

Local Surface Water Management Plan

City of Lauderdale

October 2018

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Executive Summary

This Local Surface Water Management Plan (LSWMP) will serve as a comprehensive planning document to guide the City of Lauderdale in conserving, protecting, and managing its surface water resources. This plan has been created to meet the requirements detailed in Minnesota Statutes 103B (Metropolitan Surface Water Management Act), Minnesota Rules 8410, and the requirements of the local watershed management organizations. This document provides an inventory of water resource related information including the results of assessments conducted by other governmental units, both local and state. From this inventory and assessment, Lauderdale sets forth its goals and policies and implementation program.

The plan is organized as follows:

- **Section 1** offers an introduction to and purpose of this Plan, and includes organizational information on the location of components within this document.
- **Section 2** of this Plan provides an inventory of land and water resources within the City, including a description of the physical setting, available and pertinent water resources data, and land use maps.
- **Section 3** documents the regulatory agencies and their role in the City's surface water management.
- **Section 4** describes past studies and plans related to surface water management in Lauderdale.
- **Section 5** identifies the stormwater management agreements between Lauderdale and other entities.
- **Section 6** provides a current assessment of surface water management in Lauderdale, including hydrologic modeling, the NPDES permitting process, and a regulatory standards comparison. This section also includes the identification of issues and corrective actions, including flooding and stormwater rate control problems.
- **Section 7** lists the goals and policies identified to address surface water management needs in the City, relating to land development and resource management.
- **Section 8** summarizes capital projects currently planned with known funding sources to implement the goals and policies listed in Section 6, as well as potential activities and funding mechanisms.
- **Section 9** outlines the continued administration of this plan with respect to plan updates and amendments.

The appendices provide additional detail:

- **Appendix A** provides technical detail for the City's stormwater infrastructure.
- **Appendix B** includes texts of the water resources agreements in which the City engages.
- **Appendix C** provides wetland inventory data from Capitol Region Watershed District.
- **Appendix D** provides watershed district standards from the three districts having jurisdiction within the City.

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Section 1 – Purpose and Scope

1.1 PURPOSE

This Local Surface Water Management Plan will serve as a comprehensive planning document to guide the City of Lauderdale in conserving, protecting, and managing its surface water resources. This plan has been created to meet 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 Metropolitan Council's *2040 Water Resources Policy Plan*, and the three watershed management organizations having jurisdiction within the City: the Mississippi Watershed Management Organization (MWMO), the Capitol Region Watershed District (CRWD), and the Rice Creek Watershed District (RCWD). This plan may be periodically amended to remain current with local practices and policies.

1.2 SCOPE

This Plan serves multiple purposes including statutory and rule compliance. Minnesota Statute 103B.235 defines content for Local Surface Water Management Plans. According to the statute's text, each local plan, in degree of detail required in the watershed plan, shall:

- (1) describe existing and proposed physical environment and land use;
- (2) define drainage areas and the volumes, rates, and paths of stormwater runoff;
- (3) identify areas and elevations for stormwater storage adequate to meet performance standards established in the watershed plan;
- (4) define water quality and quality protection methods adequate to meet performance standards established in the watershed plan;
- (5) identify regulated areas; and,
- (6) set forth an implementation program, including a description of official controls and, as appropriate, a capital improvement program.

Minnesota Rules 8410, administered by the Board of Water and Soil Resources, provide more detail on local plan content. Though the BWSR guidance applies specifically to watershed management organizations, this guidance has historically been used to frame expectations for municipal plans. According to Rules 8410, local plans must provide or address:

- (1) Executive summary
- (2) Land and water resource inventory
- (3) Impact on other units of government
- (4) Establishment of goals and policies
- (5) Assessment of problems
- (6) Implementation program
- (7) Implementation priorities
- (8) Plan contents; amendments
- (9) Annual reporting requirements

The reader will find that Lauderdale has structured its LSWMP to provide the information required by 8410 without holding strictly to the outline contained in the rules. Through this document, the City provides signposts identifying where a statutory or rulemaking requirement might be addressed.

The Lauderdale LSWMP must address requirements of the Minnesota Pollution Control Agency's Municipal Separate Storm Sewer System (MS4) program. This program is designed to reduce the sediment and pollution that enters groundwater and surface waters to the maximum extent practicable. The MS4 program is regulated through the National Pollutant Discharge Elimination System (NPDES) permits. These NPDES permits require the development of Storm Water Pollution Prevention Programs (SWPPP).

The Lauderdale LSWMP must also satisfy Metropolitan Council requirements as contained in their *2040 Water Resources Policy Plan*. These requirements build on those of Minnesota Rules 8410.

Beyond state level requirements and those of Metropolitan Council, this plan must be consistent with those of the watershed organizations having jurisdiction in the City. Often, watershed districts outline specific content for local plans that go beyond that required by statute and rule.

This plan is organized as follows:

Section 2 describes the physical setting; the history, natural resources and land uses within the City.

Sections 3 through **5** describe the regulatory agencies having jurisdiction in Lauderdale, and past studies and agreements related to surface water resources.

Section 6 summarizes the inventories, assessments, and modeling completed for this plan, and provides a current assessment of surface water management in Lauderdale.

Section 7 lists the goals and policies identified to address surface water management needs in the City.

Section 8 summarizes current ordinances and capital projects planned to implement the goals and policies listed in Section 7.

Section 9 outlines the continued administration of this plan.

Section 2 – Land and Water Resources Inventory

2.1 LOCATION AND HISTORY

The City of Lauderdale is a fully developed city located in Ramsey County, with a residential population around 2,400, and a total land area of 270 acres. Bordering communities include Minneapolis, St. Paul, Falcon Heights, and Roseville, as shown in Figure 2.1. Its proximity to Minneapolis, St. Paul and the University of Minnesota campuses makes Lauderdale a convenient residential location. Residents and businesses have easy access to State Highway 280, Interstate 35W and Interstate 94. Location and access will continue to keep Lauderdale's business and residential population stable. Population projections are shown in Table 2.1.

