Groveland 2nd Pond
TH-04		22.2	20	72	92.7									Tributary to TH-03 storage
TH-05	218	87.7	25	70	306.6	938.0	15" RCP (P)	938.0			944.2	9.7	19.0	Existing storage, proposed outlet
TH-06	80	32.2	30	80	131.6	940.0	18" RCP (E)	946.0	951.0	956.0	950.2	17.5	12.5	Infiltration Basin
TH-07	0	27.4	25	76	113.0	951.9	24" RCP (E)	951.9			956.4	21.3	5.4	Movie Theater Pond
TH-07A	81	75.8	100	76	127.4	954.0	15" RCP (E)	958.7	965.0	962.0	965.1	20.2	16.8	Mobile Home Pond
TH-07B	217	40.1	32	72	128.5	966.0	30" RCP (P)	966.0			971.1	46.5	4.8	Proposed Storage
TH-08	61	17.3	15	72	83.8	946.0	12" RCP, 24" RCP (E)	950.1, 951.7		954.0	949.0	1.3	4.2	Groveland 2nd Pond
TH-09	3	55.5	15	80	326.9	938.0	15" RCP (E)	940.0	945.0	948.0	944.2	14.9	14.8	Groveland 1st Pond
TH-10		17.3	80	85	41.9									Ditch to TH-01 landlocked basin
TH-11	82	19.4	25	86	98.5	937.5	42" RCP (E)	937.5		949.0	942.3	72.1	1.7	Marvin Rd/Chelsea Rd Pond
TH-12	62	54.3	20	80	276.7									Tributary to TH-13 storage
TH-13	63	48.5	20	87	281.2	933.8	21" RCP (E)	933.8			939.7	20.7	31.3	Groveland Area Pond
TH-15		18.3	20	81	95.2									Tributary to TH-01 landlocked basin
TH-16	216	27.0	40	90	111.6	948.0	18" RCP (E)	953.3		962.0	957.5	13.7	8.6	Proposed Infiltration Basin
TH-17	84	25.5	30	80	104.2	940.9	12" Orifice - 30" RCP (E)	946.0		964.0	961.0	29.1	3.2	Infiltration Basin, Wal-Mart
TH-18	85	54.3	35	72	165.6	947.0	15" RCP (E)	947.0		954.0	951.8	14.9	10.1	Mobile Home Pond
TH-19	87	22.6	20	72	94.2	938.0	6" Orifice - 12" RCP (E)	947.2			951.1	7.3	36.7	Infiltration Basin
TH-20	215	24.8	20	72	103.3	950.0	10" Orifice (P)	957.0	961.0		957.1	1.8	12.1	Existing Infiltration Basin storage, proposed outlet
TH-21	214	41.7	20	72	174.0	958.0	8" Orifice (P)	958.0			963.9	4.5	9.7	Proposed Pond
TH-22	213	14.5	20	72	60.7	946.0	6" Orifice (P)	946.0			950.7	2.8	3.0	Existing storage, proposed outlet
TH-23	212	30.9	20	72	129.1	944.0	15" RCP (E)	949.8			947.5	2.0	7.8	Proposed Infiltration Basin
TH-24	5	42.0	25	72	155.7	942.0	18" RCP (E)	948.0	957.0	958.0	952.9	16.5	12.4	Infiltration Basin
TH-25	86	6.5	15	72	31.5	940.0	12" RCP (E)	948.2		956.0	947.7	0.4	1.6	Infiltration Basin
TH-26	211	33.0	20	72	137.9	942.9	18" RCP (E)	942.9			952.6	15.6	8.5	Proposed Storage
TH-27	210	185.7	30	72	620.7	959.0	15" RCP (P)	959.0			964.4	15.1	45.3	Proposed Storage
TH-28A	83	5.9	15	92	42.0	957.0	24" RCP (E)	957.0	961.0	962.0	959.4	17.4	1.0	Wal-Mart North Pond
TH-28B	241	32.9	25	92	182.2	946.0	15" Orifice (P)	952.0			957.1	14.0	15.3	Proposed Infiltration Basin
TH-28C	240	20.0	20	92	124.2	954.0	15" Orifice (P)	960.0			961.8	7.3	7.1	Proposed Infiltration Basin
TH-28D	239	12.9	15	92	92.2	956.0	18" Orifice (P)	960.0			963.1	13.5	3.9	Proposed Storage
TH-29	242	25.7	30	89	123.5	952.0	12" Orifice (P)	956.0			961.8	9.7	8.3	Proposed Storage
TH-30		0.4	15	89	2.8									Tributary to TH-11 storage
TOTAL AREA		1391.6										438.4	624.5	

(a) The overflow elevation and low building elevations should be considered approximate, detailed field surveys are required to obtain actual elevations

(P) -PROPOSED OUTLET

(E) - EXISTING OUTLET

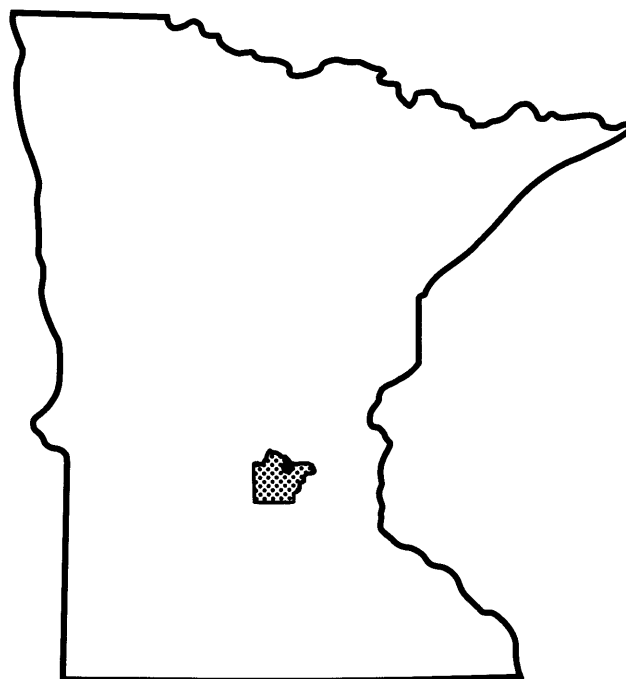
APPENDIX

Appendix B

FLOOD INSURANCE STUDY



**CITY OF MONTICELLO,
MINNESOTA
WRIGHT COUNTY**



MAY 1979

**U.S. DEPARTMENT of HOUSING & URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION**

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PUBLISHED SEPARATELY:

Flood Insurance Rate Map

FLOOD INSURANCE STUDY
CITY OF MONTICELLO,
WRIGHT COUNTY, MINNESOTA

1.0 INTRODUCTION

1.1 Purpose of Study

The purpose of this Flood Insurance Study is to investigate the existence and severity of flood hazards in the City of Monticello, Wright County, Minnesota, and to aid in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. Initial use of this information will be to convert the City of Monticello to the regular program of flood insurance by the Federal Insurance Administration. Further use of the information will be made by local and regional planners in their efforts to promote sound land use and flood plain management.

1.2 Coordination

Areas requiring detailed study were identified at a meeting held in July 1977 with representatives from the Federal Insurance Administration, the Minnesota Department of Natural Resources, the City of Monticello, and Barr Engineering Co. (the Study Contractor). Representatives from the Minnesota Department of Natural Resources, the City of Monticello, and Barr Engineering Co. met in October 1977 to review the progress of the Flood Insurance Study and to discuss the criteria for floodway selection. The city selected floodways at the latter meeting. The Minnesota Department of Natural Resources provided valuable coordination throughout this study, particularly with regard to study area definition and floodway selection. Flood discharges used in this study were coordinated with the U. S. Army Corps of Engineers (COE), the U. S. Geological Survey (USGS), the Soil Conservation Service (SCS), and the Minnesota Department of Natural Resources. A final coordination meeting was held on October 18, 1978 to present the study results to city and state officials and residents. The study was reviewed and accepted.

1.3 Authority and Acknowledgements

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968, as amended.

The hydrologic and hydraulic analyses for this study were performed by Barr Engineering Co. for the Federal Insurance Administration, under Contract No. H-3799. This work, which was completed in November 1977, covered all significant flooding sources affecting the City of Monticello.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the City of Monticello. The area of study is shown on the Vicinity Map (Figure 1).

The areas studied by detailed methods were selected with priority given to all known flood hazard areas, areas of projected development and proposed construction until July 1982. The scope and methods of study were proposed to and agreed upon by the Federal Insurance Administration and the community.

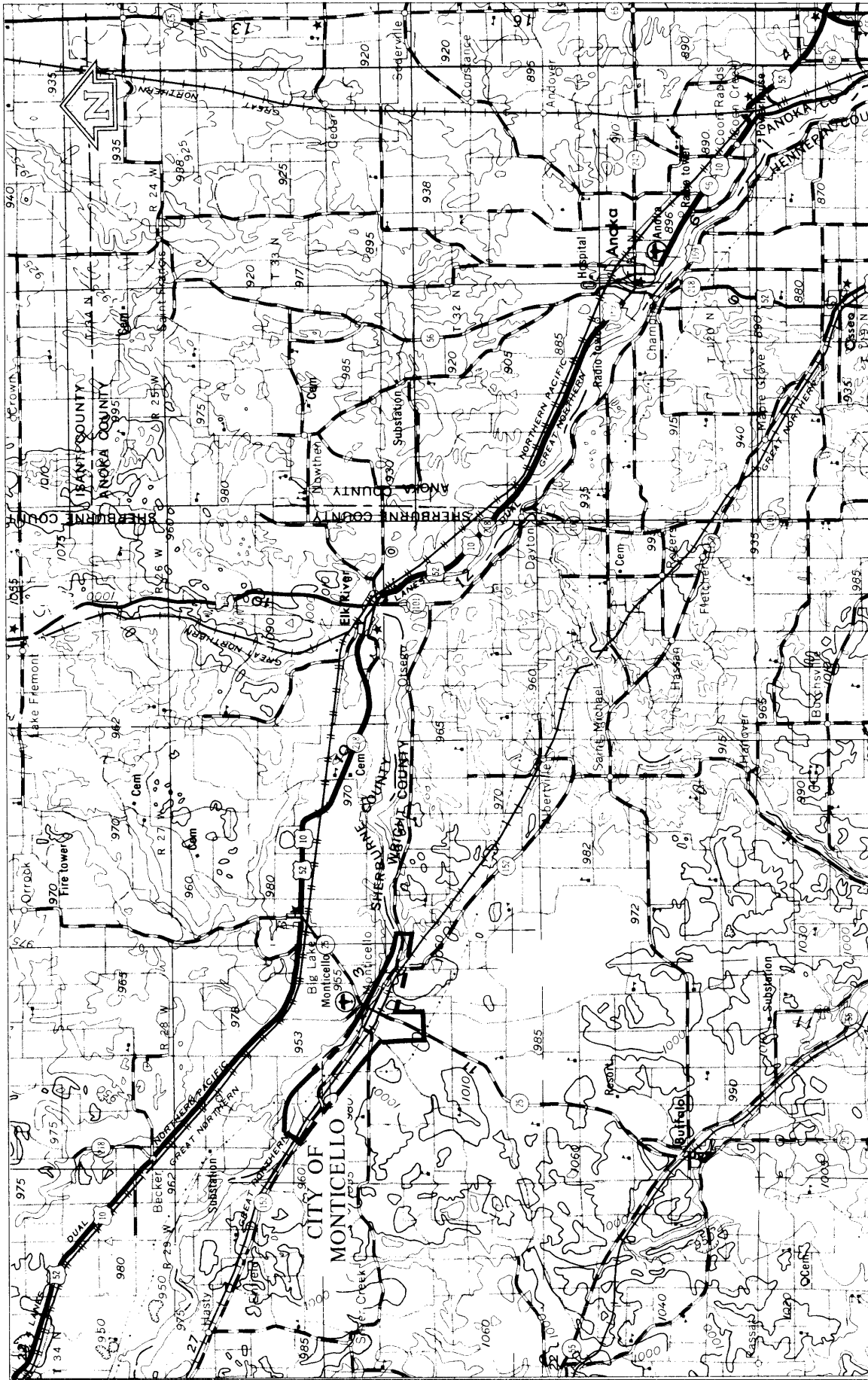
The areas studied by detailed methods are the Mississippi River, from the southern Monticello corporate limit to the northern Monticello corporate limit, and Otter Creek from its confluence with the Mississippi River to the western Monticello corporate limit at Interstate Highway 94.

2.2 Community Description

The City of Monticello is located on the Mississippi River in northeastern Wright County in central Minnesota. The city has an area of approximately 4.3 square miles and had a population of 1,636 in 1970. A population increase to approximately 5,600 by the year 2000 is projected for the city (Reference 1).

The major highways crossing Monticello are Interstate Highway 94 and State Highway 152 passing from southeast to northwest along the western city limit, State Highway 25 passing from southwest to northeast through the central business district, and County State Aid Highway 75 (Broadway Street, old State Highway 152) passing from southeast to northwest through the central portion of the city. The Burlington Northern railroad passes from southeast to northwest through the central portion of the city.

The climatic classification of the area is humid continental characterized by large seasonal variations in temperature and moderate rainfall and snowfall. The mean annual temperature is approximately 42 degrees Fahrenheit (F.), and the mean monthly temperature varies from 12 degrees F. in January to 73 degrees F. in July. The average annual precipitation is approximately 24 inches of water, with an average annual snowfall of 41 inches representing about 16 percent of the total precipitation (Reference 2).



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
 Federal Insurance Administration

CITY OF MONTICELLO, MN
 (WRIGHT CO.)

APPROXIMATE SCALE



VICINITY MAP

FIGURE 1

The vegetation in the city consists of urban landscaping in residential areas, with agricultural cropland, dry prairie vegetation, and wooded areas in the remainder of the city. The two general soil associations within the Monticello area are the Burnsville-Hayden-Peat Association and the Esterville-Hubbard-Wadena Association (Reference 1). The soils in the wetland areas consist of poorly drained, medium-textured, and moderately fine-textured soils. Moderately coarse-textured and medium-textured soils are dominant in other areas of the city.

The topography in Monticello ranges from flat to gently rolling, with elevations varying from approximately 890 feet to 970 feet. The Mississippi River forms the northeastern city limit of Monticello and a wetland system of marsh and ponded areas is scattered throughout the city. The eastern portion of the city is drained by a major drainageway located in Sections 11 and 14, Township 121 North, Range 25 West, which flows north and east into the Mississippi River. Otter Creek and its tributary drainageways provide drainage for the northern and western portions of the city.

Development in Monticello is primarily single-family residential with commercial and industrial development concentrated in the central business district and along Interstate Highway 94 and the Burlington Northern railroad. Public and recreational areas are located on the outskirts of the major residential concentration in the city. Open and agricultural areas are located along the western corporate limit. The Otter Creek and Mississippi River flood plains in Monticello include areas of residential, public, recreational, and agricultural development.

2.3 Principal Flood Problems

Floods on Otter Creek and the Mississippi River in Monticello occur primarily as the result of spring runoff events, although flooding on Otter Creek has resulted from the occurrence of short-duration, high-intensity rainstorms. The largest floods of record on the Mississippi River occurred in 1897, 1950, 1952, 1965, and 1969 (References 3 and 4). The largest of these floods occurred in 1965 and approximated an 80-year frequency event near the Elk River (Reference 5). The most recent flood on the Mississippi River occurred in 1975 and was slightly larger than the 10-year frequency event (References 4 and 5). No historic flood records are available for Otter Creek in Monticello.

2.4 Flood Protection Measures

There are no temporary or permanent structures designed specifically for flood protection in the City of Monticello. The City of Monticello Zoning Ordinance (Reference 6) provides for the establishment of a Flood Plain District in accordance with the Minnesota Department of Natural Resources standards. The Zoning Ordinance regulates temporary and permanent development within the Flood Plain District.

3.0 ENGINEERING METHODS

For flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Floods having recurrence intervals of 10-, 50-, 100-, and 500-years have been selected as having special significance for flood plain management and for flood insurance premium rates. The analyses reported here reflect current conditions in the watersheds of the streams.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for floods of the selected recurrence intervals for each stream studied in detail in the community.

The 10-, 50-, 100-, and 500-year discharges for the Mississippi River in Monticello were obtained from the hydrologic analysis of the Mississippi River performed in the Wright County Flood Insurance Study (Reference 7). The USGS developed discharge-frequency relationships for the Mississippi River between the Cities of Elk River and Monticello using log-Pearson Type III analyses and gaging station records at four locations: Royalton, Anoka, Elk River, and St. Cloud, Minnesota. The discharge-frequency relationships are based on 51 years of record (1924-1974) near Royalton, 44 years of record (1931-1974) near Anoka, partial records dating back to 1915 at Elk River, and partial records dating back to 1967 at St. Cloud (References 3 and 4). The log-Pearson Type III analyses are based on a -0.15 regional skew coefficient. The 100-year discharges for the Mississippi River at the four gaging stations were established by inter-agency agreement between the USGS and the COE on April 12, 1973. The discharge-frequency relationship for the Mississippi River at Elk River was transferred upstream from Elk River to Monticello using the drainage-area-ratio method.

The 10-, 50-, and 100-year discharges for Otter Creek in Monticello were calculated by a regression analysis using Regional Flood Frequency Equations for Minnesota (Reference 8). Parameters such as channel slope, drainage area, and other topographical data were determined using 10-foot contour interval USGS topographic maps at a scale of 1:24000 (Reference 9). The 500-year discharge for Otter Creek was determined by extrapolating the 10-, 50-, and 100-year discharges on probability paper.

Peak discharges for the 10-, 50-, 100-, and 500-year floods of each stream studied in detail in the community are shown in Table 1.

TABLE 1: SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (SQ MILES)	PEAK-DISCHARGE (CFS)			
		10-YEAR	50-YEAR	100-YEAR	500-YEAR
MISSISSIPPI RIVER					
At Pine Street	13,737	36,080	52,860	60,540	78,340
OTTER CREEK					
At West River Street	12.3	220	360	420	520

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of the streams in the community are carried out to provide estimates of the elevations of the floods of the selected recurrence intervals along each stream studied in detail.

Cross sections used in the analyses were located at close intervals upstream and downstream of bridges and other hydraulic structures to allow computation of the significant backwater effects of these structures. Other cross sections were located along the streams to provide a typical representation of stream valley topography. Data for cross sections on Otter Creek and dimensions and elevations of bridges, culverts, and other obstructions on Otter Creek were obtained by field survey. Data for the dry portions of cross sections on the Mississippi River were obtained by field survey. Data for the dry portions of cross sections on the Mississippi River were obtained by field survey and by photogrammetric methods for the Wright County Flood Insurance Study (Reference 7). Data for the portions of cross sections underwater on the Mississippi River were obtained from field survey, the Northern States Power Company river soundings (Reference 10), and the Wright County Flood Insurance Study (Reference 7). The dimensions and elevations of the Minnesota Highway 25 bridge over the Mississippi River were obtained from the Minnesota Highway Department.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway is computed (Section 4.2), selected cross section locations are shown on the Flood Boundary and Floodway Map (Exhibit 2).

Effective flow areas of flood plain cross sections, loss coefficients for bridges and other channel obstructions, and channel and overbank roughness coefficients (Manning's "n") were selected for each cross section using field inspection data, USGS topographic maps (Reference 9), and aerial photographs taken in April 1975 (Reference 11). Manning's "n" values used in this study ranged from 0.031 to 0.100 in the overbanks and from 0.027 to 0.035 in the channel for the Mississippi River, and from 0.035 to 0.160 in the overbanks and from 0.033 to 0.100 in the channel for Otter Creek.

The starting water-surface elevations for the Mississippi River were obtained from the HEC-2 analysis of the Mississippi River performed in the Wright County Flood Insurance Study (Reference 7). The starting water-surface elevations for Otter Creek were determined using a drainage area ratio of Otter Creek to the Mississippi River of less than 1:50, and the 5-year frequency water-surface elevation was determined for the Mississippi River at the confluence with Otter Creek (Reference 12). Water-surface elevations of floods of the selected recurrence intervals along the Mississippi River and Otter Creek were determined using HEC-2, the standard step-backwater computer program developed by the COE (Reference 13). The flood profiles show water-surface elevations computed to an accuracy of 0.5 foot for floods of the selected recurrence intervals on Otter Creek and the Mississippi River in Monticello (Exhibit 1).

The hydraulic analyses for this study are based only on the effects of unobstructed flow. The flood elevations as shown on the profiles (Exhibit 1) are, therefore, considered valid only if hydraulic structures, in general, remain unobstructed and if channel and overbank conditions remain essentially the same as ascertained during this study.

All elevations are referenced from National Geodetic Vertical Datum of 1929 (NGVD); elevation reference marks used in the study are shown on the maps.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

A prime purpose of the National Flood Insurance Program is to encourage state and local governments to adopt sound flood plain management programs. Each Flood Insurance Study, therefore, includes a flood boundary map designed to assist communities in developing sound flood plain management measures.

4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the Federal Insurance Administration as the base flood for purposes of flood plain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the boundaries of the 100-year and the 500-year floods have been delineated using the elevations determined at each cross section; between cross sections the boundaries were interpolated using photogrammetric methods with aerial photographs photoenlarged to a scale of 1:6000 for the Mississippi River (Reference 11) and using topographic maps photoenlarged to a scale of 1:6000, with a two-foot contour interval for Otter Creek (Reference 14).

The boundaries of the 100- and 500-year floods are shown on the Flood Boundary and Floodway Map (Exhibit 2). Small areas within the flood boundaries may lie above the flood elevations and, therefore, not be subject to flooding; owing to lack of detailed topographical information or to limitations of the map scale, such areas are not shown. In cases where the 100-year and the 500-year flood boundaries are close together, only the 100-year boundary has been shown.

4.2 Floodways

Encroachment on flood plains, such as artificial fill, reduces the flood-carrying capacity and increases flood heights, thus increasing flood hazard in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent flood plain areas, that must be kept free of encroachment in order that the 100-year flood be carried without substantial increases in flood heights. As minimum standards, the Federal Insurance Administration limits such increases in flood heights to 1.0 foot, provided that hazardous velocities are not produced. In Minnesota, however, flood plain encroachment is limited by Minnesota Regulations to that which would cause a 0.5 foot increase in flood heights above pre-floodway conditions at any point (Reference 15). Floodways having no more than a 0.5 foot surcharge were delineated for this study.

After consultation with representatives of the Minnesota Department of Natural Resources, community officials selected floodways for the detailed study portions of the Mississippi River and Otter Creek based on existing development and legal, economic, political, and hydraulic factors. The selected floodways were incorporated into the computer model to evaluate the effects of community-selected and possible future flood plain encroachment (Reference 13). The results of these computations were tabulated for selected cross sections of each stream segment for which a floodway was computed (Table 2). Because the corporate limits of Monticello bisect the Mississippi River, portions of the Mississippi River floodway lie in unincorporated Sherburne County.

As shown on the Flood Boundary and Floodway Map (Exhibit 2), the floodway boundaries were determined at cross sections; between cross sections, the boundaries were interpolated. In cases where the boundaries of the floodway and the 100-year flood are either close together or collinear, only the floodway boundary has been shown.

The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than 0.5 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 2.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH ² (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
MISSISSIPPI RIVER								
A	14.97	340	7500	8.0	897.0	897.0	897.0	0.0
B	15.31	250	6000	10.0	898.6	898.6	898.6	0.0
C	16.26	300	7100	8.5	903.8	903.8	903.8	0.0
D	16.63	340	6900	8.7	905.3	905.3	905.3	0.0
E	17.29	240	7600	7.9	907.9	907.9	907.9	0.0
F	17.62	240	7500	8.1	908.9	908.9	908.9	0.0
G	18.65	330	9500	6.4	912.1	912.1	912.1	0.0
H	19.39	230	7300	8.2	913.2	913.2	913.7	0.5
I	19.90	1420	10,700	5.7	915.7	915.7	916.0	0.3
J	20.30	1250	25,200	2.4	917.0	917.0	917.2	0.2
K	20.90	1530	18,500	3.3	917.7	917.7	917.9	0.2
L	21.26	860	12,500	4.8	918.1	918.1	918.2	0.1

¹ MILES ABOVE CONFLUENCE OF CROW RIVER

² THIS WIDTH IS WITHIN CORPORATE LIMITS

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF MONTICELLO, MN
(WRIGHT CO.)

FLOODWAY DATA

MISSISSIPPI RIVER

TABLE 2

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
OTTER CREEK								
A	80	70	245	1.7	909.9	903.9 ²	904.4	0.5
B	250	30	75	5.6	909.9	903.9 ²	904.4	0.5
C	610	30	60	7.0	909.9	909.6 ²	909.6	0.0
D	1440	70	300	1.4	913.3	913.3	913.8	0.5
E	1850	70	225	1.9	913.8	913.8	914.3	0.5
F	2290	70	165	2.5	915.2	915.2	915.7	0.5
G	2730	50	175	2.4	916.7	916.7	917.2	0.5
H	3510	40	170	2.5	920.0	920.0	920.2	0.2
I	3990	40	140	3.0	920.6	920.6	921.1	0.5
J	4200	50	180	2.3	921.0	921.0	921.5	0.5
K	4480	60	220	1.9	921.7	921.7	922.2	0.5
L	4710	90	315	1.3	921.9	921.9	922.4	0.5
M	5110	170	565	0.7	922.1	922.1	922.6	0.5
N	5350	60	205	2.0	922.4	922.4	922.9	0.5
O	5860	70	175	2.4	923.2	923.2	923.6	0.4

¹ FEET ABOVE MOUTH

² ELEVATIONS WITHOUT CONSIDERING BACKWATER EFFECT FROM MISSISSIPPI RIVER

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

CITY OF MONTICELLO, MN
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FLOODWAY DATA

OTTER CREEK

TABLE 2

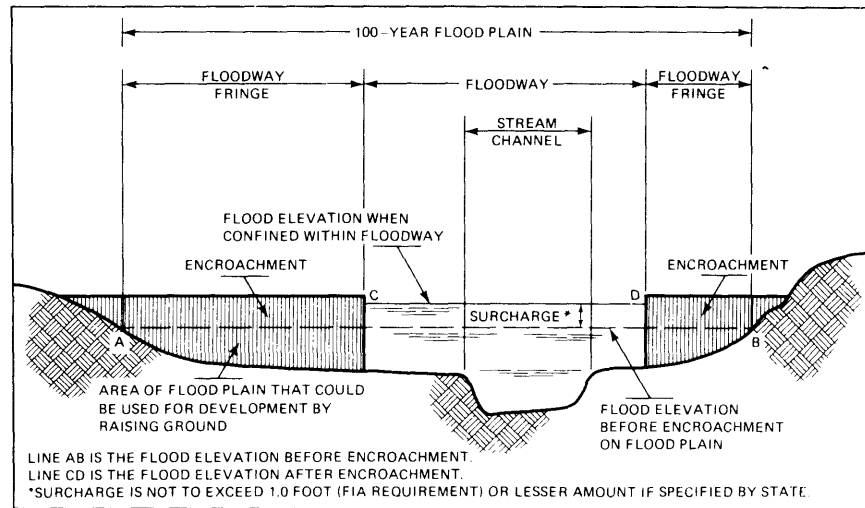


FIGURE 2. Floodway Schematic

5.0 INSURANCE APPLICATION

In order to establish actuarial insurance rates, the Federal Insurance Administration has developed a process to transform the data from the engineering study into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors, and flood insurance zone designations for each flooding source affecting the City of Monticello.

5.1 Reach Determinations

Reaches are defined as lengths of watercourses having relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference does not have a variation greater than that indicated in the following table for more than 20 percent of the reach.

<u>Average Difference Between 10- and 100-year Floods</u>	<u>Variation</u>
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot

Two reaches meeting the above criteria were required for the flooding sources of the City of Monticello. These included one reach each for the Mississippi River and Otter Creek. The locations of the reaches are shown on the Flood Profiles (Exhibit 1).

5.2 Flood Hazard Factors

The Flood Hazard Factor (FHF) is the Federal Insurance Administration device used to correlate flood information with insurance rate tables. Correlations between property damage from floods and their Flood Hazard Factors are used to set actuarial insurance premium rate tables based on Flood Hazard Factors from 005 to 200.

The Flood Hazard Factor for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations expressed to the nearest one-half foot, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the Flood Hazard Factor is 005; if the difference is 1.4 feet, the Flood Hazard Factor is 015; if the difference is 5.0 feet, the Flood Hazard Factor is 050. When the difference between the 10- and 100-year water-surface elevations is greater than 10.0 feet, accuracy for the Flood Hazard Factor is to the nearest foot.

5.3 Flood Insurance Zones

After the determination of reaches and their respective Flood Hazard Factors, the entire incorporated area of the City of Monticello was divided into zones, each having a specific flood potential or hazard. Each zone was assigned one of the following flood insurance zone designations:

Zones A2, A7: Special Flood Hazard Areas inundated by the 100-year flood, determined by detailed methods; base flood elevations shown, and zones subdivided according to Flood Hazard Factor.

Zone B: Areas between the Special Flood Hazard Area and the limits of the 500-year flood, including areas of the 500-year flood plain that are protected from the 100-year flood by dike, levee, or other water control structure; or areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.

Zone C: Areas of minimal flooding.

Table 3, "Flood Insurance Zone Data," summarizes the flood elevation differences, Flood Hazard Factors, flood insurance zones, and base flood elevations for each flooding source studied in detail in the community.

FLOODING SOURCE	PANEL ¹	ELEVATION DIFFERENCE ² BETWEEN 1.0% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION ³
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
MISSISSIPPI RIVER REACH 1	0005	-3.7	-1.1	2.2	035	A7	VARIES-SEE MAP
OTTER CREEK REACH 1	0005	-1.2	-0.3	0.6	010	A2	VARIES-SEE MAP

¹FLOOD INSURANCE RATE MAP PANEL

²WEIGHTED AVERAGE

³ROUNDED TO NEAREST FOOT

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Federal Insurance Administration

CITY OF MONTICELLO, MN

(WRIGHT CO.)

FLOOD INSURANCE ZONE DATA

MISSISSIPPI RIVER - OTTER CREEK

TABLE 3

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the City of Monticello is, for insurance purposes, the principal result of the Flood Insurance Study. This map (published separately) contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in accordance with the latest flood insurance map preparation guidelines published by the Federal Insurance Administration.

6.0 OTHER STUDIES

The flood boundaries delineated for Otter Creek and the Mississippi River in this study are not in exact agreement with those delineated on the Federal Insurance Administration Flood Hazard Boundary Maps for the City of Monticello (Reference 16). The differences are justified since more detailed methods were used to determine flood boundaries for the Monticello Flood Insurance Study. The flood boundaries and flood profiles presented in this study for the Mississippi River are in exact agreement with the flood boundaries and flood profiles presented for the Mississippi River in the Wright County Flood Insurance Study (Reference 7).

This report either supersedes or is compatible with all previous studies published on streams studied in this report and should be considered authoritative for the purposes of the National Flood Insurance Program.

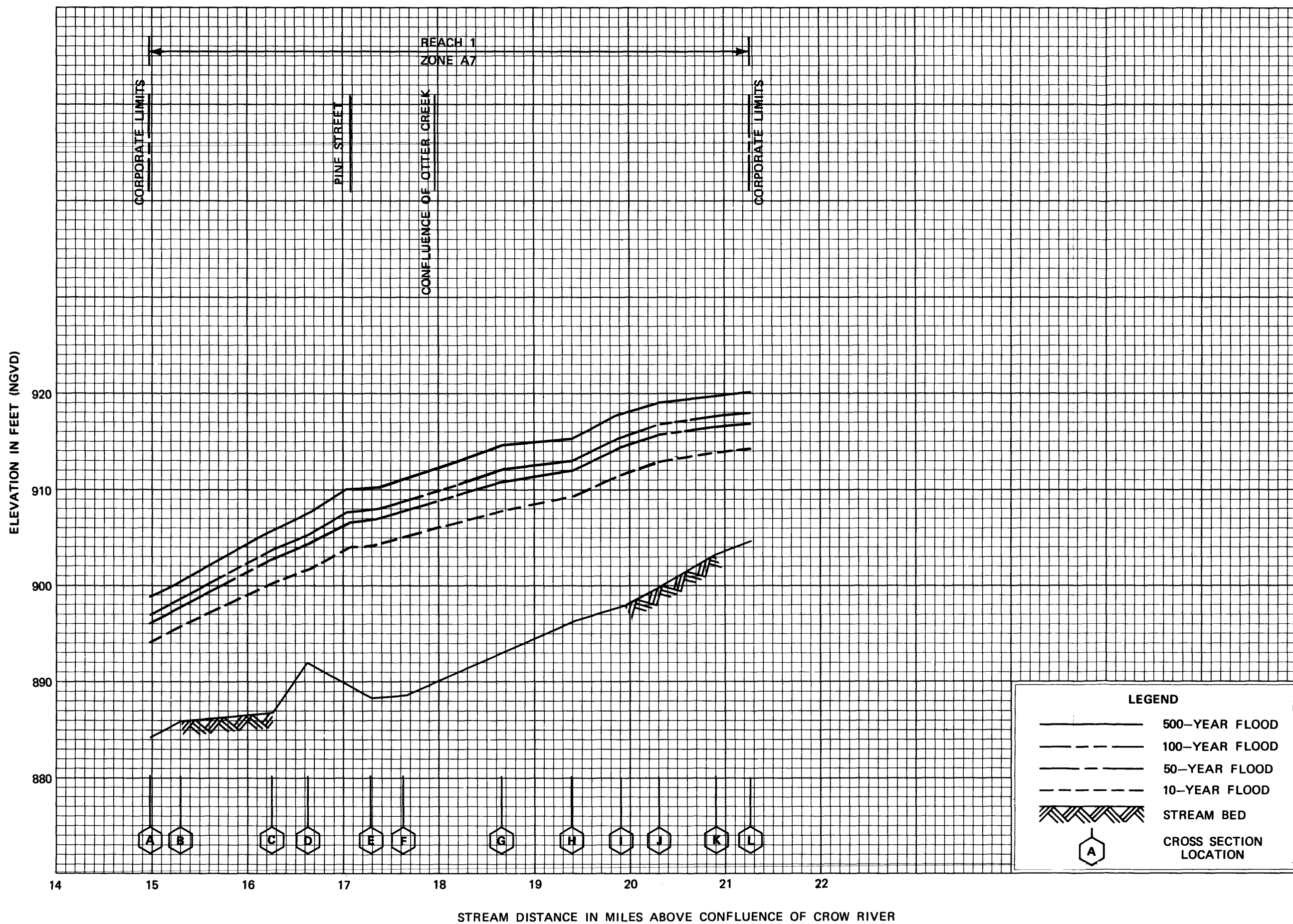
7.0 LOCATION OF DATA

Survey, hydrologic, hydraulic and other pertinent data used in this study can be obtained by contacting the office of the Federal Insurance Administration, Regional Director, One North Dearborn Street, Chicago, Illinois 60602.

8.0 REFERENCES AND BIBLIOGRAPHY

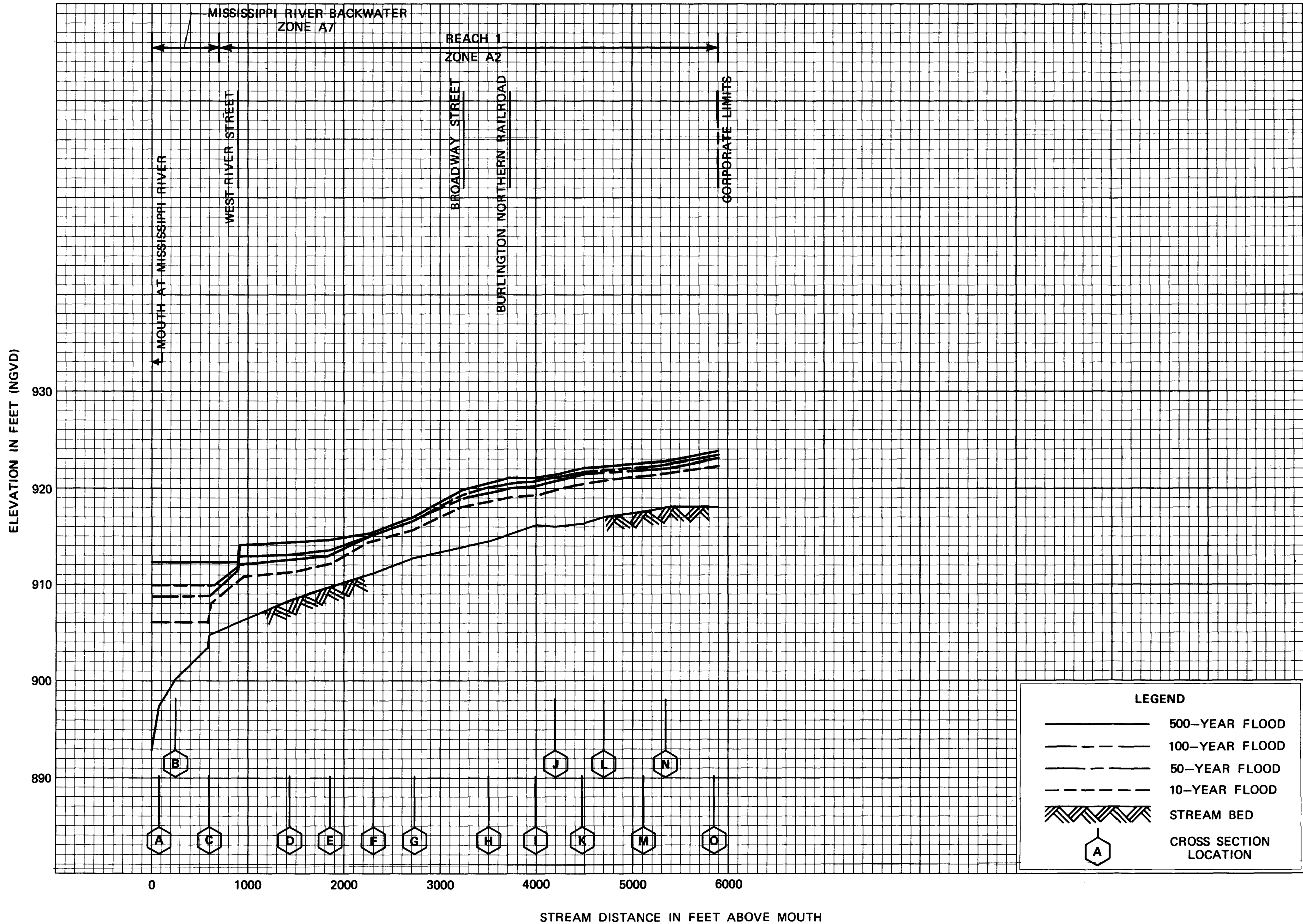
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FLOOD PROFILES
MISSISSIPPI RIVER

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Federal Insurance Administration
CITY OF MONTICELLO, MN
(WRIGHT CO.)



FLOOD PROFILES

OTTER CREEK

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
 Federal Insurance Administration
CITY OF MONTICELLO, MN
 (WRIGHT CO.)

APPENDIX

Appendix C

P8 WATER QUALITY MODELING RESULTS

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I. DESCRIPTION OF P8 WATER QUALITY MODEL

In an effort to provide the City with additional information on existing and future water quality, an urban water quality model was developed. The computer program used to model water quality within the City of Monticello is the "Program for Predicting Polluting Particle Passage through Pits, Puddles, and Ponds" referred to as the P8 Urban Catchment Model developed by Dr. William W. Walker, Jr.

The P8 urban water quality model predicts the generation and transportation of stormwater run-off pollutants within the City. This model can estimate pollutant loadings, concentrations and removal efficiencies for basins subject to single or continuous rainfall events. The model will simulate the performance of a variety of treatment devices including swales, buffer strips, detention ponds, flow splitters, infiltration basins and general devices.

The initial calibration of this model corresponds to values measured under the Nationwide Urban Run-off Program or NURP. Specific calibration of this model for the City of Shorewood will require water quality monitoring data for selected areas in the City. Without calibration of the model to site specific data, predictions for specific parameter concentrations, flows, and loadings will be less reliable. However, the relative predictions concerning the removal efficiency of a basin by particle size will be unaffected by calibration.

The methodology used to model the City of Monticello is described as follows. The Stormwater Treatment basins were assumed to provide a minimum of 4 feet of depth below the invert of the basin outlet and existing live pool storage between the basin outlet and the high water level. The storage volume of the treatment basin between the NWL and HWL was obtained from the TR-20 modeling effort for the 100-year storm event. The dimensions of the treatment basins as well as the peak discharge rates from these basins are shown in the P8 Input Tables.

Some preliminary calibration to regional standards has been completed for this P8 Water Quality Model. The data used to calibrate this model was run-off data collected from the City of Minneapolis. The original parameters that the P8 Model estimates are total suspended solids (TSS), total kjeldahl nitrogen (TKN), total phosphorous (TP), copper (CU), lead (PB), and zinc (ZN). In addition to these parameters, when calibrated to run-off data from the City of Minneapolis, the following water quality parameters were added to the calibrated model, hydrocarbons (HC), chemical oxygen demand (COD) and biological oxygen demand (BOD).

Again, it must be noted that the concentrations of individual water quality parameters estimated by P8 Water Quality Computer Model may vary significantly with concentrations obtained in the field. This inconsistency is due to the extreme variation in water quality parameter concentrations observed from individual subwatersheds. However, the estimated removal efficiency of treatment basins should be comparable to the removal efficiencies determined from field investigations. This is a result of removal efficiencies being estimated by the total removal of suspended solids. The removal efficiency of a stormwater treatment basin is determined by the particle size distribution and settling velocity of the total suspended solids found in the stormwater run-off received by the basin. The following particle classes are based primarily upon calibration of run-off

concentrations and settling velocity measured under the Nation-Wide Urban Run-off Program:

PARTICLE CLASS	DESCRIPTION	PERCENT OF TSS	SETTLING VELOCITY (FT/HR)
P 0%	Dissolved	0	0
P 10%	10th Percentile	20	0.03
P 30%	30th Percentile	20	0.3
P 50%	50th Percentile	20	1.5
P 80%	80th Percentile	40	15

The first class permits consideration of the dissolved fractions of stormwater run-off quality components.

The storm event used to model water quality is a 1-inch, 24-hour, Type II storm.

II. INTERPRETATION OF P8 WATER QUALITY MODEL RESULTS

The P8 water quality modeling results are summarized on the following table. This table contains the estimated minimum, mean, and maximum concentrations of water quality parameters found in both the inflow to a stormwater treatment basin and the outflow. This table is a summary of all stormwater treatment basins modeled in the City of Monticello. Minimum is defined as the treatment basin within the City of Monticello which contains the lowest concentration of these water quality parameters and its inflow, and outflow, as well as, the treatment basin with the lowest removal efficiency of these parameters. Mean is the average concentration of water quality parameters found in the inflow, the outflow and the average treatment efficiency of basins within the City of Monticello. Maximum is defined as the highest concentration of water quality parameters found in the inflow and outflow. The maximum removal efficiency is that pond in Monticello which removes the greatest percentage of the water quality parameters from stormwater run-off.

The treatment efficiency of a pond will be somewhat dependent upon the quality of water entering the stormwater treatment basin. A stormwater treatment basin which receives a large volume of stormwater from watersheds which have treated runoff prior to discharge into the downstream pond will show a reduced treatment or pollutant removal efficiency when compared to treatment basins that only receive untreated runoff..