TABLE 2.1 – LAUDERDALE POPULATION

Year	Population	Households
2010	2,379	1,130
2020	2,490	1,200
2030	2,500	1,200
2040	2,520	1,200

Source: Metropolitan Council 2040 Water Resources Policy Plan

Measuring slightly less than one-half square mile in area, Lauderdale has retained its independent character, despite its proximity to larger cities. Most of the City's infrastructure was developed in the 1950s. The City completed a group of major reconstruction projects in 2003, to replace and update most of the streets, sewers and waterlines. Stormwater management practices were used to create drainage capabilities throughout the residential portion of the city, thereby integrating these areas into surrounding established systems.

2.2 TOPOGRAPHY

Lauderdale's topography is highest in the center of the city. Approximately 100 acres of Falcon Heights drains into Lauderdale via two ravines. Runoff within the City drains to one of three areas, either to Walsh Lake in the northeast corner, or via two storm sewer outlets in the south end of the City. The City is located within the jurisdictional boundaries of three watersheds: The Mississippi Watershed Management Organization (MWMO), the Rice Creek Watershed District (RCWD), and the Capitol Region Watershed District (CRWD). See Figure 2.2 for watershed boundaries.

Rice Creek watershed receives stormwater from Lauderdale only when a pump on the north end of Walsh Lake is operating. When the pump is not running, runoff from the northern part of Lauderdale flows west to the Highway 280 drainage system, which flows south to the southwest corner of the City and the Bridal Veil tunnel system in the City of Minneapolis.

FIGURE 2.1 – LOCATION MAP

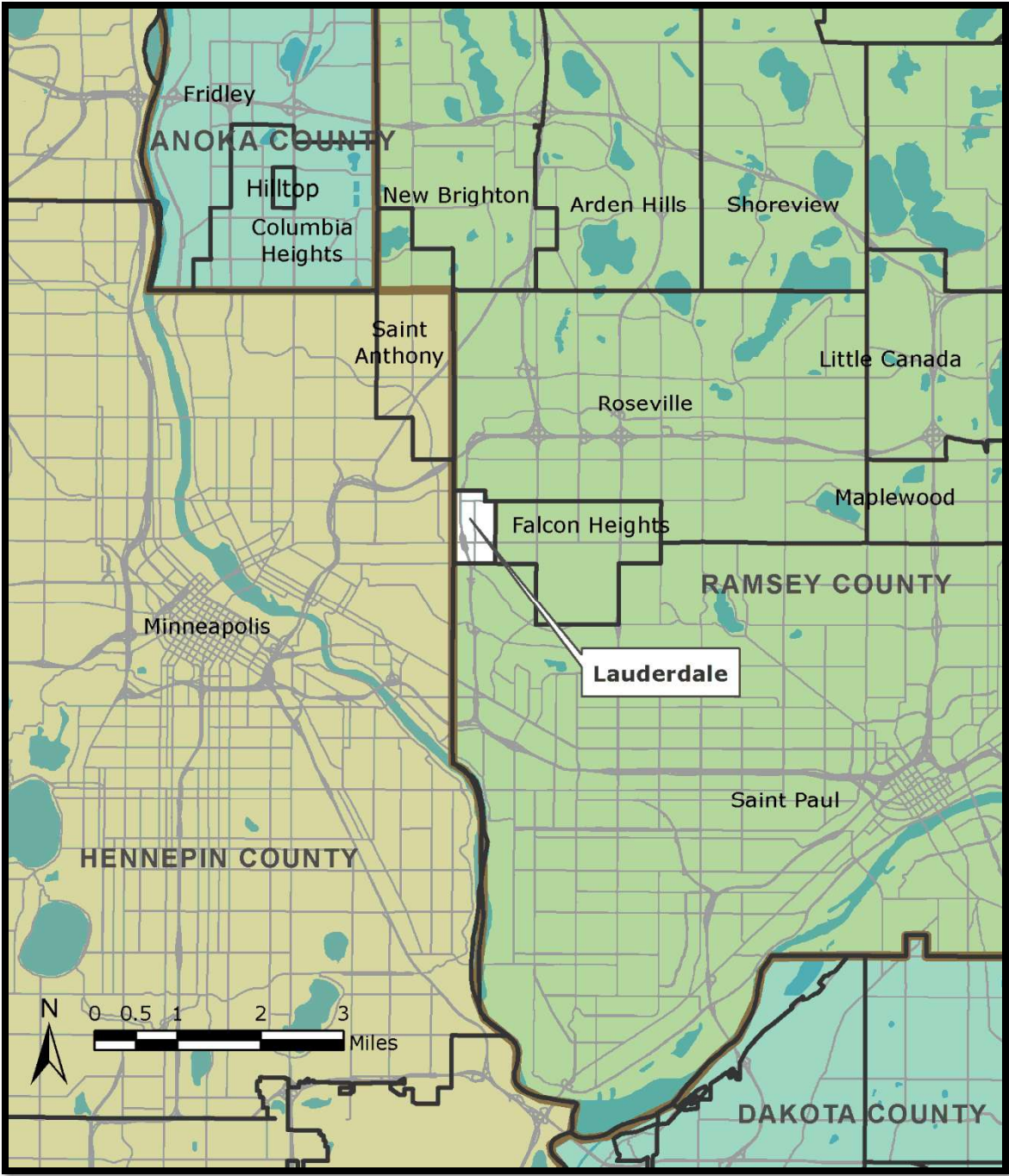
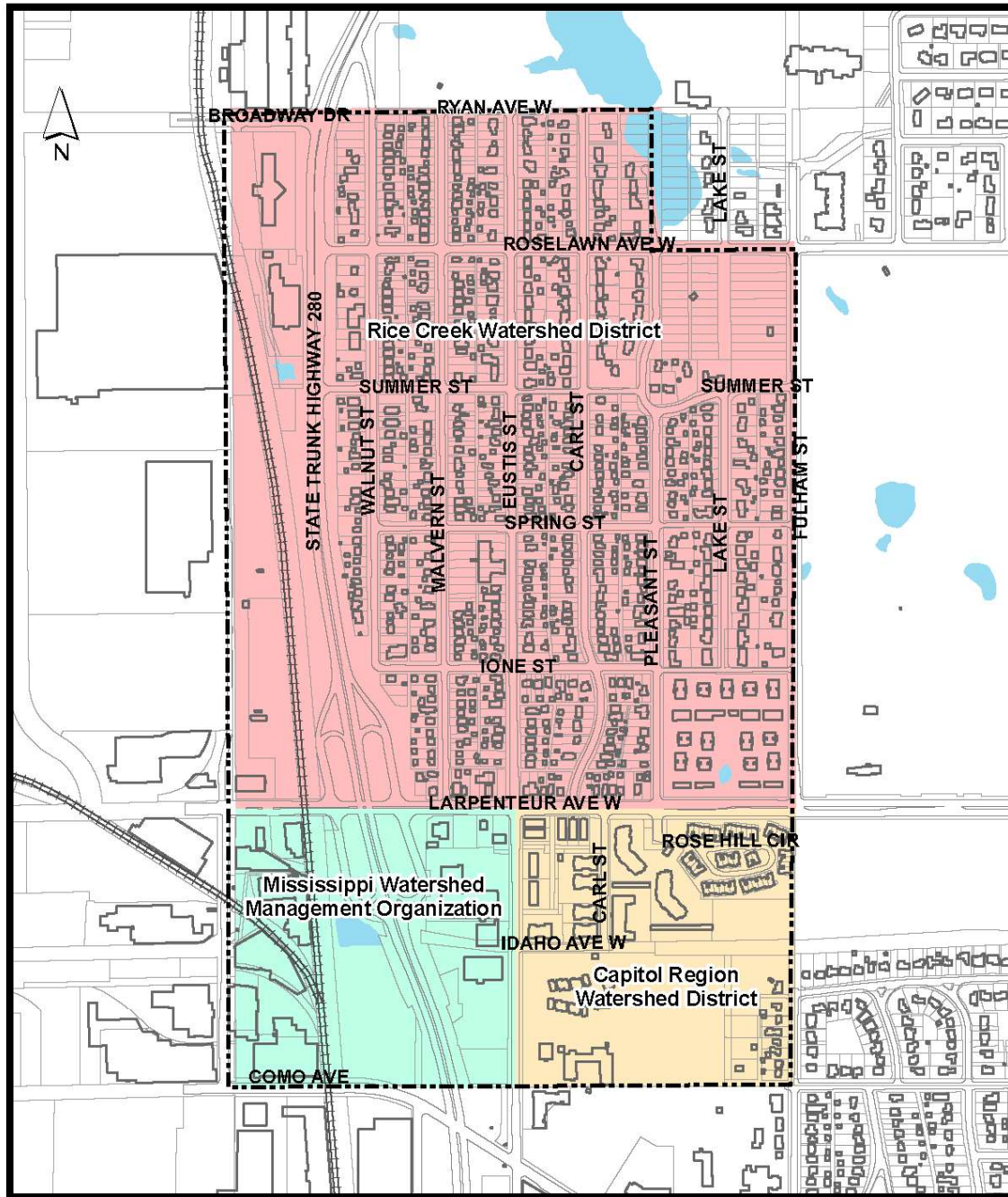


FIGURE 2.2 – JURISDICTIONAL BOUNDARIES OF THE WATERSHED MANAGEMENT ORGANIZATIONS IN LAUDERDALE



Runoff from the southeast portion of Lauderdale, including additional acreage from Falcon Heights draining into Lauderdale, discharges via storm sewer connected to the St. Anthony tunnel. This system flows south, before discharging into the Mississippi River. This portion of Lauderdale is located within the CRWD.

2.3 SOILS AND GEOLOGY

The Soil Conservation Service (SCS) published the *Soil Survey of Washington and Ramsey Counties, Minnesota* in 1980. The *Soil Survey* provides mapping and physical properties for soil types found in the area. The *Soil Survey* was added to the digital Soil Survey Geographic (SSURGO) Database in 2005.

The *Soil Survey* assigns each soil type to a hydrologic soil group, according to the soil's ability to infiltrate water during long-duration storms. The four hydrologic soil groups are: Group A - high infiltration, Group B - moderate infiltration, Group C - slow infiltration, and Group D - very slow infiltration. Most of the soil types in Lauderdale are classified in Hydrologic Soil Group B. This group is characterized by moderately well to well-drained soils, fine to moderately coarse textures, and moderate infiltration rates.

The geology of Ramsey County is dominated by unconsolidated glacial sediments, including outwash and till ranging in thickness from five to four hundred feet. These sediments were deposited during the Quaternary geologic period, and are underlain by Paleozoic bedrock. The bedrock units that underlie the City include Decorah Shale, Platteville-Glenwood Formation, St. Peter Sandstone, Prairie du Chien Group, and Jordan Sandstone.

2.4 GROUNDWATER

Lauderdale's drinking water is supplied by St. Paul Regional Water Services. Most of this water is obtained from the Mississippi River, while a small percentage is obtained from deep groundwater wells. The Ramsey Conservation District leads efforts to protect this groundwater supply, by monitoring groundwater elevations and maintaining an inventory of contamination sites. Because drinking water in the City of Lauderdale is provided by St. Paul Regional Water Services, the city has not prepared a Wellhead Protection Plan.

2.5 CLIMATE

Climate data for the Twin Cities are published by the National Weather Service (NWS) station at Chanhassen, MN. The NWS is a branch of the National Oceanic and Atmospheric Administration (NOAA). Table 2.2 provides a summary of average precipitation data for the Twin Cities area.

TABLE 2.2 – AVERAGE MONTHLY PRECIPITATION, 1971-2016

Mont	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annua
inche	0.89	0.84	1.79	2.67	3.46	4.52	3.85	4.15	2.79	2.24	1.71	1.12	30.03

Rainfall frequency estimates are used as design tools in water resource projects. Rainfall frequencies are summarized in the National Oceanographic and Atmospheric Administration's (NOAA) Atlas 14-Point Precipitation Frequency Estimates. Previously, Technical Paper No. 40, Rainfall Frequency Atlas of the United States (NOAA), was used to determine rainfall frequency estimates. The use of Atlas 14 estimates provides an advantage to Technical Paper No. 40, as estimates are based on data from denser networks with longer periods of record, and regional frequency analyses and new spatial interpolation techniques are used. Table 2.3 lists rainfall frequencies applicable to the City of Lauderdale.