Included in this Appendix is a breakdown of the treatment efficiencies, as well as, the concentrations of water quality parameters for each stormwater treatment basin proposed for the City of Monticello. These tables, as well as the P8 input, are contained in **Sections III, IV, V, VI, VII and VIII of this Appendix.**

**City of Monticello
Comprehensive Water Resources Management Plan
P8 Water Quality Monitoring Results**

		WATER QUALITY PARAMETERS													
		P 0%	P 10%	P 30%	P 50%	P 80%	TSS	TP	TKN	Cu	Pb	Zn	HC	COD	BOD
Concentration in the Inflow (PPM)	Minimum	0.483	3.964	1.605	1.224	0.218	8.852	0.119	0.627	0.007	0.009	0.036	0.320	15.561	2.204
	Mean	0.941	14.427	13.424	12.929	25.269	65.668	0.401	1.876	0.020	0.050	0.108	1.713	79.525	11.686
	Maximum	1.000	17.185	17.185	17.185	34.370	85.924	0.479	2.197	0.023	0.064	0.126	2.183	99.983	14.742
Concentration in the Outflow (PPM)	Minimum	0.397	2.246	0.366	0.062	0.009	2.794	0.073	0.394	0.004	0.005	0.023	0.158	7.420	1.025
	Mean	0.888	12.329	10.499	9.383	16.849	17.659	0.226	1.155	0.012	0.018	0.066	0.600	32.553	4.657
	Maximum	1.000	17.185	17.185	17.185	34.370	85.924	0.479	2.197	0.023	0.064	0.126	2.183	99.983	14.742
Removal Efficiency (%)	Minimum	0.000	0.100	0.400	2.200	21.800	0.600	0.100	0.100	0.100	0.400	0.100	0.400	0.200	0.300
	Mean	0.000	39.070	63.174	78.460	93.632	69.613	35.373	29.263	29.263	58.530	29.263	58.530	54.802	55.940
	Maximum	0.000	83.400	97.300	99.500	100.000	95.400	61.200	51.500	51.500	84.200	51.500	84.200	89.300	89.900

**City of Monticello
Comprehensive Water Resources Management Plan
Industrial Park Watershed P8 Results**

Subwatershed Identification	Index Number	Area (acres)	Impervious Fraction	CN	Treatment Device Number	Infiltration Rate (in/hour)	Flows to Nutrient	Area of Ponds (acres)			Storage at HWL (acre-feet)	Peak Discharge Rate (cfs)
								Bottom	NWL	HWL		
IP1A	1	48	0.6	82	1	-	0	0.06	0.62	1.22	5.9	105.0
IP1B	2	6.9	0.3	71	2	-	1	-	0.00	0.02	0.1	13.0
IP1C	3	8.5	0.38	74	3	-	1	-	0.00	0.22	0.3	25.0
IP1	4	41	0.72	88	4	-	1	-	8.00	15.20	81.6	46.3
IP2	5	81	0.38	76	5	-	4	10.00	12.00	15.00	67.2	29.5
IP3	6	45.6	0.52	80	6	-	5	0.40	0.50	0.60	2.0	83.0
IP4	7	47.6	0.85	92	7	-	5	-	-	-	-	-
IP5	8	7.2	0.65	82	8	-	5	0.25	0.40	0.55	3.4	22.0
IP6	9	58.2	0.38	76	9	-	5	-	1.10	2.94	10.1	37.1
IP7	10	110.8	0.57	82	10	-	9	1.05	1.39	3.23	19.8	19.3
IP8	11	21.9	0.38	74	11	-	9	0.77	1.67	2.80	18.0	8.3
IP9	12	28	0.38	74	12	-	11	0.44	0.89	3.00	13.4	8.4
IP10	13	25.8	0.38	74	13	-	9	0.28	0.85	1.54	8.2	8.0
IP11	14	74.8	0.38	74	14	-	11	1.71	2.67	5.00	29.7	8.4
IP12	15	4.2	0.38	74	15	-	14	0.02	0.04	1.20	2.0	0.7

**City of Monticello
Comprehensive Water Resources Management Plan
Industrial Park Watershed P8 Results**

PERCENT REMOVAL EFFICIENCY OF TREATMENT DEVICE
FOR EACH PARTICLE CLASS

Device Number	Subwatershed Number	1 P 0%	2 P 10%	3 P 30%	4 P 50%	5 P 80%
1	IP1A	0	4.7	27.1	59.8	93
2	IP1B	0	0.1	0.6	2.7	21.8
3	IP1C	0	0.3	3.1	13.8	61.5
4	IP1	0	44.4	90.8	98.4	99.8
5	IP2	0	53.7	89.7	98.1	99.8
6	IP3	0	4.6	27.1	61.9	94
7	IP4	0	0	0	0	0
8	IP5	0	64.3	85.1	91.8	98.9
9	IP6	0	9.8	46.3	83.5	98.5
10	IP7	0	12	50.8	83.2	98.3
11	IP8	0	44.9	82.8	96.2	99.8
12	IP9	0	63.8	86.5	95.5	99.6
13	IP10	0	63.8	85.4	94.9	99.6
14	IP11	0	66.3	91	97.7	99.8
15	IP12	0	42.5	80	95	99.5
25	OVERALL	0	69.6	91	95.6	99.3

**City of Monticello
Comprehensive Water Resources Management Plan
Industrial Park Watershed P8 Results**

PERCENT REMOVAL EFFICIENCY OF TREATMENT DEVICE
FOR EACH WATER QUALITY COMPONENT

Device Number	Subwatershed Number	TSS	TP	TKN	Cu	Pb	Zn	HC	COD	BOD
1	IP1A	40.6	6	4.3	4.3	22.9	4.3	22.9	18.1	19.3
2	IP1B	9.4	0.7	0.6	0.6	8.3	0.6	8.3	4.8	4.9
3	IP1C	28	3.8	3.2	3.2	24.8	3.2	24.8	14.6	14.8
4	IP1	72.7	21.5	15.7	15.7	44.1	15.7	44.1	54.2	55.8
5	IP2	81.7	39.8	31.6	31.6	64.1	31.6	64.1	66.7	68.3
6	IP3	56.3	20.7	17.4	17.4	49.8	17.4	49.8	33	34.1
7	IP4	0	0	0	0	0	0	0	0	0
8	IP5	87.8	53.3	44.9	44.9	77.6	44.9	77.6	77.3	78.3
9	IP6	47.6	17	13.3	13.3	35.1	13.3	35.1	26.1	28
10	IP7	68.5	32.2	27.2	27.2	60.5	27.2	60.5	44.4	46.2
11	IP8	76.1	28.7	21.8	21.8	53.8	21.8	53.8	58.2	59.8
12	IP9	89	54.3	45.7	45.7	78.6	45.7	78.6	77.9	78.9
13	IP10	88.7	54	45.4	45.4	78.3	45.4	78.3	77.6	78.6
14	IP11	90.8	55.5	46.5	46.5	79.8	46.5	79.8	80	81.1
15	IP12	83.3	48.1	40.5	40.5	73.6	40.5	73.6	66.4	68.1
25	OVERALL	91	56.6	47.7	47.7	80.4	47.7	80.4	81.5	82.5

**City of Monticello
Comprehensive Water Resources Management Plan
Industrial Park Watershed P8 Results**

CONCENTRATION (PPM) PRESENT IN THE INFLOW OF EACH TREATMENT DEVICE
FOR EACH PARTICLE CLASS

Device Number	Subwatershed Number	P 0%	P 10%	P 30%	P 50%	P 80%
1	IP1A	0.882	5.295	2.075	1.87	3.478
2	IP1B	1	16.849	16.849	16.849	33.699
3	IP1C	1	16.849	16.849	16.849	33.699
4	IP1	0.876	6.915	2.583	1.919	3.652
5	IP2	0.912	12.381	8.291	5.977	10.141
6	IP3	1	16.849	16.849	16.849	33.698
7	IP4	1	16.849	16.849	16.849	33.699
8	IP5	1	16.849	16.849	16.849	33.699
9	IP6	0.859	10.823	6.64	3.929	5.438
10	IP7	1	16.849	16.849	16.849	33.699
11	IP8	0.772	7.378	4.251	3.256	5.79
12	IP9	1	16.849	16.849	16.849	33.699
13	IP10	1	16.849	16.849	16.849	33.699
14	IP11	0.999	16.469	16.134	15.999	31.919
15	IP12	1	16.849	16.849	16.849	33.699
25	OVERALL	1	16.88	16.88	16.88	33.76

**City of Monticello
Comprehensive Water Resources Management Plan
Industrial Park Watershed P8 Results**

CONCENTRATION (PPM) PRESENT IN THE INFLOW OF EACH TREATMENT DEVICE
FOR EACH WATER QUALITY COMPONENT

Device Number	Subwatershed Number	TSS	TP	TKN	Cu	Pb	Zn	Hg	COD	BOD
1	IP1A	12.718	0.198	1.068	0.011	0.015	0.061	0.507	21.638	3.069
2	IP1B	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
3	IP1C	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
4	IP1	15.068	0.21	1.115	0.012	0.016	0.064	0.558	26.844	3.793
5	IP2	36.79	0.31	1.515	0.016	0.031	0.087	1.056	55.064	7.958
6	IP3	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
7	IP4	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
8	IP5	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
9	IP6	26.829	0.269	1.338	0.014	0.024	0.077	0.818	44.727	6.429
10	IP7	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
11	IP8	20.674	0.215	1.099	0.012	0.019	0.063	0.658	32.01	4.599
12	IP9	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
13	IP10	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
14	IP11	80.522	0.461	2.126	0.022	0.061	0.122	2.062	94.607	13.936
15	IP12	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
25	OVERALL	84.4	0.473	2.175	0.023	0.063	0.125	2.149	98.239	14.485

**City of Monticello
Comprehensive Water Resources Management Plan
Industrial Park Watershed P8 Results**

CONCENTRATION (PPM) PRESENT IN THE OUTFLOW OF EACH TREATMENT DEVICE
FOR EACH PARTICLE CLASS

Device Number	Subwatershed Number	1 P 10%	2 P 10%	3 P 30%	4 P 50%	5 P 80%
1	IP1A	0.878	5.046	1.512	0.751	0.244
2	IP1B	0.997	16.798	16.714	16.351	26.275
3	IP1C	0.999	16.776	16.309	14.512	12.96
4	IP1	0.868	3.846	0.237	0.031	0.006
5	IP2	0.861	5.713	0.858	0.113	0.017
6	IP3	1	16.069	12.279	6.411	2.017
7	IP4	1	16.849	16.849	16.849	33.699
8	IP5	0.738	5.766	2.509	1.379	0.377
9	IP6	0.859	9.767	3.567	0.649	0.083
10	IP7	1	14.832	8.297	2.832	0.569
11	IP8	0.626	3.901	0.73	0.125	0.014
12	IP9	0.768	5.924	2.272	0.762	0.133
13	IP10	0.793	5.984	2.453	0.853	0.15
14	IP11	0.711	5.267	1.459	0.372	0.057
15	IP12	0.988	9.695	3.382	0.839	0.172
25	OVERALL	0.878	5.046	1.512	0.751	0.244

**City of Monticello
Comprehensive Water Resources Management Plan
Industrial Park Watershed P8 Results**

CONCENTRATION (PPM) PRESENT IN THE OUTFLOW OF EACH TREATMENT DEVICE
FOR EACH WATER QUALITY COMPONENT

Device Number	Subwatershed Number	TSS	TP	TKN	Cu	Pb	Zn	HC	COD	BOD
1	IP1A	7.552	0.185	1.018	0.011	0.011	0.058	0.389	17.71	2.476
2	IP1B	76.137	0.468	2.154	0.023	0.058	0.124	1.962	93.106	13.72
3	IP1C	60.557	0.454	2.101	0.022	0.047	0.12	1.612	83.672	12.306
4	IP1	4.119	0.164	0.932	0.01	0.009	0.053	0.31	12.28	1.674
5	IP2	6.701	0.179	0.987	0.01	0.011	0.057	0.366	18.23	2.503
6	IP3	36.776	0.375	1.794	0.019	0.032	0.103	1.077	65.686	9.523
7	IP4	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
8	IP5	10.031	0.178	0.94	0.01	0.012	0.054	0.41	21.129	2.989
9	IP6	14.066	0.224	1.16	0.012	0.016	0.067	0.531	33.04	4.629
10	IP7	26.53	0.32	1.583	0.017	0.025	0.091	0.847	54.516	7.775
11	IP8	4.77	0.129	0.716	0.008	0.008	0.041	0.264	12.71	1.753
12	IP9	9.09	0.178	0.952	0.01	0.012	0.055	0.396	20.82	2.928
13	IP10	9.44	0.184	0.984	0.01	0.012	0.056	0.411	21.308	3.004
14	IP11	7.156	0.157	0.853	0.009	0.01	0.049	0.339	17.665	2.458
15	IP12	14.087	0.244	1.282	0.013	0.017	0.074	0.564	32.982	4.617
25	OVERALL	7.552	0.185	1.018	0.011	0.011	0.058	0.389	17.71	2.476

**City of Monticello
Comprehensive Water Resources Management Plan
Hart Boulevard Watershed P8 Results**

Subwatershed Identification	Index Number	Area (acres)	Impervious Fraction	GN	Treatment Device Number	Infiltration Rate (in/hour)	Flows to Number	Area of Pond (acres)		Storage at HWL (acre-feet)	Peak Discharge Rate (cfs)
								Bottom	NWL		
HB1	1	6.0	0.30	72	1	---	0	---	---	---	---
HB2	2	31.0	0.28	71	2	---	1	1.19	1.97	2.66	113.6
HB2A	3	1.0	0.65	85	3	---	1	---	0.01	0.04	84.7
HB3	4	11.5	0.33	73	4	---	2	0.10	0.13	0.25	27.1
HB3A	5	38.5	0.38	75	5	---	2	0.50	1.00	1.78	15.6
HB3B	6	38.2	0.55	81	6	---	2	1.00	1.50	1.91	22.9
HB4	7	26.0	0.25	70	7	---	3	---	0.15	0.84	131.5
HB4B	8	26.8	0.30	72	8	---	7	---	2.00	6.80	122.8
HB5	9	70.4	0.70	88	9	---	8	---	0.63	4.70	70.6
HB6	10	19.2	0.65	85	10	---	8	---	0.39	2.28	50.4
HB7	11	52.0	0.65	85	11	---	10	---	0.15	4.92	50.5
HB8	12	46.4	0.44	77	12	---	11	---	0.16	0.81	36.9
HB9	13	100.6	0.49	79	13	---	11	2.53	3.60	5.38	53.8
HB10	14	9.1	0.33	73	14	---	13	0.04	0.28	0.61	28.4
HB11	15	18.4	0.38	75	15	---	14	---	0.60	1.47	5.9
HB12	16	36.1	0.38	75	16	---	15	1.93	3.81	4.89	4.9
HB13	17	18.6	0.36	74	17	---	16	0.25	1.22	1.57	5.0

**City of Monticello
 Comprehensive Water Resources Management Plan
 Hart Boulevard Watershed P8 Results**

PERCENT REMOVAL EFFICIENCY OF TREATMENT DEVICE
 FOR EACH PARTICLE CLASS

Device Number	Subwatershed Number	PERCENT REMOVAL EFFICIENCY OF TREATMENT DEVICE FOR EACH PARTICLE CLASS				
		P 0%	P 10%	P 30%	P 50%	P 80%
1	HB1	0	0	0	0	0
2	HB2	0	47.6	75.5	88.7	98.9
3	HB2A	0	0.1	0.4	2.2	24.3
4	HB3	0	1.2	10.4	34.3	82.7
5	HB3A	0	58.7	82.1	92.5	99.3
6	HB3B	0	59.9	84.1	93.6	99.4
7	HB4	0	2.4	11.4	39.9	90.3
8	HB4B	0	4.6	31.9	71.7	96.8
9	HB5	0	1.1	9.7	34.9	84.3
10	HB6	0	1	9.4	33.9	83.3
11	HB7	0	1.7	9.4	31.6	81.5
12	HB8	0	3	20.7	53.7	91.8
13	HB9	0	49.9	80.5	92.7	99.3
14	HB10	0	13.4	49.7	81.6	98
15	HB11	0	27.2	77.6	95.3	99.5
16	HB12	0	79.5	96.2	99.2	99.9
17	HB13	0	78.2	92.7	97.9	99.8
25	OVERALL	0	37.4	69	92.5	98.9

**City of Monticello
Comprehensive Water Resources Management Plan
Hart Boulevard Watershed P8 Results**

PERCENT REMOVAL EFFICIENCY OF TREATMENT DEVICE
FOR EACH WATER QUALITY COMPONENT

Device Number	Subwatershed Number	TSS	TP	TKN	Cu	Pb	Zn	HC	COD	BOD
1	HB1	0	0	0	0	0	0	0	0	0
2	HB2	74.1	31.7	24.6	24.6	54.8	24.6	54.8	58.9	60.2
3	HB2A	0.6	0.1	0.1	0.1	0.4	0.1	0.4	0.2	0.3
4	HB3	42.3	10.1	8.5	8.5	37.4	8.5	37.4	22.9	23.4
5	HB3A	86.3	51.5	43.4	43.4	76.3	43.4	76.3	74.2	75.2
6	HB3B	87.3	52.5	44.2	44.2	77.1	44.2	77.1	75.3	76.4
7	HB4	13.3	4.3	3.3	3.3	9.1	3.3	9.1	6.3	6.8
8	HB4B	35.1	15.3	12.2	12.2	26.5	12.2	26.5	18.1	19.6
9	HB5	42.8	10.1	8.5	8.5	37.8	8.5	37.8	23	23.5
10	HB6	22.3	5.6	4.5	4.5	16.6	4.5	16.6	9.5	10
11	HB7	30.8	6.1	4.8	4.8	24	4.8	24	14.1	14.7
12	HB8	52.2	17.1	14.4	14.4	46.1	14.4	46.1	29.6	30.5
13	HB9	83.2	44.6	36.7	36.7	71	36.7	71	68	69.4
14	HB10	51.1	14	10.5	10.5	34.2	10.5	34.2	28.6	30.3
15	HB11	76.1	32.2	25.3	25.3	60.4	25.3	60.4	53.3	55.7
16	HB12	94.7	56.3	46.4	46.4	81.3	46.4	81.3	87.1	87.9
17	HB13	93.7	59.4	50	50	82.8	50	82.8	86.3	87
25	OVERALL	79.3	44	37	37	70.1	37	70.1	61.3	62.8

**City of Monticello
Comprehensive Water Resources Management Plan
Hart Boulevard Watershed P8 Results**

CONCENTRATION (PPM) PRESENT IN THE INFLOW OF EACH TREATMENT DEVICE
FOR EACH PARTICLE CLASS

Device Number	Subwatershed Number	Particle Class				
		P 0%	P 10%	P 30%	P 50%	P 80%
1	HB1	0.879	10.627	5.322	1.279	0.382
2	HB2	0.854	9.279	6.318	4.771	6.705
3	HB2A	0.918	11.949	6.122	1.346	0.218
4	HB3	1	16.849	16.849	16.849	33.699
5	HB3A	1	16.849	16.849	16.849	33.698
6	HB3B	1	16.849	16.849	16.849	33.699
7	HB4	0.92	12.229	6.874	2.158	1.159
8	HB4B	0.917	12.657	9.621	5.928	3.229
9	HB5	1	16.849	16.849	16.849	33.699
10	HB6	0.867	10.894	7.808	5.206	4.459
11	HB7	0.841	10.344	7.555	5.901	9.014
12	HB8	1	16.849	16.849	16.849	33.699
13	HB9	0.839	12.262	10.92	10.551	20.867
14	HB10	0.595	5.58	2.6	1.85	3.363
15	HB11	0.551	5.972	4.631	4.365	8.607
16	HB12	0.861	12.479	11.727	11.44	22.664
17	HB13	1	16.849	16.849	16.849	33.699
25	OVERALL	1	16.849	16.849	16.849	33.699

City of Monticello
Comprehensive Water Resources Management Plan
Hart Boulevard Watershed P8 Results

CONCENTRATION (PPM) PRESENT IN THE INFLOW OF EACH TREATMENT DEVICE
 FOR EACH WATER QUALITY COMPONENT

Device Number	Subwatershed Number	TSS	IP	TKN	Cu	Pb	Zn	Hg	COD	BOD
1	HB1	17.61	0.247	1.257	0.013	0.018	0.072	0.616	38.106	5.408
2	HB2	27.072	0.262	1.308	0.014	0.024	0.075	0.822	41.305	5.973
3	HB2A	19.634	0.267	1.347	0.014	0.02	0.077	0.671	42.726	6.067
4	HB3	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
5	HB3A	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
6	HB3B	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
7	HB4	22.42	0.278	1.394	0.015	0.022	0.08	0.735	45.44	6.485
8	HB4B	31.436	0.321	1.558	0.016	0.028	0.089	0.937	53.36	7.74
9	HB5	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
10	HB6	28.367	0.286	1.406	0.015	0.025	0.081	0.855	46.523	6.734
11	HB7	32.814	0.282	1.379	0.014	0.028	0.079	0.949	47.737	6.928
12	HB8	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
13	HB9	54.6	0.343	1.615	0.017	0.042	0.093	1.438	66.771	9.793
14	HB10	13.394	0.157	0.812	0.009	0.013	0.047	0.45	22.53	3.207
15	HB11	23.574	0.181	0.888	0.009	0.02	0.051	0.668	30.545	4.453
16	HB12	58.31	0.358	1.683	0.018	0.045	0.096	1.527	69.954	10.285
17	HB13	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
25	OVERALL	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459

**City of Monticello
Comprehensive Water Resources Management Plan
Hart Boulevard Watershed P8 Results**

CONCENTRATION (PPM) PRESENT IN THE OUTFLOW OF EACH TREATMENT DEVICE
FOR EACH PARTICLE CLASS

Device Number	Subwatershed Number	1 P 0%	2 P 10%	3 P 30%	4 P 50%	5 P 80%
1	HB1	0.879	10.627	5.322	1.279	0.382
2	HB2	0.705	4.729	1.548	0.539	0.072
3	HB2A	0.918	11.94	6.097	1.316	0.165
4	HB3	0.999	16.626	15.082	11.066	5.813
5	HB3A	0.829	6.833	3.019	1.267	0.253
6	HB3B	0.784	6.525	2.679	1.082	0.207
7	HB4	0.918	11.934	6.089	1.297	0.112
8	HB4B	0.918	12.079	6.551	1.681	0.103
9	HB5	1	16.671	15.22	10.974	5.304
10	HB6	0.883	10.983	7.208	3.503	0.758
11	HB7	0.855	10.331	6.952	4.103	1.691
12	HB8	1	16.349	13.364	7.808	2.774
13	HB9	0.733	6.047	2.126	0.769	0.143
14	HB10	0.579	4.827	1.308	0.341	0.067
15	HB11	0.55	4.345	1.039	0.207	0.039
16	HB12	0.397	2.246	0.446	0.088	0.012
17	HB13	0.578	3.526	1.233	0.358	0.058
25	OVERALL	0.879	10.627	5.322	1.279	0.382

City of Monticello
Comprehensive Water Resources Management Plan
Hart Boulevard Watershed P8 Results

CONCENTRATION (PPM) PRESENT IN THE OUTFLOW OF EACH TREATMENT DEVICE
 FOR EACH WATER QUALITY COMPONENT

Device Number	Subwatershed Number	TSS	TP	TKN	Cu	Pb	Zn	HC	COD	BOD
1	HB1	17.61	0.247	1.257	0.013	0.018	0.072	0.616	38.106	5.408
2	HB2	6.889	0.155	0.841	0.009	0.01	0.048	0.331	16.385	2.293
3	HB2A	19.518	0.266	1.345	0.014	0.02	0.077	0.669	42.623	6.051
4	HB3	48.587	0.424	1.986	0.021	0.039	0.114	1.343	75.563	11.065
5	HB3A	11.373	0.201	1.063	0.011	0.014	0.061	0.463	24.696	3.492
6	HB3B	10.493	0.189	0.999	0.01	0.013	0.057	0.432	23.228	3.275
7	HB4	19.431	0.266	1.345	0.014	0.02	0.077	0.667	42.553	6.041
8	HB4B	20.414	0.272	1.368	0.014	0.02	0.078	0.689	43.732	6.226
9	HB5	48.168	0.425	1.989	0.021	0.039	0.114	1.334	75.502	11.058
10	HB6	22.452	0.275	1.369	0.014	0.021	0.078	0.726	42.9	6.171
11	HB7	23.076	0.269	1.334	0.014	0.022	0.076	0.733	41.643	6.002
12	HB8	40.295	0.392	1.86	0.02	0.034	0.107	1.157	69.032	10.046
13	HB9	9.085	0.172	0.918	0.01	0.011	0.053	0.388	20.94	2.935
14	HB10	6.543	0.132	0.711	0.007	0.009	0.041	0.292	16.048	2.231
15	HB11	5.63	0.122	0.662	0.007	0.008	0.038	0.264	14.254	1.974
16	HB12	2.794	0.081	0.448	0.005	0.005	0.026	0.162	7.42	1.025
17	HB13	5.176	0.124	0.677	0.007	0.008	0.039	0.261	12.371	1.736
25	OVERALL	17.61	0.247	1.257	0.013	0.018	0.072	0.616	38.106	5.408

**City of Monticello
Comprehensive Water Resources Management Plan
TH25/Klein Farms South Watershed P8 Results**

Subwatershed Identification	Index Number	Area (acres)	Impervious Fraction	ON	Treatment Device Number	Infiltration Rate (in./hour)	Flows to Number	Area of Pond (acres)		Storage at HWL (acre-feet)	Peak Discharge Rate (cfs)
								Bottom	NWHL		
KFS1	1	51.8	0.35	74	1	---	3	---	---	---	---
KFS2	2	53.4	0.30	72	2	---	3	0.25	1.00	5.40	7.2
KFS3	3	104.4	0.30	72	3	---	16	0.50	3.00	18.06	9.8
KFS4	4	111.9	0.35	74	4	---	3	6.00	7.00	8.60	6.3
KFS5	5	52.7	0.33	73	5	---	4	1.30	2.30	3.89	5.1
KFS6	6	60.5	0.30	72	6	---	5	0.01	1.00	8.30	2.7
KFS7	7	129.0	0.30	72	7	---	0	2.50	3.00	3.63	30.0
TH1	8	15.4	0.62	84	8	---	17	0.25	1.00	1.40	1.8
TH2	9	40.5	0.62	84	9	---	10	0.50	2.43	5.00	5.7
TH3	10	32.5	0.72	88	10	---	17	0.65	3.25	4.81	5.3
TH4	11	21.0	0.41	76	11	---	17	0.50	1.00	2.50	1.6
TH5	12	23.6	0.65	85	12	---	17	0.50	1.42	3.55	8.4
TH6	13	26.5	0.85	92	13	---	12	---	---	---	---
TH7	14	15.5	0.85	92	14	---	16	---	---	---	---
TH8	15	18.7	0.85	92	15	---	16	0.10	1.00	1.68	11.9
TH9	16	98.5	0.72	88	16	---	17	0.89	1.00	1.50	67.1
TH9A	17	37.0	0.72	88	17	---	0	14.60	63.90	76.00	8.0
TH10	18	78.0	0.89	94	18	---	16	4.00	7.80	9.12	7.0
TH10A&11	19	40.6	0.69	86	19	---	16	---	---	---	---
TH12	20	28.4	0.81	89	20	---	18	0.25	1.00	2.09	8.2
TH13	21	244.6	0.62	84	21	---	16	4.03	10.50	19.07	8.8
TH14	22	152.0	0.62	84	22	---	17	1.00	3.20	6.40	28.2
TH15	23	113.0	0.49	79	23	---	17	1.50	4.00	9.73	17.1
TH16	24	35.8	0.52	80	24	---	16	1.00	2.00	3.30	6.5

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PERCENT REMOVAL EFFICIENCY OF TREATMENT DEVICE
FOR EACH PARTICLE CLASS

Device Number	Subwatershed Number	1 P 0%	2 P 10%	3 P 30%	4 P 50%	5 P 80%
1	KFS1	0	0	0	0	0
2	KFS2	0	58.6	85.1	96.1	99.6
3	KSF3	0	44.5	87.7	97.5	99.8
4	KFS4	0	78.1	97.1	99.4	100
5	KFS5	0	61	90.9	98.1	99.9
6	KFS6	0	62.7	92.1	98.4	99.9
7	KFS7	0	61.8	86.5	94.9	99.5
8	TH1	0	69.3	91.6	98	99.8
9	TH2	0	68.1	91.1	97.9	99.8
10	TH3	0	61.7	91.3	98.3	99.9
11	TH4	0	72.5	93.4	98.5	99.9
12	TH5	0	45.2	77.9	93.5	99.4
13	TH6	0	0	0	0	0
14	TH7	0	0	0	0	0
15	TH8	0	54.8	78.2	91.9	99.2
16	TH9	0	3.9	19	48.5	90.2
17	TH9A	0	59.5	94.6	98.8	99.9
18	TH10	0	67	94	98.8	99.9
19	TH10A&11	0	0	0	0	0
20	TH12	0	47	76.2	92	99.3
21	TH13	0	65.5	94	98.8	99.9
22	TH14	0	41.7	74.3	91.7	99.3
23	TH15	0	61.8	88.3	97	99.8
24	TH16	0	70.1	92.6	98.2	99.9
25	OVERALL	0	79.8	98.2	99.6	100

City of Monticello
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TH25/Klein Farms South Watershed P8 Results

PERCENT REMOVAL EFFICIENCY OF TREATMENT DEVICE
 FOR EACH WATER QUALITY COMPONENT

Device Number	Subwatershed Number	TSS	TP	TKN	Cu	Pb	Zn	HC	COD	BOD
1	KFS1	0	0	0	0	0	0	0	0	0
2	KFS2	87.8	53	44.6	44.6	77.6	44.6	77.6	75.2	76.4
3	KSF3	82.6	37.9	29.9	29.9	65.7	29.9	65.7	64.3	66.3
4	KFS4	94.9	60.7	51.1	51.1	83.8	51.1	83.8	87.3	88.2
5	KFS5	87.9	43.4	34.5	34.5	71	34.5	71	74.5	75.8
6	KFS6	90.6	55.9	47.1	47.1	80	47.1	80	78.9	80.2
7	KFS7	88.4	53.7	45.3	45.3	78.1	45.3	78.1	76.9	78
8	TH1	91.7	57.2	48.2	48.2	81.1	48.2	81.1	81.9	82.9
9	TH2	91.4	56.8	47.9	47.9	80.7	47.9	80.7	81.2	82.2
10	TH3	88.5	45.2	36.1	36.1	72.4	36.1	72.4	75.4	76.7
11	TH4	92.8	58.4	49.2	49.2	82	49.2	82	83.8	84.8
12	TH5	83.1	47.8	40.3	40.3	73.4	40.3	73.4	67	68.5
13	TH6	0	0	0	0	0	0	0	0	0
14	TH7	0	0	0	0	0	0	0	0	0
15	TH8	84.7	49.7	41.8	41.8	74.8	41.8	74.8	71.4	72.5
16	TH9	41	8.1	6.1	6.1	29.5	6.1	29.5	19.6	20.6
17	TH9A	77.9	29.2	21.8	21.8	48.4	21.8	48.4	65.3	66.6
18	TH10	91.2	53.2	44	44	78.3	44	78.3	80.1	81.4
19	TH10A&11	0	0	0	0	0	0	0	0	0
20	TH12	82.7	47.5	40	40	73.1	40	73.1	67.4	68.7
21	TH13	91.6	57.1	48.1	48.1	80.9	48.1	80.9	80.7	81.9
22	TH14	81.2	45.9	38.6	38.6	71.8	38.6	71.8	64.4	65.9
23	TH15	89.3	54.6	46	46	78.9	46	78.9	77.5	78.7
24	TH16	92.1	57.6	48.5	48.5	81.4	48.5	81.4	82.5	83.5
25	OVERALL	95.5	61.3	51.7	51.7	84.4	51.7	84.4	88.4	89.2

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CONCENTRATION (PPM) PRESENT IN THE INFLOW OF EACH TREATMENT DEVICE
 FOR EACH PARTICLE CLASS

Device Number	Subwatershed Number	P 0%	P 10%	P 30%	P 50%	P 80%
1	KFS1	1	16.849	16.849	16.849	33.699
2	KFS2	1	16.849	16.849	16.849	33.698
3	KSF3	0.766	8.641	6.572	6.088	11.912
4	KFS4	1	16.849	16.849	16.849	33.699
5	KFS5	0.971	11.448	8.929	8.383	16.514
6	KFS6	1	16.849	16.849	16.849	33.698
7	KFS7	1	16.849	16.849	16.849	33.699
8	TH1	1	16.849	16.849	16.849	33.699
9	TH2	1	16.849	16.849	16.849	33.699
10	TH3	0.889	10.866	8.902	8.308	16.284
11	TH4	1	16.849	16.849	16.849	33.699
12	TH5	1	16.849	16.849	16.849	33.698
13	TH6	1	16.849	16.849	16.849	33.699
14	TH7	1	16.849	16.849	16.849	33.699
15	TH8	1	16.849	16.849	16.849	33.699
16	TH9	0.807	7.632	4.358	3.738	7.149
17	TH9A	0.829	7.7	3.749	2.074	1.611
18	TH10	0.988	14.873	13.656	12.99	25.372
19	TH10A&11	1	16.849	16.849	16.849	33.699
20	TH12	1	16.849	16.849	16.849	33.699
21	TH13	1	16.849	16.849	16.849	33.699
22	TH14	1	16.849	16.849	16.849	33.699
23	TH15	1	16.849	16.849	16.849	33.698
24	TH16	1	16.849	16.849	16.849	33.698
25	OVERALL	1	16.849	16.849	16.849	33.699

City of Monticello
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TH25/Klein Farms South Watershed P8 Results

CONCENTRATION (PPM) PRESENT IN THE INFLOW OF EACH TREATMENT DEVICE
 FOR EACH WATER QUALITY COMPONENT

Device Number	Subwatershed Number	TSS	TP	TKN	GH	Pb	Zn	HC	COD	BOD
1	KFS1	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
2	KFS2	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
3	KSF3	33.213	0.254	1.246	0.013	0.028	0.071	0.939	43.541	6.341
4	KFS4	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
5	KFS5	45.273	0.333	1.623	0.017	0.037	0.093	1.261	58.5	8.529
6	KFS6	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
7	KFS7	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
8	TH1	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
9	TH2	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
10	TH3	44.36	0.316	1.527	0.016	0.036	0.088	1.22	56.555	8.263
11	TH4	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
12	TH5	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.061	14.459
13	TH6	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
14	TH7	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
15	TH8	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
16	TH9	22.878	0.226	1.152	0.012	0.021	0.066	0.716	33.977	4.884
17	TH9A	15.134	0.216	1.12	0.012	0.016	0.064	0.548	29.238	4.157
18	TH10	66.891	0.415	1.945	0.02	0.051	0.112	1.752	81.587	11.982
19	TH10A&11	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
20	TH12	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
21	TH13	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
22	TH14	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
23	TH15	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
24	TH16	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
25	OVERALL	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459

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CONCENTRATION (PPM) PRESENT IN THE OUTFLOW OF EACH TREATMENT DEVICE
 FOR EACH PARTICLE CLASS

Device Number	Subwatershed Number	P10%	P10%	P30%	P50%	P80%
1	KFS1	1	16.849	16.849	16.849	33.698
2	KFS2	0.893	6.941	2.507	0.658	0.12
3	KSF3	0.72	4.771	0.81	0.153	0.027
4	KFS4	0.435	2.883	0.489	0.103	0.016
5	KFS5	0.748	4.329	0.809	0.158	0.023
6	KFS6	0.944	6.272	1.339	0.271	0.05
7	KFS7	0.726	6.06	2.278	0.867	0.158
8	TH1	0.75	5.053	1.408	0.332	0.051
9	TH2	0.785	5.29	1.495	0.348	0.055
10	TH3	0.718	4.098	0.772	0.138	0.02
11	TH4	0.657	4.391	1.105	0.256	0.04
12	TH5	0.958	9.21	3.729	1.096	0.192
13	TH6	1	16.849	16.849	16.849	33.698
14	TH7	1	16.849	16.849	16.849	33.698
15	TH8	0.92	7.598	3.674	1.371	0.261
16	TH9	0.8	7.332	3.531	1.924	0.701
17	TH9A	0.769	3.421	0.275	0.034	0.003
18	TH10	0.707	4.633	0.822	0.157	0.024
19	TH10A&11	1	16.849	16.849	16.849	33.698
20	TH12	0.952	8.909	4.018	1.341	0.243
21	TH13	0.808	5.642	1.009	0.207	0.035
22	TH14	0.971	9.8	4.337	1.399	0.249
23	TH15	0.831	6.341	1.973	0.502	0.081
24	TH16	0.682	4.783	1.254	0.304	0.046
25	OVERALL	0.767	3.582	0.397	0.085	0.012

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TH25/Klein Farms South Watershed P8 Results

CONCENTRATION (PPM) PRESENT IN THE OUTFLOW OF EACH TREATMENT DEVICE
 FOR EACH WATER QUALITY COMPONENT

Device Number	Subwatershed Number	TSS	TP	TKN	Cu	Pb	Zn	HC	COD	BOD
1	KFS1	84.245	0.473	2.173	0.023	0.063	0.125	2.145	98.059	14.458
2	KFS2	10.226	0.205	1.1	0.012	0.013	0.063	0.453	24.039	3.372
3	KSF3	5.761	0.15	0.829	0.009	0.009	0.048	0.31	15.38	2.116
4	KFS4	3.492	0.091	0.501	0.005	0.005	0.029	0.187	9.299	1.28
5	KFS5	5.319	0.152	0.845	0.009	0.009	0.048	0.307	14.203	1.96
6	KFS6	7.932	0.199	1.095	0.011	0.012	0.063	0.414	20.595	2.848
7	KFS7	9.363	0.173	0.918	0.01	0.012	0.053	0.392	21.216	2.981
8	TH1	6.845	0.162	0.883	0.009	0.01	0.051	0.342	17.046	2.373
9	TH2	7.188	0.169	0.925	0.01	0.011	0.053	0.358	17.873	2.489
10	TH3	5.029	0.145	0.809	0.008	0.009	0.046	0.293	13.46	1.858
11	TH4	5.792	0.14	0.769	0.008	0.009	0.044	0.295	14.656	2.035
12	TH5	14.228	0.24	1.257	0.013	0.016	0.072	0.56	32.18	4.53
13	TH6	84.245	0.473	2.173	0.023	0.063	0.125	2.145	98.061	14.458
14	TH7	84.245	0.473	2.173	0.023	0.063	0.125	2.145	98.06	14.458
15	TH8	12.903	0.225	1.186	0.012	0.015	0.068	0.52	27.803	3.945
16	TH9	13.488	0.207	1.075	0.011	0.015	0.062	0.504	27.293	3.875
17	TH9A	3.733	0.146	0.828	0.009	0.008	0.047	0.276	11	1.503
18	TH10	5.635	0.147	0.813	0.009	0.009	0.047	0.303	14.992	2.065
19	TH10A&11	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.061	14.459
20	TH12	14.511	0.24	1.257	0.013	0.017	0.072	0.565	31.863	4.506
21	TH13	6.893	0.171	0.94	0.01	0.01	0.054	0.357	18.199	2.506
22	TH14	15.785	0.251	1.305	0.014	0.018	0.075	0.598	34.771	4.912
23	TH15	8.897	0.187	1.009	0.011	0.012	0.058	0.408	21.528	3.005
24	TH16	6.387	0.148	0.807	0.008	0.009	0.046	0.314	15.99	2.222
25	OVERALL	4.076	0.147	0.833	0.009	0.008	0.048	0.283	11.624	1.593

**City of Monticello
Comprehensive Water Resources Management Plan
Meadow Oaks Watershed P8 Results**

Subwatershed Identification	Index Number	Area (acres)	Imperious Fraction	CN	Treatment Device Number	Infiltration Rate (in/hour)	Flows to Number	Area of Pore (acres)		Storage at HWL (acre-feet)	Peak Discharge Rate (cfs)
								Bottom	NWL		
1	MO-1	19	0.3	72	1	-	0	-	-	-	-
2	MO-2	9.8	0.3	73	2	-	1	0.17	0.61	2.6	12.5
3	MO-3	9.25	0.3	73	3	-	1	0.04	1.52	4.0	9.2
4	MO-4	22.7	0.51	79	4	-	1	2.00	4.75	11.0	18.5
5	MO-5	9.5	0.61	85	5	-	4	-	0.90	1.0	8.4
6	MO-6	11.7	0.65	85	6	-	4	0.00	0.83	1.4	21.4
7	MO-7	9	0.3	73	7	-	6	-	2.00	5.4	39.5
8	MO-8	7.85	0.3	71	8	-	6	-	2.50	7.2	23.5
9	MO-9	55.3	0.38	74	9	-	6	3.00	4.40	61.2	9.8
10	MO-10	34	0.3	72	10	-	6	1.50	2.00	21.3	1.5
11	MO-11	8.4	0.38	75	11	-	9	0.04	0.19	4.30	10.3
12	MO-12	21.6	0.38	75	12	-	11	-	-	-	-
13	MO-13	21.3	0.38	76	13	-	11	2.50	3.00	21.9	7.2
14	MO-14	4.8	0.3	72	14	-	11	-	-	-	-
15	MO-15	20.4	0.3	72	15	-	13	-	0.01	1.3	27.4
16	MO-16	24.5	0.3	72	16	-	13	0.04	0.37	4.5	1.9
17	MO-17	107	0.3	72	17	-	13	5.80	7.30	41.3	2.8
18	MO-18	60.7	0.3	72	18	-	17	-	-	-	-
19	MO-13A	6.4	0.3	72	19	-	13	-	-	-	-

**City of Monticello
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Meadow Oaks Watershed P8 Results**

PERCENT REMOVAL EFFICIENCY OF TREATMENT DEVICE
FOR EACH PARTICLE CLASS

Device Number	Subwatershed Number	Particle Class				
		P 0%	P 10%	P 30%	P 50%	P 80%
1	MO-1	0	0	0	0	0
2	MO-2	0	53.5	75.7	87.5	98.4
3	MO-3	0	72.3	87.8	94.9	99.5
4	MO-4	0	27.3	73	92.8	99.4
5	MO-5	0	0.8	7.7	29.5	80.7
6	MO-6	0	0.2	1.7	7.4	43.8
7	MO-7	0	80.5	96.5	99.4	99.9
8	MO-8	0	1.5	13.5	43.7	88.6
9	MO-9	0	52.1	91.7	98.3	99.9
10	MO-10	0	80.2	97.3	99.4	100
11	MO-11	0	10.8	52.5	84.7	98.3
12	MO-12	0	0	0	0	0
13	MO-13	0	53.1	90.9	98.1	99.8
14	MO-14	0	0	0	0	0
15	MO-15	0	1.1	9.7	33.5	82.7
16	MO-16	0	51.6	80.6	94.1	99.5
17	MO-17	0	76.1	97.3	99.5	99.9
18	MO-18	0	0	0	0	0
19	MO-13A	0	0	0	0	0
25	OVERALL	0	69.2	90.8	95	96.3

**City of Monticello
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PERCENT REMOVAL EFFICIENCY OF TREATMENT DEVICE
FOR EACH WATER QUALITY COMPONENT

Device Number	Subwatershed Number	TSS	TP	TKN	Cu	Pb	Zn	HC	COD	BOD
1	MO-1	0	0	0	0	0	0	0	0	0
2	MO-2	82.7	47.9	40.3	40.3	73.1	40.3	73.1	69.7	70.7
3	MO-3	90.8	56.3	47.4	47.4	80.2	47.4	80.2	82.1	82.8
4	MO-4	67.1	25.6	19.6	19.6	48.4	19.6	48.4	45.4	47.6
5	MO-5	39.9	8.4	7.1	7.1	35.3	7.1	35.3	21.2	21.7
6	MO-6	11.6	0.7	0.5	0.5	7.2	0.5	7.2	4.1	4.3
7	MO-7	95.2	61	51.4	51.4	84.1	51.4	84.1	88.3	89
8	MO-8	47.2	13	10.9	10.9	41.7	10.9	41.7	25.8	26.4
9	MO-9	82.7	35.4	27.4	27.4	62	27.4	62	66.2	67.9
10	MO-10	95.4	61.2	51.5	51.5	84.2	51.5	84.2	88.4	89.1
11	MO-11	59.2	16.8	12.7	12.7	42	12.7	42	33	35
12	MO-12	0	0	0	0	0	0	0	0	0
13	MO-13	81.5	34.7	26.7	26.7	59.5	26.7	59.5	65.6	67.2
14	MO-14	0	0	0	0	0	0	0	0	0
15	MO-15	41.9	9.8	8.2	8.2	37	8.2	37	22.6	23.1
16	MO-16	85.1	50	42.1	42.1	75.1	42.1	75.1	70.7	72.1
17	MO-17	94.5	60.3	50.8	50.8	83.5	50.8	83.5	86.4	87.4
18	MO-18	0	0	0	0	0	0	0	0	0
19	MO-13A	0	0	0	0	0	0	0	0	0
25	OVERALL	89.5	56.4	47.5	47.5	79.1	47.5	79.1	80.6	81.6

**City of Monticello
Comprehensive Water Resources Management Plan
Meadow Oaks Watershed P8 Results**

CONCENTRATION (PPM) PRESENT IN THE INFLOW OF EACH TREATMENT DEVICE
FOR EACH PARTICLE CLASS

Device Number	Subwatershed Number	1 P 0%	2 P 10%	3 P 30%	4 P 50%	5 P 80%	6 P 80%
1	MO-1	0.549	4.519	1.562	0.848	1.248	33.699
2	MO-2	1	16.849	16.849	16.849	16.849	33.699
3	MO-3	1	16.849	16.849	16.849	16.849	33.699
4	MO-4	0.545	5.505	3.366	2.82	3.941	33.699
5	MO-5	1	16.849	16.849	16.849	16.849	33.699
6	MO-6	0.483	3.964	1.605	1.224	2.059	33.699
7	MO-7	1	16.849	16.849	16.849	16.849	33.699
8	MO-8	1	16.849	16.849	16.849	16.849	33.699
9	MO-9	0.651	6.917	4.401	3.63	6.698	33.699
10	MO-10	1	16.849	16.849	16.849	16.849	33.699
11	MO-11	0.572	5.036	2.848	2.576	5.047	33.699
12	MO-12	1	16.849	16.849	16.849	16.849	33.699
13	MO-13	0.646	6.715	4.217	3.407	5.13	33.699
14	MO-14	1	16.849	16.849	16.849	16.849	33.699
15	MO-15	1	16.849	16.849	16.849	16.849	33.699
16	MO-16	1	16.849	16.849	16.849	16.849	33.699
17	MO-17	1	16.849	16.849	16.849	16.849	33.699
18	MO-18	1	16.849	16.849	16.849	16.849	33.699
19	MO-13A	1	16.849	16.849	16.849	16.849	33.699
25	OVERALL	1	16.861	16.861	16.861	16.861	33.722

**City of Monticello
Comprehensive Water Resources Management Plan
Meadow Oaks Watershed P8 Results**

CONCENTRATION (PPM) PRESENT IN THE INFLOW OF EACH TREATMENT DEVICE
FOR EACH WATER QUALITY COMPONENT

Device Number	Subwatershed Number	TGS	TP	TKN	Cu	Pb	Zn	HC	COD	BOD
1	MO-1	8.177	0.13	0.693	0.007	0.009	0.04	0.321	16.447	2.311
2	MO-2	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
3	MO-3	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
4	MO-4	15.631	0.159	0.804	0.008	0.014	0.046	0.488	24.077	3.467
5	MO-5	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
6	MO-6	8.852	0.119	0.627	0.007	0.009	0.036	0.32	15.561	2.204
7	MO-7	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
8	MO-8	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
9	MO-9	21.645	0.196	0.984	0.01	0.019	0.056	0.65	31.481	4.545
10	MO-10	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
11	MO-11	15.507	0.156	0.8	0.008	0.014	0.046	0.492	22.704	3.264
12	MO-12	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
13	MO-13	19.468	0.192	0.964	0.01	0.018	0.055	0.6	29.643	4.274
14	MO-14	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
15	MO-15	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
16	MO-16	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
17	MO-17	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
18	MO-18	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
19	MO-13A	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
25	OVERALL	84.305	0.473	2.174	0.023	0.063	0.125	2.147	98.129	14.469

**City of Monticello
Comprehensive Water Resources Management Plan
Meadow Oaks Watershed P8 Results**

CONCENTRATION (PPM) PRESENT IN THE OUTFLOW OF EACH TREATMENT DEVICE
FOR EACH PARTICLE CLASS

Device Number	Subwatershed Number	CONCENTRATION (PPM)				
		P 0%	P 10%	P 30%	P 50%	P 80%
1	MO-1	0.544	4.514	1.563	0.848	1.249
2	MO-2	0.922	7.807	4.092	2.108	0.543
3	MO-3	0.707	4.587	2.06	0.852	0.171
4	MO-4	0.521	3.971	0.909	0.202	0.025
5	MO-5	0.999	16.7	15.538	11.869	6.491
6	MO-6	0.483	3.956	1.579	1.133	1.158
7	MO-7	0.779	3.288	0.593	0.107	0.017
8	MO-8	0.999	16.583	14.574	9.475	3.838
9	MO-9	0.433	2.905	0.366	0.062	0.01
10	MO-10	0.427	2.683	0.462	0.096	0.015
11	MO-11	0.566	4.485	1.353	0.393	0.088
12	MO-12	1	16.849	16.849	16.849	33.699
13	MO-13	0.497	2.958	0.386	0.066	0.009
14	MO-14	0.999	16.838	16.838	16.838	33.677
15	MO-15	1	16.663	15.22	11.209	5.835
16	MO-16	0.918	8.097	3.264	0.999	0.176
17	MO-17	0.491	3.242	0.456	0.092	0.017
18	MO-18	1	16.849	16.849	16.849	33.699
19	MO-13A	0.999	16.841	16.841	16.841	33.682
25	OVERALL	0.544	4.514	1.563	0.848	1.249