TABLE 2.3 – 24-HOUR RAINFALL DEPTHS AND FREQUENCY

Recurrence Interval (yrs)	24-hr Rainfall Depth (in)
2	2.83
5	3.54
10	4.24
50	6.34
100	7.43

2.6 WATER RESOURCES

2.6.1 WALSH LAKE

Walsh Lake is located on the north boundary of Lauderdale, and is identified on the USFWS National Wetland Inventory (NWI) and the DNR Public Waters Inventory (PWI).

The NWI Cowardin system lists Walsh Lake as PABG. This is an aquatic system defined as a palustrine waterbody with an aquatic bed that is intermittently exposed. Walsh Lake is considered a Type 4 wetland by FWS Circular 39. Type 4 or PABG wetlands are deep marshes, where the soil is usually covered with water during the spring and summer seasons. Vegetation includes cattails, reeds, bulrushes, spikerushes, and wild rice. Pondweed, naiads, coontail, watermilfoils, waterweeds, duckweeds, or spatterdocks may grow in open areas of the wetland. Walsh Lake supports stands of cattail and a dense layer of duckweed. This basin is identified on the PWI as 214W. This identification does not reveal the nature of the system but is used for record keeping. The Minnesota Department of Natural Resources has regulatory jurisdiction over the lakes, wetlands, and watercourses defined as public waters within the State.

Walsh Lake was identified in the RCWD Southwest Urban Lake Study (2009) report as a lake that had insufficient water quality monitoring data. The RCWD report recommended that Walsh Lake be added to the RCWD monitoring program. Recommendations for in-lake data collection include bathymetric data collection, water quality collection to obtain total phosphorus and chlorophyll data, and macrophyte/aquatic invertebrate data. The City will continue to coordinate with the RCWD to improve water quality in Walsh Lake as a Management Action Plan (MAP) has been created for the Lake as part of the RCWD's 2009 Southwest (SW) Urban Lakes Study.

2.6.2 SEMINARY POND

Seminary Pond is located in the southeast corner of the City. The western portion of this pond (0.79 acres) is listed on the NWI, Cowardin system as PEM1C, while the eastern portion of this pond (0.94 acres) is listed as PF01C. The designation of PEM1C indicates that this is a seasonally-flooded palustrine system supporting persistent emergent vegetation. FWS Circular 39 characterizes the western portion of the pond as a Type 3 wetland. A Type 3 or PEM1C wetland is characterized by saturated soil that is often covered with only a few inches of water. Common vegetation for these systems includes cattail, pickerelweed, sedges, rushes, arrowhead, and smartweed. However, this particular wetland does not support any of these species.

The eastern portion of the pond, designated as PF01C, is a seasonally-flooded, palustrine system, that is characterized with broad-leaved deciduous vegetation (i.e. trees or shrubs, with relatively wide, flat leaves), such as black ash. FWS Circular 39 characterizes the eastern portion of the pond as a Type 7 wetland, where typical trees are tamarack, white cedar, red maple, and black ash. The dominant species in Seminary Pond is reed canary grass, and purple loosestrife is common. Both plants are invasive species that will choke out native species. To allow native plants the chance to reclaim the site, management strategies such as a controlled burn, herbicide treatment, or mowing the area would help suppress these invasive species.

In 2017, Barr Engineering submitted a wetland delineation report to the City and the US Army Corps of Engineers (USACE) for Seminary Pond. This report details the CRWD's plans to improve water quality and flood control performance of the existing storm pond, by excavating the pond to deepen it, and create a permanent pool of water. In addition, an iron-enhanced filtration bench around the edge of the proposed wet pond would be added; the purpose of this bench would be two-fold; its first function would be to remove

dissolved phosphorus, and the second to increase the height of the berm, thereby reducing the chance of flooding. This study indicates that no wetland functions would decrease as a function of this project. For more information, this technical memorandum can be requested from the CRWD.

2.6.3 GASPERRE POND

Gasperre Pond is located in the southeast corner of the City. In the previous 2008 Lauderdale Water Plan, this pond was not listed as a delineated wetland under this section, but it has recently been added to NWI and PWI lists. The pond is classified as PUBG, which is an intermittently exposed, palustrine ecosystem with an unconsolidated bottom. It supports hydrophytic vegetation (vegetation adopted for wetland conditions).

2.6.4 IMPAIRED WATERS

None of the water bodies within Lauderdale are listed on the Minnesota Pollution Control Agency's list of impaired waters; lakes and streams in the state that do not meet federal water quality standards. However, drainage from Lauderdale ultimately discharges into multiple impaired water bodies: Pike Lake, South Long Lake, North Long Lake, Rice Creek, and the Mississippi River. Table 2.4 includes information about these impaired waters and Section 3.7 includes discussion on impaired waters and the TMDL process.

TABLE 2.4 – IMPAIRED WATERS RECEIVING DISCHARGE FROM LAUDERDALE

Impaired Water	Year Listed	Affected Use	Pollutant or Stressor	TMDL Start	TMDL Expected Completion	TMDL Approved
South Long Lake 62-0067-02	1998	Aquatic consumption	Mercury in fish tissue	N/A	N/A	2008
	2002	Aquatic recreation	Nutrient/eutrophication biological indicators	N/A	N/A	2015
	2014	Aquatic life	Chloride	N/A	N/A	2016
North Long Lake 62-0067-01	2008	Aquatic consumption	Mercury in fish tissue	N/A	N/A	2008
Pike Lake 62-0069-00	2002	Aquatic recreation	Nutrient/Eutrophication Biological Indicators	N/A	N/A	2015
	2014	Aquatic life	Chloride	N/A	N/A	2016
Mississippi River – Crow River to Upper St. Anthony Falls 07010206-509	1998	Aquatic consumption	Mercury in fish tissue	N/A	N/A	2007
	1998	Aquatic consumption	PCB in fish tissue	1998	2025	N/A
	2006	Aquatic recreation	Fecal coliform	2020	2024	N/A
	2016	Aquatic Life	Nutrient/eutrophication biological indicators	2016	2018	N/A
Mississippi River – Upper St. Anthony Falls to St. Croix River 07010206-814	2016	Aquatic life	Nutrient/eutrophication biological indicators	2016	2018	N/A
Mississippi River –	2002	Aquatic	Fecal coliform	2018	2022	N/A

Lower St. Anthony Falls to Lock & Dam #1 07010206-503		recreation				
	2002	Aquatic consumption	Mercury in fish tissue	N/A	N/A	2007
Rice Creek – Between Long Lake and Locke Lake 07010206-584	2006	Aquatic life	Aquatic macroinvertebrate bioassessments	2020	2024	N/A
	2014	Aquatic recreation	E. coli	N/A	N/A	2014
	2014	Aquatic life	Fishes bioassessments	2020	2024	N/A

2.7 NATURAL RESOURCES

The City of Lauderdale is a fully developed city. There are undeveloped areas that have natural resource significance. The first is Community Park located south of Roselawn Avenue, west of Fulham Street. The second is the Lauderdale Nature Area, located south of Larpenteur Avenue along the east city boundary.

The Minnesota Department of Natural Resources, Minnesota County Biological Survey did not have on record any rare, threatened or endangered species within the City.

2.7.1 COMMUNITY PARK

Community Park contains areas being used for passive and active recreational activities. The park contains a diverse population of Minnesota trees. Much like the state of Minnesota, this park contains evergreens on the north portion and leaved deciduous trees in the south portion. The mature trees provide nesting and food sources for many bird species.

The coniferous trees found in the north portion are approximately 70 years of age and were most likely planted. Native species represented in this stand include, white spruce, white pine and the Minnesota state tree the red or Norway pine. Scotch pine, a popular non-native evergreen, is also located within the stand. The dominant tree in the stand is the red pine. The understory of the dense coniferous stand is comprised of a sparse cover of dandelion, wood sorrel, creeping charlie, Kentucky blue-grass and plantain. The sparseness of understory coverage is typical of a northern coniferous forest but because of the manicured nature of the park, many native ground story species are not found here.

The south portion of the park includes a diverse population of deciduous trees. Species found include green ash, basswood, hackberry, American elm, black locust and sugar maple. All of these species are native to Minnesota except for the black locust. Black locust is commonly found in the state but originally was brought to the area from the eastern U.S. by Native Americans who used the wood for bows. The dominant tree in this stand is green ash. The average diameter is 15" with an approximate age of 85 years. Red cedar, which is found across the southern portions of the state, is also found in the south portion of this park. Ground cover species found within this portion of the park are the same as the north.

2.7.2 LAUDERDALE NATURE AREA

The area identified as the Lauderdale Nature Area encompasses approximately nine acres and is located south of Larpenteur Avenue west of the south portion of the University golf course and east of the Luther Seminary. Many tree and habitat types are represented within the plot. Floodplain forest is found along the bottoms of the ravines and adjacent to the Gasperre Pond. Small areas of Mesic oak forest and wetland are also found. The

topography of the area consists of two ravines separated by an abandoned railway embankment. Steep slopes and eroding intermittent creek beds can be found within the plot.

The tree species found within the Floodplain Forest community are as follows; green ash, black willow, cottonwood, silver maple and boxelder. Most of the boxelders were less than 10" DBH. The largest representative species found were the cottonwoods with some measuring over 30" DBH. Green ash was found to be the dominant species within the plot with the average DBH of 18" and an average age of 75 years. The shrub layer of the plot consisted of buckthorn, boxelder, elderberry and dogwoods. Buckthorn, an invasive species, is well-established within the plot. The ground cover found within the area consists of the following species; Jack-in-the-pulpit, wild geranium, Virginia creeper and wild violet.

The ridge tops in the Nature Area are dominated by Mesic Oak Forest. Trees within these areas consist of red oak, burr oak and black locust. The oaks are native to Minnesota but the black locust, originally from the east coast, has established itself in forests such as this across the eastern part of the state. The ground cover species found within this community did not vary much from the one found in the previous community.

Animal life found included a host of bird species such as warblers, black-capped chickadee, American crow and blue jays. Very little sign of mammalian life was found within the area except for deer, grey squirrels, raccoon and woodchucks. Because of the isolated nature of the area, larger mammals are likely not found here.

2.8 DRAINAGE SYSTEMS

Lauderdale is divided among three watershed management organizations, although most of the City's runoff discharges southerly into two separate storm sewer tunnel systems: Bridal Veil Tunnel (through the Mississippi Watershed Management Organization) and St. Anthony Tunnel (through Capitol Region Watershed District). It is only when a lift station is operating in Walsh Lake that runoff from Lauderdale discharges north to the Rice Creek Watershed District; otherwise the water discharges westerly to Trunk Highway 280 right-of-way through two pipes (12-inch and 18-inch diameter) with invert elevations of 925.5 ft. The lift station does not operate until water reaches an elevation of 926.0 ft. The lift station is operated and maintained by the City of Roseville and information regarding the pumping frequency can be requested through the City of Roseville Public Works Department. See Figure 2.2 for a map of these jurisdictional boundaries.

Many sections of Lauderdale's drainage system were rebuilt between 2000 and 2003. Map 1 shows the layout of the drainage system, including storm sewers, open channels, and ponding areas; in the south portion of the City, a few ponds have been constructed to enhance water quality and control runoff rates.

A storm drainage report prepared in 1979 recommended developing stormwater holding basins to control stormwater in the southerly portions of the City. These improvements were implemented in conjunction with development of this area. One of these improvements included a stormwater pond located in what is currently the Lauderdale Nature Area. This was developed in 1984. Another area that was identified was the Luther Seminary land south of the Lauderdale Nature Area. Thus, Seminary Pond was completed in 1994 as a part of the Rose Condominium Development. Stormwater pond improvements near the U of M golf course were completed in conjunction with the Larpenteur Avenue reconstruction in 1997. Additionally, the west berm was raised and the EOF was defined in 2006.

MnDOT has initiated improvements to the drainage system within the right-of-way of Highway 280. A stormwater detention basin was completed in 2006 on land previously occupied by the Goodwill facility. In Summer 2016, MnDOT constructed another detention pond north of Lauderdale (east of the Broadway St NE/ Highway 280 intersection), to increase drainage capacity along the highway.

2.9 PLANNING AND LAND USE

Lauderdale's last comprehensive plan was adopted in 2007. The City's next comprehensive plan, in which this Local Surface Water Management Plan is included as a section, includes updates to the goals and policies related to water and natural resources. The total area of Lauderdale is approximately 270 acres. Current land uses within the City are shown in Figure 2.3. Land uses proposed for the 2040 Comprehensive Plan are shown in Figure 2.4.