**City of Monticello
Comprehensive Water Resources Management Plan
Meadow Oaks Watershed P8 Results**

CONCENTRATION (PPM) PRESENT IN THE OUTFLOW OF EACH TREATMENT DEVICE
FOR EACH WATER QUALITY COMPONENT

Device Number	Subwatershed Number	TSS	TP	TKN	Cu	Pb	Zn	HC	COD	BOD
1	MO-1	8.175	0.13	0.688	0.007	0.009	0.039	0.32	16.428	2.309
2	MO-2	14.55	0.234	1.221	0.013	0.016	0.07	0.558	29.486	4.201
3	MO-3	7.67	0.159	0.859	0.009	0.01	0.049	0.349	16.856	2.387
4	MO-4	5.108	0.115	0.622	0.007	0.007	0.036	0.245	13.008	1.8
5	MO-5	50.598	0.433	2.018	0.021	0.041	0.116	1.388	77.187	11.319
6	MO-6	7.825	0.118	0.624	0.007	0.009	0.036	0.297	14.924	2.109
7	MO-7	4.006	0.149	0.843	0.009	0.008	0.048	0.285	11.085	1.532
8	MO-8	44.47	0.411	1.934	0.02	0.037	0.111	1.25	72.74	10.629
9	MO-9	3.343	0.09	0.495	0.005	0.005	0.028	0.183	9.18	1.257
10	MO-10	3.256	0.088	0.487	0.005	0.005	0.028	0.18	8.697	1.198
11	MO-11	6.319	0.129	0.692	0.007	0.008	0.04	0.284	15.181	2.117
12	MO-12	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
13	MO-13	3.419	0.1	0.559	0.006	0.006	0.032	0.201	9.453	1.296
14	MO-14	84.192	0.472	2.172	0.023	0.063	0.125	2.144	97.999	14.449
15	MO-15	48.927	0.426	1.994	0.021	0.04	0.114	1.351	75.93	11.122
16	MO-16	12.537	0.223	1.177	0.012	0.015	0.068	0.511	28.416	4.001
17	MO-17	3.807	0.102	0.562	0.006	0.006	0.032	0.208	10.331	1.417
18	MO-18	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
19	MO-13A	84.206	0.472	2.172	0.023	0.063	0.125	2.144	98.014	14.452
25	OVERALL	8.175	0.13	0.688	0.007	0.009	0.039	0.32	16.428	2.309

**City of Monticello
Comprehensive Water Resources Management Plan
Mississippi River Watershed P8 Results-Model #1 & #2**

Sub-watershed Identification	Index Number	Area (acres)	Impervious Fraction	CN	Treatment Device Number	Infiltration Rate (in/hour)	Flows to Number		Area of Pond (acres)		Storage at HWL (acre-feet)	Peak Discharge Rate (cfs)
							Bottom	NWL	Bottom	HWL		
MR 1	1	62.0	0.38	63	1	---	0	1.00	---	2.00	N/A	N/A
MR 2	2	28.7	0.51	80	2	---	0	---	---	---	N/A	N/A
MR 3	3	20.3	0.51	80	3	---	0	---	---	---	N/A	N/A
MR 4	4	63.7	0.38	67	4	---	0	---	---	---	N/A	N/A
MR 5	5	111.8	0.38	76	5	---	0	---	---	---	N/A	N/A
MR 6	6	70.0	0.72	89	6	---	0	---	---	---	N/A	N/A
MR 7	7	9.5	0.65	84	7	---	0	---	---	---	N/A	N/A
MR 8	8	20.7	0.72	83	8	---	10	0.00	---	0.70	3.2	6.7
MR 9	9	65.6	0.72	87	9	---	0	0.50	---	3.60	11.5	29.9
MR 10	10	119.6	0.65	76	10	---	0	---	---	---	N/A	N/A
MR 11	11	21.4	0.30	60	11	---	0	0.00	---	1.60	N/A	N/A
MR 12	12	76.1	0.38	61	12	---	0	0.50	---	3.60	N/A	N/A
MR 13	13	6.8	0.38	61	13	---	17	0.50	0.50	2.50	N/A	N/A
MR 14	14	54.1	0.38	62	14	---	16	---	---	---	N/A	N/A
MR 15	15	33.9	0.72	82	15	---	16	1.10	0.80	1.60	5.0	25.0
MR 16	16	134.6	0.38	59	16	---	17	4.00	2.00	4.50	15.3	48.7
MR 17	17	10.3	0.38	61	17	---	18	0.10	---	0.17	0.2	111.6
MR 18	18	62.1	0.38	62	18	---	0	0.14	---	1.90	1.7	150.1
MR 19	19	51.8	0.38	57	19	---	0	---	---	---	N/A	N/A
MR 20	20	63.7	0.38	63	20	---	17	---	---	---	N/A	N/A
MR 21	21	64.2	0.38	59	21	---	0	0.20	---	2.70	7.5	44.0
MR 22	22	74.3	0.38	66	22	---	21	2.50	2.00	4.00	12.9	18.9
MR 23	23	43.7	0.72	79	23	---	22	1.50	0.75	2.25	6.5	22.5
MR 24	24	293.6	0.38	64	24	---	0	---	---	---	N/A	N/A
MR 25	25	289.6	0.72	84	25	---	0	3.50	3.50	10.00	32.7	298.3
MR 26	26	60.7	0.72	88	26	---	21	2.50	2.50	3.50	13.1	25.6
MR 27	27	18.8	0.72	88	27	---	21	---	---	---	N/A	N/A

City of Monticello
Comprehensive Water Resources Management Plan
Mississippi River Watershed P8 Results-Model #1

PERCENT REMOVAL EFFICIENCY OF TREATMENT DEVICE
 FOR EACH PARTICLE CLASS

Device Number	Subwatershed Number	Percent Removal Efficiency				
		P 0%	P 10%	P 30%	P 50%	P 80%
1	MR-1	0	0	0	0	0
2	MR-2	0	0	0	0	0
3	MR-3	0	0	0	0	0
4	MR-4	0	0	0	0	0
5	MR-5	0	0	0	0	0
6	MR-6	0	0	0	0	0
7	MR-7	0	0	0	0	0
8	MR-8	0	0.5	5.1	21	72.7
9	MR-9	0	6.5	37.8	74.4	96.8
10	MR-10	0	0	0	0	0
11	MR-11	0	0	0	0	0
12	MR-12	0	10.1	46.6	80.7	97.7
13	MR-13	0	83.4	95.4	98	99.8
14	MR-14	0	0	0	0	0
15	MR-15	0	48.8	76	88.1	98.6
16	MR-16	0	47.3	77.4	92.3	99.3
17	MR-17	0	2.1	14.3	40	83.7
18	MR-18	0	2.1	11.7	33	80.9
19	MR-19	0	0	0	0	0
20	MR-20	0	0	0	0	0
25	OVERALL	0	13.3	26.5	37.9	47.6

City of Monticello
Comprehensive Water Resources Management Plan
Mississippi River Watershed P8 Results-Model #1

PERCENT REMOVAL EFFICIENCY OF TREATMENT DEVICE
FOR EACH WATER QUALITY COMPONENT

Device Number	Subwatershed Number	TSS	TP	TKN	Cu	Pb	Zn	H/C	CO2	BOD
1	MR-1	0	0	0	0	0	0	0	0	0
2	MR-2	0	0	0	0	0	0	0	0	0
3	MR-3	0	0	0	0	0	0	0	0	0
4	MR-4	0	0	0	0	0	0	0	0	0
5	MR-5	0	0	0	0	0	0	0	0	0
6	MR-6	0	0	0	0	0	0	0	0	0
7	MR-7	0	0	0	0	0	0	0	0	0
8	MR-8	34.4	5.9	5	5	30.4	5	30.4	18.1	18.4
9	MR-9	62.5	26.2	22.1	22.1	55.2	22.1	55.2	37.9	39.4
10	MR-10	0	0	0	0	0	0	0	0	0
11	MR-11	0	0	0	0	0	0	0	0	0
12	MR-12	66.6	30.4	25.6	25.6	58.8	25.6	58.8	42.3	44
13	MR-13	95.3	61.2	51.5	51.5	84.2	51.5	84.2	89.3	89.9
14	MR-14	0	0	0	0	0	0	0	0	0
15	MR-15	82	47	39.6	39.6	72.5	39.6	72.5	67.6	68.9
16	MR-16	82	44.5	36.8	36.8	70.5	36.8	70.5	66.3	67.7
17	MR-17	32	6.2	4.8	4.8	23	4.8	23	14.3	15.1
18	MR-18	27.2	5.6	4.4	4.4	20	4.4	20	12.2	12.9
19	MR-19	0	0	0	0	0	0	0	0	0
20	MR-20	0	0	0	0	0	0	0	0	0
25	OVERALL	34.6	17.2	14.5	14.5	30.6	14.5	30.6	25.2	25.8

**City of Monticello
Comprehensive Water Resources Management Plan
Mississippi River Watershed P8 Results-Model #1**

CONCENTRATION (PPM) PRESENT IN THE INFLOW OF EACH TREATMENT DEVICE
FOR EACH PARTICLE CLASS

Device Number	Subwatershed Number	Particle Class				
		P 0%	P 10%	P 30%	P 50%	P 80%
1	MR-1	1	17.185	17.185	17.185	34.37
2	MR-2	1	16.849	16.849	16.849	33.699
3	MR-3	1	16.849	16.849	16.849	33.699
4	MR-4	1	16.849	16.849	16.849	33.699
5	MR-5	1	16.849	16.849	16.849	33.699
6	MR-6	1	16.849	16.849	16.849	33.698
7	MR-7	1	16.849	16.849	16.849	33.698
8	MR-8	1	16.849	16.849	16.849	33.699
9	MR-9	1	16.849	16.849	16.849	33.699
10	MR-10	1.001	16.844	16.721	16.288	29.774
11	MR-11	1	16.849	16.849	16.849	33.698
12	MR-12	1	16.849	16.849	16.849	33.699
13	MR-13	1	16.849	16.849	16.849	33.699
14	MR-14	1	16.849	16.849	16.849	33.699
15	MR-15	1	16.849	16.849	16.849	33.698
16	MR-16	0.974	14.732	13.598	13.082	25.264
17	MR-17	0.918	9.397	5.731	4.116	6.775
18	MR-18	0.927	10.385	6.803	4.762	6.326
19	MR-19	1	16.849	16.849	16.849	33.698
20	MR-20	1	16.849	16.849	16.849	33.699
25	OVERALL	1	16.866	16.866	16.866	33.731

City of Monticello
Comprehensive Water Resources Management Plan
Mississippi River Watershed P8 Results-Model #1

CONCENTRATION (PPM) PRESENT IN THE INFLOW OF EACH TREATMENT DEVICE
 FOR EACH WATER QUALITY COMPONENT

Device Number	Subwatershed Number	TSS	TP	TKN	Cu	Pb	Zn	HC	COD	BOD
1	MR-1	85.924	0.479	2.197	0.023	0.064	0.126	2.183	99.983	14.742
2	MR-2	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
3	MR-3	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
4	MR-4	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
5	MR-5	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
6	MR-6	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
7	MR-7	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
8	MR-8	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
9	MR-9	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
10	MR-10	79.628	0.468	2.157	0.023	0.06	0.124	2.042	95.264	14.039
11	MR-11	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
12	MR-12	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
13	MR-13	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
14	MR-14	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
15	MR-15	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
16	MR-16	66.676	0.412	1.929	0.02	0.051	0.111	1.744	81.096	11.913
17	MR-17	26.018	0.266	1.343	0.014	0.024	0.077	0.815	40.679	5.855
18	MR-18	28.276	0.284	1.416	0.015	0.025	0.081	0.868	44.831	6.468
19	MR-19	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
20	MR-20	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
25	OVERALL	84.328	0.473	2.174	0.023	0.063	0.125	2.147	98.155	14.472

City of Monticello
Comprehensive Water Resources Management Plan
Mississippi River Watershed P8 Results-Model #1

CONCENTRATION (PPM) PRESENT IN THE OUTFLOW OF EACH TREATMENT DEVICE
 FOR EACH PARTICLE CLASS

Device Number	Subwatershed Number	Particle Class				
		P 0%	P 10%	P 30%	P 50%	P 80%
1	MR-1	1	17.185	17.185	17.185	34.37
2	MR-2	1	16.849	16.849	16.849	33.699
3	MR-3	1	16.849	16.849	16.849	33.699
4	MR-4	1	16.849	16.849	16.849	33.699
5	MR-5	1	16.849	16.849	16.849	33.698
6	MR-6	1	16.849	16.849	16.849	33.698
7	MR-7	1	16.849	16.849	16.849	33.699
8	MR-8	1.003	16.818	16.052	13.352	9.232
9	MR-9	0.999	15.743	10.469	4.315	1.068
10	MR-10	1.001	16.844	16.721	16.288	29.774
11	MR-11	1	16.849	16.849	16.849	33.698
12	MR-12	1	15.146	8.99	3.246	0.765
13	MR-13	0.328	2.18	0.781	0.334	0.065
14	MR-14	1	16.849	16.849	16.849	33.699
15	MR-15	0.899	8.51	4.043	2.01	0.475
16	MR-16	0.913	7.715	3.065	1.012	0.178
17	MR-17	0.913	9.15	4.885	2.455	1.101
18	MR-18	0.923	10.124	5.982	3.174	1.202
19	MR-19	1	16.849	16.849	16.849	33.699
20	MR-20	1	16.849	16.849	16.849	33.698
25	OVERALL	0.976	14.562	12.355	10.438	17.635

City of Monticello
Comprehensive Water Resources Management Plan
Mississippi River Watershed P8 Results-Model #1

CONCENTRATION (PPM) PRESENT IN THE OUTFLOW OF EACH TREATMENT DEVICE
 FOR EACH WATER QUALITY COMPONENT

Device Number	Subwatershed Number	TSS	TP	TKN	Cu	Pb	Zn	HC	COD	BOD
1	MR-1	85.924	0.479	2.197	0.023	0.064	0.126	2.183	99.983	14.742
2	MR-2	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
3	MR-3	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
4	MR-4	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
5	MR-5	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
6	MR-6	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
7	MR-7	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
8	MR-8	55.454	0.446	2.072	0.022	0.044	0.119	1.499	80.617	11.841
9	MR-9	31.595	0.348	1.692	0.018	0.028	0.097	0.961	60.814	8.749
10	MR-10	79.628	0.468	2.157	0.023	0.06	0.124	2.042	95.263	14.039
11	MR-11	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
12	MR-12	28.147	0.329	1.617	0.017	0.026	0.093	0.883	56.577	8.093
13	MR-13	3.36	0.073	0.394	0.004	0.005	0.023	0.158	7.708	1.082
14	MR-14	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
15	MR-15	15.038	0.234	1.213	0.013	0.017	0.07	0.563	31.235	4.43
16	MR-16	11.97	0.219	1.159	0.012	0.015	0.066	0.497	27.121	3.818
17	MR-17	17.591	0.248	1.272	0.013	0.018	0.073	0.624	34.668	4.943
18	MR-18	20.482	0.267	1.348	0.014	0.02	0.077	0.691	39.176	5.611
19	MR-19	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
20	MR-20	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
25	OVERALL	54.99	0.387	1.833	0.019	0.043	0.105	1.481	73.104	10.689

**City of Monticello
Comprehensive Water Resources Management Plan
Mississippi River Watershed P8 Results-Model #2**

PERCENT REMOVAL EFFICIENCY OF TREATMENT DEVICE
FOR EACH PARTICLE CLASS

Device Number	Subwatershed Number	1 P 0%	2 P 10%	3 P 30%	4 P 50%	5 P 80%
1	MR-21	0	4.3	27.8	65.6	95.2
2	MR-22	0	48.2	78.8	92.4	99.4
3	MR-23	0	49.6	76.2	89.7	98.9
4	MR-24	0	0	0	0	0
5	MR-25	0	31.6	62	80.2	97.4
6	MR-26	0	59.2	85	94.2	99.5
7	MR-27	0	0	0	0	0
25	OVERALL	0	29.4	51.5	64.1	74.3

City of Monticello
Comprehensive Water Resources Management Plan
Mississippi River Watershed P8 Results-Model #2

PERCENT REMOVAL EFFICIENCY OF TREATMENT DEVICE
 FOR EACH WATER QUALITY COMPONENT

Device Number	Subwatershed Number	TSS	TP	TKN	Cu	Pb	Zn	Hg	CO10	30D
1	MR-21	44.2	11.2	8.6	8.6	31.9	8.6	31.9	21.4	22.8
2	MR-22	80.3	39.6	31.8	31.8	65.7	31.8	65.7	64.4	65.9
3	MR-23	82.7	47.6	40.1	40.1	73.1	40.1	73.1	68.3	69.5
4	MR-24	0	0	0	0	0	0	0	0	0
5	MR-25	73.7	38.4	32.4	32.4	65.2	32.4	65.2	55.6	57
6	MR-26	87.5	52.7	44.4	44.4	77.3	44.4	77.3	75.2	76.4
7	MR-27	0	0	0	0	0	0	0	0	0
25	OVERALL	58.7	32.1	27	27	51.9	27	51.9	46.1	47.1

**City of Monticello
 Comprehensive Water Resources Management Plan
 Mississippi River Watershed P8 Results-Model #2**

CONCENTRATION (PPM) PRESENT IN THE INFLOW OF EACH TREATMENT DEVICE
 FOR EACH PARTICLE CLASS

Device Number	Subwaterated Number	Particle Class				
		P 0%	P 10%	P 30%	P 50%	P 80%
1	MR-21	0.826	8.407	5.097	3.876	6.562
2	MR-22	0.955	12.402	10.083	8.879	16.125
3	MR-23	1	16.849	16.849	16.849	33.698
4	MR-24	1	16.849	16.849	16.849	33.698
5	MR-25	1	16.849	16.849	16.849	33.698
6	MR-26	1	16.849	16.849	16.849	33.698
7	MR-27	1	16.849	16.849	16.849	33.699
25	OVERALL	1	16.867	16.867	16.867	33.733

**City of Monticello
Comprehensive Water Resources Management Plan
Mississippi River Watershed P8 Results-Model #2**

CONCENTRATION (PPM) PRESENT IN THE INFLOW OF EACH TREATMENT DEVICE
FOR EACH WATER QUALITY COMPONENT

Device Number	Subwatershed Number	TSS	TP	TNM	Cu	Pb	Zn	HC	COD	BOD
1	MR-21	23.943	0.239	1.21	0.013	0.022	0.069	0.745	36.773	5.294
2	MR-22	47.489	0.347	1.669	0.017	0.038	0.096	1.307	62.564	9.134
3	MR-23	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
4	MR-24	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
5	MR-25	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
6	MR-26	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
7	MR-27	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
25	OVERALL	84.333	0.473	2.174	0.023	0.063	0.125	2.147	98.162	14.473

City of Monticello
Comprehensive Water Resources Management Plan
Mississippi River Watershed P8 Results-Model #2

CONCENTRATION (PPM) PRESENT IN THE OUTFLOW OF EACH TREATMENT DEVICE
 FOR EACH PARTICLE CLASS

Device Number	Subwatershed Number	P 0%	P 10%	P 30%	P 50%	P 80%
1	MR-21	0.825	8.04	3.679	1.331	0.313
2	MR-22	0.8	6.244	2.139	0.674	0.1
3	MR-23	0.914	8.411	4.011	1.728	0.357
4	MR-24	1	16.849	16.849	16.849	33.698
5	MR-25	0.984	11.458	6.38	3.322	0.858
6	MR-26	0.765	6.56	2.525	0.969	0.178
7	MR-27	1	16.849	16.849	16.849	33.699
25	OVERALL	0.944	11.818	8.165	6.041	8.643

**City of Monticello
Comprehensive Water Resources Management Plan
Mississippi River Watershed P8 Results-Model #2**

CONCENTRATION (PPM) PRESENT IN THE OUTFLOW OF EACH TREATMENT DEVICE
FOR EACH WATER QUALITY COMPONENT

Device Number	Subwatershed Number	TSS	TP	TKN	Cu	Pb	Zn	Hc	COD	BOD
1	MR-21	13.363	0.212	1.106	0.012	0.015	0.063	0.507	28.89	4.088
2	MR-22	9.158	0.184	0.985	0.01	0.012	0.056	0.406	21.524	3.015
3	MR-23	14.507	0.233	1.217	0.013	0.016	0.07	0.555	30.712	4.355
4	MR-24	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
5	MR-25	22.017	0.288	1.452	0.015	0.022	0.083	0.741	43.319	6.185
6	MR-26	10.233	0.184	0.976	0.01	0.012	0.056	0.422	23.026	3.238
7	MR-27	84.246	0.473	2.173	0.023	0.063	0.125	2.146	98.062	14.459
25	OVERALL	34.666	0.312	1.531	0.016	0.03	0.088	1.016	52.567	7.606

APPENDIX

Appendix D

CHAPTER 2: APPLICATION REVIEWS AND PROCEDURES

Section 2.4 Specific Review Procedures & Requirements

Subsection (M) Grading, Drainage and Erosion Control Permit

(7) Time Limit

- (a) Failure to begin the approved home occupation within six months of the date of approval will invalidate the permit.
- (b) Upon written request, one extension of six months may be granted by the Community Development Department if the applicant can show good cause.

(8) Amendments

All requested amendments to an Administrative Home Occupation Permit shall be processed in the same manner as a new application.

(9) Appeal

The applicant for an Administrative Home Occupation Permit may appeal the decision of the Community Development Department to the Board of Adjustment and Appeals per Section 2.4(H).

(M) Grading, Drainage and Erosion Control Permit

(1) Purpose

This section establishes when a grading, drainage stormwater management, and erosion control permit (“Grading Permit”) is required, how it will be reviewed, information required with the application, and how unauthorized work will be handled. Requiring a Grading Permit enables the City to protect the public by ensuring that erosion does not endanger water resources or unnecessarily require extra maintenance of sewers and ditches and/or the dredging of lakes and ponds. A Grading Permit promotes the public welfare by guiding, regulating, and controlling the design, construction, use, and maintenance of any development or other activity that disturbs or breaks the topsoil or results in the movement of earth on land in Monticello.

[All grading requirements can be found in Section 4.10: Grading, Drainage, Stormwater Management & Erosion Control](#)

(2) In General

A Grading Permit shall be required for land-disturbing activity that would require the uncovering or distributing of material in excess of any of the following measurements:

- (a) 5000 square feet.
- (b) 400 cubic yards undeveloped land, or 40 cubic yards developed land.
- (c) Within 200 feet of a waterway or surface water(s).

(3) Exceptions

- (a)** No Grading Permit is required for land disturbances under the amounts specified in Section 2.4(M)(2), or for the following activities:
 - (i)** Any emergency activity that is immediately necessary for the protection of life, property or natural resources.
 - (ii)** General establishment of new construction lawns, or the addition of four (4) or fewer inches of topsoil.
 - (iii)** Existing nursery and agricultural operations conducted as a permitted main or accessory use.
- (b)** In the case of grading specific to and in conjunction with a single Building Permit, a separate Grading Permit is not required.
 - (i)** The Building Permit shall be reviewed and serve as the Grading Permit.
 - (ii)** The individual lot permittee shall be required to provide a letter of credit or other security deemed acceptable by the City with the building permit application.
 1. The security shall cover City costs for street sweeping, installation, maintenance and repairs to erosion control measures. The bond will be in an amount as specified by the current City ordinance for fee schedule. Said security shall be provided prior to the release of the Grading Permit.
 2. The security shall be released after turf is established as specified in the City Design Guidelines and Plan Requirements Manual, and the turf establishment is inspected by the City of Monticello and deemed to be approved.

(4) Application

- (a)** All applications for a Grading Permit shall be in accordance with Section 2.3, Common Review Requirements.
- (b)** In addition to general review requirements, applications for a Grading Permit shall also include at least the following to be considered complete (except as exempted by the Community Development Department):
 - (i)** Each application shall bear the name(s) and address(es) of the owner or developer of the site, and of any consulting firm retained by the applicant together with the name of the applicant's principal contact at such firm.
 - (ii)** A Grading, Drainage, Stormwater Management, and Erosion Control Plan meeting the requirements of Section 4.10(D). Each application shall

CHAPTER 2: APPLICATION REVIEWS AND PROCEDURES

Section 2.4 Specific Review Procedures & Requirements

Subsection (M) Grading, Drainage and Erosion Control Permit

include the required number of plans and other required materials as specified by the Community Development Department.

- (iii) The application form shall include a statement by the applicant that any land clearing, construction, or development involving the movement of earth shall be in accordance with the approved Grading, Drainage, Stormwater Management, and Erosion Control Plan.
- (iv) The permittee will be required to file with the City of Monticello an irrevocable, automatically renewing letter of credit, or other improvement security in the amount specified by the current City ordinance for fee schedule. This security shall be in addition to the required non-refundable filing fee as specified by City Ordinance, which shall be submitted under separate payment.
 - 1. The security shall cover all costs of engineering and inspection, site improvements, street sweeping, repairs to erosion control measures, and maintenance of improvements for such period as specified by the City of Monticello. Said security shall be provided prior to the release of the Grading Permit.
 - 2. Security shall be released after final stabilization is complete, erosion control measures have been removed and their removal area inspected by the City of Monticello and deemed to be approved.
- (c) The City of Monticello requires complete application no less than fifteen (15) working days in advance of the desired Grading Permit release date.

(5) Review

(a) Grading Permit Review Criteria

Approval of a Grading Permit shall be based on the following criteria:

- (i) Whether the proposed Grading Permit is consistent with all the requirements of Section 4.10 and any other City Code requirements;
- (ii) Whether the proposed Grading Permit is in compliance with all engineering standards adopted by the City;
- (iii) Whether the proposed Grading Permit is in compliance with any previous approvals for the facility (e.g. grading for additional parking previously approved by a conditional use permit).

(b) Grading Permit Review Process

- (i) The Community Development Department shall review all Grading Permit applications.

- (ii) Applications determined to conform with the approval criteria outlined in Section 2.4(M)(5)(a) shall be approved by the Community Development Department with any conditions deemed necessary. A copy of the approved permit shall be provided to the applicant which includes all conditions and comments.
- (iii) Applications not conforming with the approval criteria outlined in Section 2.4(M)(5)(a) shall be denied by the Community Development Department. A notice of denial shall be provided to the applicant which includes all identified reasons for denial.

(6) Reasonable Conditions

In approving a Grading Permit, the Community Development Department may impose such reasonable conditions and requirements as it deems necessary and appropriate to ensure continued compliance with the Grading Permit review criteria and other city ordinances.

(7) Effect of Grading Permit Approval

The issuance of a Grading Permit shall authorize only the changes approved by the Community Development Department as depicted by the application materials.

(8) Time Limit

- (a) Failure to complete the authorized grading within six months of the date of approval will invalidate the permit.
- (b) Upon written request, one extension of six months may be granted by the Community Development Department if the applicant can show good cause.

(9) Amendments

All requested amendments to an existing Grading Permit shall be processed in the same manner as a new application.

(10) Unauthorized Work

Work done without the authorization of a permit and/or found to be out of conformance with approved plans shall be immediately halted and subject to the remedies and penalties described in Section 7.6 of this ordinance. Driveways or parking lots being built out of conformance shall be brought into conformance.

3.7 Overlay Zoning Districts

(A) General Purpose

Overlay zoning districts are superimposed over portions of one or more base zoning districts in order to introduce additional zoning requirements necessary to address a specific issue.

(B) Relationship to Base Zoning Districts

- (1) Regulations governing development in an overlay zoning district shall apply in addition to the regulations governing development in the underlying base zoning district unless expressly stated otherwise in these regulations.
- (2) Conflicts between overlay district standards and other standards in this ordinance shall be resolved as outlined in Section 1.7(C).

[Section 1.7\(C\):
Conflicts Between
Standards in this
Ordinance](#)

(C) Floodplain District

(A) Statutory Authorization, Findings of Fact and Purpose

(1) **Statutory Authorization**

The legislature of the State of Minnesota has, in Minnesota Statutes Chapter 103F and Chapter 462 delegated the responsibility to local government units to adopt regulations designed to minimize flood losses. Therefore, the City Council of Monticello, Minnesota, does ordain as follows.

(2) **Purpose**

- (a) This ordinance regulates development in the flood hazard areas of the city of Monticello. These flood hazard areas are subject to periodic inundation, which may result in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base. It is the purpose of this ordinance to promote the public health, safety, and general welfare by minimizing these losses and disruptions.
- (b) National Flood Insurance Program Compliance. This ordinance is adopted to comply with the rules and regulations of the National Flood Insurance Program codified as 44 Code of Federal Regulations Parts 59 -78, as amended, so as to maintain the community's eligibility in the National Flood Insurance Program.

- (c) This ordinance is also intended to preserve the natural characteristics and functions of watercourses and floodplains in order to moderate flood and stormwater impacts, improve water quality, reduce soil erosion, protect aquatic and riparian habitat, provide recreational opportunities, provide aesthetic benefits and enhance community and economic development.

(B) General Provisions

(1) Lands to Which Ordinance Applies

This ordinance applies to all lands within the jurisdiction of the city of Monticello within the boundaries of the Floodway and Flood Fringe Districts. The boundaries of the zoning districts are determined by scaling distances on the Flood Insurance Rate Map, or as modified in accordance with 3.7(B)(1)(b) below.

- (a) The Floodway, Flood Fringe and General Floodplain Districts are overlay districts that are superimposed on all existing zoning districts. The standards imposed in the overlay districts are in addition to any other requirements in this ordinance. In case of a conflict, the more restrictive standards will apply.
- (b) Where a conflict exists between the floodplain limits illustrated on the official floodplain maps and actual field conditions, the flood elevations shall be the governing factor in locating the regulatory floodplain limits.
- (c) Persons contesting the location of the district boundaries will be given a reasonable opportunity to present their case to the Planning Commission and to submit technical evidence.

(2) Incorporation of Maps by Reference

The following maps together with all attached material are hereby adopted by reference and declared to be a part of the Official Zoning Map and this ordinance.

- Currently effective Flood Insurance Study:
 - City of Monticello, Minnesota, dated May 1979
 - Wright County Minnesota unincorporated areas, dated 8/18/1992
- Currently effective Flood Insurance Rate Map panels enumerated below:
 - City of Monticello, Panel 2705410005B, effective 11/1/1979
 - Wright County, Minnesota Panel 2705340018C, effective 8/18/1992
 - Wright County, Minnesota Panel 2705340015B, effective 8/4/1988

- Currently effective Flood Boundary and Floodway Map panels enumerated below:
 - City of Monticello, Panel 2705410001B, effective 11/1/1979
 - City of Monticello, Panel 2705410002B, effective 11/1/1979
 - City of Monticello, Panel 2705410003B, effective 11/1/1979
- Preliminary Flood Insurance Study:
 - Wright County Minnesota and Incorporated Areas, dated 6/22/2011
- Preliminary Flood Insurance Rate Map panels enumerated below:
 - Wright County, Minnesota Panel 27171C0155D, dated 6/22/2011
 - Wright County, Minnesota Panel 27171C0160D, dated 6/22/2011
 - Wright County, Minnesota Panel 27171C0165D, dated 6/22/2011
 - Wright County, Minnesota Panel 27171C0170D, dated 6/22/2011
 - Wright County, Minnesota Panel 27171C0190D, dated 6/22/2011

For any instance where the effective and preliminary maps conflict, the more restrictive map shall apply. These materials are on file in the City Clerk's Office, City of Monticello City Hall.

(3) Abrogation and Greater Restrictions

It is not intended by this ordinance to repeal, abrogate, or impair any existing easements, covenants, or other private agreements. However, where this ordinance imposes greater restrictions, the provisions of this ordinance prevail. All other ordinances inconsistent with this ordinance are hereby repealed to the extent of the inconsistency only.

(4) Warning and Disclaimer of Liability

This ordinance does not imply that areas outside the floodplain districts or land uses permitted within such districts will be free from flooding or flood damages. This ordinance does not create liability on the part of Monticello or its officers or employees for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made hereunder.

(5) Severability

If any section, clause, provision, or portion of this ordinance is adjudged unconstitutional or invalid by a court of law, the remainder of this ordinance shall not be affected and shall remain in full force.

(6) Definitions

Unless specifically defined below, words or phrases used in this ordinance must be interpreted according to common usage and so as to give this ordinance its most reasonable application.

(a) Accessory Use or Structure

A use or structure on the same lot with, and of a nature customarily incidental and subordinate to, the principal use or structure.

(b) Base Flood

The flood having a one percent chance of being equaled or exceeded in any given year.

(c) Base Flood Elevation

The elevation of the “regional flood.” The term “base flood elevation” is used is used in the flood insurance survey.

(d) Basement

Any area of a structure, including crawl spaces, having its floor or base subgrade (below ground level) on all four sides, regardless of the depth of excavation below ground level.

(e) Conditional Use

A specific type of structure or land use listed in the official control that may be allowed but only after an in-depth review procedure and with appropriate conditions or restrictions as provided in the official zoning controls or building codes and upon a finding that:

- (i) Certain conditions as detailed in the zoning ordinance exist.
- (ii) The structure and/or land use conform to the comprehensive land use plan if one exists and are compatible with the existing neighborhood.

(f) Critical Facilities

Facilities necessary to a community’s public health and safety, those that store or produce highly volatile, toxic or water-reactive materials, and those that house occupants that may be insufficiently mobile to avoid loss of life or injury. Examples of critical facilities include hospitals, correctional facilities, schools, daycare facilities, nursing homes, fire and police stations, wastewater treatment facilities, public electric utilities, water plants, fuel storage facilities, and waste handling and storage facilities.

(g) Development

Any manmade change to improved or unimproved real estate, including buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, or storage of equipment or materials.

(h) Equal Degree of Encroachment

A method of determining the location of floodway boundaries so that floodplain lands on both sides of a stream are capable of conveying a proportionate share of flood flows.

(i) Farm Fence

A fence as defined by Minn. Statutes Section 344.02, Subd. 1(a)-(d). An open type fence of posts and wire is not considered to be a structure under this ordinance. Fences that have the potential to obstruct flood flows, such as chain link fences and rigid walls, are regulated as structures under this ordinance.

(j) Flood

A temporary increase in the flow or stage of a stream or in the stage of a wetland or lake that results in the inundation of normally dry areas.

(k) Flood Frequency

The frequency for which it is expected that a specific flood stage or discharge may be equaled or exceeded.

(l) Flood Fringe

The portion of the Special Flood Hazard Area (one percent annual chance flood) located outside of the floodway. Flood fringe is synonymous with the term “floodway fringe” used in the Flood Insurance Study for Wright County, Minnesota.

(m) Flood Insurance Rate Map

An official map on which the Federal Insurance Administrator has delineated both the special hazard areas and the risk premium zones applicable to the community. A FIRM that has been made available digitally is called a Digital Flood Insurance Rate Map (DFIRM).

(n) Flood Prone Area

Any land susceptible to being inundated by water from any source.

(o) Floodplain

The beds proper and the areas adjoining a wetland, lake or watercourse which have been or hereafter may be covered by the regional flood.

(p) Floodproofing

A combination of structural provisions, changes, or adjustments to properties and structures subject to flooding, primarily for the reduction or elimination of flood damages.

(q) Floodway

The bed of a wetland or lake and the channel of a watercourse and those portions of the adjoining floodplain which are reasonably required to carry or store the regional flood discharge.

(r) Lowest Floor

The lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, used solely for parking of vehicles, building access, or storage in an area other than a basement area, is not considered a building's lowest floor; provided, that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of 44 Code of Federal Regulations, Part 60.3.

(s) Manufactured Home

A structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilities. The term "manufactured home" does not include the term "recreational vehicle."

(t) New Construction

Structures, including additions and improvements, and placement of manufactured homes, for which the start of construction commenced on or after the effective date of this ordinance.

(u) Obstruction

Any dam, wall, wharf, embankment, levee, dike, pile, abutment, projection, excavation, channel modification, culvert, building, wire, fence, stockpile, refuse, fill, structure, or matter in, along, across, or projecting into any channel, watercourse, or regulatory floodplain which may impede, retard, or change the direction of the flow of water, either in itself or by catching or collecting debris carried by such water.

(v) One Hundred Year Floodplain

Lands inundated by the "Regional Flood" (see definition).

(w) Principal Use or Structure

All uses or structures that are not accessory uses or structures.

(x) Reach

A hydraulic engineering term to describe a longitudinal segment of a stream or river influenced by a natural or man-made obstruction. In an urban area,

the segment of a stream or river between two consecutive bridge crossings would most typically constitute a reach.

(y) Recreational Vehicle

A vehicle that is built on a single chassis, is 400 square feet or less when measured at the largest horizontal projection, is designed to be self-propelled or permanently towable by a light duty truck, and is designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use. For the purposes of this ordinance, the term recreational vehicle is synonymous with the term “travel trailer/travel vehicle.”

(z) Regional Flood

A flood which is representative of large floods known to have occurred generally in Minnesota and reasonably characteristic of what can be expected to occur on an average frequency in the magnitude of the 1% chance or 100-year recurrence interval. Regional flood is synonymous with the term "base flood" used in a flood insurance study.

(aa) Regulatory Flood Protection Elevation (RFPE)

An elevation not less than one foot above the elevation of the regional flood plus any increases in flood elevation caused by encroachments on the floodplain that result from designation of a floodway.

(bb) Repetitive Loss

Flood related damages sustained by a structure on two separate occasions during a ten year period for which the cost of repairs at the time of each such flood event on the average equals or exceeds 25% of the market value of the structure before the damage occurred.

(cc) Special Flood Hazard Area

A term used for flood insurance purposes synonymous with “One Hundred Year Floodplain.”

(dd) Start of Construction

Includes substantial improvement, and means the actual start of construction, repair, reconstruction, rehabilitation, addition, placement or other improvement that occurred before the permit’s expiration date. The actual start is either the first placement of permanent construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of

excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, foundations, or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a substantial improvement, the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

(ee) Structure

Anything constructed or erected on the ground or attached to the ground or on-site utilities, including, but not limited to, buildings, factories, sheds, detached garages, cabins, manufactured homes, recreational vehicles not meeting the exemption criteria specified in Section 3.7(J)(2)(b) of this ordinance and other similar items.

(ff) Substantial Damage

Means damage of any origin sustained by a structure where the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred.

(gg) Substantial Improvement

Within any consecutive 365-day period, any reconstruction, rehabilitation (including normal maintenance and repair), repair after damage, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent of the market value of the structure before the “start of construction” of the improvement. This term includes structures that have incurred “substantial damage,” regardless of the actual repair work performed. The term does not, however, include either:

- (i)** Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions.
- (ii)** Any alteration of a “historic structure,” provided that the alteration will not preclude the structure’s continued designation as a “historic structure.” For the purpose of this ordinance, “historic structure” is as defined in 44 Code of Federal Regulations, Part 59.1.

(7) Annexations

The Flood Insurance Rate Map panels adopted by reference into Section 3.7(B)(2) above may include floodplain areas that lie outside of the corporate boundaries of the City of Monticello at the time of adoption of this ordinance. If any of these floodplain land areas are annexed into the city of Monticello after the date of adoption of this ordinance, the newly annexed floodplain lands will be subject to the provisions of this ordinance.

(8) Detachments

The Flood Insurance Rate Map panels adopted by reference into 3.7(B)(2) above will include floodplain areas that lie inside the corporate boundaries of municipalities at the time of adoption of this ordinance. If any of these floodplain land areas are detached from a municipality and come under the jurisdiction of Monticello after the date of adoption of this ordinance, the newly detached floodplain lands will be subject to the provisions of this ordinance immediately upon the date of detachment.

(C) Establishment of Floodplain Districts

(1) Districts

- (a)** Floodway District - The Floodway District includes those areas within Zones AE, A2, A7 delineated within floodway areas as shown on the Flood Insurance Rate Maps and Flood Boundary and Floodway Maps adopted in Section 3.7(B)(2).
- (b)** Flood Fringe District - The Flood Fringe District includes areas within Zones AE, A2, A7 on the Flood Insurance Rate Map and Flood Boundary and Floodway Maps adopted in Section 3.7(B)(2), but located outside of the floodway.
- (c)** Reserved for General Floodplain District

(2) Applicability

Where Floodway and Flood Fringe districts are delineated on the floodplain maps, the standards in Sections 3.7(E) or 3.7(F) will apply, depending on the location of a property.

(D) Requirements for All Floodplain Districts

(1) Permit Required

- (a)** A permit must be obtained from the Zoning Administrator to verify a development meets the standards outlined in this ordinance prior to conducting the following activities:

CHAPTER 3: ZONING DISTRICTS

Section 3.7 Overlay Zoning Districts

Subsection (C) Floodplain District

- (i) The erection, addition, modification, rehabilitation, or alteration of any building, structure, or portion thereof. Normal maintenance and repair also requires a permit if such work, separately or in conjunction with other planned work, constitutes a substantial improvement as defined in this ordinance.
- (ii) The construction of a dam, on-site septic system, or fence, although a permit is not required for a farm fence as defined in this ordinance.
- (iii) The use or change of use of a building, structure, or land.
- (iv) The change or extension of a nonconforming use.
- (v) The repair of a structure that has been damaged by flood, fire, tornado, or any other source.
- (vi) The placement of fill, excavation of materials, or the storage of materials or equipment within the floodplain.
- (vii) Relocation or alteration of a watercourse (including new or replacement culverts and bridges), unless a public waters work permit has been applied for.
- (viii) Any other type of “development” as defined in this ordinance.

(2) Building Sites

- (a) If a proposed building site is in a flood prone area, all new construction and substantial improvements (including the placement of manufactured homes) must be:
 - (i) Designed (or modified) and adequately anchored to prevent floatation, collapse, or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy;
 - (ii) Constructed with materials and utility equipment resistant to flood damage;
 - (iii) Constructed by methods and practices that minimize flood damage; and
 - (iv) Constructed with electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

(3) Flood Capacity

In no cases shall floodplain development adversely affect the efficiency or unduly restrict the capacity of the channels or floodways of any tributaries to the main stream, drainage ditches, or any other drainage facilities or systems.

(4) Other

- (a)** The storage or processing of materials that are, in time of flooding, flammable, explosive, or potentially injurious to human, animal, or plant life is prohibited.
- (b)** Critical Facilities, as defined in Section 3.7(B)(6)(f), are prohibited in all floodplain districts.

(E) Floodway District (FW)

(1) Permitted Uses

The following uses, subject to the standards set forth in Section 3.7(E)(2), are permitted uses if otherwise allowed in the underlying zoning district or any applicable overlay district:

- (a)** General farming, pasture, grazing, farm fences, outdoor plant nurseries, horticulture, forestry, sod farming, and wild crop harvesting.
- (b)** Industrial-commercial loading areas, parking areas, and airport landing strips.
- (c)** Open space uses, including but not limited to private and public golf courses, tennis courts, driving ranges, archery ranges, picnic grounds, boat launching ramps, swimming areas, parks, wildlife and nature preserves, game farms, fish hatcheries, shooting preserves, hunting and fishing areas, and single or multiple purpose recreational trails.
- (d)** Residential yards, lawns, gardens, parking areas, and play areas.
- (e)** Railroads, streets, bridges, utility transmission lines and pipelines, provided that the Department of Natural Resources' Area Hydrologist is notified at least ten days prior to issuance of any permit.

(2) Standards for Floodway Permitted Uses

- (a)** The use must have a low flood damage potential.
- (b)** The use must not obstruct flood flows or cause any increase in flood elevations and must not involve structures, obstructions, or storage of materials or equipment.
- (c)** Any facility that will be used by employees or the general public must be designed with a flood warning system that provides adequate time for evacuation if the area is inundated to a depth and velocity such that the depth (in feet) multiplied by the velocity (in feet per second) would exceed a product of four upon occurrence of the regional (1% chance) flood.

(3) Conditional Uses

The following uses may be allowed as conditional uses following the standards and procedures set forth in Section 3.7(K)(4) of this ordinance and further subject to the standards set forth in Section 3.7(E)(4), if otherwise allowed in the underlying zoning district or any applicable overlay district.

- (a) Structures accessory to the uses listed in 3.7(E)(1)(a)-(c) above and the uses listed in 3.7(E)(3)(b)-(c) below
- (b) Extraction, fill and storage of soil, sand, gravel, and other materials.
- (c) Marinas, boat rentals, permanent docks, piers, wharves, and water control structures.
- (d) Storage yards for equipment, machinery, or materials.
- (e) Construction of fences that obstruct flood flows. Farm fences, as defined in section 3.7(B)(6)(i), are permitted uses.
- (f) Travel-ready recreational vehicles meeting the exception standards in Section 3.7(J)(2)(b).
- (g) Levees or dikes intended to protect agricultural crops for a frequency flood event equal to or less than the 10-year frequency flood event.

(4) Standards for Floodway Conditional Uses

(a) All Uses

A conditional use must not cause any increase in the regional flood elevations or cause an increase in flood damages in the reach or reaches affected.

(b) Fill; Storage of Materials and Equipment

- (i) Fill, dredge spoil, and other similar materials deposited or stored in the floodplain must be protected from erosion by vegetative cover, mulching, riprap or other acceptable method. Permanent sand and gravel operations and similar uses must be covered by a long-term site development plan.
- (ii) Temporary placement of fill, other materials, or equipment which would cause an increase to the stage of the 1% percent chance or regional flood may only be allowed if the City of Monticello has approved a plan that assures removal of the materials from the floodway based upon the flood warning time available.

(c) Accessory Structures

Accessory structures, as identified in Section 3.7(E)(3)(a), may be permitted, provided that:

- (i) Structures are not intended for human habitation;

- (ii) Structures will have a low flood damage potential;
- (iii) Structures will be constructed and placed so as to offer a minimal obstruction to the flow of flood waters;
- (iv) Service utilities, such as electrical and heating equipment, within these structures must be elevated to or above the regulatory flood protection elevation or properly floodproofed;
- (v) Structures must be elevated on fill or structurally dry floodproofed in accordance with the FP1 or FP2 floodproofing classifications in the State Building Code. All floodproofed structures must be adequately anchored to prevent flotation, collapse or lateral movement and designed to equalize hydrostatic flood forces on exterior walls.
- (vi) As an alternative, an accessory structure may be internally/wet floodproofed to the FP3 or FP4 floodproofing classifications in the State Building Code, provided the accessory structure constitutes a minimal investment. Designs for meeting this requirement must either be certified by a registered professional engineer or meet or exceed the following criteria:

 - 1. To allow for the equalization of hydrostatic pressure, there must be a minimum of two “automatic” openings in the outside walls of the structure, with a total net area of not less than one square inch for every square foot of enclosed area subject to flooding; and
 - 2. There must be openings on at least two sides of the structure and the bottom of all openings must be no higher than one foot above the lowest adjacent grade to the structure. Using human intervention to open a garage door prior to flooding will not satisfy this requirement for automatic openings.
- (d) Structural works for flood control that will change the course, current or cross section of protected wetlands or public waters are subject to the provisions of Minnesota Statutes, Section 103G.245.
- (e) A levee, dike or floodwall constructed in the floodway must not cause an increase to the 1% chance or regional flood. The technical analysis must assume equal conveyance or storage loss on both sides of a stream.
- (f) Floodway developments must not adversely affect the hydraulic capacity of the channel and adjoining floodplain of any tributary watercourse or drainage system.

(F) Flood Fringe District (FF)

(1) Permitted Uses

Permitted uses are those uses of land or structures allowed in the underlying zoning district(s) that comply with the standards in Sections 3.7(F)(2). If no pre-existing, underlying zoning districts exist, then any residential or nonresidential structure or use of a structure or land is a permitted use provided it does not constitute a public nuisance.