FIGURE 2.3 – EXISTING LAND USE

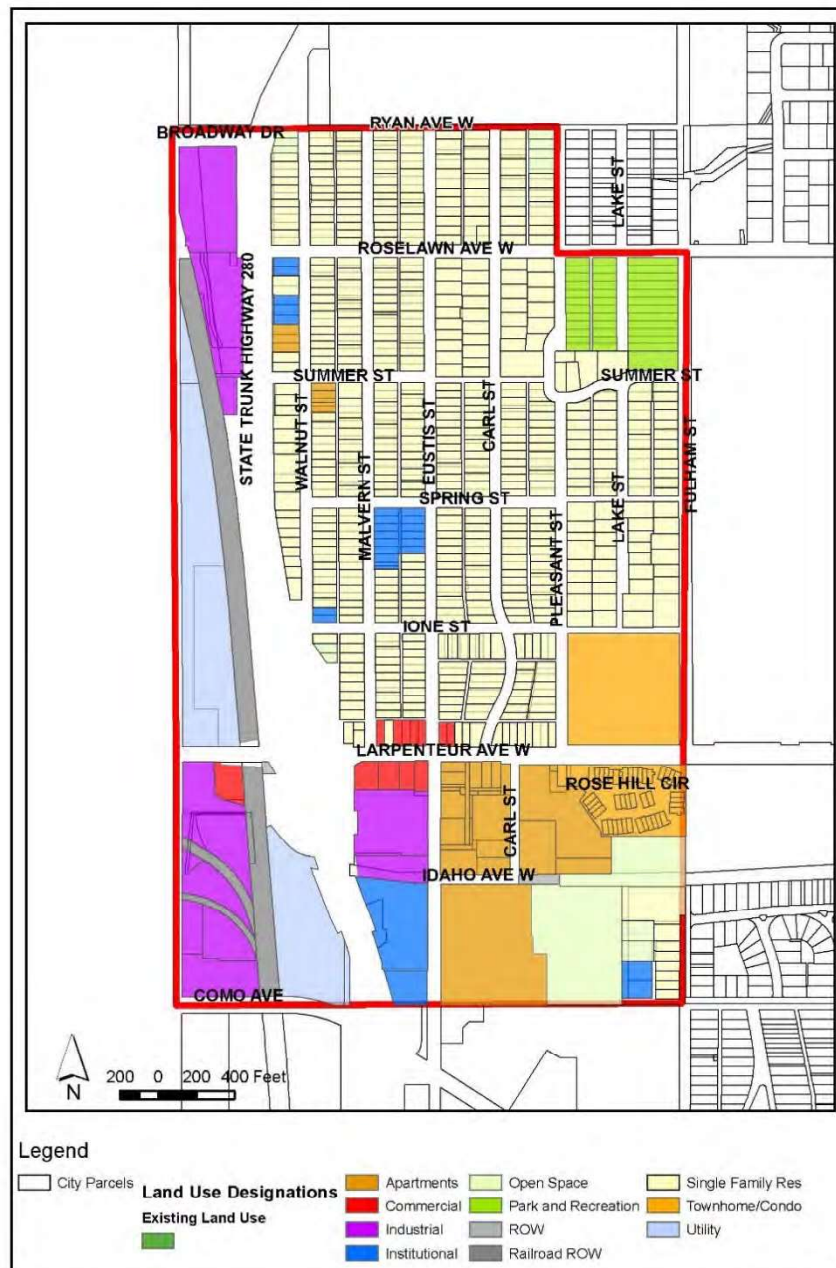
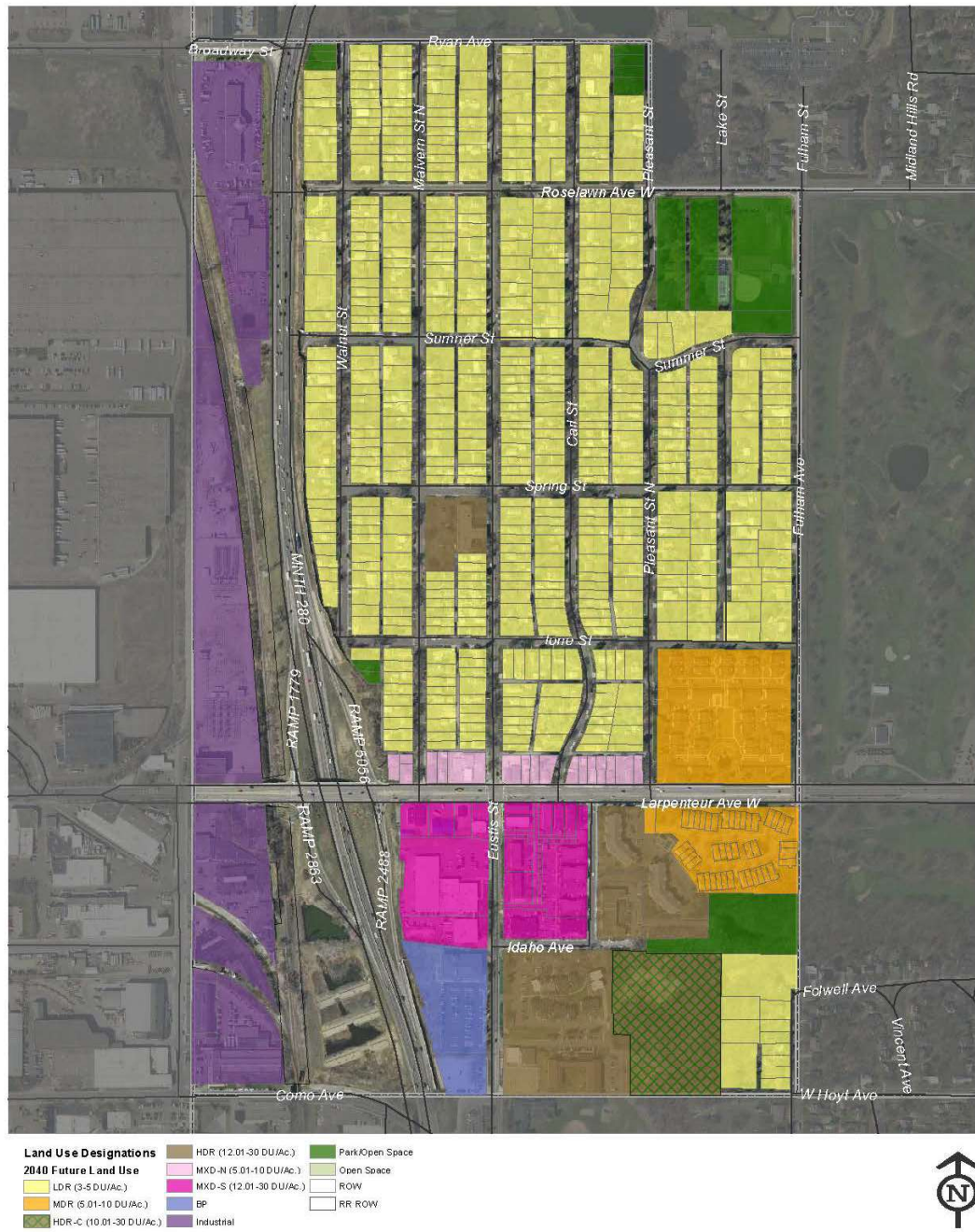