(2) Standards for Flood Fringe Permitted Uses

(a) All structures, including accessory structures, must be elevated on fill so that the lowest floor, as defined, is at or above the regulatory flood protection elevation. The finished fill elevation for structures must be no lower than one foot below the regulatory flood protection elevation and the fill must extend at the same elevation at least 15 feet beyond the outside limits of the structure.

(b) Accessory Structures

As an alternative to the fill requirements of section 3.7(F)(2)(a), structures accessory to the uses identified in Section 3.7(F)(1) may be permitted to be internally/wet floodproofed to the FP3 or FP4 floodproofing classifications in the State Building Code, provided that:

- (i)** The accessory structure constitutes a minimal investment, does not exceed 576 square feet in size, and is only used for parking and storage.
- (ii)** All portions of floodproofed accessory structures below the Regulatory Flood Protection Elevation must be: (i) adequately anchored to prevent flotation, collapse or lateral movement and designed to equalize hydrostatic flood forces on exterior walls, (ii) be constructed with materials resistant to flood damage, and (iii) must have all service utilities be water-tight or elevated to above the regulatory flood protection elevation
- (iii)** Designs for meeting this requirement must either be certified by a registered professional engineer or meet or exceed the following criteria:
 - 1. To allow for the equalization of hydrostatic pressure, there must be a minimum of two “automatic” openings in the outside walls of the structure, with a total net area of not less than one square inch for every square foot of enclosed area subject to flooding; and

2. There must be openings on at least two sides of the structure and the bottom of all openings must be no higher than one foot above the lowest adjacent grade to the structure. Using human intervention to open a garage door prior to flooding will not satisfy this requirement for automatic openings.

- (c) The cumulative placement of fill or similar material on a parcel must not exceed 1,000 cubic yards, unless the fill is specifically intended to elevate a structure in accordance with Section 3.7(F)(2)(a) of this ordinance, or if allowed as a conditional use under Section 3.7(F)(3)(c) below.
- (d) The storage of any materials or equipment must be elevated on fill to the regulatory flood protection elevation.
- (e) All service utilities, including ductwork, must be elevated or water-tight to prevent infiltration of floodwaters.
- (f) All fill must be properly compacted and the slopes must be properly protected by the use of riprap, vegetative cover or other acceptable method.
- (g) All new principal structures must have vehicular access at or above an elevation not more than two feet below the regulatory flood protection elevation, or must have a flood warning /emergency evacuation plan acceptable to the City of Monticello.
- (h) Accessory uses such as yards, railroad tracks, and parking lots may be at an elevation lower than the regulatory flood protection elevation. However, any facilities used by employees or the general public must be designed with a flood warning system that provides adequate time for evacuation if the area is inundated to a depth and velocity such that the depth (in feet) multiplied by the velocity (in feet per second) would exceed a product of four upon occurrence of the regional (1% chance) flood.
- (i) Manufactured homes and recreational vehicles must meet the standards of Section 3.7(J) of this ordinance.

(3) Conditional Uses

The following uses and activities may also be allowed as conditional uses as a principal or accessory use only if allowed in the underlying zoning district(s) or any applicable overlay district, following the procedures in Section 3.7(K) of this ordinance.

- (a) Storage of any material or equipment below the regulatory flood protection elevation.

- (f) Alternative elevation methods other than the use of fill may be utilized to elevate a structure's lowest floor above the regulatory flood protection elevation. The base or floor of an enclosed area shall be considered above-grade and not a structure's basement or lowest floor if: 1) the enclosed area is above-grade on at least one side of the structure; 2) it is designed to internally flood and is constructed with flood resistant materials; and 3) it is used solely for parking of vehicles, building access or storage. The above-noted alternative elevation methods are subject to the following additional standards:
- (i) Design and Certification - The structure's design and as-built condition must be certified by a registered professional engineer as being in compliance with the general design standards of the State Building Code and, specifically, that all electrical, heating, ventilation, plumbing and air conditioning equipment and other service facilities must be at or above the regulatory flood protection elevation or be designed to prevent flood water from entering or accumulating within these components during times of flooding. Structure shall be subject to a nonconversion agreement with upon the issuance of any permit.
 - (ii) Above-grade, fully enclosed areas such as crawl spaces or tuck under garages must be designed to internally flood and the design plans must stipulate:
 1. The minimum area of openings in the walls where internal flooding is to be used as a floodproofing technique. There shall be a minimum of two openings on at least two sides of the structure and the bottom of all openings shall be no higher than one foot above grade. The automatic openings shall have a minimum net area of not less than one square inch for every square foot of enclosed area subject to flooding unless a registered professional engineer or architect certifies that a smaller net area would suffice. The automatic openings may be equipped with screens, louvers, valves, or other coverings or devices provided that they permit the automatic entry and exit of flood waters without any form of human intervention; and
 2. That the enclosed area will be designed of flood resistant materials in accordance with the FP3 or FP4 classifications in the State Building Code and shall be used solely for building access, parking of vehicles or storage.

(G) **Reserved for General Floodplain District**

(H) **Subdivision Standards**

(1) Subdivisions

No land may be subdivided which is unsuitable for reasons of flooding or inadequate drainage, water supply or sewage treatment facilities. Manufactured home parks and recreational vehicle parks or campgrounds are considered subdivisions under this ordinance.

- (a) All lots within the floodplain districts must be able to contain a building site outside of the Floodway District at or above the regulatory flood protection elevation.
- (b) All subdivisions must have road access both to the subdivision and to the individual building sites no lower than two feet below the regulatory flood protection elevation, unless a flood warning emergency plan for the safe evacuation of all vehicles and people during the regional (1% chance) flood has been approved by the City of Monticello. The plan must be prepared by a registered engineer or other qualified individual, and must demonstrate that adequate time and personnel exist to carry out the evacuation.
- (c) For all subdivisions in the floodplain, the Floodway and Flood Fringe District boundaries, the regulatory flood protection elevation and the required elevation of all access roads must be clearly labeled on all required subdivision drawings and platting documents.
- (d) Subdivision proposals must be reviewed to assure that:
 - (i) All such proposals are consistent with the need to minimize flood damage within the flood prone area,
 - (ii) All public utilities and facilities, such as sewer, gas, electrical, and water systems are located and constructed to minimize or eliminate flood damage, and
 - (iii) Adequate drainage is provided to reduce exposure of flood hazard.

(I) Public Utilities, Railroads, Roads, and Bridges

(1) Public Utilities

All public utilities and facilities such as gas, electrical, sewer, and water supply systems to be located in the floodplain must be flood proofed in accordance with the State Building Code or elevated to the regulatory flood protection elevation.

(2) Public Transportation Facilities

Railroad tracks, roads, and bridges to be located within the floodplain must comply with Sections 3.7(D) and 3.7(E) of this ordinance. These transportation facilities must be elevated to the regulatory flood protection elevation where failure or interruption of these facilities would result in danger to the public health or safety or where such facilities are essential to the orderly functioning of the area. Minor or auxiliary roads or railroads may be constructed at a lower elevation where failure or interruption of transportation services would not endanger the public health or safety.

(3) On-site Water Supply and Sewage Treatment Systems

Where public utilities are not provided: 1) On-site water supply systems must be designed to minimize or eliminate infiltration of flood waters into the systems and are subject to the provisions in Minnesota Rules Chapter 4725.4350, as amended; and 2) New or replacement on-site sewage treatment systems must be designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters, they must not be subject to impairment or contamination during times of flooding, and are subject to the provisions in Minnesota Rules Chapter 7080.2270, as amended.

(J) Manufactured Homes and Recreational Vehicles

(1) Manufactured Homes

New manufactured home parks and expansions to existing manufactured home parks are prohibited in any floodplain district. For existing manufactured home parks or lots of record, the following requirements apply:

- (a)** Placement or replacement of manufactured home units is prohibited in the Floodway District.
- (b)** Placement or replacement of manufactured home units in the Flood Fringe District is subject to the requirements of Section 3.7(F) of this ordinance and the following standards.
 - (i)** New and replacement manufactured homes must be elevated in compliance with Section 3.7(E) of this ordinance and must be securely anchored to an adequately anchored foundation system that resists flotation, collapse and lateral movement. Methods of anchoring may include, but are not limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable state or local anchoring requirements for resisting wind forces.

- (ii) New or replacement manufactured homes in existing manufactured home parks must meet the vehicular access requirements for subdivisions in Section 3.7(H)(1)(b) of this ordinance.

(2) Recreational Vehicles

New recreational vehicle parks or campgrounds and expansions to existing recreational vehicle parks or campgrounds are prohibited in any floodplain district. Placement of recreational vehicles in existing recreational vehicle parks or campgrounds in the floodplain must meet the requirements below.

- (a) Recreational vehicles are exempt from the provisions of this ordinance if they are placed in any of the following areas and meet the criteria listed in Section 3.7(J)(2)(b):

- (i) Individual lots or parcels of record
- (ii) Existing commercial recreational vehicle parks or campgrounds.
- (iii) Existing condominium-type associations.

- (b) Criteria for Exempt Recreational Vehicles:

- (i) The vehicle must have a current license required for highway use.
- (ii) The vehicle must be highway ready, meaning on wheels or the internal jacking system, attached to the site only by quick disconnect type utilities commonly used in campgrounds and recreational vehicle parks.
- (iii) No permanent structural type additions may be attached to the vehicle.
- (iv) Accessory structures may be permitted in the Flood Fringe District, provided that they constitute a minimal investment, do not hinder the removal of the vehicle should flooding occur, and meet the standards outlined in Sections 3.7(D)(2) and 3.7(F)(2)(b).

(K) Administration

(1) Duties

A Zoning Administrator or other official designated by the City of Monticello must administer and enforce this ordinance.

(2) Permit Application Requirements:

- (a) Application for Permit. Permit applications must be submitted to the Zoning Administrator on forms provided by the Zoning Administrator. The permit application must include the following as applicable:

- (i) A site plan showing all pertinent dimensions, existing or proposed buildings, structures, and significant natural features having an influence on the permit.
- (ii) Location of fill or storage of materials in relation to the stream channel.
- (iii) Copies of any required municipal, county, state or federal permits or approvals.
- (iv) Other relevant information requested by the Zoning Administrator as necessary to properly evaluate the permit application.

(b) Certification

The applicant is required to submit certification by a registered professional engineer, registered architect, or registered land surveyor that the finished fill and building elevations were accomplished in compliance with the provisions of this ordinance. Floodproofing measures must be certified by a registered professional engineer or registered architect. Accessory structures designed in accordance with Section 3.7(F)(2)(b) of this ordinance are exempt from certification, provided sufficient documentation is provided.

(c) Certificate of Zoning Compliance for a New, Altered, or Nonconforming Use

No building, land or structure may be occupied or used in any manner until a certificate of zoning compliance has been issued by the Zoning Administrator stating that the use of the building or land conforms to the requirements of this ordinance.

(d) Construction and Use as Provided on Applications

Permits, conditional use permits or certificates of Zoning Compliance issued on the basis of approved plans and applications authorize only the use, arrangement, and construction set forth in such approved plans and applications, and no other use, arrangement, or construction. Any use arrangement, or construction at variance with that authorized shall be deemed a violation of this ordinance.

(e) Record of First Floor Elevation

The Zoning Administrator must maintain a record of the elevation of the lowest floor (including basement) of all new structures and alterations or additions to existing structures in the floodplain. The Zoning Administrator must also maintain a record of the elevation to which structures and alterations or additions to structures are floodproofed.

(f) Notifications for Watercourse Alterations

Before authorizing any alteration or relocation of a river or stream, the Zoning Administrator must notify adjacent communities. If the applicant has applied for a permit to work in public waters pursuant to Minnesota Statutes, Section 103G.245, this will suffice as adequate notice. A copy of the notification must also be submitted to the Chicago Regional Office of the Federal Emergency Management Agency (FEMA).

(g) Notification to FEMA When Physical Changes Increase or Decrease Base Flood Elevations

As soon as is practicable, but not later than six months after the date such supporting information becomes available, the Zoning Administrator must notify the Chicago Regional Office of FEMA of the changes by submitting a copy of the relevant technical or scientific data.

(3) Variances

(a) Variance Applications

An application for a variance to the provisions of this ordinance will be processed and reviewed in accordance with applicable State Statutes and Chapter 2 of the zoning ordinance.

(b) Adherence to State Floodplain Management Standards

A variance must not allow a use that is not allowed in that district, permit a lower degree of flood protection than the regulatory flood protection elevation for the particular area, or permit standards lower than those required by state law.

(c) Additional Variance Criteria

The following additional variance criteria of the Federal Emergency Management Agency must be satisfied:

- (i)** Variances must not be issued by a community within any designated regulatory floodway if any increase in flood levels during the base flood discharge would result.
- (ii)** Variances may only be issued by a community upon (i) a showing of good and sufficient cause, (ii) a determination that failure to grant the variance would result in exceptional hardship to the applicant, and (iii) a determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, create nuisances, cause fraud on or victimization of the public, or conflict with existing local laws or ordinances.

- (iii) Variances may only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.

(d) Flood Insurance Notice

The Zoning Administrator must notify the applicant for a variance that: 1) The issuance of a variance to construct a structure below the base flood level will result in increased premium rates for flood insurance up to amounts as high as \$25 for \$100 of insurance coverage; and 2) Such construction below the base or regional flood level increases risks to life and property. Such notification must be maintained with a record of all variance actions.

(e) General Considerations

The community may consider the following factors in granting variances and imposing conditions on variances and conditional uses in floodplains:

- (i) The potential danger of life and property due to increased flood heights or velocities caused by encroachments;
- (ii) The danger that materials may be swept onto other lands or downstream to the injury of others;
- (iii) The proposed water supply and sanitation systems, if any, and the ability of these systems to minimize the potential for disease, contamination and unsanitary conditions;
- (iv) The susceptibility of any proposed use and its contents to flood damage and the effect of such damage on the individual owner;
- (v) The importance of the services to be provided by the proposed use to the community;
- (vi) The requirements of the facility for a waterfront location;
- (vii) The availability of viable alternative locations for the proposed use that are not subject to flooding;
- (viii) The compatibility of the proposed use with existing development and development anticipated in the foreseeable future;
- (ix) The relationship of the proposed use to the Comprehensive Land Use Plan and flood plain management program for the area;
- (x) The safety of access to the property in times of flood for ordinary and emergency vehicles;
- (xi) The expected heights, velocity, duration, rate of rise and sediment transport of the flood waters expected at the site.

(f) Submittal of Hearing Notices to the Department of Natural Resources (DNR)

The Zoning Administrator or other official designated by the City of Monticello must submit hearing notices for proposed variances to the DNR sufficiently in advance to provide at least ten days' notice of the hearing. The notice may be sent by electronic mail or U.S. Mail to the respective DNR area hydrologist.

(g) Submittal of Final Decisions to the DNR

A copy of all decisions granting variances must be forwarded to the DNR within ten days of such action. The notice may be sent by electronic mail or U.S. Mail to the respective DNR area hydrologist.

(h) Record-Keeping

The Zoning Administrator must maintain a record of all variance actions, including justification for their issuance, and must report such variances in an annual or biennial report to the Administrator of the National Flood Insurance Program, when requested by the Federal Emergency Management Agency.

(4) Conditional Uses:

(a) Administrative Review

An application for a conditional use permit under the provisions of this ordinance will be processed and reviewed in accordance with Chapter 2 of the zoning ordinance.

(b) Factors Used in Decision-Making

In passing upon conditional use applications, the City of Monticello must consider all relevant factors specified in other sections of this ordinance, and those factors identified in Section 3.7(K)(3)(e) of this ordinance.

(c) Conditions Attached to Conditional Use Permits

The City of Monticello may attach such conditions to the granting of conditional use permits as it deems necessary to fulfill the purposes of this ordinance. Such conditions may include, but are not limited to, the following:

- (i)** Modification of waste treatment and water supply facilities.
- (ii)** Limitations on period of use, occupancy, and operation.
- (iii)** Imposition of operational controls, sureties, and deed restrictions.
- (iv)** Requirements for construction of channel modifications, compensatory storage, dikes, levees, and other protective measures.

- (v) Floodproofing measures, in accordance with the State Building Code and this ordinance. The applicant must submit a plan or document certified by a registered professional engineer or architect that the floodproofing measures are consistent with the regulatory flood protection elevation and associated flood factors for the particular area.

(d) Submittal of Hearing Notices to the Department of Natural Resources (DNR)

The Zoning Administrator or other official designated by the City of Monticello must submit hearing notices for proposed conditional uses to the DNR sufficiently in advance to provide at least ten days' notice of the hearing. The notice may be sent by electronic mail or U.S. Mail to the respective DNR area hydrologist.

(e) Submittal of Hearing Notices to the Department of Natural Resources (DNR)

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(f) Submittal of Final Decisions to the DNR

A copy of all decisions granting conditional uses must be forwarded to the DNR within ten days of such action. The notice may be sent by electronic mail or U.S. Mail to the respective DNR area hydrologist.

(L) Nonconformities

(1) Continuance of Nonconformities

A use, structure, or occupancy of land which was lawful before the passage or amendment of this ordinance but which is not in conformity with the provisions of this ordinance may be continued subject to the following conditions. Historic structures, as defined in Section 3.7(B)(6) of this ordinance, are subject to the provisions of Sections 3.7(L)(1)(a) – 3.7(L)(1)(f) of this ordinance.

- (a) A nonconforming use, structure, or occupancy must not be expanded, changed, enlarged, or altered in a way that increases its flood damage potential or degree of obstruction to flood flows except as provided in 3.7(L)(1)(b) below. Expansion or enlargement of uses, structures or occupancies within the Floodway District is prohibited.

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- (b) Any addition or structural alteration to a nonconforming structure or nonconforming use that would result in increasing its flood damage potential must be protected to the regulatory flood protection elevation in accordance with any of the elevation on fill or floodproofing techniques (i.e., FP1 thru FP4 floodproofing classifications) allowable in the State Building Code, except as further restricted in 3.7(L)(1)(d) below.
- (c) If any nonconforming use, or any use of a nonconforming structure, is discontinued for more than one year, any future use of the premises must conform to this ordinance.
- (d) If any structure experiences a substantial improvement as defined in this ordinance, then the entire structure must meet the standards of Section 3.7(E) or 3.7(F) of this ordinance for new structures, depending upon whether the structure is in the Floodway or Flood Fringe District, respectively. If the current proposal, including maintenance and repair during the previous 365 days, plus the costs of any previous alterations and additions since the first Flood Insurance Rate Map exceeds 50 percent of the market value of any nonconforming structure, the entire structure must meet the standards of Section 3.7(E) or 3.7(F) of this ordinance.
- (e) If any nonconformity is substantially damaged, as defined in this ordinance, it may not be reconstructed except in conformity with the provisions of this ordinance. The applicable provisions for establishing new uses or new structures in Sections 3.7(E) or 3.7(F) will apply depending upon whether the use or structure is in the Floodway or Flood Fringe, respectively.
- (f) If any nonconforming use or structure experiences a repetitive loss, as defined in Section 3.7(B)(6)(bb) of this ordinance, it must not be reconstructed except in conformity with the provisions of this ordinance.

(M) Violations and Penalties

(1) Violation Constitutes a Misdemeanor

Violation of the provisions of this ordinance or failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with grants of variances or conditional uses) constitute a misdemeanor and will be punishable as defined by law.

(2) Other Lawful Action

Nothing in this ordinance restricts the City of Monticello from taking such other lawful action as is necessary to prevent or remedy any violation. If the responsible party does not appropriately respond to the Zoning Administrator within the specified period of time, each additional day that lapses will constitute an additional violation of this ordinance and will be prosecuted accordingly.

(3) Enforcement

Violations of the provisions of this ordinance will be investigated and resolved in accordance with the provisions of Chapter 7 of the zoning ordinance. In responding to a suspected ordinance violation, the Zoning Administrator and City of Monticello may utilize the full array of enforcement actions available to it including but not limited to prosecution and fines, injunctions, after-the-fact permits, orders for corrective measures or a request to the National Flood Insurance Program for denial of flood insurance availability to the guilty party. The City of Monticello must act in good faith to enforce these official controls and to correct ordinance violations to the extent possible so as not to jeopardize its eligibility in the National Flood Insurance Program.

(N) Amendments

(1) Floodplain Designation – Restrictions on Removal

The floodplain designation on the Official Zoning Map must not be removed from floodplain areas unless it can be shown that the designation is in error or that the area has been filled to or above the elevation of the regulatory flood protection elevation and is contiguous to lands outside the floodplain. Special exceptions to this rule may be permitted by the Commissioner of the Department of Natural Resources (DNR) if the Commissioner determines that, through other measures, lands are adequately protected for the intended use.

(2) Amendments Require DNR Approval

All amendments to this ordinance must be submitted to and approved by the Commissioner of the Department of Natural Resources (DNR) prior to adoption. The Commissioner must approve the amendment prior to community approval.

(3) Map Revisions Require Ordinance Amendments

The floodplain district regulations must be amended to incorporate any revisions by the Federal Emergency Management Agency to the floodplain maps adopted in Section 3.7(B)(2) of this ordinance.

(D) Wetland District

(1) Findings, Intent and Incorporation by Reference

- (a)** The City has determined that wetlands serve to maintain water quality by filtering water that is discharged into ground water aquifers and by retaining inorganic sediments, toxicants, and nutrients. They also retain and reduce the discharge of phosphorus and transform nutrients from their inorganic to organic forms, thereby, protecting streams and water bodies from eutrophication and contamination. Wetlands also store runoff and reduce the velocity of and magnitude of flood peaks. In addition, some wetlands receive the upward discharge of ground water. These wetlands tend to support more stable biological communities since their water temperatures and water levels tend to be more stable.
- (b)** Wetland vegetation also reduces the energy of waves, currents, and other erosive forces and serves to prevent the erosion of shoreline areas. In addition, aquatic vegetation provides food, shelter, and special habitat for wildlife. All of these wetland characteristics provide valuable recreation and education resources.
- (c)** The City has also found that wetlands vary significantly in the degree that they have been altered. Wetlands within the City exhibit great variations in their floral variety, quality of wildlife and fishery habitat, degree of fluctuation in response to storms, the extent to which their shorelines have been altered or eroded, and their relative value in protecting water quality. Therefore, the City has determined that it is necessary and beneficial to classify wetlands based upon their functions and values. The City has also found that it is in the best interest of the general health and welfare of the City to achieve no net loss of wetlands within the community.
- (d)** The City recognizes that a substantial amount of wetland degradation results from sedimentation and nutrient loading related to construction projects. Therefore, the City finds it necessary to require extraordinary measures to prevent such construction related degradation.
- (e)** In addition to having regulations that affect the physical impacts within wetland areas the City also finds that it is necessary to regulate the use of lands surrounding wetlands. Wetland buffer strips (as defined in Section 8.4 of this ordinance), are necessary and beneficial to maintaining the health of wetlands. These strips of land surrounding wetlands protect their shorelines from erosion, while serving to filter sediment, chemicals and other nutrients

before storm water discharges into the wetland. Buffer strips are also beneficial in providing habitat for wildlife.

- (f) This section hereby incorporates by reference the Wetlands Conservation Act of 1991 [Minn. Stat, 103G,221 et seq. (herein after referred to as the WCA)] and any future amendments adopted by the legislature. Any activities exempted from the provisions of the WCA are also exempted from the requirements of this section, insofar as they relate to the WCA. All wetlands, as defined in Section 8.4 of this ordinance, including those governed by the Department of Natural Resources, are covered by the other provisions of this ordinance. Also, there are circumstances under which the strict enforcement of these regulations may be unreasonable and in circumstances that meet the criteria established in Section 2.4(C) of this ordinance, departures from the strict application of these standards may be permitted.
- (g) It is the intent of Section 3.7(D) to avoid the alteration and destruction of wetlands. When wetlands are altered or destroyed, mitigation must be provided to recreate the functions and values of the lost wetland.

(2) Purpose and Implementation

- (a) Through the adoption and enforcement of this section, the City shall promote the general health, safety, and welfare of its residents by both conserving and protecting wetlands and requiring sound management practices and mitigation as provided for in the WCA when development occurs in the vicinity of wetlands. Through the implementation of this section, the City seeks to accomplish the following purposes:
 - (i) To satisfy the requirements of the WCA as it may be amended and, thereby achieve no net loss of wetlands within the City;
 - (ii) To balance the needs to preserve and protect natural resources and systems with both the rights of private property owners and the need to support the efficient use of developable land within the City;
 - (iii) To preserve the natural character of the landscape through the maintenance of wetland ecosystems;
 - (iv) To promote water quality by maintaining the ability of wetlands to recharge ground water and receive the discharge of ground water, to retain sediment and toxicants and filter and strip nutrients from surface water runoff before it discharges into community lakes and streams, thus avoiding the contamination and eutrophication of these water features; and

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- (v) To provide wildlife habitat and thereby support the maintenance of variety of both plant and animal species within the City.
- (b) To accomplish these purposes, the City will:
 - (i) Maintain an inventory of all wetlands within the City;
 - (ii) Maintain a system of classification for wetlands within the City and classify the City's wetlands based upon their relative values related to floral variety, wildlife habitat, water quality protection, fishery habitat, flood storage, shoreline protection, and aesthetic, recreational and education benefits.
 - (iii) Prepare and maintain a comprehensive set of official maps identifying the location and classification of all wetlands within the City.
 - (iv) Establish wetland regulations that are coordinated with flood plain and shoreland protection regulations.
 - (v) Require sound management practices to protect, conserve, maintain, enhance, and improve the quality of wetlands within the community.
 - (vi) Enforce standards for the alteration of wetlands when alteration is allowed, including standards and procedures for the mitigation of the loss of wetland areas and their functions and values, when alteration or destruction occurs.
 - (vii) Obtain protective easements over or acquire fee title to wetlands as appropriate.
 - (viii) Develop and maintain a program to educate the public about the numerous benefits and features that wetlands provide and the adverse effects of improperly managed urban development on wetlands.

(3) General Provisions

(a) Identification and Delineation of Wetlands.

- (i) This section shall apply to all land containing wetlands and land within the setback and buffer areas required by this section. Wetlands shall be subject to the requirements established herein, as well as restrictions and requirements established by other applicable Federal, State, and City ordinances and regulations. These wetland protection regulations shall not be construed to allow anything otherwise prohibited in the zoning district where the wetland area is located.
- (ii) A wetland is land that meets the definition of "wetlands" as set forth in Section 8.4 of this ordinance. Wetlands shall be determined according to the United States Army Corps of Engineers Wetland Delineation Manual (January 1987) and regional supplements if available. Wetlands have

been or will be identified and the wetland classification as established by the officially adopted City maps shall be prima facie evidence of the location and classification of a wetland. The official maps shall be developed and maintained by the Community Development Department and are open to inspection by the public. The presence or absence of a wetland on the official maps does not represent a definitive determination as to whether a wetland covered by this section is or is not present. Wetlands that are identified during site specific delineation activities but do not appear on the official wetland maps are still subject to the provisions of the section. It will be the responsibility of an applicant to delineate the exact wetland boundary or to determine that no wetland exists on a subject property. All delineations must be reviewed and approved by the City. If an applicant questions whether a wetland exists or disputes its classification, the applicant shall have the burden to supply detailed information for review supporting the applicant's assertion, including but not limited to, topographic, hydrologic, floristic and soil data deemed necessary by the City to determine the jurisdictional status of the wetland, its exact boundary and its classification. Wetland delineations supplied by applicants shall be certified by a qualified wetland delineator. Wetland delineators must satisfy any certification requirements that may be established by the U.S. Army Corps of Engineers or the Minnesota Board of Water and Soil Resources.

- (iii) Only that portion of a property within the boundaries of a wetland shall be subject to the provisions of this section.
- (iv) This section establishes four wetland classifications as defined in Section 8.4 of this ordinance: Exceptional Quality, High Quality, Medium Quality, and Low Quality.

(4) General Standards

The following standards apply to all lands containing or abutting a wetland:

- (a) Septic and soil absorption systems must be set back a minimum of seventy-five (75) feet from the City approved boundary of the wetland.
- (b) The lowest ground floor elevation of a structure shall be two (2) feet above the 100-Year flood elevation, three (3) feet above the Ordinary High Water Mark, or three (3) feet above the highest known water level, whichever is greater, of public waters regulated by Section 3.7(E) and Section 3.7(F) of this ordinance, whichever is greater.

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- (c) Structures intended to provide access across a wetland shall be prohibited unless a permit is obtained in conformance with State Regulations.
- (d) The MPCA's Best Management Practices and Minnesota Storm Water Manual, as applicable, shall be followed to avoid erosion and sedimentation during the construction process.
- (e) City inspection schedules and fines for erosion control will double on projects abutting wetlands.
- (f) Before the City issues a building permit for a lot with a required wetland buffer, the lot owner shall:
 - (i) Record a notice of the wetland buffer requirement against the title to the lot with the office of the Wright County Recorder or Registrar of Titles, and
 - (ii) Install the wetland monumentation required by Section 3.7(D)(6).
- (g) In cases where a site is not subject to the wetland buffer strips and setbacks required by Section 3.7(D)(5), buildings, swimming pools, patios, decks, drive aisles, and parking lots shall be set back not less than fifteen (15) feet from a wetland edge.

(5) Wetland Buffer Strips and Setbacks

- (a) For lots of record created after effective date of this ordinance as denoted in Section 1.4, a buffer strip shall be maintained abutting all wetlands. The setback and buffer provisions of Section 3.7(D) shall not apply to lots of record created before the effective date of this ordinance. The City does however; strongly encourage the use of a wetland buffer and setback on all lots in the City.
- (b) Wetland buffer strips and structure setbacks shall apply to all parcels of land whether or not the wetland is on the same parcel as a proposed development.
- (c) Buffer strip vegetation shall be established and maintained in accordance with the requirements of this Section. Buffer strips shall be identified within each lot by permanent monumentation approved by the City.
- (d) For roadways that must be aligned either adjacent to or across wetlands and are subject to WCA replacement requirements, additional wetland filling to create a buffer strip shall not be required. Trails that are intended to serve an interpretive function may also be exempted from the buffer requirement. All

other roadways and trails shall meet the buffer standards established in subsection (h) below.

- (e) If the area of the buffer has a preconstruction slope of twelve (12) percent or greater, the buffer shall be at the applicable maximum width for the wetland classification. The use of a meandering buffer strip to maintain a natural appearance is encouraged but not required in areas of flat topography.
- (f) The required structure setback shall apply to all structures, except that such structure setback shall not apply to roadways and trails and their related retaining walls and fences.
- (g) Wetland buffer strips not required by this section may be voluntarily created in conformance with the requirements of this section concurrent with approval of a site plan, or in the absence of a site plan, upon approval of an administrative permit.
- (h) Pursuant to the regulations of this section, the following dimensional requirements shall apply for wetland buffers and setbacks:

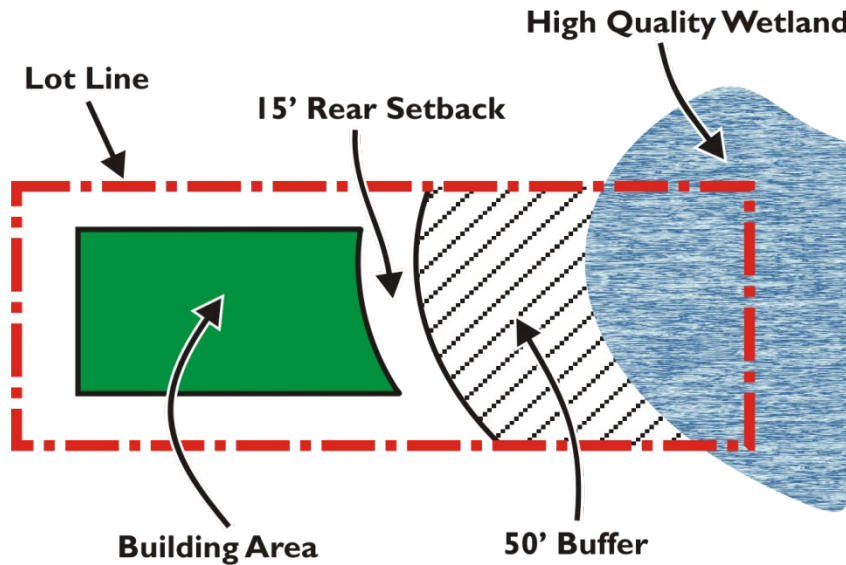
TABLE 3-19: WETLAND BUFFER AND SETBACKS FOR EXISTING WETLANDS, IMPACTED WETLANDS, AND MITIGATED WETLANDS

	Exceptional	High	Medium	Low
Wetland Buffer Width (Minimum):	50'	40'	10'	10'
Wetland Buffer Width (Maximum): [1]	100'	60'	50'	50'
Wetland Buffer Average Width:	75'	50'	30'	25'
Structure Setback (from Buffer): [2]	15'	15'	15'	15'
Total (Average):	90'	65'	45'	40'

[1]: Buffer widths in excess of the listed maximums shall not be used in calculating the average buffer width.

[2]: These setbacks shall take precedence over other setbacks required in this ordinance.

Figure 3-4: Example of Buffer and Setback Applied to a High Quality Wetland



(6) Monument Required

A permanent wetland buffer monument shall be installed and maintained at each lot line where it crosses a wetland buffer, and where needed to indicate the contour of the buffer, with a maximum spacing of two hundred (200) feet of wetland edge.

(7) Buffer Strip Vegetation Performance Standards

- (a)** Where acceptable natural vegetation exists in buffer strip areas, such vegetation shall be retained. A buffer strip has acceptable natural vegetation if it:
 - (i)** has a continuous, dense layer of perennial grasses that have been uncultivated or unbroken for at least five (5) consecutive years, or
 - (ii)** has an overstory of trees or shrubs with at least eighty (80) percent canopy closure that have been uncultivated or unbroken for at least five (5) consecutive years, or
 - (iii)** contains a mixture of the plant communities described in (i) and (ii) above, that have been uncultivated or unbroken for at least five (5) consecutive years.

- (b)** Notwithstanding the performance standards outlined in subdivision (7)(a) above, the City may determine existing buffer vegetation to be unacceptable if:
- (i)** it is composed of undesirable plant species (including but not limited to reed canary grass, common buckthorn, purple loosestrife, leafy spurge or noxious weeds), or
 - (ii)** it is lacking a layer of organic thatch or duff, or
 - (iii)** has topography that tends to channelize the flow of surface runoff, or
 - (iv)** for some other reason it is unlikely to retain nutrients and sediment.
- (c)** Where buffer areas, or a portion thereof, are not vegetated or have been cultivated or otherwise disturbed within five (5) years of the permit application, such areas shall be re-planted and maintained according to each of the following standards:
- (i)** The soil in wetland buffer strips shall be amended, as necessary, to ensure that the soil has an organic content of not less than ten (10) percent and not more than thirty five (35) percent.
 - (ii)** Buffer zones shall be planted with a Board of Water and Soil Resources (BWSR) approved seed mix containing one hundred (100) percent perennial native plant species, except for a one-time planting of an annual nurse or cover crop such as oats or rye.
 - (iii)** The seed mix to be used shall consist of at least twelve (12) pounds pure live seed (PLS) per acre of native prairie grass seed and five (5) pounds PLS per acre of native forbs. Native prairie grass and native forb mixes shall contain no fewer than four (4) and five (5) species, respectively.
 - (iv)** The annual nurse or cover crop shall be applied at a rate of twenty (20) pounds per acre.
 - (v)** Native shrubs may be substituted for forbs. Such shrubs may be bare root seedlings and shall be planted at a rate of sixty (60) plants per acre. Shrubs shall be distributed so as to provide a natural appearance and shall not be planted in rows.
 - (vi)** Any ground cover or shrub plantings installed in buffer areas are independent of landscaping requirements set forth elsewhere in the City code and City policy.
 - (vii)** Native prairie grasses and forbs shall be planted by a qualified contractor using a drill designed for native prairie grass seedings, such as a Truax or Nesbitt Native Grass Drill or a John Deere 1550 Power-Till Seeder.
 - (viii)** No fertilizer shall be used in establishing new buffer zones, except on highly disturbed sites when deemed necessary to establish acceptable

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buffer vegetation and then limited to amounts indicated by an accredited soil testing laboratory.

- (ix) All seeded areas shall have a two-inch thick application of compost (Mn/DOT Grade 1 Section 3890) or be mulched immediately with clean straw at a rate of one and one-half (1.5) tons per acre. Mulch shall be anchored with a disk or tackifier.
 - (x) Buffer zones (both natural and created), shall be protected by silt fence during construction and the fence shall remain in place until the area crop is established.
 - (xi) Applicants may obtain from the City a set of standard seeding and planting specifications for buffer zones which meet all the City requirements.
- (d) During the first five (5) years after initial planting, the developer shall submit to the City an annual report documenting the progress for establishment of the buffer. The report shall include a map of the buffer location, a description of compliance with the performance standards, a description of activities completed within the past year, a description of activities planned for the upcoming year, a map of plant communities within the buffer boundary including square footage estimates of the areas of native plantings and invasive or non-native vegetation, and other information as may be requested by the City of Monticello. Until such time as the buffer is accepted by the City, the developer shall be required to replant any buffer vegetation that does not survive. After the City has accepted the buffer, if the condition of the buffer area changes through natural processes not caused by the property owner, the owner shall not be required to re-establish the buffer area to meet the standards established in this subdivision.

(8) Encroachment in Required Setback and Buffer Areas

- (a) Patios and decks may encroach up to a maximum of six (6) feet into required structure setback areas. Porches may not encroach into required structure setback areas. Any fence or retaining wall located within the required structure setback area shall be designed and constructed so as to not obstruct the flow of storm water.
- (b) Water quality ponds may encroach into required wetland buffer areas, provided that the amount of buffer encroached upon does not exceed 50 percent of the total area required for such ponding, and provided that the amount of buffer encroached upon does not exceed 50 percent of the total area

required for buffering. These limitations may be exceeded where two-cell water quality ponding is utilized.

- (c) Wetlands and required wetland buffer areas must be kept free of all structures and features, including fences and play equipment.
- (d) Wetlands and required wetland buffer areas shall not be used for outside storage of household or personal items, lawn equipment, furniture, firewood, parts, yard waste, and the like.

(9) Variances

[Section 2.4\(C\):
Variances](#)

- (a) Requests for variances shall be made in accordance with the procedures and requirements set forth in Section 2.4(C) of this ordinance.
- (b) Variances shall only be granted when the standards and criteria set forth in Section 2.4(C) of this ordinance have been met. Variances shall not be granted which would circumvent the intent and purposes of Section 3.7(D).

(E) Wild and Scenic Recreational River District

(1) Purpose

The purpose of this district is to protect and preserve the scenic, recreational, natural and historical values of the Mississippi River in the city by carefully controlling development of this river corridor consistent with the state Wild and Scenic River Act (Minn. Stats. § 103F.301 et seq.) and Minn. Rules 6105.0010 to 6105.0070; 6105.0150 to 6105.0250; and as applicable, the provision of 6120.2600 to 6120.3900.

(2) Designation of District

In order to preserve and protect the Mississippi River and its adjacent land which possess scenic, recreational, natural and historical values, the Mississippi River in the city has been given a recreational river classification, and lands adjacent to the river are hereby designated by land use districts, the boundaries of which are based upon the Mississippi River Management Plan, Minn. Rules 6105.0800--6105.0960. The provisions of Section 3.7(E) shall apply to all lands within the jurisdiction of Monticello that are denoted on the official zoning map as being within the Wild and Scenic Recreational River overlay district. In case of conflict between the map and the property descriptions and boundaries in Minn. Rules 6105.0910 and 6105.0950, the latter shall prevail.

(3) District Application

The regulations and requirements imposed by the WSRR overlay district shall be in addition to those established for the base zoning districts which jointly apply. Under the joint application of standards, the more restrictive requirements shall apply. Any person contemplating development in the WSRR overlay district should review the base district requirements with the Community Development Department to determine which regulations will apply.

(4) Substandard Lots

Any lot of record filed in the office of the county recorder on or before July 1, 2000, which does not meet the dimensional requirements of this chapter may be allowed as a building site subject to the following:

- (a)** Such use is permitted in the land use district.
- (b)** The lot was in separate ownership on the date of enactment of the ordinance from which this chapter is derived.
- (c)** All sewage disposal and sewage setback requirements of the shoreland overlay district are met.
- (d)** The lot is at least 10,000 square feet in area.
- (e)** If in a group of two or more contiguous lots under a single ownership, any individual lot does not meet the lot width requirements of the local regulation, such individual lot cannot be considered as a separate parcel of land for purposes of sale or development, but must be combined with adjacent lots under the same ownership so that the combination of lots will equal one or more parcels of land, each meeting lot width requirements.

(5) Substandard Uses

Any uses in existence on a lot of record filed in the office of the county recorder on or before July 1, 2000, which are permitted uses in accordance with Chapter 5, but do not meet minimum setbacks or other dimensional requirements of the ordinance are to be considered as substandard uses. All substandard uses, except for substandard signs, shall be allowed to continue subject to the following conditions and exceptions:

- (a)** Any structural alteration or addition to a substandard use which will increase the substandard dimension(s) shall not be allowed.

- (b) Substandard signs shall be gradually amortized over a period of time not to exceed five years once amortization has been initiated by the City.

(6) Allowable Uses

The allowable uses in the WSRR overlay district shall be as allowed in Chapter 5 for the underlying zoning classification provided the uses are in conformance with the criteria for Urban River Class Standards in Minn. Rules 6120.3000, 6120.3100 and 6120.3200; and with the criteria for Recreational Rivers in 6105.0100 subpart 3.

(7) Conditional Uses

- (a) Conditional uses allowable within the WSRR overlay district shall be reviewed under the provisions outlined in Section 2.4(D), and interim use permits for uses or structures within WSRR overlay district shall be reviewed under the provisions outlined in Section 2.4(E).
- (b) Any structure(s) associated with a conditional use which are proposed to be located upon steep slopes greater than 12 percent shall adhere to the following conditions:
 - (i) The structure, in a manner judged acceptable by the city, shall be screened from view of the river and adjacent shorelands as much as possible assuming summer, leaf-on conditions.
 - (ii) An adequate conforming sanitary sewer and water system can be established on the site.
 - (iii) All provisions of Section 4.10 Grading, Drainage, Stormwater Management and Erosion Control are adhered to as part of the conditional use permit.

(8) Recreational river land use subdistricts – standards, lot dimensions, setbacks, and impervious surface requirements

(a) Areas covered

The following areas of the city are covered by this division: all areas of the wild and scenic recreational river district within the city.

(b) Standards for lots

Lots within the WSRR overlay district shall conform to the standards in Table 3-20. Where these standards conflict with the standards of the base zoning districts, the more restrictive standard shall prevail.

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Subsection (E) Wild and Scenic Recreational River District

TABLE 3-20: WILD & SCENIC LOT REQUIREMENTS

RIVER TYPE	Lot Size	Lot Width [1]
Wild	6 acres	300 feet
Scenic	4 acres	250 feet
Recreational	2 acres	200 feet

[1]: Lot width shall be met at both the OHW and at the required setback from the OHW in accordance with Section 8.2(B)(1)(i).

(c) Standards for principal structures

Principal structures within the WSRR overlay district shall conform to the standards in Table 3-21. Where these standards conflict with the standards of the base zoning districts, the more restrictive standard shall prevail.

TABLE 3-21: WILD & SCENIC PRINCIPAL STRUCTURE SETBACKS

Front yard setback and setback from rights-of-way or roadway easements (setbacks must be met from all roads when a lot is bounded by two or more roadways)		
- Arterial Road		30 feet
- Collector Road		30 feet
- Local Road		30 feet
- Landlocked Parcel		30 feet
	Unsewered	Sewered
Side yard setbacks	30 feet	10 feet
Rear yard setbacks	50 feet	30 feet
Setback from the OHW of the Mississippi River	150 feet	100 feet
Setback from a bluff line	75 feet	75 feet
Sewer setback from the OWH	75 feet	75 feet

(d) Accessory structure setbacks

Accessory structures within the WSRR overlay district shall conform to the standards in Table 3-22. Where these standards conflict with the standards of the base zoning districts, the more restrictive standard shall prevail.

TABLE 3-22: WILD & SCENIC ACCESSORY STRUCTURE SETBACKS

	Unsewered	Sewered
<u>Setback from the OHW of the Mississippi River</u>	<u>75 feet</u>	<u>50 feet</u>
<u>Setback from a bluff line</u>	<u>30 feet</u>	<u>30 feet</u>

(e) Impervious surface requirements

- (i)** Impervious surfaces on lots within the WSRR overlay district shall adhere to the following standards:
 - 1. Impervious surface coverage of lots must not exceed 25 percent of the lot area.
 - 2. When constructed facilities are used for storm water management, they must be designed and installed consistent with the field office technical guide of the local soil and water conservation districts.
 - 3. New constructed storm water outfalls to public waters must provide for filtering or settling of suspended solids and skimming of surface debris before discharge.
- (ii)** The provisions of subdivision (i) above may be varied without a variance if all of the following criteria and standards are met:
 - 1. All structures and impervious surfaces are located on slopes less than 12 percent. The physical alteration of slopes shall not be permitted for the purpose of overcoming this limitation.
 - 2. The site development is designed, implemented, and maintained using the most applicable combination of comprehensive practices that prevent flooding, pollutant, erosion and sedimentation problems consistent with Protecting Water Quality in Urban Areas: Best Management Practices for Minnesota, Minnesota Pollution Control Agency, October 1989, or as amended, which is incorporated by reference, available at the state law library and not subject to frequent change.
 - 3. A site development, maintenance, and inspection plan incorporating the comprehensive practices of this section is submitted and approved by the city prior to the issuance of an impervious surfacing permit and the plan is implemented.
 - 4. The city may impose additional conditions determined necessary to protect the public health, safety, and welfare.

(9) Building Height

The following minimum requirements shall be observed in the WSRR overlay district:

- (a)** The maximum height of principal structures shall not exceed 25 feet.
- (b)** The maximum height of accessory structures shall not exceed 25 feet.

(10) Additional structure and use standards

(a) Placement of structures

Structures shall not be located on slopes greater than 12 percent except by conditional use permit as provided for in subsection 3.7(E)(7).

(b) Maximum density

The maximum density in the WSRR overlay district shall not exceed one dwelling unit per lot.

(c) Multiple unit dwelling structures

Multiple family dwelling units shall meet the following additional standards:

- (i)** Each building must be set back at least 200 feet from the ordinary high water level;
- (ii)** Each building must have common sewage treatment and water systems in one location and serve all dwelling units in the building; and
- (iii)** Watercraft docking facilities for each lot must be centralized in one location and serve all dwelling units in the building (i.e. only one docking facility per lot).

(d) Stormwater management

Subject to other more restrictive limitations which may be imposed by this ordinance, the following general and specific standards shall apply:

(i) General standards

1. When possible, existing natural drainageways, wetlands, and vegetated soil surfaces shall be used to convey, store, filter, and retain stormwater runoff before discharge to public waters.
2. Development shall be planned and conducted in a manner that will minimize the extent of disturbed areas, runoff velocities, erosion potential, and reduce and delay runoff volumes. Disturbed areas must be stabilized and protected as soon as possible and facilities or methods used to retain sediment on the site.
3. When development density, topographic features, and soil and vegetation conditions are not sufficient to adequately handle stormwater runoff using natural features and vegetation, various types of constructed facilities such as diversions, settling basins, skimming devices, dikes, waterways, and ponds may be used. Preference shall be given to designs using surface drainage, vegetation, and infiltration rather than buried pipes and manmade materials and facilities.

(ii) Specific Standards

1. When constructed facilities are used for stormwater management, documentation shall be provided by a qualified individual that they are designed and installed consistent with the field office technical guide of the local soil and water conservation districts.
2. New constructed stormwater outfalls to public waters shall provide for filtering or settling of suspended solids and skimming of surface debris before discharge.

(e) Special Provisions for Commercial, Industrial, Public/Semipublic, Agricultural, and Forestry

(i) Standards for commercial, industrial, public, and semipublic uses

1. Surface water-oriented commercial uses and industrial, public, or semipublic uses with similar needs for access to and use of public waters may be located on parcels or lots with frontage on public waters. Subject to other more restrictive limitations which may be imposed by this chapter, those uses with water-oriented needs shall meet the following standards:
 - a. In addition to meeting impervious coverage limits, setbacks, and other zoning standards in this chapter, the uses shall be designed to incorporate topographic and vegetative screening of parking areas and structures;
 - b. Uses that require short-term watercraft mooring for patrons must centralize these facilities and design them to avoid obstructions of navigation and to be the minimum size necessary to meet the need; and
 - c. Uses that depend on patrons arriving by watercraft may use signs and lighting to convey needed information to the public, subject to the following general standards:
 - i. No advertising signs or supporting facilities for signs may be placed in or upon public waters. Signs conveying information or safety messages may be placed in or on public waters by a public authority or under a permit issued by the county sheriff.
 - ii. Signs may be placed, when necessary, within the shore impact zone if they are designed and sized to be the minimum necessary to convey needed information. They shall only convey the location and name of the establishment and the general types of goods or services available. The signs shall not contain other detailed information such as product brands

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and prices, shall not be located higher than ten feet above the ground, and shall not exceed 32 square feet in size. If illuminated by artificial lights, the lights shall be shielded or directed to prevent illumination out across public waters; and

iii. Other outside lighting may be located within the shore impact zone or over public waters if it is used primarily to illuminate potential safety hazards and is shielded or otherwise directed to prevent direct illumination out across public waters. This does not preclude use of navigational lights.

2. Uses without water-oriented needs must be located on lots or parcels without public waters frontage, or, if located on lots or parcels with public waters frontage, must either be set back double the normal ordinary high water level setback or be substantially screened from view from the water by vegetation or topography, assuming summer, leaf-on conditions.

(ii) Agriculture use standards

1. General cultivation farming, grazing, nurseries, horticulture, truck farming, sod farming, and wild crop harvesting are permitted uses if steep slopes and shore and bluff impact zones are maintained in permanent vegetation or operated under an approved conservation plan (resource management systems) consistent with the field office technical guides of the local soil and water conservation districts or the natural resources conservation service, as provided by a qualified individual or agency.
 - a. The shore impact zone for parcels with permitted agricultural land uses is equal to a line parallel to and 50 feet from the ordinary high water level.
 - b. The bluff impact zone is equal to the bluff and land located within 20 feet from a bluff line.
2. Animal feedlots shall meet the requirements of this chapter, as well as the following standards:
 - a. New feedlots shall not be located in the WSRR overlay district; and
 - b. Modifications or expansions to existing feedlots that are located within 300 feet of the ordinary high water level or within the bluff impact zone are allowed if they do not further encroach into the existing ordinary high water level setback or encroach on bluff impact zones.

3. Use of fertilizer, pesticides, or animal wastes within the WSRR overlay district shall be done in such a way as to minimize impact on the shore impact zone or public water by proper application or use of earth or vegetation.

(iii) Forest management standard

1. The harvesting of timber and associated reforestation must be conducted consistent with the provisions of the Minnesota Nonpoint Source Pollution Assessment--Forestry and the provisions of Water Quality in Forest Management--Best Management Practices in Minnesota.
2. Use of fertilizer, pesticides, or animal wastes within the WSRR overlay district shall be done in such a way as to minimize impact on the shore impact zone or public water by proper application or use of earth or vegetation.

(iv) Extractive use standards

1. Site development and restoration plan. An extractive use site development and restoration plan shall be developed, approved, and followed over the course of operation of the site. The plan shall address dust, noise, possible pollutant discharges, hours and duration of operation, and anticipated vegetation and topographic alterations. It must also identify actions to be taken during operation to mitigate adverse environmental impacts, particularly erosion, and shall clearly explain how the site will be rehabilitated after extractive activities end.
2. Setbacks for processing machinery. Processing machinery shall be located consistent with setback standards for structures from the ordinary high water level and from blufflines.

(11) Vegetative Cutting

Selective cutting of trees in excess of four inches in diameter at four feet height within the WSRR overlay district and within 100 feet of the ordinary high water level and 20 feet landward of the bluffline shall be subject to the following:

- (a)** Clearcutting, except for any authorized public services such as roads and essential services, shall not be permitted. Clearcutting for essential services, such as telephone lines, substations, and related structures, shall require a special permit issued by the City Council in accordance with 2.4(N) of this ordinance.
- (b)** Cutting is spaced in several cutting operations and a continuous tree cover is maintained, uninterrupted by large openings. In cases where the existing tree

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cover has been interrupted by large openings in the past, selective cutting may be performed so as to maintain a continuous tree cover in the remaining wooded areas.

- (c) The above cutting provisions shall not be deemed to prevent:
 - (i) The removal of diseased or insect-infested trees, or of rotten or damaged trees that present safety hazards.
 - (ii) Pruning understory vegetation, shrubs, plants, bushes, or grasses, or harvesting crops, or cutting suppressed trees or trees less than four inches in diameter at four-foot height.

- (d) Except in cases where vegetative cutting has been approved as part of a subdivision or other development, any person proposing vegetative cutting shall apply to the city for a vegetative cutting permit. Application forms for the permit shall be provided by the Community Development Department and require the following information:
 - (i) Name and address of applicant.
 - (ii) The name and address of the owner of the land.
 - (iii) The address and legal description of the land involved.
 - (iv) The purpose of the vegetative cutting.
 - (v) A description of the type and amount of vegetation to be cut.
 - (vi) The highway, street, or streets, or other public ways in the city upon and along which any material is to be hauled or carried.
 - (vii) An estimate of the time required to complete the vegetative cutting.
 - (viii) A site plan showing the proposed cutting area.
 - (ix) A plan or statement demonstrating that the activity will in no way jeopardize the public health, safety and welfare.
 - (x) A statement that the applicant will comply with all conditions prescribed by the city.

(12) Clearcutting Restrictions

Clearcutting within the WSRR overlay district shall be subject to the following standards and criteria:

- (a) Clearcutting shall not be used as a cutting method where soil, slope, or other watershed conditions are fragile and subject to injury.

- (b) Clearcutting shall be conducted only where clearcut blocks, patches, or strips are, in all cases, shaped and blended with the natural terrain.

- (c) The size of clearcut blocks, patches, or strips shall be kept at the minimum necessary.

- (d) Where feasible, all clearcuts shall be conducted between September 15 and May 15. If natural regeneration will not result in adequate vegetative cover, areas in which clearcutting is conducted shall be replanted to prevent erosion and to maintain the aesthetic quality of the area. Where feasible, replanting shall be performed in the same spring or the following spring.
- (e) Except in cases where clearcutting has been approved as part of a subdivision or other development, any person proposing clearcutting shall apply to the city for a clearcutting permit. Application forms for the permit shall be provided by the Community Development Department and require the following information:
 - (i) Name and address of applicant.
 - (ii) The name and address of the owner of the land.
 - (iii) The address and legal description of the land involved.
 - (iv) The purpose of the clearcutting.
 - (v) A description of the type and amount of clearcutting to be conducted.
 - (vi) The highway, street, or streets, or other public ways in the city upon and along which any material is to be hauled or carried.
 - (vii) An estimate of the time required to complete the vegetative cutting.
 - (viii) A site plan showing the proposed cutting area.
 - (ix) A plan or statement demonstrating that the activity will in no way jeopardize the public health, safety and welfare.
 - (x) A statement that the applicant will comply with all conditions prescribed by the city.

(13) Grading and Filling

Any grading and filling conducted within the WSRR overlay district shall require a permit and shall comply with the following:

- (a) The provisions of 2.4(N) of this ordinance are satisfactorily met.
- (b) Grading and filling of the natural topography which is not accessory to a permitted or conditional use shall not be allowed.
- (c) Grading and filling of the natural topography which is accessory to a permitted or conditional use shall not be conducted without a grading and filling permit from the zoning authority.

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- (d) Grading and filling of the natural topography which is accessory to a permitted or conditional use shall be performed in a manner which minimizes earth moving, erosion, tree clearing and the destruction of natural amenities.
- (e) Grading and filling of the natural topography shall also meet the following standards:
 - (i) The smallest amount of bare ground is exposed for as short a time as feasible.
 - (ii) Temporary ground cover such as mulch is used and permanent ground cover such as sod is planted.
 - (iii) Methods to prevent erosion and to trap sediment are employed.
- (f) Excavation of material from, or filling in the river, or construction of any permanent structures or navigational obstructions therein is prohibited, unless authorized by a permit from the Commissioner of the Department of Natural Resources pursuant to Minn. Stats. § 103G.245.
- (g) Draining or filling of wetlands as defined by this chapter shall be expressly prohibited.

(14) Utility Transmission Lines

All utility transmission crossings of land within the WSRR overlay district shall require a conditional use permit. The construction of such transmission services shall be subject to the standards and criteria of Minn. Rules 6105.0170 and 6105.0180.

(15) Public Roads

In addition to such permits as may be required by Minn. Stats. § 103G.245, a conditional use permit shall be required for any construction or reconstruction of new public roads within the WSRR overlay district. Such construction or reconstruction shall be subject to the standards and criteria of Minn. Rules 6105.0190 and 6105.0200. A conditional use permit shall not be required for marginal access streets which are intended to serve primarily as an access to abutting properties.

(16) Land Suitability

No land shall be subdivided which is determined by the city or the Commissioner of the Department of Natural Resources to be unsuitable by reason of flooding, inadequate drainage, soil and rock formation with severe limitations for development, severe erosion potential, unfavorable topography, inadequate water supply or sewage treatment capabilities or any other feature likely to be harmful

to the health, safety, or welfare of the future residents of the proposed subdivision or the city.

(17) Nonconforming Use

All uses in existence prior to July 1, 2000, which are lawfully permitted uses within the wild and scenic recreational river district, but do not meet the minimum lot area, setbacks or other dimensional requirements of this chapter shall be allowed to continue subject to the following conditions and exceptions:

- (a)** Any structural alteration or addition to a nonconforming use which will increase the substandard dimensions shall not be allowed.
- (b)** Substandard signs shall be gradually eliminated over a period of time not to exceed five years from the date of enactment or amendment of this division.

(18) Sewage Treatment

(a) Public System Required

Publicly-owned sewer systems must be used.

(b) Nonconforming Sewage Treatment Systems

A nonconforming sewage treatment system not meeting the requirements of applicable rules of the state Department of Health, the state pollution control agency, specifically Minn Rules ch. 7080, for individual sewage treatment systems, and any other applicable local government standards shall be brought into conformity or discontinued within five years of the date of enactment of the Wild and Scenic Recreational River District Ordinance from which this division is derived.

(19) Water Supply

Any public or private supply of water for domestic purposes must meet or exceed standards for water quality of the state Department of Health and the state pollution control agency and administrative procedures of this chapter. Private wells must be located, maintained, and sealed in accordance with or in a more thorough manner than the water well construction code of the state Department of Health.

(20) Plats

Copies of all plats within the Wild and Scenic Recreational River District shall be forwarded to the Commissioner of the Department of Natural Resources within ten days of approval by the City. Approval of a plat which is inconsistent with

this division is permissible only if the detrimental impact of the inconsistency is more than overcome by other protective characteristics.

(21) Planned Unit Development

A planned unit development may be allowed per the requirements of section 2.4(P) only when the proposed development provides a better means of preserving agricultural land, open space, woods, scenic views, wetlands, and other features of the natural environment than traditional subdivision development. Planned Unit Developments shall be reviewed under the provisions outlined in Section 2.4(P) of this ordinance, with the following additional criteria:

- (a) Preliminary plans are approved by the Commissioner of the Department of Natural Resources prior to their enactment by the City Council.
- (b) A publicly-owned sewer systems is used.
- (c) Open space is permanently preserved. This may be accomplished through the use of restrictive deed covenants, public dedications, granting of scenic easements, or other equally effective and permanent methods.
- (d) There is not more than one centralized boat launching facility for each cluster of homes.
- (e) The only uses that shall be allowed within the development are those allowed under section 2.4(P) and the underlying zoning district.
- (f) Under the joint application of standards, the more restrictive provisions of this chapter shall apply.

(22) Variances

- (a) Variances shall be reviewed under the provisions outlined in Section 2.4(C) with the following additional variance criteria:
 - (i) Granting of the variance is not contrary to the purpose and intent of this section and is consistent with Minn. Rules 6105.0010--6105.0250 and 6105.0800--6105.0960.
 - (ii) Granting of the variance will not allow any use which is neither a permitted or conditional use in the land use district in which the subject property is located.
- (b) Exception: Where a setback pattern from the ordinary high water level has already been established on both sides of a proposed building site, the setback

of the proposed structure may be allowed to conform to that pattern. This provision shall apply only to lots which do not meet the applicable minimum lot width requirement.

- (c) Appeals from variance decisions on shoreland issues may be made in accordance with the provisions of Section 2.4(H) and also Minnesota Statutes.

(23) Notice to the DNR of Proposed Actions within the Wild and Scenic Recreational River District

(a) Notification of Proposals

- (i) For properties within the Wild and Scenic Recreational River District, the Community Development Department shall notify the Commissioner of the Department of Natural Resources of any application for a variance, ordinance amendment (including proposed changes to district lines), conditional use permits, PUDs, or plats inconsistent with the ordinance.
- (ii) Notifications for ordinance changes and PUDs shall consist of a copy of the proposed ordinance amendment(s), a copy of the proposed PUD, and all other application materials as may be needed by the Commissioner of the Department of Natural Resources or the commissioner's designated representative to fully understand the proposal.
- (iii) Notifications for variances, plats or CUPs may consist simply of the notice of the applicable public hearing, or if a public hearing is not required, a copy of application materials as may be needed by the Commissioner of the Department of Natural Resources to fully understand the proposal.
- (iv) Notification shall be sent so as to be received by the Commissioner of the Department of Natural Resources at least 30 days prior to the planned hearing or meeting to consider the requested action.

(b) Notification of final decision

The Community Development Department shall notify the Commissioner of the Department of Natural Resources of the City's final decision on the proposed action within ten (10) days of the decision.

(c) Effective date of decision

- (i) Decisions on variances, plats or CUPs become effective upon completion of the applicable review process at the City level.
- (ii) Decisions on PUDs and ordinance amendments within or affecting the Wild and Scenic Recreational River District become effective upon the happening of any of the following events, whichever first occurs:

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1. The final decision taken by the city has previously received certification of approval from the Commissioner of the Department of Natural Resources.
2. The city receives certification of approval from the Commissioner of the Department of Natural Resources after its final decision.
3. Thirty days have elapsed from the day the Commissioner of the Department of Natural Resources received notice of the final decision, and the city has received from the Commissioner neither certification of approval nor notice of non-approval.
4. The Commissioner of the Department of Natural Resources certifies his approval within 30 days after conducting a public hearing.

(d) Hearing after non-approval

In case the Commissioner of the Department of Natural Resources gives notice of a PUD or proposed ordinance amendment, either the applicant or Community Development Department may, within 30 days of said notice, file with the Commissioner a demand for a hearing. If the demand for a hearing is not made within 30 days, the notice of non-approval becomes final.

- (i) The hearing shall be held within 60 days of the demand and after at least two weeks' published notice.
- (ii) The hearing shall be conducted in accordance with Minn. Stats. § 103G.311, subds. 2, 6 and 7.
- (iii) The Commissioner of the Department of Natural Resources shall either certify his approval or disapproval of the proposed action within 30 days of the hearing.

(F) Shoreland District

(1) Statutory Authorization and Policy

- (a) **STATUTORY AUTHORIZATION:** This shoreland ordinance is adopted pursuant to the authorization and policies contained in Minnesota Statutes, Chapter 103F, Minnesota Regulations, Parts 6120.2500 - 6120.3900, and the planning and zoning enabling legislation in Minnesota Statutes, Chapter 462.
- (b) **POLICY:** The uncontrolled use of shorelands of the City of Monticello, Minnesota affects the public health, safety, and general welfare not only by contributing to pollution of public waters, but also by impairing the local tax base. Therefore, it is in the best interests of the public health, safety, and welfare to provide for the wise subdivision, use and development of shorelands of public waters. The legislature of Minnesota has delegated

responsibility to local governments of the state to regulate the subdivision, use and development of the shorelands of public waters and thus preserve and enhance the quality of surface waters, conserve the economic and natural environmental values of shorelands, and provide for the wise use of waters and related land resources. This responsibility is hereby recognized by the City of Monticello.

(2) General Provisions

(a) Jurisdiction

- (i)** The provisions of this ordinance shall apply to the shorelands of the public water bodies as classified in Section 3.7(F)(4) of this ordinance.
- (ii)** Shoreland shall include all land within 1,000 feet of the Ordinary High Water Level (OHWL) of a lake and 300 feet of a river and its designated floodplain as depicted on the City of Monticello's Official Zoning Map.
- (iii)** Pursuant to Minnesota Regulations, Parts 6120.2500 - 6120.3900, no lake, pond, or flowage less than 10 acres in size in municipalities or 25 acres in size in unincorporated areas need be regulated in a local government's shoreland regulations. A body of water created by a private user where there was no previous shoreland may, at the discretion of the governing body, be exempt from this ordinance.

(b) Compliance

The use of any shoreland of public waters; the size and shape of lots; the use, size, type and location of structures on lots; the installation and maintenance of water supply and waste treatment systems, the grading and filling of any shoreland area; the cutting of shoreland vegetation; and the subdivision of land shall be in full compliance with the terms of this ordinance and other applicable regulations.

(c) Enforcement

The Community Development Department is responsible for the administration and enforcement of this ordinance. Any violation of the provisions of this ordinance or failure to comply with any of its requirements (including violations of conditions and safeguards established in connection with grants of permits, variances or conditional uses) shall be subject to the remedies and penalties outlined in Section 7.6 of this ordinance.

(d) Interpretation

In their interpretation and application, the provisions of this overlay district shall be held to be minimum requirements and shall be liberally construed in favor of the City and shall not be deemed a limitation or repeal of any other powers granted by State Statutes.

(e) Abrogation and Greater Restrictions

It is not intended by this ordinance to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this ordinance imposes greater restrictions, the provisions of this ordinance shall prevail.

(3) Administration

(a) Permits Required

- (i) A permit is required for the construction of buildings or building additions (including but not limited to related activities such as construction of decks or signs), the installation and/or alteration of sewage treatment systems, and all grading and filling activities as required by this ordinance. Application for a permit shall be made to the Community Development Department pursuant to the applicable regulations in Chapter 2 of this ordinance. The application shall include the necessary information so that the Community Development Department can determine the site's suitability for the intended use and that a compliant sewage treatment system will be provided.
- (ii) A permit authorizing an addition to an existing structure shall stipulate that an identified nonconforming sewage treatment system shall be reconstructed or replaced in accordance with the provisions of this ordinance.

[Chapter 2
Application Reviews
& Procedures](#)

(b) Determination of Zoning Compliance

The Community Development Department, in reviewing a required permit, shall make a determination as to whether the proposal is compliant with all provisions of Section 3.7(F) Shoreland District. Any use, arrangement, or construction not authorized by permit shall be deemed a violation of this ordinance and shall be punishable as provided in Section 7.6 of this ordinance.

[Section 7.6
Remedies and
Penalties](#)

(c) Variances

- (i) Variances shall be reviewed under the provisions outlined in Section 2.4(C) with the following additional requirements:

1. No variance shall circumvent the general purposes and intent of the shoreland overlay district.
 2. No variance may be granted that would allow any use that is prohibited in the zoning district in which the subject property is located.
 3. The variance application must clearly demonstrate whether a conforming sewage treatment system is present for the intended use of the property. The variance, if issued, must require reconstruction of a nonconforming sewage treatment system.
- (ii) A copy of the notice for the public hearing(s) to consider a variance must be sent to the Commissioner of the Department of Natural Resources or the commissioner's designated representative and postmarked at least ten days before the hearings.
- (iii) A copy of all decisions granting variances to shoreland regulations shall be forwarded by mail to the Commissioner of the Department of Natural Resources within ten (10) days of such action.
- (iv) Appeals from variance decisions on shoreland issues may be made in accordance with the provisions of Section 2.4(H) and also Minnesota Statutes.

(d) Conditional Uses

Conditional uses allowable within shoreland areas shall be reviewed under the provisions outlined in Section 2.4(D), and interim use permits for uses or structures within shoreland areas shall be reviewed under the provisions outlined in Section 2.4(E), with the following additional requirements:

(i) Evaluation Criteria

A thorough evaluation of the waterbody and the topographic, vegetation, and soils conditions on the site must be made to ensure:

1. The prevention of soil erosion or other possible pollution of public waters, both during and after construction;
2. The visibility of structures and other facilities as viewed from public waters is limited assuming summer, leaf-on conditions;
3. The site is adequate for water supply and on-site sewage treatment; and
4. The types, uses, and numbers of watercraft that the project will generate are compatible in relation to the suitability of public waters to safely accommodate these watercraft.

(ii) Conditions attached to conditional use permits

The Community Development Department, upon consideration of the criteria listed above and the purposes of this ordinance, shall attach such conditions to the issuance of the conditional use permits as it deems necessary to fulfill the purposes of this ordinance. Such conditions may include, but are not limited to, the following:

1. Increased setbacks from the ordinary high water level;
2. Limitations on the natural vegetation to be removed or the requirement that additional vegetation be planted; and
3. Special provisions for the location, design, and use of structures, sewage treatment systems, watercraft launching and docking areas, and vehicle parking areas.

(iii) Notification Procedures

1. A copy of the notice for the public hearing(s) to consider a conditional use permit must be sent to the Commissioner of the Department of Natural Resources or the commissioner's designated representative and postmarked at least ten days before the hearings.
2. A copy of all decisions granting a conditional use permit subject to shoreland regulations shall be forwarded by mail to the Commissioner of the Department of Natural Resources within ten (10) days of such action.

(e) Proposed Shoreland District Amendments and PUDs

(i) Notification Required

The Community Development Department shall submit to the Commissioner of the Department of Natural Resources (or the commissioner's designated representative), a copy of any application for a zoning amendment to Section 3.7(F), or an application for a Planned Unit Development (PUD) within the shoreland district for certification. The materials shall be sent so as to be received by the Commissioner at least 30 days prior to such hearing or meeting to consider such action. The notice of application shall include a copy of the proposed ordinances or amendment, or a copy of the proposed Planned Unit Development along with a description of the request.

(ii) Notification of final decision

The Community Development Department shall notify the Commissioner of the Department of Natural Resources of its final decision on the proposed action within ten days of the decision.

(iii) Effective date of decision

The ordinance amendment or PUD becomes effective upon the happening of any of the following events, whichever first occurs:

1. The final decision taken by the city has previously received certification of approval from the Commissioner of the Department of Natural Resources.
2. The city receives certification of approval from the Commissioner of the Department of Natural Resources after its final decision.
3. Thirty days have elapsed from the day the Commissioner of the Department of Natural Resources received notice of the final decision, and the city has received from the Commissioner neither certification of approval nor notice of non-approval.
4. The Commissioner of the Department of Natural Resources certifies his approval within 30 days after conducting a public hearing.

(iv) Hearing after non-approval

In case the Commissioner of the Department of Natural Resources gives notice of non-approval of an ordinance amendment or PUD, either the applicant or Community Development Department may, within 30 days of said notice, file with the Commissioner a demand for a hearing. If the demand for a hearing is not made within 30 days, the notice of non-approval becomes final.

1. The hearing shall be held within 60 days of the demand and after at least two weeks' published notice.
2. The hearing shall be conducted in accordance with Minn. Stats. § 103G.311, subds. 2, 6 and 7.
3. The Commissioner of the Department of Natural Resources shall either certify his approval or disapproval of the proposed action within 30 days of the hearing.

(4) Shoreland Classification System and Land Use Districts

(a) Shoreland Classification System

The public waters of the City of Monticello have been classified below consistent with the criteria found in Minnesota Regulations, Part 6120.3300, and the Protected Waters Inventory Map for Wright County, Minnesota. The Mississippi River is regulated by Section 3.7(E) Wild and Scenic Recreational River District.

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- (i) The shoreland area for the water bodies listed in subsections (ii) and (iii) below shall be as defined in this ordinance and as shown on the Official Zoning Map.
- (ii) Lakes
 - 1. Natural Environment Lakes
 - a. Mud Lake (DNR ID: 86-68 P)
 - 2. Recreational Development Lakes – RESERVED
 - 3. General Development Lakes
 - a. Pelican Lake (DNR ID: 86-31 P)
 - b. Long Lake (DNR ID: 86-69 P)
 - c. Slough Lake (DNR ID: 86-78 P)
- (iii) Rivers and Streams
 - 1. Remote Rivers – RESERVED
 - 2. Forested Rivers – RESERVED
 - 3. Transition Rivers – RESERVED
 - 4. Agricultural Rivers – RESERVED
 - 5. Tributary streams
 - a. Otter Creek

All protected watercourses in the City of Monticello shown on the Protected Waters Inventory Map for Wright County, a copy of which is hereby adopted by reference, that are not given a classification in Items 1 through 6 above shall be considered “Tributary streams.”

(b) Land Use District Descriptions

(i) Criteria For Designation

The land use districts in subsection (ii) below and the delineation of a land use district’s boundaries on the Official Zoning Map, must be consistent with the goals, policies, and objectives of the comprehensive land use plan.

(ii) Land Use in Shoreland Areas

Land uses on parcels within the shoreland district shall be regulated by the underlying zoning district or by Table 3-23 below, whichever is more restrictive.

TABLE 3-23: SHORELAND USES BY LAKE CLASSIFICATION

Lake Classes in SPECIAL PROTECTION Districts <i>(within the Wild and Scenic Recreational River Overlay District)</i>			
Uses	General Development	Recreational Development	Natural Environment
Forest management	P	P	P
Sensitive resource management	P	P	P
Agricultural: cropland and pasture	P	P	P
Agricultural feedlots	C	C	C
Parks and historic sites	C	C	C
Extractive use	C	C	C
Single residential	C	C	C
Mining of metallic minerals and peat	P	P	P
Lake Classes in LOW DENSITY RESIDENTIAL Districts <i>(within the A-O, R-A, R-1, R-2 or T-N Districts)</i>			
Uses	General Development	Recreational Development	Natural Environment
Single Residential	P	P	P
Semipublic	C	C	C
Parks and historic sites	C	C	C
Extractive use	C	C	C
Duplex, triplex, quad residential	P	P	C
Forest management	P	P	P
Mining of metallic minerals and peat	P	P	P
(C) Lake Classes in HIGH DENSITY RESIDENTIAL Districts <i>(within the R-3 or M-H Districts)</i>			
Uses	General Development	Recreational Development	Natural Environment
Residential Planned Unit Developments (PUDs)	C	C	C
Single Residential	P	P	P
Surface Water oriented commercial (as accessory to a residential PUD)	C	C	C
Semipublic	C	C	C
Parks and historic sites	C	C	C
Duplex, triplex, quad residential	P	P	P
Forest management	P	P	P
(D) Lake Classes in WATER ORIENTED COMMERCIAL Districts <i>(within a Business District AND includes a proposed water oriented use)</i>			
Uses	General Development	Recreational Development	Natural Environment
Surface Water oriented commercial	P	P	C
Commercial Planned Unit Development	C	C	C
Public, Semipublic	C	C	C
Parks and historic sites	C	C	C
Forest management	P	P	P

TABLE 3-23 (cont.)			
(E) Lake Classes in GENERAL USE Districts <i>(within a business or industrial district)</i>			
Uses	General Development	Recreational Development	<u>Natural Environment</u>
Commercial	P	P	<u>C</u>
Commercial Planned Unit Development	C	C	<u>C</u>
Industrial	C	C	<u>N</u>
Public, Semipublic	P	P	<u>C</u>
Extractive Use	C	C	<u>C</u>
Parks and historic sites	C	C	<u>C</u>
Forest management	P	P	<u>P</u>
Mining of metallic minerals and peat	P	P	<u>P</u>
(P) = Permitted Use, (C) = Conditional Use, and (N) = Prohibited Use			

(5) Shoreland Development Standards

(a) In General

- (i) Except as may be specifically provided, no new lot shall be created—by plat or by metes and bounds description—which does not meet the minimum dimensional requirements outlined in Section 3.7(F)(5).
- (ii) No lot area shall be so reduced or diminished so that the yards or other open spaces are smaller than prescribed herein, nor shall the number of dwelling units be increased in any manner except in conformity with the area regulations in this Ordinance.
- (iii) The area of any lot shall not be reduced below the minimum standards specified herein.

(b) Lot Standards

Tables 3-23, 3-24, and 3-25 list the lot standards for lands within the shoreland district.

- (i) Structure setbacks shall be measured from the Ordinary High Water mark (OHW) or the highest known water level;
- (ii) Lot widths shall be met at both the OHW and at the required structural setback from the OHW.
- (iii) Lot area shall be calculated based on land area above the OHW.

TABLE 3-24: SHORELAND LOT STANDARDS FOR SEWERED LAKES								
(A) Residential Lot Area (square feet)								
Lake Class	LAKESHORE				NON-LAKESHORE			
	Single	Duplex	Triplex	Quad	Single	Duplex	Triplex	Quad
Natural Environment	40,000	70,000	100,000	130,000	20,000	35,000	52,000	65,000
Recreational Development	20,000	35,000	50,000	65,000	15,000	26,000	38,000	49,000
General Development	15,000	26,000	38,000	49,000	10,000	17,500	25,000	32,500
(B) Residential Lot Width								
Lake Class	LAKESHORE				NON-LAKESHORE			
	Single	Duplex	Triplex	Quad	Single	Duplex	Triplex	Quad
Natural Environment	125	225	325	425	125	220	315	410
Recreational Development	75	135	195	255	75	135	190	245
General Development	75	135	195	255	75	135	190	245
(C) Setbacks (feet)								
Lake Class	LAKESHORE LOTS (distances in feet)							
	Structure Setback from OHW				Shore Impact Zone from OHW			
Natural Environment	150				75			
Recreational Development	75				37.5			
General Development	50				25			

CHAPTER 3: ZONING DISTRICTS

Section 3.7 Overlay Zoning Districts

Subsection (F) Shoreland District

TABLE 3-25: SHORELAND LOT STANDARDS FOR UNSEWERED LAKES								
(A) Residential Lot Area (square feet)								
Lake Class	LAKESHORE				NON-LAKESHORE			
	Single	Duplex	Triplex	Quad	Single	Duplex	Triplex	Quad
Natural Environment	80,000	120,000	160,000	200,000	80,000	160,000	240,000	320,000
Recreational Development	40,000	80,000	120,000	160,000	40,000	80,000	120,000	160,000
General Development	20,000	40,000	60,000	80,000	40,000	80,000	120,000	160,000
(B) Residential Lot Width								
Lake Class	LAKESHORE				NON-LAKESHORE			
	Single	Duplex	Triplex	Quad	Single	Duplex	Triplex	Quad
Natural Environment	200	300	400	500	200	400	600	800
Recreational Development	150	225	300	375	150	265	375	490
General Development	100	180	260	340	150	265	375	490
(C) Setbacks (feet)								
Lake Class	LAKESHORE LOTS (distances in feet)							
	Structure Setback from OHW	Shore Impact Zone from OHW	On-site Sewage Setback from OHW					
Natural Environment	150	75	150					
Recreational Development	100	50	75					
General Development	75	37.5	50					

TABLE 3-26: SHORELAND LOT STANDARDS FOR RIVERS							
<i>River Class</i>	Residential Lot Width (ft)				<i>Structure Setback</i>	<i>Shore Impact Zone</i>	<i>Sewage Setback</i>
	<i>Single</i>	<i>Duplex</i>	<i>Triplex</i>	<i>Quad</i>			
Remote	300	450	600	750	200	100	150
Forested	200	300	400	500	150	75	100
Transition	250	375	500	625	150	75	100
Agricultural	150	225	300	375	50/100*	25/50*	75
Urban & Tributary	75/100*	115/150*	150/200*	190/250*	50/100*	25/50*	75
* sewerred / unsewerred							

(c) Non-residential District Lot Standards

- (i) Minimum lot standards for non-residential zoned properties shall be as dictated by the requirements for the underlying zoning district classification.
- (ii) All structures and septic systems within non-residential districts shall comply with the structural setback standards for such features as listed in Tables 3-24, 3-25 and 3-26.

(d) Bluff Impact Zones

Structures or facilities, except stairways and landings, must not be placed within bluff impact zones.

(e) Height of Structures

- (i) No structures, except for churches and non-residential agricultural structures, shall exceed twenty-five (25) feet in height.
- (ii) Detached accessory structures shall not exceed fifteen (15) feet in height.

(f) Uses Without Water-Oriented Needs

Uses without water-oriented needs are encouraged to locate on lots or parcels without public water frontage, or, if located on lots or parcels with public water frontage, must either be setback double the normal ordinary high water level setback or be substantially screened from view from the water by vegetation or topography, assuming summer, leaf-on conditions.

(6) Zoning and Water Supply / Sanitary Provisions

(a) Design Criteria for Structures in the Shoreland District

(i) High Water Elevations

Structures must be placed in accordance with any floodplain regulations applicable to the site. Where these controls do not exist, the elevation to which the lowest floor, including basement, is placed or flood-proofed must be determined as follows:

1. For lakes, by placing the lowest floor at a level at least three feet above the highest known water level, or three feet above the ordinary high water level, whichever is higher;
2. For rivers and streams, by placing the lowest floor at least three feet above the flood of record, if data are available. If data are not available, by placing the lowest floor at least three feet above the ordinary high water level, or by conducting a technical evaluation to determine effects of proposed construction upon flood stages and flood flows and to establish a flood protection elevation. Under all three approaches, technical evaluations must be done by a qualified engineer or hydrologist consistent with parts 6120.5000 to 6120.6200 governing the management of flood plain areas. If more than one approach is used, the highest flood protection elevation determined must be used for placing structures and other facilities; and
3. Water-oriented accessory structures may have the lowest floor placed lower than the elevation determined in this item if the structure is constructed of flood-resistant materials to the elevation, electrical and mechanical equipment is placed above the elevation and, if long duration flooding is anticipated, the structure is built to withstand ice action and wind-driven waves and debris, or incorporation of flood openings.

(ii) Water-oriented Accessory Structures

Each lot may have one water-oriented accessory structure not meeting the normal structure setback of this ordinance if this water-oriented accessory structure complies with the following provisions:

1. The structure or facility must not exceed ten feet in height, exclusive of safety rails, and cannot occupy an area greater than 250 square feet. Detached decks must not exceed eight feet above grade at any point;
2. The setback of the structure or facility from the ordinary high water level must be at least ten feet;

3. The structure or facility must be treated to reduce visibility as viewed from public waters and adjacent shorelands by vegetation, topography, increased setbacks or color, assuming summer, leaf-on conditions;
4. The roof may be used as a deck with safety rails, but must not be enclosed or used as a storage area;
5. The structure or facility must not be designed or used for human habitation and must not contain water supply or sewage treatment facilities; and
6. As an alternative for general development and recreational development waterbodies, water-oriented accessory structures used solely for watercraft storage, and including storage of related boating and water-oriented sporting equipment, may occupy an area up to 400 square feet provided the maximum width of the structure is 20 feet as measured parallel to the configuration of the shoreline.

(iii) Stairways, Lifts, and Landings

Stairways and lifts are the preferred alternative to major topographic alterations for achieving access up and down bluffs and steep slopes to shore areas. Stairways and lifts must meet the following design requirements:

1. Stairways and lifts must not exceed four feet in width;
2. Landings for stairways and lifts must not exceed 32 square feet in area.
3. Canopies or roofs are not allowed on stairways, lifts, or landings;
4. Stairways, lifts, and landings shall be constructed above the ground on posts or pilings, and be designed and built in a manner that ensures control of soil erosion in conformance with the requirements of Section 2.4(N);
5. Stairways, lifts, and landings must be located in the most visually inconspicuous portions of lots, as viewed from the surface of the public water assuming summer, leaf-on conditions, whenever practical; and
6. Facilities such as ramps, lifts, or mobility paths for physically handicapped persons are also allowed for achieving access to shore areas, provided that the dimensional and performance standards of sub-items (1) to (5) are complied with in addition to the requirements of Minnesota Regulations, Chapter 1341.

(iv) Significant Historic Sites

No structure may be placed on a significant historic site in a manner that is inconsistent with State Historic Preservation Office regulations.

(v) Steep Slopes

The Community Development Department must evaluate possible soil erosion impacts and development visibility from public waters before issuing a permit for construction of sewage treatment systems, roads, driveways, structures, or other improvements on steep slopes. When determined necessary, conditions must be attached to issued permits to prevent erosion and to preserve existing vegetation screening of structures, vehicles, and other facilities as viewed from the surface of public waters, assuming summer, leaf-on vegetation.

(b) Shoreland Alterations

Alterations of vegetation and topography will be regulated to prevent erosion into public waters, fix nutrients, preserve shoreland aesthetics, preserve historic values, prevent bank slumping, and protect fish and wildlife habitat.

(i) Vegetation Alterations

1. Vegetation alteration necessary for the construction of structures and sewage treatment systems and the construction of roads and parking areas are exempt from the vegetation alteration standards that follow.
2. Removal or alteration of vegetation, except for agricultural and forest management uses as regulated in Section 3.7(F)(6)(e)(ii) and 3.7(F)(6)(e)(iii), respectfully, is allowed subject to the following standards:
 - a. Intensive vegetation clearing within the shore and bluff impact zones and on steep slopes is not allowed. Intensive vegetation clearing for forest land conversion to another use outside of these areas is allowable as a conditional use if an erosion control and sedimentation plan is developed and approved by the soil and water conservation district in which the property is located.
 - b. In shore and bluff impact zones and on steep slopes, limited clearing of trees and shrubs and cutting, pruning, and trimming of trees is allowed to provide a view to the water from the principal dwelling site and to accommodate the placement of stairways and landings, picnic areas, access paths, beach and

watercraft access areas, and permitted water-oriented accessory structures or facilities, provided that:

- i. The screening of structures, vehicles, or other facilities as viewed from the water, assuming summer, leaf-on conditions, is not substantially reduced;
- ii. Along rivers, existing shading of water surfaces is preserved; and
- iii. The above provisions are not applicable to the removal of trees, limbs, or branches that are dead, diseased, or pose safety hazards.

(ii) Topographic Alterations/Grading and Filling

1. Grading and filling and excavations necessary for the construction of structures, sewage treatment systems, and driveways under validly issued construction permits for these facilities do not require the issuance of a separate grading and filling permit. However, the grading and filling standards in this Section must be incorporated into the issuance of permits for construction of structures, sewage treatment systems, and driveways.
2. Public roads and parking areas are regulated by Section 3.7(F)(6)(c) of this ordinance.
3. Notwithstanding sub-items 1. and 2. above, a grading and filling permit will be required for:
 - a. The movement of more than ten (10) cubic yards of material on steep slopes or within shore or bluff impact zones; and
 - b. The movement of more than 50 cubic yards of material outside of steep slopes and shore and bluff impact zones.
4. The following considerations and conditions must be adhered to during the issuance of construction permits, grading and filling permits, conditional use permits, variances and subdivision approvals:
 - a. Grading or filling in any type 2, 3, 4, 5, 6, 7, or 8 wetland must be evaluated to determine how extensively the proposed activity would affect the following functional qualities of the wetland:
 - i. Sediment and pollutant trapping and retention;
 - ii. Storage of surface runoff to prevent or reduce flood damage;
 - iii. Fish and wildlife habitat;

CHAPTER 3: ZONING DISTRICTS

Section 3.7 Overlay Zoning Districts

Subsection (F) Shoreland District

- iv. Recreational use;
- v. Shoreline or bank stabilization; and
- vi. Noteworthiness, including special qualities such as historic significance, critical habitat for endangered plants and animals, or others.

This evaluation must also include a determination of whether the wetland alteration being proposed requires permits, reviews, or approvals by other local, state, or federal agencies such as a watershed district, the Minnesota Department of Natural Resources, or the United States Army Corps of Engineers. The applicant will be so advised.

- b. Alterations must be designed and conducted in a manner that ensures only the smallest amount of bare ground is exposed for the shortest time possible;
- c. Mulches or similar materials must be used for temporary bare soil coverage, and a permanent vegetation cover must be established as soon as possible;
- d. Methods to minimize soil erosion and to trap sediments before they reach any surface water feature must be used;
- e. Altered areas must be stabilized to acceptable erosion control standards consistent with the field office technical guides of the local soil and water conservation districts and the United States Soil Conservation Service;
- f. Fill or excavated material must not be placed in a manner that creates an unstable slope;
- g. Plans to place fill or excavated material on steep slopes must be reviewed by a qualified Engineer for continued slope stability and must not create finished slopes of 30 percent or greater;
- h. Fill or excavated material must not be placed in bluff impact zones;
- i. Any alterations below the ordinary high water level of public waters must first be authorized by the Commissioner of the Department of Natural Resources under Minnesota Statutes, section 103G;
- j. Alterations of topography must only be allowed if they are accessory to permitted or conditional uses and do not adversely affect adjacent or nearby properties; and
- k. Placement of natural rock riprap, including associated grading of the shoreline and placement of a filter blanket, is permitted if

the finished slope does not exceed three feet horizontal to one foot vertical, the landward extent of the riprap is within ten feet of the ordinary high water level, and the height of the riprap above the ordinary high water level does not exceed three feet.

(c) Placement and Design of Roads, Driveways, and Parking Areas

- (i)** Public and private roads and parking areas must be designed to take advantage of natural vegetation and topography to achieve maximum screening from view from public waters. Documentation must be provided by a qualified Engineer that all roads and parking areas are designed and constructed to minimize and control erosion to public waters consistent with the field office technical guides of the local soil and water conservation district, or other applicable technical materials.
- (ii)** Roads, driveways, and parking areas must meet structure setbacks and must not be placed within bluff and shore impact zones, when other reasonable and feasible placement alternatives exist. If no alternatives exist, they may be placed within these areas, and must be designed to minimize adverse impacts.
- (iii)** Public and private watercraft access ramps, approach roads, and access-related parking areas may be placed within shore impact zones provided the vegetative screening and erosion control conditions of this subpart are met. For private facilities, the grading and filling provisions of Section 3.7(F)(6)(b)(ii) of this ordinance must be met.

(d) Stormwater Management

The following general and specific standards shall apply:

(i) General Standards

1. When possible, existing natural drainage ways, wetlands, and vegetated soil surfaces must be used to convey, store, filter, and retain stormwater runoff before discharge to public waters.
2. Development must be planned and conducted in a manner that will minimize the extent of disturbed areas, runoff velocities, erosion potential, and reduce and delay runoff volumes. Disturbed areas must be stabilized and protected as soon as possible and facilities or methods used to retain sediment on the site.
3. Stormwater shall not be directed to wetlands without sufficient pre-treatment as approved by the City.
4. When development density, topographic features, and soil and vegetation conditions are not sufficient to adequately handle stormwater runoff using natural features and vegetation, various

types of constructed facilities such as diversions, settling basins, skimming devices, dikes, waterways, and ponds may be used. Preference must be given to designs using surface drainage, vegetation, and infiltration rather than buried pipes and man-made materials and facilities.

(ii) Specific Standards

1. Impervious surface coverage of lots must not exceed 25 percent of the lot area.
2. When constructed facilities are used for stormwater management, documentation must be provided by a qualified Engineer that they are designed and installed consistent with the field office technical guide of the local soil and water conservation districts.
3. New constructed stormwater outfalls to public waters must provide for filtering or settling of suspended solids and skimming of surface debris before discharge.

(e) Special Provisions for Commercial, Industrial, Public/Semipublic, Agricultural, Forestry and Extractive Uses and Mining of Metallic Minerals and Peat

(i) Standards for Commercial, Industrial, Public, and Semipublic Uses

1. Surface water-oriented commercial uses and industrial, public, or semipublic uses with similar needs to have access to and use of public waters may be located on parcels or lots with frontage on public waters. Those uses with water-oriented needs must meet the following standards:
 - a. In addition to meeting impervious coverage limits, setbacks, and other zoning standards in this ordinance, the uses must be designed to incorporate topographic and vegetative screening of parking areas and structures;
 - b. Uses that require short-term watercraft mooring for patrons must centralize these facilities and design them to avoid obstructions of navigation and to be the minimum size necessary to meet the need; and
 - c. Uses that depend on patrons arriving by watercraft may use signs and lighting to convey needed information to the public, subject to the following general standards:
 - i. No advertising signs or supporting facilities for signs may be placed in or upon public waters. Signs conveying information or safety messages may be placed in or on

public waters by a public authority or under a permit issued by the county sheriff;

- ii. Signs may be placed, when necessary, within the shore impact zone if they are designed and sized to be the minimum necessary to convey needed information. They must only convey the location and name of the establishment and the general types of goods or services available. The signs must not contain other detailed information such as product brands and prices, must not be located higher than ten feet above the ground, and must not exceed thirty-two (32) square feet in size. If illuminated by artificial lights, the lights must be shielded or directed to prevent illumination out across public waters; and
- iii. Other outside lighting may be located within the shore impact zone or over public waters if it is used primarily to illuminate potential safety hazards and is shielded or otherwise directed to prevent direct illumination out across public waters. This does not preclude use of navigational lights.

2. Uses without water-oriented needs must be located on lots or parcels without public waters frontage, or, if located on lots or parcels with public waters frontage, must either be set back double the normal ordinary high water level setback or be substantially screened from view from the water by vegetation or topography, assuming summer, leaf-on conditions.

(ii) Agriculture Use Standards

1. General cultivation farming, grazing, nurseries, horticulture, truck farming, sod farming, and wild crop harvesting are permitted uses if steep slopes and shore and bluff impact zones are maintained in permanent vegetation or operated under an approved conservation plan (Resource Management Systems) consistent with the field office technical guides of the local soil and water conservation districts or the United States Soil Conservation Service. The shore impact zone for parcels with permitted agricultural land uses is equal to a line parallel to and 50 feet from the ordinary high water level.
2. Animal feedlots are prohibited.