FIGURE 2.4 – FUTURE LAND USE PER THE 2040 COMPREHENSIVE PLAN



Section 3 – Regulatory Setting

3.1 OVERVIEW

This section describes the City's current surface water resources management programs and practices and the agencies and organizations having roles in the City's management of these resources. Table 3.1 summarizes the City's and other agencies' respective regulatory controls related to water resources management and protection. Acronyms used in Table 3.1 are described in Sections 3.2-3.16.

TABLE 3.1 – REGULATORY CONTROLS

Official Control	Responsibility	Mechanism
Erosion and Sediment Control	City, CRWD, RCWD, RCD	<ul style="list-style-type: none"> City Code 8-4-9 F – Site erosion control City Code 8-4-9 F – Site sediment control City Code 8-4-9 – Project approval standards NPDES General Permit – SWPPP MCM 4 – Construction site stormwater runoff control NPDES General Permit – SWPPP MCM 5 – Post-construction stormwater management CRWD – Rule F RCWD – Rule D Ramsey Conservation District – Site inspections
Shoreland	City	<ul style="list-style-type: none"> City Code 8-4-9 L.4 – Redevelopment around Walsh Lake shall follow MnDNR standards
Floodplain	City, CRWD, RCWD	<ul style="list-style-type: none"> Lauderdale is currently within an unmapped area CRWD – Rule D RCWD – Rule E
Wetlands	City, DNR, USACE, CRWD, RCWD	<ul style="list-style-type: none"> City Code 8-4-9 L.3 – Wetland protection standards NPDES General Permit – SWPPP MCM 5 – Post-construction stormwater management NPDES General Permit – SWPPP MCM 6 – Pollution prevention DNR – Public Waters Work Permit USACE – Section 404, Clean Water Act CRWD – Rule E RCWD – Rule F
Illicit Discharge	City, CRWD	<ul style="list-style-type: none"> City Code 8-2-2-9 – Discharge of surface water prohibited NPDES General Permit – SWPPP MCM 3 – Illicit discharge detection and elimination CRWD – Rule G RCWD – Rule H
Water Quality	City, CRWD, RCWD	<ul style="list-style-type: none"> City Code 8-4-9 – Project approval standards City Code 8-4-10 – Lawn fertilizer regulations NPDES General Permit CRWD – Rule C RCWD – Rule C
Water Quantity	City, CRWD, RCWD	<ul style="list-style-type: none"> City Code 8-4-7 C – Final site condition requirements City Code 8-4-9 – Project approval standards NPDES General Permit – SWPPP MCM 1 – Public education and outreach NPDES General Permit – SWPPP MCM 4 – Construction site stormwater runoff control CRWD – Rule C RCWD – Rules C, I and J
Acronyms are defined in Sections 3.2-3.17 of this Plan.		

3.2 CITY SERVICES

Residential streets, sanitary and storm sewers, waterlines, stormwater facilities, and park lands within Lauderdale are maintained by the City. Drinking water within the City of Lauderdale is supplied by the St. Paul Regional Water Services utility or the City of Minneapolis Water Department. Wastewater is collected in the City sewer system and discharged to collection systems in St. Paul and Minneapolis. The City adopted the Storm Water drainage Utility (see City Code 8-3) in 1994 to pay for the maintenance, operation, and improvement of the City's stormwater management system.

City staff coordinates with watershed management organizations and other outside agencies in water resource management and conservation. A collection of City residents and council members manage comprehensive planning for Lauderdale. The City's current regulations are available on the City's website.

3.3 RAMSEY COUNTY (RCD)

Ramsey County was created in 1849, and is one of Minnesota's original nine counties. The County provides many services to Lauderdale residents, including health services and property records. County government also includes the Ramsey Conservation District (RCD), which encourages the protection of natural resources.

Ramsey County adopted the *Ramsey County Groundwater Protection Plan* in May 1996, which was updated in 2010. Information about this plan can be found in Section 4.7.

3.4 WATERSHED MANAGEMENT ORGANIZATIONS (WMO)

In 1955, the Minnesota State Legislature established the Watershed Act. This act provided the means to create watershed districts, special purpose units of local government with broad authority to regulate land use planning, flood control and conservation issues, for the purpose of protecting and managing water resources. There are currently 46 watershed districts in the state, and 14 in the seven-county metropolitan area. Watershed districts have the authority to:

- Adopt rules with the power of the law to regulate, conserve and control the use of water resources within the district;
- Contract with units of government, as well as private and public corporations, to carry out water resources management projects;
- Hire staff and contract with consultants;
- Assess properties for benefits received and levy taxes to finance direct administration;
- Accept public and private grant funds, and encumber debt;
- Acquire property necessary for projects;
- Construct and operate drainage systems, dams, dikes, reservoirs and waters supply systems; and
- Enter upon lands within and without the district to conduct investigations.

In 1982, the legislature approved the Metropolitan Surface Water Management Act, Chapter 103B of Minnesota Statutes. This act requires all local governments within the seven-county metropolitan area to address surface water management through participation in a Watershed Management Organization (WMO). A WMO can be organized as a watershed district, as a Joint Powers Agreement (JPA) among municipalities, or as a function of county government. There are 36 joint powers WMOs and ten watershed districts within the seven-county metropolitan area. These entities prepare watershed plans 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 officials controls for surface and groundwater management;
- Prevent erosion of soil into surface water systems;
- Promote groundwater recharge;
- 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.