(iii) Forest Management Standards

The harvesting of timber and associated reforestation or conversion of forested use to a non-forested use must be conducted consistent with the following standards:

1. Timber harvesting and associated reforestation must be conducted consistent with the provisions of the Minnesota Non-point Source Pollution Assessment-Forestry and the provisions of Water Quality in Forest Management "Best Management Practices in Minnesota."
2. Forest land conversion to another use shall require issuance of a conditional use permit subject to Section 2.4(D) and adherence to the following standards:
 - a. Shore and bluff impact zones must not be intensively cleared of vegetation; and
 - b. An erosion and sediment control plan is developed and approved by the local soil and water conservation district before issuance of a conditional use permit for the conversion.
 - c. Use of fertilizer, pesticides, or animal wastes within shorelands must be done in such a way as to minimize impact on the shore impact zone or public water by proper application or use of earth or vegetation.

(iv) Extractive Use Standards

1. Site Development and Restoration Plan. An extractive use site development and restoration plan must be developed, approved, and followed over the course of operation of the site. The plan must address dust, noise, possible pollutant discharges, hours and duration of operation, and anticipated vegetation and topographic alterations. It must also identify actions to be taken during operation to mitigate adverse environmental impacts, particularly erosion, and must clearly explain how the site will be rehabilitated after extractive activities end.
2. Setbacks for Processing Machinery. Processing machinery must be located consistent with setback standards for structures from ordinary high water levels of public waters and from bluffs.

(v) Mining of Metallic Minerals and Peat

Mining of metallic minerals and peat, as defined in Minnesota Statutes, sections 93.44 to 93.51, shall be a permitted use provided the provisions of Minnesota Statutes, sections 93.44 to 93.51, are satisfied.

(f) Water Supply and Sewage Treatment

(i) Water Supply

Water shall be supplied through the City of Monticello municipal water system.

(ii) Sewage Treatment

Any premises used for human occupancy must be provided with an adequate method of sewage treatment, as follows:

1. Publicly-owned sewer systems shall be used for any new development.
2. Nonconforming sewage treatment systems shall be regulated and upgraded in accordance with the provisions Section 3.7(F)(7) below.

(7) Nonconformities

All legally established nonconformities as of the date of this ordinance may continue, but they will be managed according to applicable state statutes and the provisions of Chapter 6 of this ordinance for the subjects of alterations and additions, repair after damage, discontinuance of use, and intensification of use; except that the following standards will also apply in shoreland areas:

(a) Construction on nonconforming lots of record

- (i)** Lots of record in the office of the county recorder on the date of enactment of local shoreland controls that do not meet the requirements of Section 3.7(F)(5)(b) may be allowed as building sites without variances from lot size requirements provided the use is permitted in the zoning district, the lot has been in separate ownership from abutting lands at all times since it became substandard, was created compliant with official controls in effect at the time, and sewage treatment and setback requirements of this ordinance are met.
- (ii)** A variance from setback requirements must be obtained before any use, sewage treatment system, or building permit is issued for a lot. In evaluating the variance, the board of adjustment shall consider sewage treatment and water supply capabilities or constraints of the lot and shall deny the variance if adequate facilities cannot be provided.
- (iii)** If, in a group of two or more contiguous lots under the same ownership, any individual lot does not meet the requirements of Section 3.7(F)(5)(b), the lot must not be considered as a separate parcel of land for the purposes of sale or development. The lot must be combined with the one or more contiguous lots so they equal one or more parcels of

land, each meeting the requirements of Section 3.7(F)(5)(b) as much as possible.

(b) Additions/expansions to nonconforming structures

- (i)** All additions or expansions to the outside dimensions of an existing nonconforming structure must meet the setback, height, and other requirements of Section 3.7(F). Any deviation from these requirements must be authorized by a variance pursuant to Section 3.7(F)(3)(c).
- (ii)** Deck additions may be allowed without a variance to a structure not meeting the required setback from the ordinary high water level if all of the following criteria and standards are met:
 - 1. The structure existed on the date the structure setbacks were established;
 - 2. A thorough evaluation of the property and structure reveals no reasonable location for a deck meeting or exceeding the existing ordinary high water level setback of the structure;
 - 3. The deck encroachment toward the ordinary high water level does not exceed 15 percent of the existing setback of the structure from the ordinary high water level or does not encroach closer than 30 feet, whichever is more restrictive; and
 - 4. The deck is constructed primarily of wood, and is not roofed or screened.

(8) Special Provisions for Subdivision and Platting in Shoreland Districts

(a) Land suitability

Each lot created through subdivision, including planned unit developments authorized under Section 2.4(P) of this ordinance, must be suitable in its natural state for the proposed use with minimal alteration. Suitability analysis by the local unit of government shall consider susceptibility to flooding, existence of wetlands, soil and rock formations with severe limitations for development, severe erosion potential, steep topography, inadequate water supply or sewage treatment capabilities, near-shore aquatic conditions unsuitable for water-based recreation, important fish and wildlife habitat, presence of significant historic sites, or any other feature of the natural land likely to be harmful to the health, safety, or welfare of future residents of the proposed subdivision or of the community.

(b) Consistency with other controls

Subdivisions must conform to all official controls of this community. A subdivision will not be approved where a later variance from one or more standards in official controls would be needed to use the lots for their intended purpose. Each lot shall meet the minimum lot size and dimensional requirements of Section 3.7(F)(5), including at least a minimum contiguous lawn area, that is free of limiting factors sufficient for the construction of two standard soil treatment systems. Lots that would require use of holding tanks must not be approved.

(c) Information requirements.

Sufficient information must be submitted by the applicant for the community to make a determination of land suitability. The information shall include at least the following:

- (i)** Topographic contours at ten-foot intervals or less from United States Geological Survey maps or more accurate sources, showing limiting site characteristics;
- (ii)** The surface water features required in Minnesota Statutes, section 505.02, subdivision 1, to be shown on plats, obtained from United States Geological Survey quadrangle topographic maps or more accurate sources;
- (iii)** Adequate soils information from field investigations such as soil borings, percolation tests, or other methods to determine suitability for building and on-site sewage treatment capabilities for every lot;
- (iv)** Information regarding adequacy of domestic water supply; extent of anticipated vegetation and topographic alterations; near-shore aquatic conditions, including depths, types of bottom sediments, and aquatic vegetation; and proposed methods for controlling stormwater runoff and erosion, both during and after construction activities;
- (v)** Location of 100-year flood plain areas and floodway districts from existing adopted maps or data; and
- (vi)** A line or contour representing the ordinary high water level, the “toe” and the “top” of bluffs, and the minimum building setback distances from the top of the bluff and the lake or stream.

(d) Dedications

When a land or easement dedication is a condition of subdivision approval, the approval must provide easements over natural drainage or ponding areas for management of stormwater and significant wetlands.

(G) Number of Loading Berths Required

The number of required off-street loading berths shall be as follows:

(1) Manufacturing, Fabrication, Processing, Warehousing, Storing, Retail Sales, Schools and Hotels

For such a building five thousand (5,000) to one hundred thousand (100,000) square feet of floor area, one (1) loading berth fifty-five (55) feet in length and one (1) additional berth for each additional one hundred thousand (100,000) square feet or fraction thereof, plus one (1) berth thirty (30) feet in length for each thirty-five thousand (35,000) square feet of floor area or fraction thereof.

(2) Auditorium, Convention Hall, Exhibition Hall, Sports Arena or Stadium

Ten thousand (10,000) to one hundred thousand (100,000) square feet of floor area, one (1) loading berth; for each additional one hundred thousand (100,000) square feet of floor area or fraction thereof, one (1) additional loading berth.

4.10 Grading, Drainage, Stormwater Management & Erosion Control

(A) Purpose

(1) Statutory Authorization

This Section is adopted pursuant to the authorization and policies contained in Minnesota Statutes Chapters 103B and 462; Minnesota Rules, Parts 6120.2500-6120.3900, Minnesota Rules Chapters 8410, 8420 and 70510.0210.

(2) Findings

The City of Monticello finds that uncontrolled Stormwater runoff and construction Site Erosion from Land Development and Land Disturbing Activities can have significant adverse impacts upon local and regional water resources, diminishing the quality of public health, safety, public and private property and natural resources of the community.

(3) Purpose

The general purpose of this Section is to establish regulatory requirements for land Development and Land Disturbing Activities aimed at minimizing the threats to public health, safety, public and private property and natural resources within

CHAPTER 4: FINISHING STANDARDS

Section 4.10 Grading, Drainage, Stormwater Management & Erosion Control

Subsection (B) Definitions

the community resulting from construction Site Erosion and post-construction Stormwater runoff.

- (4) This ordinance is intended to meet the current construction site erosion and sediment control and post-construction stormwater management regulatory requirements for construction activity and small construction activity (NPDES Permit) as defined in 40 CFR pt. 122.26(b)(14)(x) and (b)(15), respectively.
- (5) This ordinance is intended to meet the Minimal Impact Design Standards (MIDS) developed under Minnesota Statutes 2009, Section 115.03, subdivision 5c.

(B) Definitions

Definitions for the following terms can be found in Section 8.4

- (1) **Best Management Practices (BMPs)**
- (2) **Contractor**
- (3) **Dewatering**
- (4) **Erosion**
- (5) **Erosion Prevention**
- (6) **Final Stabilization**
- (7) **Impervious Surface**
- (8) **Land Disturbing Activity**
- (9) **Owner**
- (10) **Permanent Cover**
- (11) **Sediment**
- (12) **Stabilized**
- (13) **Stormwater**
- (14) **Stormwater Pollution Prevention Plan**
- (15) **Surface Water or Waters**

(16) Temporary Erosion Protection

(C) Permits

- (1) The thresholds for required Grading, Drainage, Stormwater Management and Erosion Control permits along with the permit review process is outlined in Section 2.4(M) of this ordinance.
- (2) The Permittee(s) shall be responsible for obtaining required permits from other government agencies prior to conducting grading work (e.g. dewatering a site for development will require one or more permits from the MPCA).

(D) Grading, Drainage, Stormwater Management, and Erosion Control Plan Requirements

Grading, drainage, stormwater management and erosion control plans are required for any activities that require a grading permit as defined in Section 2.4(M). The plans shall contain the following information and be in conformance with the City's Plan Requirements and Design Guidelines ("Design Manual"):

- (1) The name and address of the applicant, a legal description of the site, north point, date and scale of drawing and number of sheets;
- (2) An existing site map: a map of existing site conditions showing the site and immediately adjacent areas, which shall include the following information:
 - a. Existing topography with a contour interval appropriate to the topography of the land but in no case having a contour interval greater than two feet;
 - b. A delineation of all Surface Waters located on and immediately adjacent to the site, including depth of water, a description of all vegetation which may be found in the water, a statement of general water quality and any classification given to the water body or wetland by the Minnesota Department of Natural Resources, the Minnesota Pollution Control Agency, and/or the United States Army Corps of Engineers;
 - c. The location and dimensions of existing stormwater drainage systems and natural drainage patterns on and immediately adjacent to the site delineating the direction and the rate the stormwater is conveyed from the site, identifying the receiving stream, river, public water, or wetland and setting forth those areas of the unaltered site where stormwater collects;
 - d. A description of the soils of the site, including a map indicating soil types of areas to be disturbed as well as a soil report containing information on the suitability of the soils for the type of development proposed and for the type

CHAPTER 4: FINISHING STANDARDS

Section 4.10 Grading, Drainage, Stormwater Management & Erosion Control

Subsection (D) Grading, Drainage, Stormwater Management, and Erosion Control Plan Requirements

of sewage disposal proposed which describes any remedial steps to be taken by the applicant to render the soils suitable;

- e. The location and type of vegetative cover on the site and clearly delineating any vegetation proposed for removal; and
 - f. 100 year floodplain, flood fringes and floodways boundaries.
 - g. The location of any water body, and any biologically or archaeologically significant areas within one mile of the site that is identified as: (CGP Part I.B.6).
 - i. Impaired pursuant to section 303(d) of the Federal Clean Water Act (33 U.S.C. § 303(d)) where the identified pollutant(s) or stressor(s) are phosphorus (nutrient eutrophication biological indicators), turbidity, dissolved oxygen or aquatic biota (fish bioassessment, aquatic plant bioassessment and aquatic macroinvertebrate bioassessment), and with or without a U.S. Environmental Protection Agency (USEPA) approved Total Maximum Daily Load (TMDL) for any of these identified pollutant(s) or stressors(s) also meeting the specific impaired waters criteria of the Minnesota Pollution Control Agency's National Pollutant Discharge Elimination System (NPDES) construction general permit (Permit No: MN R10001), regarding construction-site erosion and sediment control;
 - ii. An outstanding resource value waters as listed in Minn. R. 7050.0180, subp. 3, 4, 5, 6, 6a and 6b;
 - iii. A trout waters as listed in Minn. R. 6264.0050, subp. 2 and 4;
 - iv. A wetland defined in Minn. R. 7050.0186 subd.1a.B;
 - v. Any lands where state or federally listed endangered or threatened species are known to occur, or properties listed in the National Register of Historic Places, including archaeological sites may be impacted.
- (3)** A site construction plan which shall include the following information:
- a. Locations and dimensions of all proposed land disturbing activities and any phasing of those activities;
 - b. Locations and dimensions of all temporary soil or dirt stockpiles;
 - c. Locations and dimensions of all erosion prevention measures and best management practices necessary to meet the requirements of this ordinance;
 - d. Schedule of anticipated start and completion dates of each land disturbing activity including the dates of installation of erosion prevention measures for each phase needed to meet the requirements of this ordinance; and

- e. Provisions for maintenance of the erosion and sediment prevention measures prior to final stabilization.
- (4) A plan of final site conditions, which shall include the following information:
- a. Finished grading shown at contours at the same interval as provided on the existing site map to clearly indicate the relationship of proposed changes to the site's existing topography and remaining features;
 - b. A landscape plan, drawn to an appropriate scale, including dimensions and distances and the location, type, size and description of all proposed landscape materials that will be added to the site;
 - c. A drainage plan of the developed site delineating in which direction and the rate stormwater will be conveyed from the site and setting forth the areas of the site where stormwater will be allowed to collect;
 - d. The proposed size, alignments and intended use of any structures to be erected on the site;
 - e. A clear delineation and tabulation of all impervious surfaces to be installed on the site, including a description of the surfacing material to be used;
 - f. Any other information pertinent to the particular project which in the opinion of the applicant is necessary for the review of the project; and
 - g. Seeding mixtures and rates, types of sod, method of seedbed preparation, expected seeding dates, type and rate of lime and fertilizer application, and kind and quantity of mulching for both temporary and permanent vegetative control measures. Required specifications are referenced in the City of Monticello's Design Manual.
 - h. Provisions for maintenance of erosion and sediment plan, specifically in boulevards, easements and other public areas, and estimates of the cost of maintenance.
 - i. Provisions for regular permittee inspections of all control measures in accordance with the inspection schedule outlined on the approved Grading, Drainage, Stormwater Management and Erosion Control Plan(s).
 - j. Modifications to the plan shall be processed and approved or disapproved in the same manner as a new application per the requirements of Section 2.4(M).
- (5) A copy of the applicant's Minnesota Pollution Control Agency's Permit for discharging stormwater from construction activity (MN R100001), if the area of disturbed land is equal to or greater than one (1) acre. A Stormwater Pollution Prevention Plan must be prepared and must meet the NPDES requirements and conform to the SWPPP standards specified in the MPCA NPDES construction

CHAPTER 4: FINISHING STANDARDS

Section 4.10 Grading, Drainage, Stormwater Management & Erosion Control

Subsection (E) Stormwater Management

general permit (Permit No: MN R10001), regarding construction-site erosion and sediment control (CGP Part III.A-B).

(E) Stormwater Management

Plan Required: The proposed provisions for stormwater runoff shall be documented in a stormwater management plan including a narrative, prepared by a Minnesota licensed engineer to stating how the proposed activity meets the requirements of the City of Monticello's Design Manual.

(1) Minimum Standards For Runoff Water Management Plans

A runoff water management plan shall include the following items:

- a. A map containing a delineation of the subwatershed contributing runoff from off site, and proposed and existing subwatersheds on site. The delineation shall conform to the nomenclature of the water resources management plan and shall indicate any significant departures from the watershed delineation of the water resources management plan
- b. Delineation of existing on site "wetlands", as defined in the Wetland Conservation Act, lakes, watercourses, shoreland, and/or floodplain areas.
- c. For water bodies and channels, a listing of normal (runout) and calculated 10-year and 100-year elevations on site for both existing and proposed conditions.
- d. Stormwater runoff volumes and rates for existing and proposed conditions.
- e. All hydrologic and hydraulic computations completed to design the proposed stormwater management facilities. Reservoir routing procedures and critical duration runoff events shall be used for design of water storage areas and outlets.
- f. A checklist of best management practices to demonstrate that, to the maximum extent practical, the plan has incorporated the structural and nonstructural best management practices described in the book "Protecting Water Quality In Urban Areas", published by the Minnesota Pollution Control Agency or the applicable publications.
- g. A grading plan identifying stormwater overflow routes along streets or drainage easements designed to protect structures from damage due to:
 - i. Storms in excess of the design storm, or
 - ii. Clogging, collapse or other failure of the primary drainage facilities.
- h. An assessment of the potential for construction or contribution to regional detention basins, as opposed to the construction of on-site stormwater basins. The water resources management plan identifies potential regional stormwater

basins for control of rate and nutrient loading. The following criteria shall be used to determine whether on site storage is required within the subdivision:

- i. If the stormwater management plan indicates construction or enlargement of a storage site or water quality storage in a wetland or other water body, the facility or its equivalent shall be constructed to meet the goals of the water resources management plan.
- ii. If a proposed subdivision is indirectly tributary to a water body and the intervening regional detention storage is inadequate, in the opinion of city staff, to meet the water quality goals for downstream water bodies as described in the water resources management plan, additional on-site stormwater basin construction will be required to meet these goals.
- iii. If a proposed subdivision will increase rates of runoff and where downstream stormwater storage or conveyance facilities are inadequate to protect downstream riparian owners from effects of these increases, then on site stormwater storage must be constructed to restrict stormwater rates to the predevelopment rates.

(2) Where on site water quality detention basins are required, the permittee(s) will have to comply with the design and sizing requirements determined by the City of Monticello’s Design Manual.

(3) Maintenance of Private Stormwater Management Facilities

- a. No private Stormwater Management Facilities may be approved unless a maintenance plan is provided and is consistent with the City’s Design Manual. All such facilities shall be inspected annually, with reports submitted to the City, and maintained in proper condition consistent with the performance standards for which they were originally designed.
- b. Owners of private Stormwater Management Facilities shall provide an agreement to the City describing responsibility for the long-term operation and maintenance of the facilities.

(4) Public Stormwater Management Facilities – Easements

The applicant shall establish, in a form acceptable to the city, temporary and perpetual easements, or dedicated outlots, for ponding, flowage, and drainage purposes over hydrologic features such as water bodies and stormwater basins. The easements or outlots shall include the right of reasonable access for inspection, monitoring, maintenance, and enforcement purposes.

(F) Construction Requirements

(1) Construction Specifications

- a. Site Dewatering and Basin Draining: Water pumped from the site shall be treated by temporary sedimentation basins, grit chambers, sand filters, upflow chambers, hydrocyclones, swirl concentrators or other appropriate controls as appropriate. Water shall not be discharged in a manner that causes Erosion, scour, sedimentation or flooding of the site, receiving channels or wetlands.
- b. Grading, erosion and sediment controls as specified in the City's Design Manual.
- c. Tracking: All roads, access drives and parking areas must utilize a temporary tracking pad and must be of sufficient width and length to prevent sediment from being tracked onto public or private roadways and/or the stormwater conveyance system. Temporary tracking pads must be installed and maintained in all locations on the site where vehicles enter and exit.
- d. Clearing and grading of natural resources, such as forests and wetlands, shall not be permitted, except when in compliance with all provisions of this ordinance. Clearing techniques that retain natural vegetation and drainage patterns shall be recommended as necessary and used to the satisfaction of the Community Development Department.
- e. Clearing, except that necessary to establish sediment control devices, shall not begin until all sediment control devices have been installed and have been stabilized.
- f. Phasing may be required on all sites based on site specifics, with the size of each phase to be established at plan review and as approved by the Community Development Department.
- g. Silt fence or equivalent sediment control measures to be used must conform to the City's standards.
- h. Silt fences or equivalent sediment control measures must be installed along the downslope and sideslope perimeters and up-gradient of any buffer zones from the approved grading and construction limits before any up-gradient land-disturbing activities begin. Perimeter controls should be located to maintain a buffer of existing vegetation during construction, as site conditions allow, along the edges of any curbs, wetlands, channels or other water resources that could receive sediment from the site. These controls shall remain in place until final stabilization has been established.

- i.** Sufficient silt fence or equivalent sediment control measures are required to hold all sheet flow runoff generated at an individual site to minimize sediment from entering surface waters, including curb and gutter systems and storm sewer systems. Additional measures such as check dams, diversion, temporary or permanent sedimentation basins and drainage ditches are required to handle channelized flow. Additional upgradient sediment control practices or redundant BMPs shall be installed if down gradient sediment controls are overloaded (based on frequent failure or excessive maintenance requirement) (CGP Part IV.C.1.a-b).
- j.** All storm drain inlets must be protected during construction until all sources with potential for discharging to the inlet have been stabilized (CGP Part IV.C.4).
- k.** Soil stabilization shall be initiated immediately to limit soil erosion but in no case completed later than fourteen (14) days after construction activity in that portion of the site has temporarily or permanently ceased, and seven (7) days if discharge points are located within 1-mile of an impaired or special waterbody.
- l.** Final stabilization on all sites shall become established within six (6) months. The City of Monticello may require the site to be reseeded or a non-vegetative option employed.
- m.** Seeding shall be in accordance with the City's current seeding specification as detailed in the Design Manual. All seeded areas shall be fertilized, mulched, and disc anchored as necessary for seed retention.
- n.** Special techniques that meet the design criteria outlined in Design Manual shall be in place on steep slopes or in drainage ways to ensure stabilization.
- o.** Soil stockpiles which shall be inactive for a period of seven (7) or more days shall include provisions for perimeter sediment controls. The placement of soil stockpiles adjacent to public rights-of-way or waterways is prohibited.
- p.** The entire site must be stabilized to a minimum of 70% coverage, using a heavy mulch layer or another method that does not require germination to control erosion, at the close of the construction season.
- q.** Techniques shall be employed to prevent the blowing of dust or sediment from the site.
- r.** Techniques that divert upland runoff past disturbed slopes shall be employed.
- s.** For sites that have more than ten (10) acres of disturbed soil that drains to a common location, one or more temporary sediment basins shall be constructed. Use of temporary basins is encouraged when construction

CHAPTER 4: FINISHING STANDARDS

Section 4.10 Grading, Drainage, Stormwater Management & Erosion Control

Subsection (F) Construction Requirements

projects will impact steep slopes or when highly erodible soils are present. The basin shall provide treatment to the runoff before it leaves the construction site or enters surface waters. The temporary sediment basins must be designed and constructed as follows

- i. Provide live storage for a calculated volume of runoff from a two (2)-year, 24-hour storm from each acre drained to the basin. All basins shall provide at least 1,800 cubic feet of live storage from each acre drained or more.
- ii. For basins where the calculation from the previous requirement has not been performed, a temporary sediment basin providing 3,600 cubic feet of live storage from each acre drained to the basin shall be provided.
- iii. The outlet structure must be designed to withdraw water from the surface in order to minimize the discharge of pollutants.
- iv. The basin outlet shall be designed to prevent short-circuiting and the discharge of floating debris.
- v. Ensure the basin can be completely drawn down to conduct maintenance activities.
- vi. Include energy dissipation on the outlet of the basin and a stabilized emergency overflow to prevent failure of pond integrity.
- vii. Be located outside of surface waters or any buffer zone, and be designed to avoid draining water from wetlands unless appropriate approval from the U.S. Army Corps of Engineers and the Minnesota Department of Natural Resources is obtained.
- viii. If installation of a temporary sediment basin is infeasible, 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 side-slope boundaries where appropriate. Determination of infeasibility shall be documented in the erosion and sediment control plan.

(2) Waterway and Watercourse Protection Requirements

The Permittee(s) shall implement the following waterway and watercourse measures on the site:

- a. A temporary stream crossing installed and approved by the local government unit and regulating agency if a wet watercourse will be crossed regularly during construction.
- b. Stabilization of the watercourse channel before, during, and within 24 hours after any in-channel work.
- c. The normal wetted perimeter of any temporary or permanent drainage ditch or swale that drains water from the site, or diverts water around a site must be stabilized within 24 hours of connecting to a surface water and within 200 feet of the water's edge of a Public Waters that drains to waters where the Minnesota Department of Natural Resources has promulgated "work in water restrictions" during specified fish spawning time frames (CGP Part IV.A.2).
- d. Portions of the ditch that are under construction must be stabilized within 24 hours after the construction activity in that portion has ceased. The normal wetted perimeter is defined as the area that is in contact with water during annual flow events.
- e. All on-site stormwater conveyance channels designed according to the criteria outlined in the Plan Requirements and Design Guidelines.
- f. Stabilization adequate to prevent erosion located at the outlets of all pipes and paved channels.

(3) Pollution Prevention Management Measures

The Permittee(s) shall implement the following pollution prevention management measures on the site:

- a. **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.
- b. **Hazardous Materials:** 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 must be provided to prevent vandalism. Storage and disposal of hazardous waste must be in compliance with MPCA regulations.

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Section 4.10 Grading, Drainage, Stormwater Management & Erosion Control

Subsection (G) Inspection

- c. External washing of trucks and other construction vehicles must be limited to a defined area of the site. Runoff must be contained and waste properly disposed of. No engine degreasing is allowed on site.
- d. Portable toilets must be positioned so that they are secure and will not be tipped or knocked over. Sanitary waste must be disposed of properly in accordance with Minn. R. ch. 7041.
- e. Concrete and other washout waste must have effective containment for all liquid and solid wastes generated by these operations related to the construction activity. The liquid and solid washout wastes must not contact the ground outside a proper containment area. Waste must be disposed of properly and in compliance with MPCA rules, and a sign must be installed adjacent to each washout facility.

(4) Special and Impaired Waters

Additional BMPs together with enhanced runoff controls are required for discharge from a site to special and impaired water as defined by Appendix A of the Minnesota Pollution Control Agency General Stormwater Permit for Construction Activity.

(G) Inspection

(1) Notification

The Erosion Control Inspector shall make inspections as hereinafter required and either shall approve that portion of the work completed or shall notify the permittee wherein the work fails to comply with the Erosion and Sediment Control Plan as approved.

(2) Procedure

The City shall inspect all permit sites once per week and within 24 hours after a rain event greater than 0.5 inches. The City shall also require inspections at other development benchmarks as follows and as applicable. Inspections must be continued until final stabilization has occurred. To obtain inspections, the permittee shall notify the City of Monticello at least one working day before the following:

- a. Installation of sediment and erosion control measures;
- b. Start of construction or site development;
- c. Close of the construction season;
- d. Completion of final stabilization/landscaping;

- e. Removal of erosion control measures;
- f. Final project compliance and acceptance close-out.

(3) Material Requirements

Seed tags shall be submitted to the Erosion Control Inspector for approval prior to commencing work. Proof of application rates shall be provided.

(4) Permittee Inspection

The permittee or his/her agent shall also make regular inspections of all control measures in accordance with the inspection schedule outlined on the approved Grading, Drainage and Erosion Control Plan(s). The purpose of such inspections will be to determine the overall effectiveness of the control plan and the need for additional control measures. All inspections shall be documented in written form and submitted to the City of Monticello at the time interval specified in the approved permit. The records of each inspection and maintenance activity shall include the following information:

- a. Date and time of inspection
- b. Name(s) of persons conducting the inspection;
- c. Findings of inspections, including recommendations for corrective actions;
- d. Corrective actions taken, including the dates, times and the name of the party completing the corrective action;
- e. Date and the amount of rainfall events that are greater than 0.5 inch in a 24-hour period; and
- f. Documentation of any changes made to the Stormwater Pollution Prevention Plan.

(5) Authorization

A member of the Community Development Department shall enter the property of the applicant as deemed necessary to make regular inspections to ensure the validity of the reports filed under Section 4.9(E)(4).

(H) Site Maintenance

(1) Responsibilities

- a. Within 24 hours, the permittee shall clean dirt and debris from streets that has resulted from construction work by the Developer, home builders, subcontractors, their agents or assigns. Prior to any construction in the plat, the Developer shall provide the Community Development Department with a schedule for erosion and sediment control inspection, street cleaning, and street sweeping.
- b. All silt fences and biorolls must be repaired, replaced or supplemented when they become nonfunctional or the sediment reached one-half (1/2) of the height of the fence or bioroll. Repairs shall be made within 24 hours of discovery or as soon as field conditions allow access.
- c. Temporary and permanent sedimentation basins must be drained and the sediment must be removed when the depth of the sediment collected in the basin reached one-half (1/2) the storage volume. Drainage and removal must be completed within 72 hours of discovery or as soon as final conditions allow access.
- d. The applicant shall remove all deltas and sediment deposited in the surface waters, including drainage ways, catch basins, and other drainage systems and must restabilize the areas where sediment removal results in exposed soil. The removal and stabilization must take place within seven (7) days of discovery unless precluded by legal, regulatory or physical access constraints. In the event of an access constraint, the applicant shall use all reasonable efforts to obtain access. If the access is precluded, removal and stabilization must take place within seven (7) calendar days of obtaining access. The applicant is responsible for contacting all local, regional, state and federal authorities and obtaining any required permits prior to conducting any work.
- e. No development, utility or street construction will be allowed and no Building Permits will be issued unless the development is in full compliance with the requirements of this Ordinance.

(I) Final Stabilization

The Permittee(s) must ensure Final Stabilization of the site after the completion of construction activities and prior to the termination of the permit. Final Stabilization is not complete until all requirement in accordance to the definition in Section (B) are complete that are intended to prevent discharge of pollutants associated with stormwater discharges from the project.

(J) Certification**(1) Approved Grading, Drainage, Stormwater Management, and Erosion Control Plan**

- a. Plans for grading, stripping, excavating, and filling work bearing the stamp of approval of the Community Development Department, as applicable, shall be maintained at the site during the progress of the work.
- b. The Stormwater Pollution Prevention Plan (SWPPP) must:
 - i. Ensure the SWPPP is prepared by an individual trained in the design of construction SWPPPs in accordance with the MPCA NPDES construction general permit training requirements (CGP Part III.A.3);
 - ii. Ensure at least one individual is present or available to the project site within 72 hours that is trained in the job duties for construction site management to inspect, oversee implementation of, revise, and amend the SWPPP (CGP Part III.F.b);
 - iii. Ensure at least one individual is present or available to the project site within 72 hours that is trained in the job duties for construction installation to perform or supervise the installation, maintenance and repair of Best Management Practices (BMPs) (CGP Part III.F.c);
 - iv. Document the name(s) of the trained personnel to design the construction SWPPP, the construction site manager and the construction installer. Documentation shall include the date of training, name of instructor(s), name of entity providing the training, content covered and hours of training attended (CGP Part III.A.3).

(2) As-built Grading Plan and Development Plan

Within thirty (30) days after completion of site development as per the approved Grading, Drainage and Erosion Plan, and prior to the approval of individual building permits, the Developer shall provide the City with an As-Built Grading Plan and Development Plan as defined in the City of Monticello Plan Requirements and Design Guidelines.

(3) Procedure

The City will withhold issuance of building permits until the approved certified As-Built Grading Plan and As-Built Development Plan are on file with the City, all securities as required by this ordinance are received, conservation easement posts are installed, and all erosion control measures are in place as determined by the Community Development Department.

(4) Removal of Erosion Control Measures

The above specified requirements will be authorized for removal upon the sodding of the rear yards, completion of punch list items involving ponds and slopes, final stabilization, completion of proper turf establishment and placement of the proper conservation easement posts and signs as specified. Inspection is required after the removal of erosion control measures to verify proper restoration. Please refer to City of Monticello’s Design Manual for specifications.

(5) Notice of Termination (NOT)

The applicant must ensure final stabilization of the project. The applicant must submit a NOT within 30 days of final stabilization being achieved, or another party assuming control on all areas of the project that have not achieved final stabilization.

(K) Enforcement

(1) Notice of Violation

If the Grading permittee fails to meet or maintain sediment and erosion control measures per the Approved Grading, Drainage, Stormwater Management, and Erosion Control Plan, the City shall issue a Notice of Violation. The Notice of Violation shall detail the default and prescribe a remedy and required schedule for compliance.

(2) Lapse and Order for Work

- a. If the Grading permittee fails to meet or maintain sediment and erosion control measures per the Approved Grading, Drainage, Stormwater Management and Erosion Control Plan, the City may, in its discretion, perform the work or contract to have the work completed and draw down on the security to pay any costs.
- b. The City will endeavor to notify the Developer in advance of any proposed action, but failure of the City to do so will not affect the Developer's and City's rights or obligations hereunder.

(3) Stop Work Order / Revocation of Grading Permit

In the event that any person holding a Grading Permit pursuant to this ordinance violates the terms of the permit or implements site development in such a manner as to materially adversely affect the health, welfare, environment, or safety of persons residing or working in the neighborhood or development site so as to be materially detrimental to the public welfare or injurious to property or improvements in the neighborhood, the City of Monticello may suspend or revoke the Grading Permit through the issuance of a stop work order or the revocation of the Grading or Building Permit.

(4) Violation and Penalties

- a. No person shall construct, enlarge, alter, repair, or maintain any grading, excavation, or fill, or cause the same to be done, contrary to or in violation of any terms of this ordinance. Any person violating any of the provisions of this ordinance shall be deemed guilty of a misdemeanor and each day during which any violation of any of the provisions of this ordinance is committed, continued, or permitted, shall constitute a separate offense.
- b. Upon conviction of any such violation, such person, partnership, or corporation shall be punished by a fine as specified by the City ordinance per the fee schedule for each offense. In addition to any other penalty authorized by this section, any person, partnership, or corporation convicted of violating any of the provisions of this ordinance shall be required to bear the expense of such restoration.

4.11 Building Materials

(A) Purpose

The purpose of these regulations is to enhance the quality and longevity of buildings in all zoning districts of the City, and to protect citizen investments in property value by ensuring complementary building style, construction, and appearance.

(B) General Requirements

(1) Consistency required

In all districts, all buildings shall be finished on all sides with consistent architectural quality, materials, and design.

CHAPTER 9

PROHIBITING FERTILIZERS WITH PHOSPHORUS

SECTION:

- 7-9-1: Purpose
- 7-9-2: Definitions
- 7-9-3: Regulations
- 7-9-4: Exceptions
- 7-9-5: Impervious Surfaces and Drainage Ways
- 7-9-6: Penalty

7-9-1: PURPOSE:

The City has considered data that indicates that water quality of lakes, rivers and streams within the community may be maintained or improved if the City is able to regulate the amount of lawn fertilizer and other chemicals entering these bodies of water as a result of storm water runoff or other causes. The purpose of this Chapter is to set forth regulations that will aid the City in managing and protecting its water resources.

7-9-2: DEFINITIONS: For the purpose of this section, certain terms and words are defined as follows:

- A. **Administrator.** The individual responsible for overseeing the requirements of the City Code. For purposes of the section of the code, the administrator shall be the Director of Public Works or his/her designee.
- B. **Fertilizer.** Fertilizer means a substance containing one or more recognized plant nutrients that is used for its plant nutrient content and designed for use or claimed to have value in promoting plant growth. Fertilizer does not include animal and vegetable manures that are not manipulated, marl, lime, limestone, and other products exempted by Rule by the Minnesota Commissioner of Agriculture.
- C. **Pesticide.** A substance or mixture of substances intended to prevent, destroy, repel, or mitigate a pest, and a substance or mixture of substances intended for use as a plant regulator, defoliant or desiccant.

7-9-3: REGULATIONS:

- (A) **Time of Application:** Neither commercial applicators nor noncommercial applicators may apply lawn fertilizer when the ground is frozen or when conditions exist which will promote or create runoff.
- (B) **Sample Analysis Cost.** The cost of analyzing fertilizer samples taken from commercial applicators shall be paid by the commercial applicators if the sample

analysis indicates that phosphorus content exceeds the levels authorized herein.

- (C) Fertilizer Content. No person shall apply any lawn fertilizer, liquid or granular, within the City of Monticello which contains any amount of phosphorus or other compound containing phosphorus, such as phosphate, except:
1. The naturally occurring phosphorous in unadulterated natural or organic fertilizing products such as yard waste compost.
 2. Or as otherwise provided in Subdivision 7- 9-4.

7-9-4: EXCEPTIONS: The prohibition against use of fertilizer containing any quantity of phosphorus set forth under Subdivision 7-9-3 shall not apply to:

- (A) Newly established turf and lawn areas during first growing season; or
- (B) Turf and lawn areas which have been confirmed by soil testing to be below phosphorus levels established by the University of Minnesota Extension Services. The lawn fertilizer application shall not contain an amount of phosphorus in excess of that which is recommended in the soil test evaluation.
- (C) Phosphorus applied as lawn fertilizer pursuant to the aforementioned exemptions shall be watered into the soil so that it is immobilized and protected from loss by runoff.

7-9-5: IMPERVIOUS SURFACES AND DRAINAGE WAYS. No person shall apply fertilizer to impervious surfaces, areas within drainage ditches, or waterways.

7-9-6: PENALTY. Any person violating this Chapter of the Code shall be guilty of a petty misdemeanor.

(#378, 5/28/02)

CHAPTER 10

ILLICIT DISCHARGE, DETECTION, AND ELIMINATION

SECTION:

- 7-10-1: Statutory Authorization, Purpose and Intent
 - 7-10-2: Definitions
 - 7-10-3: Applicability
 - 7-10-4: Responsibility for Administration
 - 7-10-5: Severability
 - 7-10-6: Ultimate Responsibility
 - 7-10-7: Prohibitions
 - 7-10-8: Suspension of MS4 Access
 - 7-10-9: Industrial or Construction Activity Discharges
 - 7-10-10: Monitoring of Discharges
 - 7-10-11: Requirement to Prevent, Control, and Reduce Storm Water Pollutants by the use of Best Management Practices
 - 7-10-12: Watercourse Protection
 - 7-10-13: Notification of Spills
 - 7-10-14: Enforcement
 - 7-10-15: Appeal of Notice of Violation
 - 7-10-16: Enforcement Measures after Appeal
 - 7-10-17: Cost of Abatement of the Violation
 - 7-10-18: Injunctive Relief
 - 7-10-19: Compensatory Action
 - 7-10-20: Violations Deemed a Public Nuisance
 - 7-10-21: Criminal Prosecution
 - 7-10-22: Remedies Not Exclusive
 - 7-10-23: Adoption of Ordinance
- 7-10-1: **STATUTORY AUTHORIZATION, PURPOSE AND INTENT:** The purpose of this ordinance is provide for the health, safety, and general welfare of the citizens of Monticello through the regulation of non-storm water discharges to the storm drainage system to the maximum extent practicable as required by federal and state law. This ordinance establishes methods for controlling the introduction of pollutants into the municipal separate storm sewer system (MS4) in order to comply with requirements of the National Pollutant Discharge Elimination System (NPDES) permit process. The objectives of this ordinance are:
(#606, 12/8/14)
- (A) To regulate the contribution of pollutants to the municipal separate storm sewer system (MS4) by stormwater discharges by any user.
 - (B) To prohibit illicit connections and discharges to the municipal separate storm sewer system, and

- (C) To establish legal authority to carry out all inspection, surveillance, enforcement, and monitoring procedures necessary to ensure compliance with this ordinance.
- (D) This section is adopted pursuant to the authorization and policies contained in Minnesota Statutes, Chapters 103B and 462; Minnesota Rules, Parts 6120.2500-6120.3900; Minnesota Rules, Chapters 8410, 8420, and 70510.0210.

(#606, 12/8/14)

7-10-2: DEFINITIONS: For the purpose of this chapter, certain words and terms are defined as follows:

ACCIDENTAL DISCHARGE: means a discharge prohibited by this ordinance and without planning or thought prior to occurrence.

AUTHORIZED ENFORCEMENT AGENCY: employees or designees of the City of Monticello designated to enforce this ordinance.

BEST MANAGEMENT PRACTICES (BMPs): schedules of activities, prohibitions of practices, general good housekeeping practices, pollution prevention and educational practices, maintenance procedures, and other management practices to prevent or reduce the discharge of pollutants directly or indirectly to stormwater, receiving waters, or stormwater conveyance systems. BMPs also include treatment practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.

CLEAN WATER ACT: the Federal Water Pollution Control Act (33 U.S. C. § 1251 et seq.), and any subsequent amendments thereto.

CONSTRUCTION ACTIVITY: Activities subject to the ND PES Construction Permits. Currently these include construction projects resulting in land disturbance of 1 acre or more. Such activities include but are not limited to clearing and grubbing, grading, excavating, and demolition.

HAZARDOUS MATERIALS: Any material, including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property, or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

ILLICIT DISCHARGE: Any direct or indirect non-storm water discharge to the storm drain system, except as exempted in Section 7 of this ordinance.

ILLCIT CONNECTIONS: An illicit connection is defined as either of the following:

- (A) Any drain or conveyance, whether on the surface or subsurface, which allows an illegal discharge including sewage, process wastewater, and wash water to enter the storm drain system, including any connections to the storm drain system from indoor drains and sinks, regardless of whether said drain or connection had been previously allowed, permitted, or approved by an authorized enforcement agency or,
- (B) Any drain or conveyance connected from a commercial or industrial land use to the storm drain system which has not been documented in plans, maps, or equivalent records and approved by an authorized enforcement agency.

INDUSTRIAL ACTIVITY: Activities subject to NDPEs Industrial Permits as defined in 40 CFR, Section 122.26 (b) (14).

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4): A stormwater conveyance or unified stormwater conveyance system (including without limitation: roads with drainage systems, municipal streets, catch basins, stormwater detention facilities, curbs, gutters, ditches, natural or man-made channels, or storm drains), that:

- (A) Is located within the corporate limits of Monticello, MN.
- (B) Is owned or operated by the State, County, the City, or other public body.
- (C) Discharges to Waters of the State and/or United States, excluding publicly owned treatment works, and lawful connections thereto, which in turn discharge into the Waters of the State and/or United States.

NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT: Any permit or requirement enforced pursuant to the clean water act as amended for the purposes of regulating storm water discharge.

NON-STORM WATER DISCHARGE: Any discharge to the storm drain system that is not composed entirely of storm water.

PERSON: means any individual, association, organization, partnership, firm, corporation or other entity recognized by law and acting as either the owner or as the owner's agent.

POLLUTANT: Anything which causes or contributes to pollution. Pollutants may include, but are not limited to: paints, varnishes, and solvents; oil and other automotive fluids; non-hazardous liquid and solid wastes and yard wastes; refuse,

rubbish, garbage, litter, or other discarded or abandoned objects, ordinances, and accumulations, so that same may cause or contribute to pollution; floatables, pesticides, herbicides; hazardous substances and wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.

POLLUTION: Man-made or man-induced alteration of the chemical, physical, biological, thermal, and/or radiological integrity of water.

PREMISES: Any buildings, lot, parcel of land or portion of land whether improved or unimproved including adjacent sidewalks and parking strips.

STORM DRAINAGE SYSTEM: Publicly-owned facilities by which storm water is collected and/or conveyed, including but not limited to any roads with drainage systems, municipal streets, gutters, curbs, inlets, piped storm drains, pumping facilities, retention and detention basins, natural and human-made or altered drainage channels, reservoirs, and other drainage structures.

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

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 and/or Receiving Waters to the Maximum Extent Practicable.

WASTEWATER: any water or other liquid, other than uncontaminated storm water, discharged from a facility.

WATERS OF THE STATE AND/OR UNITED STATES: All water bodies regulated by the State and/or United States including streams, lakes, ponds, wetlands, marshes, waterways, wells, springs, reservoirs, aquifers, irrigation systems, drainage systems and all other bodies or accumulations of water, surface or underground, natural or artificial, public or private, which are contained within, flow through, or border upon the state of Minnesota or any portion thereof, or which may be susceptible to use in interstate or foreign commerce.

7-10-3: **APPLICABILITY:** This ordinance shall apply to all water entering the storm drain system generated on any developed and undeveloped lands unless explicitly exempted by an authorized enforcement agency.

7-10-4: **RESPONSIBILITY FOR ADMINISTRATION:** The City of Monticello shall administer, implement, and enforce the provisions of this ordinance. Any powers

granted or duties imposed upon the authorized enforcement agency may be delegated in writing by the Director of the authorized enforcement agency to persons or entities acting in the beneficial interest of or in the employ of the agency.

7-10-5: SEVERABILITY: The provisions of this ordinance are hereby declared to be severable. If any provision, clause, sentence, or paragraph of this Ordinance or the application thereof to any person, establishment, or circumstances shall be held invalid, such invalidity shall not affect the other provisions or applications of this Ordinance.

7-10-6: ULTIMATE RESPONSIBILITY: The standards set forth herein and promulgated pursuant to this ordinance are minimum standards: therefore this ordinance does not intend nor imply that compliance by any person will ensure that there will be no contamination, pollution, nor unauthorized discharge of pollutants.

7-10-7: PROHIBITIONS:

(A) Prohibition of Illicit Discharges:

1. No person shall discharge or cause to be discharged into the municipal storm drain 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 storm water.
2. The commencement or continuance of any illicit discharge to the storm drain system is prohibited except as described as follows:

(B) The following discharges are exempt from discharge prohibitions established by this ordinance: water line flushing or other potable water sources, landscape irrigation or lawn watering, diverted stream flows, rising ground water, ground water infiltration to storm drains, uncontaminated pumped ground water, foundation or footing drains (not including active groundwater dewatering systems), crawl space pumps, air conditioning condensation, springs, non-commercial washing of vehicles, natural riparian habitat or wet-land flows, swimming pools (if chlorinated – typically less than one PPM chlorine), fire fighting activities, and any other water source not containing pollutants.

1. Discharges specified in writing by the authorized enforcement agency as being necessary to protect public health and safety.
2. Dye testing is an allowable discharge, but requires a verbal notification to the authorized enforcement agency prior to the time of the test.

3. The prohibition shall not apply to any non-storm water discharge permitted under an NPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the Federal Environmental Protection Agency, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the storm drain system.

(C) Prohibition of Illicit Connections:

1. The construction, use, maintenance or continued existence of illicit connections to the storm drain system is prohibited.
2. 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.
3. A person is considered to be in violation of this ordinance if the person connects a line conveying sewage to the MS4, or allows such a connection to continue.

7-10-8: SUSPENSION OF MS4 ACCESS:

- (A) Emergency Cease and Desist Orders: When the City of Monticello finds that any person has violated, or continues to violate, any provision of this ordinance, or any order issued hereunder, or that the person's past violations are likely to recur, and that the person's violation(s) has (have) caused or contributed to an actual or threatened discharge to the MS4 or waters of the United States which reasonably appears to present an imminent or substantial endangerment to the health or welfare of persons or to the environment, the City may issue an order to the violator directing it immediately to cease and desist all such violations and directing the violator to:

1. Immediately comply with all ordinance requirements; and
2. Take such appropriate preventive action as may be needed to properly address a continuing or threatened violation, including immediately halting operations and/or terminating the discharge.

Any person notified of an emergency order directed to it under this Subsection shall immediately comply and stop or eliminate its endangering discharge. In the event of a discharger's failure to immediately comply voluntarily with the emergency order, the City may

take such steps as deemed necessary to prevent or minimize harm to the MS4 or waters of the United States, and/or endangerment to persons or to the environment, including immediate termination of a facility's water supply, sewer connection, or other municipal utility services. The City of Monticello may allow the person to recommence its discharge when it has demonstrated to the satisfaction of the authorized enforcement agency that the period of endangerment has passed, unless further termination proceedings are initiated against the discharger under this ordinance. A person that is responsible, in whole or in part, for any discharge presenting imminent endangerment shall submit a detailed written statement, describing the causes of the harmful discharge and the measures taken to prevent any future occurrence, to the authorized enforcement agency within 7 days of receipt of the emergency order. Issuance of an emergency cease and desist order shall not be a bar against, or a prerequisite for, taking any other action against the violator.

(#606, 12/8/14)

(B) **Suspension Due to Illicit Discharges in Emergency Situations:** The City of Monticello may, without prior notice, suspend MS4 discharge access to a person when such suspension is necessary to stop an actual or threatened discharge which presents or may present imminent and substantial danger to the environment, or to the health or welfare of persons, or to the MS4 or Waters of the State and/or 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 MS4 or Waters of the State and/or United States, or to minimize danger to persons.

(C) **Suspension Due to Detection of Illicit Discharges:**

1. Any person discharging to the MS4 in violation of this ordinance may have their MS4 access terminated if such termination would abate or reduce an illicit discharge. The authorized enforcement agency will notify a violator of the proposed termination of its MS4 access. The violator may petition the authorized enforcement agency for a reconsideration and hearing.
2. A person commits an offense if the person reinstates MS4 access to premises terminated pursuant to this Section, without the prior approval of the authorized enforcement agency.

7-10-9: **INDUSTRIAL OR CONSTRUCTION ACTIVITY DISCHARGES:** Any person subject to an industrial or construction activity NPDES storm water 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 of Monticello prior to the allowing of discharges to the MS4.

7-10-10: MONITORING OF DISCHARGES:

(A) Applicability: This section applies to all facilities that have storm water discharges associated with industrial activity and construction activity.
(#606, 12/8/14)

(B) Access to Facilities:

1. The City of Monticello shall be permitted to enter and inspect facilities subject to regulation under this ordinance as often as may be necessary to determine compliance with this ordinance. If a discharger has security measures in force which require proper identification and clearance before entry into its premises, the discharger shall make the necessary arrangements to allow access to representatives of the authorized enforcement agency.
2. Facility operators shall allow the City of Monticello ready access to all parts of the premises for the purposes of inspection, sampling, examination, and copying of records that must be kept under the conditions of an NPDES permit to discharge storm water, and the performance of any additional duties as defined by state and federal law.
3. The City of Monticello shall have the right to set up on any permitted facility such devices as are necessary in the opinion of the authorized enforcement agency to conduct monitoring and/or sampling of the facility's storm water discharge.
4. The City of Monticello has the right to require the discharger to install monitoring equipment as necessary. 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. All devices used to measure stormwater flow and quality shall be calibrated to ensure their accuracy.
5. 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 operator at the written or oral request of the City of Monticello and shall not be replaced. The costs of clearing such access shall be borne by the operator.
6. Unreasonable delays in allowing the City of Monticello access to a permitted facility is a violation of a storm water discharge permit and of this ordinance. A person who is the operator of a facility with a NPDES permit to discharge storm water associated with industrial

activity commits an offense if the person denies the authorized enforcement agency reasonable access to the permitted facility for the purpose of conducting any activity authorized or required by this ordinance.

7. If the City of Monticello has been refused access to any part of the premises from which stormwater is discharged, and he/she is able to demonstrate probable cause to believe that there may be a violation of this ordinance, or that there is a need to inspect and/or sample as part of a routine inspection and sampling program designed to verify compliance with this ordinance or any order issued hereunder, or to protect the overall public health, safety, and welfare of the community, then the authorized enforcement agency may seek issuance of a search warrant from any court of competent jurisdiction.

- 7-10-11: **REQUIREMENTS TO PREVENT, CONTROL, AND REDUCE STORM WATER POLLUTANTS BY THE USE OF BEST MANAGEMENT PRACTICES:** The City of Monticello will adopt requirements identifying Best Management Practices for any activity, operation, or facility which may cause or contribute to pollution or contamination of storm water, the storm drain system, or waters of the State and/or United States. The owner or operator of a commercial or industrial establishment shall provide, at their own expense, reasonable protection from accidental discharge of prohibited materials or other wastes into the municipal storm drain system or watercourses through the use of these structural and non-structural BMPs. Further, any person responsible for a property or premise, which is, or may be, the source of an illicit discharge, may be required to implement, at said person's expense, additional structural and non-structural BMPs to prevent the further discharge of pollutants to the municipal separate storm sewer system. Compliance with all terms and conditions of a valid NPDES permit authorizing the discharge of storm water associated with industrial activity, to the extent practicable, shall be deemed compliance with the provisions of this section. These BMPs shall be part of a stormwater pollution prevention plan (SWPPP) as necessary for compliance with requirements of the NPDES permit.
- 7-10-12: **WATERCOURSE PROTECTION:** Every person owning property through which a watercourse passes, or such person's lessee, shall keep and maintain that part of the watercourse within the property free of trash, debris, excessive vegetation, and other obstacles that would pollute, contaminate, or significantly retard the flow of water through the watercourse. In addition, the owner or lessee 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.
- 7-10-13: **NOTIFICATION OF SPILLS:** Notwithstanding other requirements of law, as soon as any person responsible for a facility or operation, or responsible for

emergency response for a facility or operation has information of any known or suspected release of materials which are resulting or may result in illicit discharges or pollutants discharging into storm water, the storm drain system, or water of the State and/or 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 emergency response agencies of the occurrence via emergency dispatch services. In the event of a release of non-hazardous materials, said person shall notify the authorized enforcement agency in person or by phone or facsimile no later than the next business day. Notifications in person or by phone shall be confirmed by written notice addressed and mailed to the Public Works Director, City of Monticello within three business days of the phone notice. If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator of such establishment shall also retain an on-site written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years.

7-10-14: ENFORCEMENT:

(A) Warning Notice: When the City of Monticello finds that any person has violated, or continues to violate, any provision of this ordinance or any order issued hereunder, the City may serve upon that person or business a written Warning Notice, specifying the particular violation believed to have occurred and requesting the discharger to immediately investigate the matter and to seek a resolution whereby any offending discharge will cease. Investigation and/or resolution of the matter in response to the Warning Notice in no way relieves the alleged violator of liability for any violations occurring before or after receipt of the Warning Notice. Nothing in this subsection shall limit the authority of the city staff to take any action, including emergency action or any other enforcement action, without first issuing a Warning Notice.

(#606, 12/8/14)

(B) Notice of Violation: Whenever the City of Monticello finds a person has violated a prohibition or failed to meet a requirement of this Ordinance, the authorized enforcement agency may order compliance by written notice of violation to the responsible person.

The Notice of Violation shall contain:

1. The name and address of the alleged violator;
2. The address when available or a description of the building, structure or land upon which the violation is occurring, or has occurred;
3. A statement specifying the nature of the violation;
4. A description of the remedial measures necessary to restore compliance with this ordinance and a time schedule for the completion of such remedial action;

5. A statement of the penalty or penalties that shall or may be assessed against the person to whom the notice of violation is directed;
6. A statement that the determination of violation may be appealed to the City of Monticello by filing a written notice of appeal within 30 days of service of notice of violation; and
7. A statement specifying that, should the violator fail to restore compliance within the established time schedule, the work will be done by a designated governmental agency or a contractor and the expense thereof shall be charged to the violator.

(#606, 12/8/14)

Such notice may require without limitation:

1. Monitoring, analyses, and reporting;
2. Elimination of illicit connections or discharges;
3. Abatement of pollution and hazards;
4. Restoration of affected property;
5. Payment of fine to cover administrative and remediation costs;
6. Implementation of source control or treatment BMPs; and
7. Other actions as deemed necessary by the City.

- (C) 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. Said notice shall further advise that, should the violator fail to remediate or restore within the established deadline, the work will be done by a designated governmental agency or a contractor and the expense thereof shall be charged to the violator.

7-10-15: **APPEAL OF NOTICE OF VIOLATION:** Any person receiving a Notice of Violation may appeal the determination of the authorized enforcement agency. The notice of appeal must be received within 14 calendar days from the date of the Notice of Violation. Hearing on the appeal before the appropriate authority or his/her designee shall take place within 30 calendar days from the date of receipt of the notice of appeal. The decision of the municipal authority or their designee shall be final.

7-10-16: **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 7 calendar days of the decision of the municipal authority 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.

- 7-10-17: **COST OF ABATEMENT OF THE VIOLATION:** Within 30 calendar 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 may file a written protest objecting to the amount of the assessment within 30 calendar days. If the amount due is not paid within a timely manner as determined by the decision of the municipal authority or by the expiration of the time in which to file an appeal, the charges 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 article shall become liable to the city by reason of such violation.
- 7-10-18: **INJUNCTIVE RELIEF:** It shall be unlawful for any person to violate any provision or fail to comply with any of the requirements of this Ordinance. If a person has violated or continues to violate the provisions of this ordinance, 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.
- 7-10-19: **COMPENSATORY ACTION:** In lieu of enforcement proceedings, penalties, and remedies authorized by this Ordinance, the authorized enforcement agency may impose upon violator alternative compensatory actions, such as storm drain stenciling, attendance at compliance workshops, creek cleanup, etc.
- 7-10-20: **VIOLATIONS DEEMED A PUBLIC NUISANCE:** In addition to the enforcement of processes and penalties provided, any condition caused or permitted to exist in violation of any of the provisions of this Ordinance 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.
- 7-10-21: **CRIMINAL PROSECUTION:**
- (A) Any person that has violated or continues to violate this ordinance shall be liable to criminal prosecution to the fullest extent of the law.
 - (B) The enforcement agency may recover all attorneys' fees court costs and other expenses associated with enforcement of this ordinance, including sampling and monitoring expenses.
- 7-10-22: **REMEDIES NOT EXCLUSIVE:** The remedies listed in this ordinance 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.

7-10-23: ADOPTION OF ORDINANCE: All prior ordinances and parts of ordinances in conflict with this ordinance are hereby repealed.

(#516, 6/14/2010)

APPENDIX

Appendix E



You are currently logged in as:

Monticello City MS4

If this is correct, click the 'Next' button. If this information is incorrect, contact Cole Landgraf (651-757-2880, cole.landgraf@state.mn.us).

Before you begin...

A fillable Microsoft Word document with all of the questions is available at https://stormwater.pca.state.mn.us/index.php?title=MS4_Annual_Report (for personal use only, not for submittal).

The MS4 Annual Report for 2018 will automatically save your answers when you hit the 'Next' button at the bottom of each page.

If you wish to leave the MS4 Annual Report for 2018 and complete the document at another time, you may do so by clicking 'Next' at the bottom of your current page to save your progress before exiting the document. Return to the survey by following the previously used web link, and again login using your email and assigned password credentials. Once you successfully log in, your previous answers will appear.

The MPCA will email a PDF of your MS4 Annual Report for 2018 information to you in a confirmation email within three business days after you submit this form.

You may print a copy of the MS4 Annual Report for 2018 for your records at any time by pressing the 'Print' button at the bottom of the page.

Additionally, it is possible to save a PDF copy of the MS4 Annual Report for 2018 if you are working on a computer with OneNote (a program often included in Microsoft Office packages). Detailed saving instructions are available at stormwater.pca.state.mn.us/index.php/Guidance_for_saving_MS4_annual_reports.

MS4 Annual Report for 2018

Reporting period: January 1, 2018 to December 31, 2018

Due: June 30, 2019

Instructions: Complete this annual report to provide a summary of your activities under the 2013 MS4 Permit (Permit) between January 1, 2018 and December 31, 2018. MPCA staff may contact you for additional information.

Fillable document available at https://stormwater.pca.state.mn.us/index.php?title=MS4_Annual_Report (for personal use only, not for submittal).

Questions: Contact Cole Landgraf (cole.landgraf@state.mn.us, 651-757-2880)

MS4 General Contact Information

Full name	Matt Leonard
Title	Public Works Director
Mailing address	505 Walnut St
City	Monticello
State	MN
Zip code	55362
Phone	763-271-3271
Email	matt.leonard@ci.monticello.mn.us

Preparer Contact Information (if different from the MS4 General Contact)

Full name	Ryan Melhouse
Title	Engineering Technician
Organization	City of Monticello
Mailing address	505 Walnut St
City	Monticello
State	MN
Zip code	55362
Phone	763-271-3227
Email	ryan.melhouse@ci.monticello.mn.us

MCM 1: Public Education and Outreach

The following questions refer to Part III.D.1. of the Permit.

Q2 Did you select a stormwater-related issue of high priority to be emphasized during this Permit term? [Part III.D.1.a.(1)]

- Yes
- No

Q3 What is your stormwater-related issue(s)? Check all that apply.

- TMDL(s)
- Local businesses
- Residential BMPs
- Pet waste
- Yard waste
- Deicing materials
- Household chemicals
- Construction activities
- Post-construction activities
- Other

Q4 Have you distributed educational materials or equivalent outreach to the public focused on illicit discharge recognition and reporting? [Part III.D.1.a.(2)]

- Yes
- No

Q5 Do you have an implementation plan as required by the Permit? [Part III.D.1.b.]

- Yes
- No

Q6 How did you distribute educational materials or equivalent outreach? Check all that apply and provide circulation/audience associated with each item. [Part III.D.1.a.]

- Brochure
- Newsletter
- Utility bill insert
- Newspaper ad
- Radio ad
- Television ad
- Cable access channel
- Stormwater-related event
- School presentation or project
- Website
- Other (1)
- Other (2)
- Other (3)

Q7 Intended audience? Check all that apply.

	Residents	Local Businesses	Developers	Students	Employees	Other
Brochure	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Newsletter	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Website	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Q8 Enter the total circulation/audience (if unknown, use best estimate):

Brochure	100
Newsletter	5400
Website	6000

Provide a brief description of each activity related to public education and outreach (e.g. rain garden workshop, school presentation, public works open house) held and the date each activity was held from January 1, 2018 to December 31, 2018. [Part III.D.1.c.(4)]

Q9 Date of activity

Q10 Description of activity

Date (mm/dd/yyyy) 4/23/2018

Public Meeting on SWPPP Annual Report

Date (mm/dd/yyyy) 2/1/2018

Added Brochures to website

Date (mm/dd/yyyy) 4/1/2018

Spring Newsletter

Date (mm/dd/yyyy) 6/9/2018

Stormwater Handouts at Walk and Roll Event

Date (mm/dd/yyyy) 10/1/2018

Fall Newsletter

Date (mm/dd/yyyy) 

Date (mm/dd/yyyy) 

Date (mm/dd/yyyy) 

Q11 Between January 1, 2018 and December 31, 2018, did you modify your BMPs, measurable goals, or future plans for your public education and outreach program? [Part IV.B.]

- Yes
- No

MCM 2: Public Participation/Involvement

The following questions refer to Part III.D.2.a. of the Permit.

Q12 You must provide a minimum of one opportunity each year for the public to provide input on the adequacy of your Stormwater Pollution Prevention Program (SWPPP). Did you provide this opportunity between January 1, 2018 and December 31, 2018? [Part III.D.2.a.(1)]

- Yes
- No

Q13 What was the opportunity that you provided? Check all that apply.

- Public meeting
- Public event
- Other

Q14 Did you hold a stand-alone meeting or combine it with another event?

- Stand-alone
- Combined

Enter the date of the public meeting (mm/dd/yyyy):

4/23/2018

Enter the number of citizens that attended and were informed about your SWPPP:

0

Q17 Between January 1, 2018 and December 31, 2018, did you receive any input regarding your SWPPP?

- Yes
- No

Q19 Between January 1, 2018 and December 31, 2018, did you modify your BMPs, measurable goals, or future plans for your public participation/involvement program? [Part IV.B.]

- Yes
- No

MCM 3: Illicit Discharge Detection and Elimination

The following questions refer to Part III.D.3. of the Permit.

Q20 Do you have a regulatory mechanism which prohibits non-stormwater discharges to your MS4? [Part III.D.3.b.]

- Yes
- No

Q21 Did you identify any illicit discharges between January 1, 2018 and December 31, 2018? [Part III.D.3.h.(4)]

- Yes
- No

Q22 Enter the number of illicit discharges detected:

Q23 How did you discover these illicit discharges? Check all that apply and enter the number of illicit discharges discovered by each category.

- Public complaint
- Staff

Q25 Enter the number discovered by staff:

Q26 Did any of the discovered illicit discharges result in an enforcement action (this includes verbal warnings)?

- Yes
- No

Q27 What type of enforcement action(s) was taken and how many of each action were issued between January 1, 2018 and December 31, 2018? Check all that apply.

- Verbal warning
- Notice of violation
- Fines
- Criminal action
- Civil penalties
- Other

Enter the number of verbal warnings issued:

Q28 Did the enforcement action(s) taken sufficiently address the illicit discharge(s)?

- Yes
- No

Q30 Do you have written Enforcement Response Procedures (ERPs) to compel compliance with your illicit discharge regulatory mechanism(s)? [Part III.B.]

- Yes
- No

Q31 Between January 1, 2018 and December 31, 2018, did you train all field staff in illicit discharge recognition (including conditions which could cause illicit discharges) and reporting illicit discharges for further investigations? [Part III.D.3.e.]

- Yes
- No

Q32 How did you train your field staff? Check all that apply.

- Email
- PowerPoint
- Presentation
- Video
- Field Training
- Other

Other, describe:

Gave handouts with examples

The following questions refer to Part III.C.1. of the Permit.

Q33 Did you update your storm sewer system map between January 1, 2018 and December 31, 2018? [Part III.C.1.]

- Yes
- No

Q34 Does your storm sewer map include all pipes 12 inches or greater in diameter and the direction of stormwater flow in those pipes? [Part III.C.1.a.]

- Yes
- No

Q35 Does your storm sewer map include outfalls, including a unique identification (ID) number and an associated geographic coordinate? [Part III.C.1.b.]

- Yes
- No

Q36 Does your storm sewer map include all structural stormwater BMPs that are part of your MS4? [Part III.C.1.c.]

- Yes
- No

Q37 Does your storm sewer map include all receiving waters? [Part III.C.1.d.]

- Yes
- No

Q38 In what format is your storm sewer map available?

- Hardcopy only
- GIS
- CAD
- Other

Q39 Between January 1, 2018 and December 31, 2018, did you modify your BMPs, measurable goals, or future plans for your illicit discharge detection and elimination (IDDE) program? [Part IV.B.]

- Yes
- No

Describe those modifications:

Updated IDDE to add additional items to the form.

MCM 4: Construction Site Stormwater Runoff Control

The following questions refer to Part III.D.4. of the Permit.

Q40 Do you have a regulatory mechanism that is at least as stringent as the Agency's general permit to Discharge Stormwater Associated with Construction Activity (CSW Permit) No. MN R100001 (<http://www.pca.state.mn.us/index.php/view-document.html?gid=18984>) for erosion and sediment controls and waste controls? [Part III.D.4.a.]

- Yes
- No

Q41 Have you developed written procedures for site plan reviews as required by the Permit? [Part III.D.4.b.]

- Yes
- No

Q42 Have you documented each site plan review as required by the Permit? [Part III.D.4.f.]

- Yes
- No

Q43 Enter the number of site plan reviews conducted for sites an acre or greater of soil disturbance between January 1, 2018 and December 31, 2018:

9

Q44 What types of enforcement actions do you have available to compel compliance with your regulatory mechanism? Check all that apply and enter the number of each used from January 1, 2018 to December 31, 2018.

- Verbal warnings
- Notice of violation
- Administrative orders
- Stop-work orders
- Fines
- Forfeit of security of bond money
- Withholding of certificate of occupancy
- Criminal actions
- Civil penalties
- Other

Other, describe:

Written Warning

Enter the number of verbal warnings issued:

26

Enter the number of stop-work orders issued:

0

Enter the number of 'other' issued:

3

Q45 Do you have written Enforcement Response Procedures (ERPs) to compel compliance with your construction site stormwater runoff control regulatory mechanism(s)? [Part III.B.]

- Yes
- No

Q46 Enter the number of active construction sites an acre or greater that were in your jurisdiction between January 1, 2018 and December 31, 2018:

10

Q47 Do you have written procedures for identifying priority sites for inspections? [Part III.D.4.d.(1)]

- Yes
- No

Q48 How are sites prioritized for inspections? Check all that apply.

- Site topography
- Soil characteristics
- Types of receiving water(s)
- Stage of construction
- Compliance history
- Weather conditions
- Citizen complaints
- Project size
- Other

Other, describe:

Magnitude of construction sites and proximity to water bodies.

Q49 Do you have a checklist or other written means to document site inspections when determining compliance? [Part III.D.4.d.(4)]

- Yes
- No

Q50 Enter the number of site inspections conducted for sites an acre or greater between January 1, 2018 and December 31, 2018:

252

Q51 Enter the frequency at which site inspections are conducted (e.g. daily, weekly, monthly): [Part III.D.4.d.(2)]

Weekly and after 1/2" rain events as workload allows.

Q52 Enter the number of trained inspectors that were available for construction site inspections between January 1, 2018 and December 31, 2018:

2

Q53 Provide the contact information for the inspector(s) and/or organization that conducts construction stormwater inspections for your MS4. List your primary construction stormwater contact first if you have multiple inspectors.

(1)

Inspector name

Organization

Phone (Office)

Phone (Work Cell)

Email

Preferred contact method

(2)

Inspector name

Organization

Phone (Office)

Phone (Work Cell)

Email

Preferred contact method

(3)

Inspector name

Organization

Phone (Office)

Phone (Work Cell)

Email

Preferred contact method

- Q54 What training did inspectors receive? Check all that apply.
- University of Minnesota Erosion and Stormwater Management Certification Program
 - Qualified Compliance Inspector of Stormwater (QCIS)
 - Minnesota Laborers Training Center Stormwater Pollution Prevention Plan Installer or Supervisor
 - Minnesota Utility Contractors Association Erosion Control Training
 - Certified Professional in Erosion and Sediment Control (CPESC)
 - Certified Professional in Stormwater Quality (CPSWQ)
 - Certified Erosion, Sediment and Storm Water Inspector (CESSWI)
 - Other

- Q55 Between January 1, 2018 and December 31, 2018, did you modify your BMPs, measurable goals, or future plans for your construction site stormwater runoff control program? [Part IV.B.]
- Yes
 - No

MCM 5: Post-Construction Stormwater Management

The following questions refer to Part III.D.5. of the Permit.

- Q56 Do you have a regulatory mechanism which meets all requirements as specified in Part III.D.5.a. of the Permit?
- Yes
 - No
- Q57 What approach are you using to meet the performance standard for Volume, Total Suspended Solids (TSS), and Total Phosphorus (TP) as required by the Permit? [Part III.D.5.a.(2)]
Check all that apply.

Refer to the link <http://www.pca.state.mn.us/index.php/view-document.html?gid=17815> for guidance on stormwater management approaches.

- Retain a runoff volume equal to one inch times the area of the proposed increase of impervious surfaces on-site
 - Retain the post-construction runoff volume on site for the 95th percentile storm
 - Match the pre-development runoff conditions
 - Adopt the Minimal Impact Design Standards (MIDS)
 - An approach has not been selected
 - Other method (Must be technically defensible--e.g. based on modeling, research and acceptable engineering practices)
- Q58 Do you have written Enforcement Response Procedures (ERPs) to compel compliance with your post-construction stormwater management regulatory mechanism(s)? [Part III.B.]
- Yes
 - No

Q59 Between January 1, 2018 and December 31, 2018, did you modify your BMPs, measurable goals, or future plans for your post-construction stormwater management program? [Part IV.B.]

- Yes
- No

MCM 6: Pollution Prevention/Good Housekeeping for Municipal Operations

The following questions refer to Part III.D.6. of the Permit.

Q60 Enter the total number of structural stormwater BMPs, outfalls (excluding underground outfalls), and ponds within your MS4 (exclude privately owned).

Structural stormwater BMPs	<input type="text" value="47"/>
Outfalls	<input type="text" value="31"/>
Ponds	<input type="text" value="107"/>

Q61 Enter the number of structural stormwater BMPs, outfalls (excluding underground outfalls), and ponds that were inspected from January 1, 2018 to December 31, 2018 within your MS4 (exclude privately owned). [Part III.D.6.e.]

Structural stormwater BMPs	<input type="text" value="47"/>
Outfalls	<input type="text" value="1"/>
Ponds	<input type="text" value="37"/>

Q62 Have you developed an alternative inspection frequency for any structural stormwater BMPs, as allowed in Part III.D.6.e.(1) of the Permit?

- Yes
- No

Q63 Based on inspection findings, did you conduct any maintenance on any structural stormwater BMPs? [Part III.D.6.e.(1)]

- Yes
- No

Q64 Briefly describe the maintenance that was conducted:

Cleaned out stormceptors

Q65 Do you own or operate any stockpiles, and/or storage and material handling areas? [Part III.D.6.e.(3)]

- Yes
- No

- Q66 Did you inspect all stockpiles and storage and material handling areas quarterly?
[Part III.D.6.e.(3)]
- Yes
 No
- Q67 Based on inspection findings, did you conduct maintenance at any of the
stockpiles and/or storage and material handling areas?
- Yes
 No
- Q69 Between January 1, 2018 and December 31, 2018, did you modify your BMPs,
measurable goals, or future plans for your pollution prevention/good housekeeping
for municipal operations program? [Part IV.B.]
- Yes
 No

Partnerships

- Q78 Did you rely on any other regulated MS4s to satisfy one or more Permit
requirements?
- Yes
 No

Additional Information

If you would like to provide any additional files to accompany your annual report,
use the space below to upload those files. For each space, you may attach one
file. You may provide additional explanation and/or information in an email with the
subject *YourMS4NameHere_2018AR* to ms4permitprogram.pca@state.mn.us.

- Q80 Click the "up arrow" icon below to upload a file. When it has uploaded successfully,
a unique ID will appear in the box. Only files less than 10 MB in size will upload.



- Q81 Click the "up arrow" icon below to upload a file. When it has uploaded successfully,
a unique ID will appear in the box. Only files less than 10 MB in size will upload.



Q82 Click the "up arrow" icon below to upload a file. When it has uploaded successfully, a unique ID will appear in the box. Only files less than 10 MB in size will upload.



Q83 Optional, describe the file(s) uploaded:

Owner or Operator Certification

The person with overall administrative responsibility for SWPPP implementation and Permit compliance must certify this MS4 Annual Report. This person must be duly authorized and should be either a principal executive (i.e., Director of Public Works, City Administrator) or ranking elected official (i.e., Mayor, Township Supervisor).

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. 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 (Minn. R. 7001.0070). I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment (Minn. R. 7001.0540).

Yes

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 information can be used for the purpose of processing my MS4 Annual Report.

Name:

Title:

Date:

(mm/dd/yyyy)

When you are ready to submit, you must click the 'Submit' button at the bottom of this page.

Provide the email(s) of the individual(s) you would like to receive the MS4 Annual Report for 2018 submittal confirmation email from the MPCA. After you click the Submit button below, please allow up to three business days to receive this email.

Email (1)

Email (2)

Email (3)

Print or save a copy of your completed MS4 Annual Report for 2018 for your records. The MPCA will email a PDF of your MS4 Annual Report for 2018 information in a confirmation email within three business days after you submit this form to the email(s) you provided above.

You may print a copy of the MS4 Annual Report for 2018 for your records by pressing the 'Print' button at the bottom of the page.

Additionally, it is possible to save a PDF copy of the MS4 Annual Report for 2018 if you are working on a computer with OneNote (a program often included in Microsoft Office packages). Detailed saving instructions are available at stormwater.pca.state.mn.us/index.php/Guidance_for_saving_MS4_annual_reports.

If you have any questions, contact MPCA staff Cole Landgraf (cole.landgraf@state.mn.us, 651-757-2880).

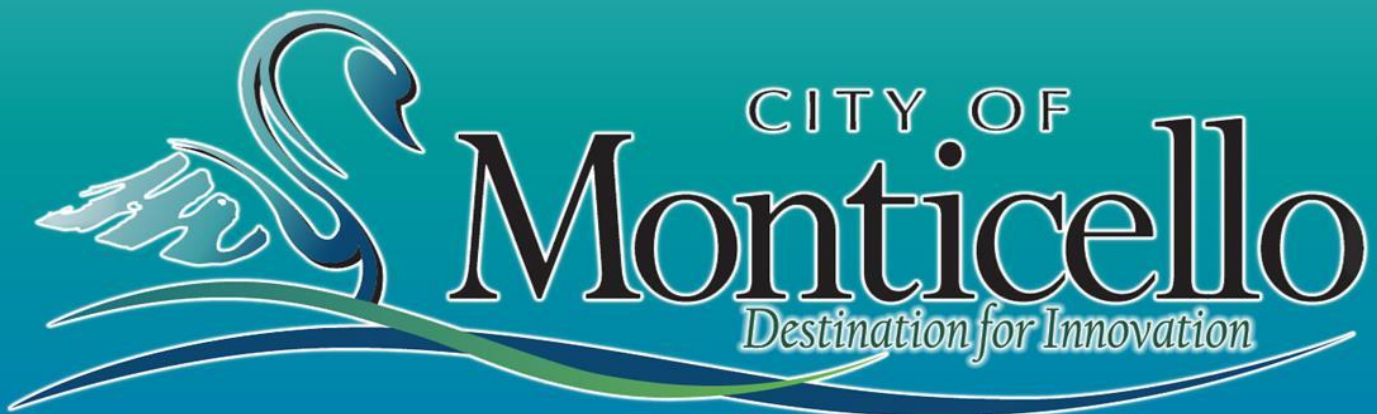
APPENDIX

Appendix F

Design Manual

Plan Requirements and Design Guidelines

February 2018



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www.ci.monticello.mn.us

PLAN REQUIREMENTS

AND

DESIGN GUIDELINES

(“DESIGN MANUAL”)

Revised February 2018

**CITY OF MONTICELLO
PLAN REQUIREMENTS AND DESIGN GUIDELINES**

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**APPENDIX A
STORMWATER SITE PLAN REVIEW CHECKLIST**

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I. PLAN REQUIREMENTS

A. GENERAL PLAN AND DRAFTING REQUIREMENTS

1. Title Sheet

The title sheet shall include a project location map and the City project number. An approval block for the City Engineer shall be included on the title sheet with the current date of the plans.

2. Overall Plan

Incorporated in the set of plans shall be an overall plan sheet duplicating the entire project showing all proposed improvements with an index of corresponding sheet numbers referencing each sheet. An approval block for the City Engineer shall be included on the overall plan sheet.

3. Standard Sheet

All drawings shall be submitted on standard sheets at standard scale.

a) Standard Sheet:

- Grading Plan – 22" x 34"
- Public Street and Utility Plan – 22" x 34"

b) Standard Scale:

- Horizontal 1" = 50'
- Vertical 1" = 10'

c) Larger scales may be required where necessary to clearly show details.

d) If the project limits are too large to show clearly on one sheet, an overall plan sheet should be provided referencing multiple sheets to show the project limits.

4. Plan

All plan sheets should show:

- North arrow
- Rights-of-way and width

**CITY OF MONTICELLO
PLAN REQUIREMENTS AND DESIGN GUIDELINES**

- Property lines
- Lot and block numbers
- Street names
- Utility lines and size
- Railroad tracks
- Ditches
- Easements and width
- Match lines
- Reference sheet numbers (with “See Sheet XX”)
- Vicinity or location map of the whole site with the area the sheet is referencing shaded.
- All utility alignments should have stationing.

All roadway improvements and utilities shall be tied to the centerline of City right-of-way, centerline of a City easement, subdivision corners, Government land corners, or Government land lines. Plans shall locate and describe additional information required under the standards for the particular improvement proposed.

5. Profile

The profile is to be located directly below the plan with stationing aligned as closely as practical. Original ground (dashed) and proposed if different (solid). Profile shall locate and describe additional information required under the standards for the particular improvement proposed. All utilities shall be shown in profile to include sanitary sewer, watermain, storm sewer, and storm sewer crossings.

6. Additional Sheets

Use standard sheet with appropriate scale for details of anything not covered by City of Monticello Standard Details or approved MnDOT Standard Plates. More than one (1) sheet may be used if necessary.

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7. Benchmark

Description on each sheet, elevation, USGS 1929 datum, tie to City bench loop, and description of City benchmark to which it is tied.

8. Title Block

Shall include the name of project, subdivision, or planned building group or street, as applicable, and type of utility or roadway and the name, address, zip, telephone of the Engineer.

9. Certification

Certification signature and registration number of Professional Engineer on each sheet along with the current date.

10. Required Notes

These notes shall appear on the cover sheet. If no cover sheet, they shall be put on every sheet submitted for approval.

- a) All Street Construction shall conform to the most recent edition of the City of Monticello Standards & Specifications.
- b) All Sanitary Sewer Construction shall conform to the most recent edition of the City of Monticello Standards & Specifications.
- c) All Storm Sewer Construction shall conform to the most recent edition of the City of Monticello Standards & Specifications.
- d) All Water Distribution Construction shall conform to the most recent edition of the City of Monticello Standards & Specifications.
- e) Paving shall not start until subgrade compaction tests have been taken and roadway conditions are approved by the Engineer.

11. Drafting Standards

All final drawings submitted for approval and record shall meet the following minimum standards to facilitate microfilming:

- a) Drawings shall be 22" x 34" or 24" x 36" originals or reverse reading, 3 mil mylar sepia, clean, clear and free from objectionable background. Drawings shall be completed using AutoCAD, Microstation, or an

**CITY OF MONTICELLO
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equivalent software program.

- b) Existing utilities shall be shown and labeled as existing.
- c) The approximate locations of gas, electric, telephone, and cable lines shall be shown.
- d) Sanitary sewer and watermain shall be shown together on plan sheets (plan and profile view) separate from storm sewer and street construction. Storm sewer should be shown as screened.
- e) Storm sewer and street construction shall be shown together on plan sheets (plan and profile view) separate from sanitary sewer and watermain. Sanitary Sewer and watermain should be shown as screened.
- f) Storm sewer that is not located within the streets (i.e. along lot lines, ditches, pond outlets/inlets) should be shown on a separate plan sheet.

12. Lettering

Letter size shall be not less than 0.12 (No. 120 LeRoy template).

13. Submittals

Electronic copies of final construction plans and final plat shall be submitted for updating the City base maps.

B. RECORD PLAN REQUIREMENTS

All record plans shall be mylar sepias from inked and clearly legible drawings with unnecessary construction information removed (contours, trees, shrubs, fences, etc.). Electronic copies of the record plans shall also be provided using County coordinates.

1. Sanitary Sewer Services

- a) Stationing of sanitary sewer wyes shall be indicated.
- b) All sanitary services shall be shown on the record plan with length, size, elevation at the stub end, and pipe type noted.
- c) If sanitary sewer wye only is constructed, it shall be noted as “Wye Only” after the stationing.
- d) The invert elevation at the 45-degree bend of all sanitary sewer service

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stubs shall be shown on the plans. If deep risers are placed, the height of each shall be indicated on the plans and each shall be drawn on the profile, and the height of the risers indicated.

- e) All sanitary sewer service ends shall be tied with at least two ties using the following priority:
- Sanitary sewer manholes
 - Hydrants
 - Storm sewer manholes
 - Catch basins
 - Power transformers
 - Building corners

See example in this section for tie documentation.

2. Watermain

Any significant changes in alignment or grade shall be shown including all bends.

3. Water Services

- a) Stationing of water corporation stop shall be indicated.
- b) All water services shall be shown with length, size, and pipe type noted.
- c) All curb stop boxes shall be tied with at least two ties using the following priority:
- (1) Sanitary sewer manholes
 - (2) Hydrants
 - (3) Storm sewer manholes
 - (4) Catch basins
 - (5) Power transformers
 - (6) Building corners

See example in this section for tie documentation.

4. Watermain Fittings

All water fittings should be labeled as to size and type such as bends, ties, plugs, etc. with corresponding road stationing noted.

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5. Gate Valves

All gate valves shall be tied with at least two ties using the following priority:

- a) Fire hydrants
- b) Manholes
- c) Catch basins, if curb and gutter is in
- d) Buildings or other permanent structures
- e) Telephone pedestals
- f) Power poles, trees, other semi-permanent items
- g) Stationing from hydrants, manholes, catch basins, if over 100 feet

All ties should be less than 200 feet whenever possible.

6. Fire Hydrants

All fire hydrants shall have a benchmark elevation shown for the top-nut of the fire hydrant. Hydrant lead lengths should be noted.

7. Storm Sewer

- a) All structures shall have the top of casting elevation and invert elevations shown.
- b) Corrected lengths and pipe grades should be indicated.

8. Streets

Street as-builts would include a typical street section and horizontal and vertical curve data.

9. Conduit Crossings

- a) All conduits crossing streets and driveways shall be shown with size and shall identify utility type (i.e. gas, electric, telephone, cable, fiber optic).

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- b) All conduit crossing ends shall be tied with at least two ties.

10. Miscellaneous

- a) The following information shall be shown on every sheet:
- Contractor's name
 - Construction observer's name
 - Project Engineer's name
 - Manhole and pipe manufacturer on applicable sheets
 - Brass fitting manufacturer on applicable sheets
 - Valve manufacturer on applicable sheets
 - Concrete manufacturer on applicable sheets
- b) Sanitary sewer, watermain, and storm sewer shall be shown on separate sheets. Sheet numbers will be assigned by the Public Works Department.
- c) One set of 22" x 34" mylar sepias and two sets 22" x 34" of black lines shall be provided to the Public Works Department.
- d) WSB & Associates, Inc. will GPS survey all structures and service locations and provide this information to the developer's engineer to include in the record plans.

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**As-Built Example
Curb Stop Ties**

<p>LOT 1</p> <p>Curb Stop 33.6' MH-1 98' ST-11</p>	<p>LOT 2</p> <p>Curb Stop 11.5' MH-1 37.2' ST-11</p>	<p>LOT 3</p> <p>Curb Stop 22.6' MH-2 5.2' ST-9</p>
---	---	---

STREET NAME

<p>LOT 1</p>	<p>LOT 2</p>	<p>LOT 3</p>
--------------	--------------	--------------

Show gate valve ties with arrow pointing to the gate valve.

**CITY OF MONTICELLO
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II. DESIGN GUIDELINES

A. GRADING AND EROSION CONTROL PLANS

The grading and erosion control plans shall conform to the most recent editions of “**Minnesota Stormwater Manual**”, “**Protecting Water Quality in Urban Areas**” (Best Management Practices for Minnesota), “**National Urban Runoff Program**” (NURP), “**MPCA Minimal Impact Design Standards (MIDS)**”, and City of Monticello “**Comprehensive Stormwater Management Plan**” or as modified herein and the City’s most recent Standard Detail Plates.

The following are specific requirements related to the development of grading and erosion control plans for the proposed development and adjacent land within 200 feet unless noted otherwise:

- Show and label existing underground and overhead utilities.
- Show the location and indication of demolition or relocation of existing structures.
- Show lot corner elevations and benchmarks utilized. Benchmarks should be on 1988 datum.
- Existing contours shall be at one or two foot intervals shown with dashed lines and screened. The contours shall extend beyond the proposed plat boundaries a minimum of 200 feet or as necessary to completely show the limits of a drainage basin not fully contained within the proposed plat. Ten-foot contour intervals shall be bold.
- Proposed contours shall be at one or two foot intervals shown with solid lines. Ten-foot contour intervals shall be bold.
- Maximum slopes of 4:1 are allowed.
- Minimum slopes of two percent (2%) are required for drainage swales, ditches, etc.
- Boulevards shall be graded with a four percent (4%) slope from the right-of-way to back-of-curb.
- Driveway grades should not exceed a 10 percent slope. Driveways shall not be located off of temporary cul-de-sac.

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PLAN REQUIREMENTS AND DESIGN GUIDELINES**

- Ponds, wetlands, lakes, streams or manholes shall be shown with the following:
 - Show the NWL and HWL for ponds and wetlands.
 - Show OHWL and DNR number if applicable.
 - Show proposed storage volume.
 - Ponds shall include a 10-foot, 10:1 bench from the NWL to 1 foot below the NWL.
 - Show the delineated wetland boundary.
- Flared end sections to a pond should not be placed in line with the overflow swales in order to prevent erosion problems.
- All rip rap should be grouted in place and extended to the bottom of the pond.
- Rear yard catch basins are not preferred. Positive overflows are preferred. If rear yard catch basins are allowed, they shall meet the following conditions:
 - a minimum depth of 4 feet
 - maintenance access with a 12-foot width, 10% max side slopes, and be of suitable material to accommodate vehicle access
 - a separate emergency overland overflow route to prevent home flooding
 - easement over 100-year flood elevation
- Maintenance access for ponds outlet structures, and turf structures should be provided and be included within a drainage and utility easement.
- Show existing and proposed building footprints with proposed floor elevations.
- The lowest opening elevations of affected structures adjacent to outletted ponds shall be 2 feet above the HWL.
- Show emergency overflow routes from all low points and show the high point elevation along emergency overflow routes. Show directional flow arrows. Emergency overflows shall be a minimum of 1.5-foot below the lowest opening elevation of adjacent affected structures and should be overland.

**CITY OF MONTICELLO
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- All existing trees 6 inches and larger in diameter should be shown. The elevation and species should be noted. The drip line should be shown for all tree stands and individual trees.
- Show limits of clearing and grubbing and removal limits.
- For proposed retaining walls, identify top and bottom elevations of retaining wall. Retaining walls greater than 4 feet in height shall be designed and certified by a registered professional engineer and shall include a railing at the top of the wall. A drainage swale is required behind all retaining walls. Retaining walls are not allowed in the right-of-way unless approved by the City.
- All rear yard swales are limited to extend across four lots and the ultimate runoff event must be contained within a drainage and utility easement.
- All plans with grading adjacent to existing lots should show topography and drainage patterns of the existing lots, including low floor elevations of existing homes if necessary.
- Residential lots should have a minimum 30-foot backyard area with a maximum 8:1 slope.
- Trail outlots shall be a minimum 30 feet wide.
- The typical street section(s) should be shown on the grading plan.
- Show all drainage and utility easements. The appropriate drainage and utility easements shall be dedicated on the final plat for all utilities and ponding areas lying outside the right-of-way. The drainage and utility easement width shall be a minimum of 20 feet wide.
- Drainage and utility easements for side yard lot lines shall be 6 feet wide except where it is adjacent to another plat or street, then it shall be 12 feet wide.
- Wetlands
 - Wetland Boundaries must be accurately shown along with the name of the delineator.
 - Applicant will meet wetland rules and regulations as stated in Corps of Engineers section 404 permit, the State Wetland Conservation Act, and the City's Wetland Ordinance. Mitigation work shall be implemented prior to or concurrent with wetland fill activity in all phases of the project.

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- The plans shall provide drainage and utility easements around all wetlands.
 - The wetland identification numbers and wetland types (Circular 39) should be shown on the plans.
 - The wetland delineation will need to be approved by the LGU before preliminary platting. The wetland approval process is 60 days from the time of delineation/alteration plan submittal provided the delineation report is submitted within the growing season.
 - The anticipated type of wetland to be created by the mitigation should be included in a wetland replacement application. Vegetation establishment discussion and monitoring plans should also be included in the application. The vegetation establishment should also be shown on the plans.
 - All known or suspected drain tile locations shall be noted in the wetland delineation report and as part of the storm water management plan.
 - The process for delineating and mitigating wetlands has to be completed and approved before the preliminary plat is approved.
 - Grading shall be phased with a maximum 40-acre area of exposed soil.
- Conservation Easements
 - Conservation easements shall be placed over all wetland and storm water ponding areas. The easements shall include at a minimum all proposed open water areas and a minimum 10-foot strip extending outward from the normal water elevation.
 - Conservation easements shall be required as an addendum to the final plat at the time of final platting.
 - City standard “Conservation Easement” markers should be included at every other lot corner boundary or at every lot corner to clearly identify the easement as directed by the City Engineer. Building permits will not be issued without the posts in place.
 - Fences are not allowed within the conservation easement.
 - Upon completion of grading, a Development Plan and an As-Built Grading Plan are required as specified below:

Development Plan Requirements

The plan should show the following information:

- Finished contours (includes streets, ponds, swales)
- Street grades and centerline elevations at high and low points
- Typical street section
- Overflow elevations

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- Drainage arrows depicting drainage patterns for each lot
- Drainage and utility easements
- Lot corner elevations
- Finished floor elevations with housing style identified
- Lot and block numbers
- Typical building pad grading detail
- Invert and top of casting elevations for all storm sewer structures and label storm pipe sizes (this should be legible, structure numbers do not need to be labeled)
- Update legend
- Conservation easement areas and post locations
- Signed and dated (with current date) by a registered professional engineer or land surveyor.

Three review copies should be submitted to the City for review. Once approved, three final signed copies should be submitted. These plans must be approved before building permits will be issued.

As-Built Grading Plan Requirements

The As-Built Grading Plan should contain all the information required on the Development Plan (as noted above) plus the following:

Topographic survey of ponds, swales, ditches, and major drainage patterns as constructed on public easement or land owned by the City. These items specifically include field verified elevations of the following: a) cross sections of ponds; b) location and elevations along all swales, wetlands, wetland mitigation areas if any, ditches, borrow areas/stockpiles, and building pad corner elevations.

Three review copies should be submitted to the City for review. Once approved, three final signed copies should be submitted. These plans must be approved before building permits will be issued.

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B. SANITARY SEWER

The design and construction of sanitary sewer and sanitary sewer services shall conform to the most recent editions of “**City Engineers Association of Minnesota Standard Utilities Specifications,**” “**Recommended Standards for Wastewater Facilities,**” (Ten States’ Standards) or as modified herein and the City’s most recent Standard Detail Plates, general specifications and comprehensive plans.

The following are specific requirements related to the design of sanitary sewer and sanitary sewer services:

- The sanitary sewer alignment shall follow the centerline of the street where practical.
- The maximum spacing between manholes is 400 feet unless approved otherwise.
- All manholes shall be located along the centerline of the street and outside of the wheel path.
- Manholes are required on the terminus end of all stubs if the line will be active.
- Connections to existing sanitary sewer manholes shall be core-drilled and fitted with a watertight boot.
- Inside drop manholes are not allowed if over two-foot drop in elevation.
- Outside drops are required if there is a drop in invert elevation greater than two feet.
- Changing of pipe material between manholes is not allowed. Changes in pipe grade or direction shall occur at manholes only.
- Sanitary sewer services shall be a minimum four-inch-diameter PVC (SDR 26).
- Cleanouts are required at 70-foot intervals including the riser on sanitary sewer services.
- Sanitary sewer services shall not be connected to a manhole.

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C. WATERMAIN

The design and construction of watermain and water services shall conform to the most recent editions of “**City Engineers Association of Minnesota Standard Utilities Specifications**,” “**AWWA Standards**,” “**Recommended Standards for Water Works**” (Ten State’s Standards) or as modified herein and the City’s most recent Standard Detail Plates, general specifications and comprehensive plans.

The following are specific requirements related to the design of watermain and water services:

- Minimum watermain diameter shall be eight inches for residential property.
- Minimum watermain diameter shall be 12 inches for commercial, industrial, and business park property.
- Material shall be ductile iron pipe, Class 52, for six-inch through 12- inch watermain. Material for large diameter watermain (over 12 inches) shall be ductile iron and the class of pipe determined on an individual basis.
- All utilities that cross the watermain shall cross at a 90-degree angle if possible with the minimum requirement of a 45-degree angle for the crossing.
- Watermain should be kept within the street and not under the curb line.
- A minimum of two valves shall be located at three-leg intersections; and three valves at four-leg intersections. Gate valves should be located in line with the right-of-way.
- Valves six-inch to 12-inch shall be compression resilient seated gate valves; valves larger than 12-inch shall be butterfly valves.
- Hydrants shall be installed with gate valves on the hydrant lead.
- Hydrants should be located at intersections and property lines.

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D. DRAINAGE FACILITIES/STORM SEWER

Drainage facilities shall conform to the most recent editions of “**City Engineers Association of Minnesota Standard Utilities Specifications,**” “**Protecting Water Quality in Urban Areas,**” (Best Management Practices for Minnesota), “**National Urban Runoff Program**” (NURP), “**MPCA Minimal Impact Design Standards (MIDS)**”, and **City of Monticello “Comprehensive Stormwater Management Plan”** or as modified herein and the City’s most recent Standard Detail Plates, general specifications and comprehensive plans.

A Stormwater Management Plan, along with supporting documentation, must be prepared and submitted that meets City drainage standards. Outlined below, please find a listing of information to be submitted:

- a) Drainage reports and studies shall include an overall drainage plan. The information listed below, if not shown on the drawings, shall be included in the report. The use of appropriate forms and design aids is recommended.
 - Open channel flow calculations/computations.
 - Storm sewer and storm inlet flow calculations for the 10- year and 100-year rainfall event.
 - Culvert design flow calculations for the 10-year and 100- year rainfall event.
 - Summation of all design variables used and design assumptions made.
 - Soil classification reports and depth of groundwater table throughout the study area when detention or retention ponds are used.
 - The boundary and designation of all tributary drainage areas and the area of each in acres.
 - The designation and location of each design point referred to in the calculations.
 - The reference source and a copy of all other monographs or design aids used in the calculations.
- b) The preliminary drainage report shall be approved by the City Engineer prior to Engineering approval of any Preliminary Plat or Preliminary P.U.D.

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The study will consist of calculations, comments and descriptions on 8-1/2" x 11" paper and an area map on one 24" x 36" drawing. Calculations shall include the 10-year and 100-year rainfall event calculations of all tributary areas to the development, all collection points within the development and all points discharging from the development. The 24" x 36" map shall be a topographic map of both the development and all areas tributary to the development less than 2,000 acres. The map shall show the total acreage and anticipated runoff rates at all points noted in the calculations. In addition, the map shall show the proposed location of all drainage facilities to be located within the development and their relationship to any existing facilities in adjacent developments. Any scale from 1" = 50' to 1" = 1,000' may be used to limit the drawing to one sheet.

- c) A final drainage report shall be submitted and approved in conjunction with construction drawings. The study shall include calculations on 8-1/2" x 11" paper and a drainage map of the development of 24" x 36" drawing. Calculations shall address all aspects of runoff, retention, detention, channel flow, or other appropriate information that is necessary for the design of the drainage system. The drainage map shall be prepared on the overall grading plan for the development. It shall illustrate the drainage patterns in the development as well as the location of all drainage facilities within the development. The map shall also show the runoff rates and acreage tributary to all collection points within the development. When intersections serve as collector points, the flow in each curb line must be noted. This drawing may use scales from 1" = 50' to 1" = 200', in order to limit the drawing to one sheet. When more than one sheet is used a scale of 1" = 200' shall be utilized.

Any land disturbing activities must conform to this plan. Any modification made to the approved plans must be made pursuant to current Design Guidelines.

- d) An overall drainage plan of the study area, including all areas outside of the study area, which contribute runoff to the study area and all downstream areas, which will be effected, by runoff from the study area, must be submitted. Drainage area plans shall be submitted showing the effects of the 10-year and 100-year rainfall events.
- e) Available storage volume of landlocked areas shall be established by estimating the water surface elevation resulting from a 100-year, 10-day runoff (7.2 inches) and saturated or frozen soil conditions (Curve Number equals 100).
- f) The following methods shall be used to verify the adequacy of designs submitted for approval:

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- Rational method for storm sewer design computations and peak discharge rates from a single isolated watershed.
- Urban Hydrology for Small Wetlands Technical Release No. 55 and Technical Release No. 20 published by Soil Conservation Service, U.S. Department of Agriculture.
- HEC-1, HEC-2, or HEC-RAS.
- HydroCAD
- P8 or MIDS calculator
- Minnesota Hydrology Guide published by Soil Conservation Service, U.S. Department of Agriculture.
- Stormwater treatment ponds designed to NURP standards.
- Infiltration basins designed to MIDS Standards and as specified in the MPCA Stormwater Manual's Infiltration Design Criteria.

g) The following criteria shall be utilized in the analysis of the drainage system.

- Runoff analysis shall be based upon proposed land use, and shall take into consideration all contributing runoff from areas outside of the study area.

The analysis of storm runoff from existing developed areas lying outside of the study area shall be based upon present land use and topographic features.

All undeveloped land lying outside of the study area shall be considered as fully developed based upon the most probable anticipated future land use. Provided, however, that whenever the future land use of a specific undeveloped area cannot be accurately predicted, the average runoff coefficient to be used in said area shall not be less than 0.60 for the Rational Method runoff coefficient or an approved equivalent value for any other method.

- The probable future flow pattern in undeveloped areas shall be based on existing natural topographic features (existing slopes, drainage ways, etc.) and shall conform to the Comprehensive Storm Drainage Plan.

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- Average land slopes in both developed and undeveloped area may be used in computing runoff. However, for areas in which drainage patterns and slopes are established, these shall be utilized.
 - Flows and velocities which may occur at a design point when the upstream area is fully developed shall be considered. Drainage facilities shall be so designed such that increased flows and velocities will not cause erosion damage.
 - Streets shall not be used as floodways for the 10-year rainfall event. The primary use of streets shall be for the conveyance of traffic.
 - The use of on-site detention and natural drainage ways is recommended and encouraged whenever possible. The changing of natural drainage way locations will not be approved unless such change is shown to be without unreasonable hazard and liability, substantiated by thorough analysis and investigation.
 - The planning and design of drainage systems shall be such that problems are not transferred from one location to another. Outfall points shall be designed in such a manner that will not create flooding hazards downstream.
- h) The rainfall intensities to be used in the computation of runoff for stormsewer design shall be obtained from the Intensity - Duration - Frequency Curves for the Monticello area as contained in the MnDOT Drainage Manual and shall be based upon a 10-year return frequency and 100-year return frequency.
- i) Runoff Coefficients
- a) Rational Method Runoff Coefficients by Land Use

The runoff coefficient (C) to be used in conjunction with the Rational Method shall not be less than listed in the table below:

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Area Description	Runoff Coefficients (C)
Business:	
Downtown Areas	0.95
Neighborhood Areas	0.70
Residential:	
Single-Family Areas	0.40
Multi-Units (Detached)	0.50
Multi-Units (Attached)	0.60
Residential (1/2 acre lots or larger)	0.30
Apartment Dwelling Areas	0.70
Commercial	0.70
Industrial:	
Light Areas	0.75
Heavy Areas	0.90
Parks, Cemeteries	0.25
Playgrounds:	
Paved	0.95
Grass	0.35
Gravel	0.60
Undeveloped Areas:	
Permanent Unimproved Areas, Greenbelts, Open Space, etc.	0.20
Temporary Unimproved Areas which will be considered as fully developed in the future	0.65
Ponds, Wetlands	1.0

j) Design Standards:

Roughness coefficients (N) shall be as follows:

- HDPE Pipe 0.012
- Concrete Pipe 0.013
- CMP Culverts 0.024
- Grassed Channel, Cut 0.030
- Grassed Channel, Natural 0.060

Minimum allowable velocity in closed conduit: 3.0 fps.

k) All lateral storm sewer facilities shall be designed to accommodate a 10-year rainfall event. The initial 10-year storm shall be conveyed

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without surcharging the system. Low points on streets shall be designed with an acceptable emergency overflow route.

- l) Catch basin inlets shall be designed with sufficient capacity to limit ponding to a maximum depth of 0.3 feet for a 10-year rainfall event.
- m) The minimum storm sewer pipe diameter shall be 15 inches.
- n) Storm sewer pipe for all public systems within street right-of-way and connection to public systems shall be RCP.
- o) HDPE pipe is allowed in green areas outside of street right-of-way.
- p) Catch basins should have a minimum depth of four feet to prevent freezing.
- q) Catch basin castings shall be Neenah R-3246 or approved equal. Catch basin castings not located at property corners in residential areas shall be Neenah R-3508-A2 or approved equal.
- r) Catch basin manholes greater than five-feet-deep are not allowed. In this case, catch basins should connect to a storm sewer trunk or main line through a separate storm sewer manhole. However, if a series of two or more catch basins are less than five-feet-deep, they should still connect to a storm sewer trunk or mainline through a separate manhole.
- s) Connections to existing manholes or catch basins shall be core drilled.
- t) All flared end sections 24 inches in diameter and greater should include sheet piling as per the City detail.
- u) All flared end sections 12 inches in diameter and greater shall include trash guards per City detail.
- v) Six-inch PVC perforated draintile shall be placed behind all curb for the full length of the street.
- w) The minimum allowable velocity in closed conduit is three feet per second (fps). In addition, the maximum allowable velocity in closed conduit is 12.0 fps.
- x) Changing of pipe material between manholes is not allowed. Changes in pipe grade or direction shall occur at manholes only.
- y) All storm sewer manholes should be aligned outside of the wheel path.

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- z) All storm sewer should be kept in the street a minimum of five feet from the curblin and not under the curblin at radii to connect catch basins.

2. Storm Sewers

- a) Manhole spacing shall not exceed 400 feet.
- b) Where more than one pipe enters a structure, a catch basin/manhole shall be used.
- c) Storm sewer pipe should match top of pipe on top of pipe unless grade constraints prevent this. In that case, hydraulic calculations will be necessary to verify that excessive surcharging will not occur.
- d) Stormwater pipes shall be designed utilizing the Rational Method. Channel design shall be hydrograph method only. All methods are subject to the City Engineer's approval.
- e) Lateral systems shall be designed for the 10-year rainfall using the Rational Method. State Aid roadway storm sewer shall be designed per the State Aid requirements.
- f) The minimum full flow velocity within the storm sewer should be three fps. The maximum velocity shall be 10 fps, except when entering a pond, where the maximum velocity shall be limited to six fps.
- g) Trunk storm sewer should be designed at a minimum to carry 100-year pond discharge in addition to the 10-year design flow for directly tributary areas. The following table shall be used for the calculation of peak rates using the Rational Method:

Cover Type	10-Year Runoff Coefficient
Single-family Residential	0.4
Multi-family Residential	0.5
Commercial	0.7
Industrial	0.7
Parks, Open Space	0.2
Ponds, Wetlands	1.0

- h) For storms greater than the 10-year event, and in the case of plugged inlets, transient street ponding will occur. For safety reasons, the maximum depth in streets should not exceed one and a half feet at the deepest point.

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- i) To promote efficient hydraulics within manholes, manhole benching shall be provided to half diameter of the largest pipe entering or leaving the manhole.
- j) Vaned grate (3067V) catch basin castings shall be used on all streets.
- k) The maximum design flow at a catch basin for the 10-year storm event shall be three cubic feet per second (cfs), unless high capacity grates are provided. Catch basins at low points will be evaluated for higher flow with the approval of the City Engineer.
- l) All structures located in the street are to be a minimum of four feet deep (rim to invert) and a minimum of three feet deep elsewhere. Two-by-three catch basins are to be four feet deep.
- m) The last structure in the street prior to discharging into a pond is to be a minimum of five-feet-deep with a four-foot-deep sump, where appropriate.

3. Outlet and Inlet Pipes

- a) Inlet pipes of stormwater ponds shall be extended to the pond normal water level whenever possible.
- b) Outfalls with velocities greater than four fps into channels, where the angle of the outfall to the channel flow direction is greater than 30 degrees, requires energy dissipation or stilling basins.
- c) Outfalls with velocities of less than four fps, that project flows downstream into a channel in a direction 30 degrees or less from the channel flow direction, generally do not require energy dissipaters or stilling basins, but will require riprap protection.
- d) In the case of discharge to channels, riprap shall be provided on all outlets to an adequate depth below the channel grade and to a height above the outfall or channel bottom. Riprap shall be placed over a suitably graded filter material and filter fabric to ensure that soil particles do not migrate through the riprap and reduce its stability. Riprap shall be placed to a thickness at least two and a half times the mean rock diameter to ensure that it will not be undermined or rendered ineffective by displacement. If riprap is used as protection for overland drainage routes, grouting may be recommended.
- e) Discharge velocity into a pond at the outlet elevation shall be six fps or less. Riprap protection is required at all inlet pipes into ponds from the NWL to the pond bottom.

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- f) Where outlet velocities to ponds 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.
- g) Submerged outlet pipes from ponds are not allowed.

E. STORMWATER MANAGEMENT FACILITIES

Unless otherwise exempted in these Standards, applicants are required to develop a Stormwater Management Plan that meets the requirements in this Section E, for all proposed land disturbing activities that meet any or all of the following:

- Any land disturbing activity that may ultimately result in the addition of one acre or greater of impervious surfaces, including smaller individual sites that are part of a common plan of development that may be constructed at different times; or
- The construction of any new public or private road; or
- Any land disturbance activity, regardless of size, that the City determines is likely to cause an adverse impact to an environmentally sensitive area or other property.

Proposed Stormwater Management Plans must incorporate **Volume Control**, **Rate Control**, and **Water Quality Control** as the basis for stormwater management in the proposed development plan.

1. Volume Control Requirements

Volume control measures are required on projects to meet the water quality criteria of the City of Monticello's Surface Water Management Plan and the MPCA Minimal Impact Design Standards (MIDS). Volume control shall be required for proposed new impervious area. If an applicant can demonstrate that the MIDS control standard has been met, then the water quality sizing criteria shall also be considered satisfied.

Volume Control Calculations

Depending on applicability, a proposed development shall capture and retain on site 1.1 inches of runoff from the impervious surfaces in post-construction conditions. For redevelopment projects, the performance goal is to capture and retain on site 1.1 inches of runoff from the new and/or fully redeveloped impervious surfaces. For linear projects, the performance goal is to capture

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and retain onsite the larger of the following:

- 0.55 inches of runoff from the new and fully reconstructed impervious surfaces
- 1.1 inches of runoff from the net increase in impervious surfaces

For projects where it is not feasible to meet the volume reductions requirements it will be required to meeting the water quality requirements of these engineering guidelines. Infiltration is infeasible when:

- Where industrial facilities are not authorized to infiltrate industrial stormwater under and NPDES/SDS Industrial Stormwater Permit issued by the MPCA.
- Where vehicle fueling and maintenance occur.
- With less than three feet of separation distance from the bottom of the infiltration system to the elevation of the seasonally saturated soils or the top of the bedrock.
- Where high levels of contaminant in soil or groundwater will be mobilized by the infiltrating stormwater.
- The site is located within a moderate or high vulnerability drinking water supply management area (DWSMA). (Follow MDH flowchart for final determination).

2. Rate Control Requirements

At a minimum, detention basins should maintain existing flow rates for the 2-year, 10-year, and 100-year 24-hour rainfall events. Details on the calculations and modeling that is accepted for verifying conformance is provided below:

a) Rate Control Calculations:

- The 2-year,10-year, and 100-year 24-hour rainfall events for Atlas 14, shown below, will be used for all modeling and calculations:

Event	Rainfall/Snowmelt Depth (inches)
2-year, 24-hour	2.84
10-year, 24-hour	4.22
100-year, 24-hour	6.87
100-year, 10-day snowmelt	7.2

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- 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 two-hour, six-hour, 12-hour, or 24-hour rainfall events or the 10-day, 7.2-inch snowmelt runoff event.
- 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 10.2-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 MSE3 distribution should be used. For shorter duration critical events other distributions may be used with the approval of the City Engineer.
- All drainage system analyses and designs shall be based on proposed full development land use patterns.
- For 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):
 - Three feet above the HWL determined by modeling back to back 100- year, 24-hour events,
 - Three feet above the highest known water level, or
 - 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.
- For basins with a suitable outlet, freeboard will be two-feet above the HWL determined by modeling the 100-year critical event.
- At least two feet of vertical separation is required from an area's emergency overflow elevation to the lowest opening of a home. In areas where this separation is not or cannot be provided, additional analysis is required showing that the 100-year back-to-back storm event does not affect adjacent homes.

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- Adjacent to channels, creeks, and ravines freeboard will also be two feet to the 100-year critical event elevation.
- Drainage easements and outlots for ponds, lakes, wetlands, streams, etc., shall encompass an area to the calculated one foot above the 100-year HWL.
- A 24-hour MSE3 rainfall distribution with average antecedent moisture conditions should be utilized for runoff calculations.
- The recommended minimum outlet diameter is six inches due to plugging susceptibility and may supersede the rate control requirement for the 2-year event.
- City standard detail plates should be utilized for pond outlet structures.
- Outlet structures should be designed in three phases with primary outlet structure and secondary overflow structure routed to the storm sewer and a defined emergency overflow as the tertiary outlet structure.

3. Water Quality Requirements

The City of Monticello, as a permitted MS4, requires:

- New development projects to have a **no net increase** from pre-project conditions of total volume, TSS, and TP;
- Redevelopment projects within the city to have a **net reduction** from pre-project conditions of total volume, TSS and TP.

For New Development, the water quality control standard shall be considered satisfied if the volume control standard has been satisfied. In the event that it is infeasible to meet the volume control standard due to contaminated soils, site constraints, or other factors, the proposed STP will need to satisfy the water quality standards using the MIDS flexible treatment options as outlined below in addition to the MIDS Design Sequence Flowchart.

MIDS Flexible Treatment Options:

- Applicant attempts to comply with the following conditions:
 - Achieve at least 0.55-inch volume reduction goal
 - Remove 75 percent of the annual total phosphorus load
 - Options considered and presented shall examine the merits of relocating project elements to address varying soil conditions and other constraints across the site

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- Applicant attempts to comply with the following conditions:
 - Achieve volume reduction to the maximum extent practicable (as determined by the Local Authority)
 - Remove 60 percent of the annual total phosphorus load
 - Options considered and presented shall examine the merits of relocating project elements to address varying soil conditions and other constraints across the site.

- Off-site mitigation (including banking or cash or treatment on another project, as determined by the local authority) equivalent to the volume reduction performance goal can be used in areas selected in the following order of preference:
 - Locations that yield benefits to the same receiving water that receives runoff from the original construction activity.
 - Locations within the same Department of Natural Resources (DNR) catchment area as the original construction activity.
 - Locations in the next adjacent DNR catchment area up-stream.
 - Locations anywhere within the local authority's jurisdiction.

F. BMP DESIGN

1. Channels and Overland Drainage

- a) Overland drainage routes where velocities exceed four 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 pip.

- c) The minimum grade in all unpaved areas shall be two percent.

- d) Maximum length for drainage swales shall be 400 feet.

- e) Channel side slopes should be a maximum of 4:1 (horizontal to vertical) with gentler slopes being desirable.

- f) Riprap shall be provided at all points of juncture, particularly between two open channels and where storm sewer pipes discharge into a channel.

- g) Open channels should be designed to handle the expected velocity from a 10-year design storm without erosion. Riprap may need to be provided.

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- h) Periodic cleaning of an open channel is required to ensure that the design capacity is maintained. Therefore, all channels shall be designed to allow easy access for equipment.

2. Ponds

- a) Maximum allowable pond slopes above the outlet elevation are 4:1.
- 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:
- Cross-slope no steeper than 10:1.
 - Minimum width of 10 feet.
 - Located from pond outlet elevation to one-foot pond outlet elevation.
- c) All constructed ponds shall be provided a maintenance access from an adjacent roadway. The maintenance access shall be provided in the form of an easement no narrower than 20 feet. The maintenance access shall have a longitudinal slope no steeper than 6:1 and minimal cross slope. Maintenance access routes, due to their extra width, also serve well as emergency overflow (EOF) routes.
- d) All constructed ponds and wetland mitigation areas shall have a maintenance access bench around sufficient perimeter to provide access to all inlets and outlets. The maintenance bench shall be located within a designated outlot or within a permanent easement. The maintenance bench shall extend from the outlet elevation to one foot above the outlet elevation and its cross slope shall be no steeper than 10:1. The maintenance bench shall connect to the maintenance access.
- e) Maximum pond wet volume depth is eight feet.
- f) Mean depth for wet ponds shall be a minimum of four feet. If the pond is smaller than three acre-feet in volume, mean depths of three to four feet may be used. Mean depth is defined as the area at outlet elevation divided by the wet volume.
- g) All ponds shall be graded to one foot below design bottom elevation. This “hold down” allows sediment storage until site restoration is complete.
- h) The top berm elevation of ponds shall be a minimum of one foot above the 100-year pond HWL.

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- i) 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.
- j) All ponds shall have a protected EOF.

3. Infiltration/Filtration Practices

- a) Sizing of filtration/infiltration practices, or STPs, shall be in conformance with the volume control requirements of this manual.
- b) When designing an infiltration practice for volume control and water quality management, on-site testing and detailed analysis are strongly encouraged in order to determine the infiltration rates of the proposed infiltration facility. Documented site-specific infiltration or hydraulic conductivity measurements (double-ring infiltrometer) completed by a licensed soil scientist or engineer is required. In the absence of a detailed analysis, the saturated infiltration rates listed in the Infiltration Rates for Infiltration STPs table found on the Minnesota Stormwater Manual shall be used. A piezometer shall be installed in order to ascertain the level of the local groundwater table and demonstrate at least three feet of separation between the bottom of the proposed facility and the groundwater. The soil boring is required to go to a depth of at least five feet below the proposed bottom of the STP. The soils shall be classified using the Unified Soil Classification system. The least permeable soil horizon will dictate the infiltration rate. Infiltration practices shall be designed to infiltrate the required runoff volume within 48 hours.
- c) Pretreatment, in the form of ponds, forebays, filter strips, or other approved methods, shall be provided for all infiltration areas. Pretreatment upstream of volume management practices is a key element in the long-term viability of infiltration areas. The level of pretreatment varies largely depending on the STP and drainage area. City staff and the Minnesota Stormwater Manual recommendations shall be utilized for determining the appropriate level of pretreatment on a case-by-case basis.
- d) The infiltration practice shall not be used within fifty feet of a municipal, community, or private well, unless specifically allowed by an approved wellhead protection plan.
- e) The infiltration practice shall not be used for runoff from fueling and vehicle maintenance areas and industrial areas with exposed materials posing contamination risk, unless the infiltration practice is designed to allow for spill containment.

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- f) The infiltration practice shall not be used in Hydrologic Soil Group (HSG) C and D soils without soil corrections.
- g) Vegetation of infiltration/filtration practices shall be as shown in the City of Monticello Standard Details. A plan for management for vegetation shall be included in the Stormwater Pollution Prevention Plan.
- h) If soils are unsuitable for infiltration, then filtration may be used with drain tile, provided in accordance with the City of Monticello Standard Details.
- i) Subgrade soils for infiltration/filtration practices shall be as presented in the City of Monticello Standard Details. Assume a 30 percent void ratio for the purposes of volume calculations.
- j) For infiltration benches adjacent to ponds, benches shall have slopes no steeper than 5:1 over the proposed infiltration zone. A slope of 10:1 is preferred. The Minnesota Stormwater Manual cites concerns with locating infiltration features immediately adjacent to ponds. To address this, benches shall be located to maintain hydraulic separation from the saturated zone of the pond in order to minimize the loss of infiltration potential over time.

4. Emergency Overflow Paths

- a) Emergency Overflows (EOFs) shall be sized with a minimum bottom width of five feet and 4:1 side slopes.
- b) The maximum flow depth in EOFs shall be less than equal to one foot as calculated for a 100-year back-to-back storm event.

G. STREET CONSTRUCTION

Streets shall conform to the most recent editions of “**MnDOT Standard Specifications for Highway Construction**,” “**MnDOT Road Design Manual**,” “**Minnesota Manual on Uniform Traffic Control Devices for Streets and Highways**” or as modified herein and the City’s most recent Standard Detail Plates, general specifications and plans.

The following are specific requirements related to the design of street construction:

- The minimum street grade shall be half a percent with a maximum allowable grade as shown on **Table 1**. At intersections, the street grade shall not exceed two percent for the first 100 feet approaching said intersection. The 100 feet shall be measured from the curb line of the intersected street.

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- Grade breaks without vertical curve will be allowed if the algebraic difference in grade is less than 0.8 percent.
- In cul-de-sacs, the gutter grade shall not be less than 0.50 percent.
- A 20-foot minimum intersection radius shall be used on residential streets. Boulevard widths less than 10 feet should remain the same through the radius.
- New residential subdivisions will require modified “D” concrete and gutter in accordance with City’s Standard Detail Plates. This curb type shall be used along curb radii also.
- Temporary cul-de-sac with a radius of 40 feet will be required on all “dead-end” public streets associated with phased development and providing access for future extension to and through adjacent undeveloped property.
- Stub streets should not be extended if not included in phasing of the development or future development.
- Pavement design shall be in accordance with the Flexible Pavement Design Section of the MnDOT Road Design Manual. It shall be accompanied by a soils report including R-value determinations and signed by a Registered Professional Engineer. The standard typical section for residential streets consists of one and a half inches of bituminous wear course, two inches of base course, six inches of Class 5 aggregate base, and a two-foot sand section, with a maximum of 10 percent passing the No. 200 sieve. A soils engineer shall provide a recommendation of the two-foot subgrade to determine if existing soils are suitable. The minimum criteria set forth in **Table 2** shall be met.
- Signs should be shown on the street plan or on a separate plan sheet and shall be installed by a Contractor. The City does not install signs.
- Horizontal curve data should be shown on the plans.
- Curb elevations and drainage arrows should be shown along radii at all street intersections to define drainage patterns.
- The minimum street radius should be 100 feet.

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TABLE 1 VERTICAL CURVES					
	Design Speed V	Minimum L	Crest K	Sag K	Maximum Grade
Arterials	50	150	145	100	6%
Collector	45	130	105	80	5%
Local	35	100	50	45	5%

Notes to Table 1:

1. All vertical curves shall be labeled with length of curve (L), stopping sight distance (SSD), or headlight sight distance (HSD), safe speed (S), and $K (= L/A)$ where A equals algebraic difference in grade in percent and L equals the length of vertical curve.
2. The minimum speed listed shall also comply with horizontal alignment. Horizontal curve radius and super-elevation shall be in accordance with the recommendations of MnDOT.
3. The source of the above is the Road Design Manual, Engineering Division of Minnesota Department of Transportation, as revised.

TABLE 2 STREET CONSTRUCTION REQUIREMENTS				
	Minimum Width of Dedicated Right-of- Way	Minimum Street Width Flow Line to Flow Line	Minimum Bituminous Pavement	Minimum Aggregate Base
Collector	80'	44'	4" Surface	8" Base
Local	60'	30' ⁽¹⁾ , 32' ⁽²⁾ , 36' ⁽³⁾	3½" Surface	6" Base

Street widths will be reviewed and determined by the City Engineer on a case-by-case basis and may vary depending on on-street parking needs.

The final street section shall be based on actual subgrade conditions and will be assigned by the City Engineer following review of soil borings.

- (1) Cul-de-sacs or streets determined to have less than 200 trips/day calculated at 10 trips/home/day.
- (2) Streets with between 200 and 750 trips/day or over 750 trips/day with separate pedestrian facilities.
- (3) Minor collectors. Streets with over 750 trips/day.

- Conduit crossings should be shown on the plans.
- Driveways shall be a maximum 24-feet-wide. If a wider driveway is proposed, turning movement templates shall be provided indicating the required width.
- Sidewalk shall be six-feet-wide and include truncated dome pedestrian ramps.
- Sidewalks shall be placed, at a minimum, along one side of all streets.

TABLE 3 TURN LAND REQUIREMENTS		
	Design Speed	
	< 35 mph	40-50 mph
Collector ⁽¹⁾ Length ⁽³⁾ Taper	360 feet 15:1	480 feet 15:1
Local ⁽²⁾ Length ⁽³⁾ Taper	225 feet 7.5:1	- -

- (1) Turn lane widths shall be 14-feet-wide.
- (2) Turn lane widths shall be 12-feet-wide.
- (3) Turn lane length includes the taper length

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H. SITE PLANS

The design and construction of site plans shall conform to the most recent editions of “City Engineer’s Association of Minnesota Standard Utilities Specifications”, or as modified herein and the City’s most recent General Specifications and Standard Detail Plates.

The following are specific requirements to the design of site plans:

- Requirements listed in Section II.A Grading and Erosion Control Plans unless superseded below.
- Maximum slopes for green areas of 4:1 are allowed.
- Minimum slopes for green areas of 2% are required.
- Show existing and proposed building footprints with proposed floor elevations.
- For proposed retaining walls, identify top and bottom elevations of retaining wall. Retaining walls greater than four feet in height shall be designed and certified by a licensed professional engineer. Retaining walls are not allowed in the right-of-way.
- Show all drainage and utility easements.
- Maximum parking lot grade is four percent.
- Minimum grade for bituminous surfaces is one percent.
- Minimum grade for concrete curb and gutter or concrete surfaces is one half percent.
- B612 concrete curb and gutter is allowed in parking lot areas.
- Storm sewer connections to City storm sewer system shall be with reinforced concrete pipe.

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III. CONSTRUCTION REQUIREMENTS

A. CONSTRUCTION STAKING

The following is a summary of construction staking requirements for improvement projects in the City of Monticello:

Copies of cut sheets are required for the File, Inspector, and Contractor (three copies total).

Separate cut sheets for:

1. Sanitary

- Offset distance
- Benchmark
- Stationing at 0+00 at each manhole with first offset stake placed 25 feet off of each manhole and then placed at 50-foot intervals thereafter.
- Hub elevations shall be determined using leveling methods, not GPS-generated elevations at each station.
- Pipe/manhole inverts
- Cuts to grade
- Manhole builds
- Percent grade on each run
- Wye locations from downstream manhole

2. Watermain

- Offset distance
- Benchmark
- Stationing at 50-foot intervals
- Hub elevations

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B. TESTING REQUIREMENTS

Testing rates and requirements are shown in the City of Monticello Standard Specification.

1. Sanitary Sewer

- Density test for trench backfill
- Sanitary Sewer Leakage Test
 - Air Test Method
 - Hydrostatic Test Method
- Deflection Test
- Cleaning and Televising

2. Watermain

- Density test for trench backfill
- Electrical Conductivity Test
- Bacteria Test
- Hydrostatic Pressure Test

3. Storm Sewer

- Density test for trench backfill
- Cleaning and Televising

4. Street Construction

All testing shall be completed by the City's contracted testing firm.

- Gradations for select granular borrow and aggregate base
- Density test for subgrade and aggregate base
- Roll test for subgrade and aggregate base

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C. EROSION CONTROL

- 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.
- All exposed soil areas must be stabilized as soon as possible to limit soil erosion but in no case later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased and no later than seven days after construction activity in that portion of the site has temporarily or permanently ceased when discharge points on the project is within one mile of a special or impaired water and flows to that special or impaired water.
- 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.
- The permittee must stabilize the normal wetted perimeter of any temporary or permanent drainage ditch or swale that drains water from any portion of the construction site, or diverts water around the site, within 200 lineal feet from the property edge, or from the point of discharge into any surface water. Stabilization of the last 200 lineal feet must be completed within 24 hours after connecting to a surface water or property edge.
- Pipe outlet must have temporary or permanent energy dissipation before connecting to surface water.
- When possible, all slopes must be graded in such a fashion so that tracking marks made from heavy equipment are perpendicular to the slope.
- 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 six 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.
 - Areas with slopes that area less than 3:1 must be seeded and mulched within 14 days of the area not being actively worked.

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- Areas with slopes that are greater or equal to 3:1 must be seeded and erosion control blanket placed within 14 days of the area not being actively worked.
- All seeded area must be either mulched and disc anchored, hydro-mulched, or covered by erosion control blanket to reduce erosion and protect the seed. Temporary or permanent mulch must be disc anchored and applied at a uniform rate of two tons per acre and have 90 percent coverage.
- 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.
- 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.
- 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.
- Restoration of disturbed wetland areas shall be accomplished using an approved seed mixture and application rate.
- All erosion control measures must be maintained for the duration of the project until final stabilization has been achieved in accordance with Section C Erosion Control Requirements. If construction operations or natural events damage or interfere with any erosion control measures, they shall be restored to serve their intended function.
- 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

D. SEDIMENT CONTROL PRACTICES

- 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 C Erosion Control Requirements.
- If down gradient treatment system is overloaded additional up gradient

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sediment control practices must be installed to eliminate overloading. The SWPPP must be amended to identify the additional practices.

- 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.
- 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 25 feet from any road, wetland, protected water, drainage channel, or storm water inlets. Stockpile left for more than 14 days must be stabilized with mulch, vegetation, tarps or other approved means.
- 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.
- Sediment that has washed or tracked from site by motor vehicles or equipment shall be cleaned from paved surfaces throughout the duration of construction.
- Silt fence or other approved sediment control devices must be installed in all areas as shown on the SWPPP.
- Silt fence or other approved sediment control devices shall be required along the entire curb line, except for approved opening where construction entrance will be installed or drainage flows away from curb. This device must be maintained until final stabilization is achieved. Ditch checks shall be required in ditch bottoms. Spacing for the check must be as follows: [Height in feet (of the sediment device used)] X 100 / Slope Gradient
- Dust control measures, such as application of water must be performed periodically due to weather, construction activity, and/or as directed by the City.
- 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.
- 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

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impermeable liner. A sign must be installed adjacent to each washout facility to inform operators to utilize the proper facilities.

- All sediment control measures shall be used and maintained for the duration of the project until final stabilization has been achieved accordance with Section C Erosion Control requirements. If construction operations or natural events damage or interfere with any erosion control measures, they must be restored to serve their intended function.
- 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.
- Restrict clearing and grading within 20 feet of an existing wetland boundary to provide for a protective buffer strip of natural vegetation.

E. TEMPORARY SEDIMENT BASINS

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.

- The basins must provide storage below the outlet pipe for a calculated volume of runoff from a 2-year, 24-hour storm from each acre drained to the basin, except that in no case shall the basin provide less than 1,800 cubic feet of storage below the outlet pipe from each acre drained to the basin.
- 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.
- 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.
- Temporary (or permanent) basins must be constructed and made operational

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concurrent with the start of soil disturbance that is up gradient of the area and contributes runoff to the pond.

- 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.
- The Permittee shall maintain the sedimentation basins until an acceptable vegetative cover is restored to the site, resulting in a pre-development level rate of erosion. The City will not issue building permits for lots containing sediment basins until they have been removed or relocated based on the projects restoration progress.
- Basins designed to be used for permanent stormwater management shall be brought back to their original design contours.

F. DEWATERING AND BASIN DRAINING

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.

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.

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G. INSPECTIONS AND MAINTENANCE

- The Permittee shall be responsible for inspecting and maintenance of the BMPs.
- The Permittee must routinely inspect the construction project once every seven days during active construction and within 24 hours of a rainfall event of one half inch or greater in 24 hours.
- 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:
 - Date and time of inspection.
 - Name of person(s) conducting the inspections.
 - Findings of inspections, including recommendations for corrective actions.
 - Corrective actions taken (including dates, times, and the party completing the maintenance activities).
 - Date and amount of all rainfall events one half inch or greater in 24 hours.
 - Documentation of changes made to SWPPP.
- 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.
- 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.
- All silt fences must be repaired, replaced, or supplemented when they become nonfunctional or the sediment reaches one half of the height of the fence. These repairs shall be made within 24 hours of discovery, or as soon as field conditions allow access.
- Temporary and permanent sedimentation basins must be drained and the sediment removed when the depth of sediment collected in the basin reaches one half the storage volume. Drainage and removal must be completed within 72 hours of discovery, or as soon as field conditions allow access.
- 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

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drainage ways, catch basins, and other drainage systems, and restabilize the areas where sediment removal results in exposed soil. The removal and stabilization shall take place within seven 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 seven 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.

- 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.
- 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.
- 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).
- 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.
- 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. 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.

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H. POLLUTION MANAGEMENT MEASURES/CONSTRUCTION SITE WASTE CONTROL

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

- 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.
- 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.
- 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.
- The City of Monticello 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.

I. FINAL STABILIZATION

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

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;

- All drainage ditches, constructed to drain water from the site after construction is complete, must be stabilized to preclude erosion.
- 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.

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- 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.

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

- Temporary erosion protection and down gradient perimeter control for individual lots has been completed and the residence has been transferred to the homeowner.
- The Permittee must distribute the MPCA “homeowner factsheet” to the homeowner so the homeowner is informed for the need, and benefits, of final stabilization.

J. TRAINING

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.

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.

APPENDIX A

Stormwater Site Plan Review Checklist



City of Monticello – Stormwater Site Plan Review

Address:		Permit No:	
PID:		Date Approved:	
Date Received:		Signature:	
Site Size (acres):		Area of Disturbance(acres):	
Existing Impervious (acres):		Proposed Impervious (acres):	

A Stormwater Management Plan is required for:

- Any land disturbing activity that may ultimately result in the addition of one acre or greater of impervious surfaces, including smaller individual sites that are part of a common plan of development that may be constructed at different times.
- The construction of any new public or private road; or
- Any land disturbance activity, regardless of size, that the City determines is likely to cause an adverse impact to an environmentally sensitive area or other property.

Submittals Received

Date	Document	Author

General Site Plan		
	Yes <input type="checkbox"/>	No <input type="checkbox"/>
1. Scale of Survey. Minimum scale 1" = 50'. Maximum size plan sheet 24" x 36"	<input type="checkbox"/>	<input type="checkbox"/>
2. Survey signed by a registered survey with elevations in NGVD-1929 datum for the following locations:		
• Each lot corner	<input type="checkbox"/>	<input type="checkbox"/>
• Grade elevation at the foundation and elevation of top of foundation of structures on adjacent lots	<input type="checkbox"/>	<input type="checkbox"/>
• Grade elevation at the foundation, elevation of top of foundation and garage floor of proposed new construction	<input type="checkbox"/>	<input type="checkbox"/>
• Lowest point of entry (i.e. door sill or top of window well) of proposed and existing construction	<input type="checkbox"/>	<input type="checkbox"/>
• Lowest floor of proposed and existing construction	<input type="checkbox"/>	<input type="checkbox"/>
3. Any proposed retaining wall must have a top and bottom elevation and bottom elevation would be finish grade. Also, no retaining wall is allowed to be built on private property	<input type="checkbox"/>	<input type="checkbox"/>
4. Retaining walls greater than 4.0 feet in height have been designed and certified by a licensed professional engineer and a building permit has been acquired	<input type="checkbox"/>	<input type="checkbox"/>
5. All drainage and utility easements are shown?	<input type="checkbox"/>	<input type="checkbox"/>

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6. Easements are clear of any encroachments?	<input type="checkbox"/>	<input type="checkbox"/>
7. New curb cuts proposed?	<input type="checkbox"/>	<input type="checkbox"/>
8. If new curb cut is proposed, stamp all survey maps with the curb cut stamp. Also, write a note on the Residential Plan & Routing Approval form reminding the builder that a curb cut permit is required if the driveway is moved or a new driveway is added	<input type="checkbox"/>	<input type="checkbox"/>
9. Low floor a minimum of 4.25' (feet) above the sanitary sewer invert elevation	<input type="checkbox"/>	<input type="checkbox"/>
Comments:		

Erosion/Sediment Control Plan		
	Yes <input type="checkbox"/>	No <input type="checkbox"/>
1. SWPPP notes provided on the plan	<input type="checkbox"/>	<input type="checkbox"/>
2. Temporary stabilization measures provided	<input type="checkbox"/>	<input type="checkbox"/>
3. Erosion control blankets provided on all slopes greater than 3:1	<input type="checkbox"/>	<input type="checkbox"/>
4. Perimeter Control i.e., Silt Fence, Filter Log, etc.	<input type="checkbox"/>	<input type="checkbox"/>
5. Phasing for sites that are \geq 1 acre	<input type="checkbox"/>	<input type="checkbox"/>
6. CB Inlet Protection	<input type="checkbox"/>	<input type="checkbox"/>
7. Dewatering	<input type="checkbox"/>	<input type="checkbox"/>
8. Sediment control	<input type="checkbox"/>	<input type="checkbox"/>
9. Waste control	<input type="checkbox"/>	<input type="checkbox"/>
10. Concrete washout	<input type="checkbox"/>	<input type="checkbox"/>
11. Rock entrance	<input type="checkbox"/>	<input type="checkbox"/>
12. Street sweeping schedule	<input type="checkbox"/>	<input type="checkbox"/>
13. Permanent restoration plan	<input type="checkbox"/>	<input type="checkbox"/>
14. Erosion protection at all outlet pipes	<input type="checkbox"/>	<input type="checkbox"/>
15. SWPPP includes an erosion and sediment control inspection schedule and person responsible for maintenance	<input type="checkbox"/>	<input type="checkbox"/>
Comments:		

Stormwater Management Plan		
	Yes <input type="checkbox"/>	No <input type="checkbox"/>
1. Delineation maps for existing and proposed conditions	<input type="checkbox"/>	<input type="checkbox"/>
2. Modeling calculations for existing and proposed conditions using Atlas 14 storm events with an MSE3 type distribution.		
• 2 year 24 hr. (2.84"), 10 year 24 hr. (4.22"), 100 (6.87"), 10-day snowmelt (7.2")	<input type="checkbox"/>	<input type="checkbox"/>
• Modeled direct connected impervious separate	<input type="checkbox"/>	<input type="checkbox"/>
3. Off-site drainage included	<input type="checkbox"/>	<input type="checkbox"/>
4. Wetlands shown on plans and wetland permitting completed	<input type="checkbox"/>	<input type="checkbox"/>
5. Pretreatment	<input type="checkbox"/>	<input type="checkbox"/>
6. Skimmer structures provided on the outlets of all ponds.	<input type="checkbox"/>	<input type="checkbox"/>
7. Soil borings	<input type="checkbox"/>	<input type="checkbox"/>
8. Design Infiltration Rate Determination – Geotechnical Report or Infiltration Testing provided	<input type="checkbox"/>	<input type="checkbox"/>
9. Seasonal High Water Elevation	<input type="checkbox"/>	<input type="checkbox"/>
10. Open channel flow calculations	<input type="checkbox"/>	<input type="checkbox"/>
11. Storm sewer calculations – 10 year event	<input type="checkbox"/>	<input type="checkbox"/>

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12. Narrative describing the following:

a. Existing Conditions: _____

b. Proposed Conditions: _____

c. Stormwater Management for Proposed Site: _____

Comments:

Water Quality and Volume Reduction		
<i>"The City of Monticello has adopted MPCA Minimal Impact Design Standards in Chapter 4 of Monticello Zoning Ordinance Section 4.10. MIDs Infiltration design criteria as described in the MPCA Stormwater Manual shall be followed for the proposed project."</i>		
	Yes <input checked="" type="checkbox"/>	No <input checked="" type="checkbox"/>
1. Volume control provided as per the City's Engineering Design Standards and MIDS (1.1" over new impervious surface)	<input type="checkbox"/>	<input type="checkbox"/>
2. Impervious area equal to or greater than the net increase in impervious surface is routed through infiltration BMP	<input type="checkbox"/>	<input type="checkbox"/>
3. Sequencing provided for alternatives where infiltration is infeasible	<input type="checkbox"/>	<input type="checkbox"/>
4. Required Volume Reduction:	_____	
5. Provided Volume Reduction:	_____	
6. Separation to groundwater and/or bedrock is a minimum of 3 feet from bottom of infiltration BMP	<input type="checkbox"/>	<input type="checkbox"/>
7. Drawdown time for infiltration BMP is within 48 hours	<input type="checkbox"/>	<input type="checkbox"/>
8. Proposed ponds meet or exceed NURP design criteria	<input type="checkbox"/>	<input type="checkbox"/>
9. If infiltration of 1.1" is not feasible, water quality goals are met with NURP pond on site?	<input type="checkbox"/>	<input type="checkbox"/>
Comments:		

Rate Control		
	Yes <input checked="" type="checkbox"/>	No <input checked="" type="checkbox"/>
1. Peak Proposed Discharge Rates < Existing	<input type="checkbox"/>	<input type="checkbox"/>
2. Existing infrastructure can accommodate peak discharge rates for 10 year storm?	<input type="checkbox"/>	<input type="checkbox"/>
3. Existing infrastructure and EOF for proposed 100 year peak discharge rate?	<input type="checkbox"/>	<input type="checkbox"/>
4. Proposed flow patterns do not create flooding impacts for structures adjacent to the property?	<input type="checkbox"/>	<input type="checkbox"/>
Comments:		

Freeboard		
	Yes <input checked="" type="checkbox"/>	No <input checked="" type="checkbox"/>
1. Building Opening:		
• 2' above the critical 100-yr HWL of local basins, wetlands, & infiltration basins	<input type="checkbox"/>	<input type="checkbox"/>
• 2' above EOF of local basins, wetlands, & infiltration basins	<input type="checkbox"/>	<input type="checkbox"/>
• 2' above the 100-yr flow elevation of a swale or channel at the point where the swale channel is closest to the building	<input type="checkbox"/>	<input type="checkbox"/>
2. Low Floor Elevation:		
• 2' above the critical 100-yr HWL of major basins	<input type="checkbox"/>	<input type="checkbox"/>

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- 2' above EOF of major basins
- For landlocked basins: 2' above the HWL from back to back 100-yr rainfalls or 2' above the HWL from the 100-yr 10-day snowmelt, whichever is higher. Starting elevation of the basin/waterbody prior to runoff is one of the following:
 - Existing Ordinary High Water level established by the Minnesota Department of Natural Resources
 - Annual water balance calculation approved by the City
 - Local observation well records, as approved by the City
 - Mottled soil

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