The City of Lauderdale is located within the jurisdictional boundaries of three watersheds: The Mississippi Water Management Organization (MWMO), the Rice Creek Watershed District (RCWD), and the Capitol Region Watershed District (CRWD). See Figure 2.2 for the boundaries of these three watershed districts. These agencies each have authority for review and approval of this Local Surface Water Management Plan. Lauderdale requests the water districts to continue implementing their rules and regulations, and to issue permits within the community.

3.4.1 RICE CREEK WATERSHED DISTRICT (RCWD)

The Rice Creek Watershed District encompasses approximately 185 square miles of Anoka, Hennepin, Ramsey, and Washington counties in Minnesota. Portions of the district can be found in the following municipalities: Arden Hills, Birchwood Village, Blaine, Centerville, Circle Pines, Columbia Heights, Columbus, Dellwood, Falcon Heights, Forest Lake, Fridley, Grant, Hugo, Lauderdale, Lexington, Lino Lakes, Mahtomedi, May Township, Mounds View, New Brighton, Scandia, Roseville, Shoreview, Spring Lake Park, St. Anthony, White Bear Lake, White Bear Township, and Willernie.

The current RCWD Watershed Management Plan was adopted in January 2010 and amended in November 2016. The current watershed rules were adopted in December 2016.

The City defers to the current RCWD stormwater management permitting program for all areas that are within the jurisdiction of the RCWD. The City requires applicants to provide documentation that they have obtained the necessary permits from the watershed. Figure 2.2 identifies the jurisdictional boundaries of RCWD within the City of Lauderdale.

3.4.2 THE MISSISSIPPI WATERSHED MANAGEMENT ORGANIZATION (MWMO)

The Mississippi Watershed Management Organization contains 40 square miles, of fully developed urban lands and waters. The MWMO's boundaries include the Mississippi River as it runs through Minneapolis, as well as adjacent areas that drain to the river. Member groups include portions of Columbia Heights, Fridley, Lauderdale, Hilltop, Minneapolis, St. Anthony Village, St. Paul, and the Minneapolis Park and Recreation Board.

The current Joint and Cooperative Agreement for the MWMO was executed by member communities in 2002. The current MWMO Watershed Plan was amended in 2016, and includes stormwater management standards to be implemented by member communities.

3.4.3 THE CAPITOL REGION WATERSHED DISTRICT (CRWD)

Established in 1998, the Capitol Region Watershed District covers 41 square miles and includes portions of Falcon Heights, Lauderdale, Maplewood, Roseville, and St. Paul. The District is located within Ramsey County and has a population of 225,000 people. The Mississippi River forms the western and southern borders of the district, and is the predominant water resource to which the entire district drains. Como Lake, Crosby Lake, Loeb Lake, and Lake McCarrons are also located within the District.

The current CRWD Watershed Management Plan was completed in September 2010. The current watershed rules were adopted in September 2006, and revised in April 2015.

3.5 METROPOLITAN COUNCIL

Established by the Minnesota Legislature in 1967, the Metropolitan Council is the regional planning organization for the Twin Cities, seven-county area. The Council manages public transit, housing programs, wastewater collection and treatment, regional parks and regional water resources. Council members, of which there are seventeen members, are appointed by the Minnesota Governor.

The Metropolitan Council reviews municipal comprehensive plans, including this Local Surface Water Management Plan. The Council adopted the *2040 Water Resources Management Policy Plan* in 2015, establishing expectations to be met in local plans. The Council's goals focus on water quality standards and pollution control, "to reduce the effects of nonpoint source pollution on the region's wetlands, lakes, streams and rivers."

3.6 STATE BOARD OF WATER AND SOIL RESOURCES (BWSR)

The Minnesota Board of Water and Soil Resources works through local government agencies to implement Minnesota's water and soil conservation policies. The BWSR is the administrative agency for soil and water conservation districts, watershed districts, watershed management organizations and county water managers. The BWSR is responsible for implementation of the Metropolitan Surface Water Management Act and the Wetland Conservation Act. Staff members are located in eight field offices throughout the state.

First established in 1937 as the State Soil Conservation Committee, the agency became part of the University of Minnesota in the 1950s, transferred to the Department of Natural Resources in 1971, and then transferred to the Department of Agriculture in 1982. In 1987 the State Legislature established the current Board of Water and Soil Resources. The Board consists of 17 members, appointed by the governor to four-year terms. Multiple state and local agencies are represented on the Board. In 1992, the BWSR adopted rules (8410), establishing the required content for Local Surface Water Management Plans.

3.7 MINNESOTA POLLUTION CONTROL AGENCY (MPCA)

The MPCA is the state's lead environmental protection agency. Created by the State Legislature in 1967, the MPCA is responsible for monitoring environmental quality and enforcing environmental regulations to protect land, air, and water in the state of Minnesota. The MPCA regulates the City's management of wastewater, stormwater and solid waste. The MPCA administers the federal Clean Water Act (CWA) in Minnesota.

The MPCA is the permitting authority in Minnesota for the Municipal Separate Storm Sewer Systems (MS4) program under the National Pollutant Discharge Elimination System (NPDES), the federal program

administered by the Environmental Protection Agency to address polluted stormwater runoff. Certain MS4s in Minnesota are subject to stormwater regulation under the Clean Water Act and Minnesota Rule 7090. There are multiple ways for a City or township to be subject to the MPCA's stormwater regulation under the MPCA's general permit. The MPCA regulates the entire jurisdiction of a city (or township) that is located fully or partially within an urbanized area as determined by the latest Decennial Census and that owns or operates an MS4. Consequently, Lauderdale has developed a stormwater pollution prevention program (SWPPP) to address six minimum control measures: 1) public education, 2) public involvement, 3) illicit discharge detection and elimination, 4) construction site runoff control, 5) post-construction runoff control, and 6) pollution prevention in municipal operations. As the SWPPP is reviewed and updated as necessary on an annual basis, a copy of the SWPPP is not included in this LSWMP as it would eventually become outdated.

In addition to the NPDES program, the MPCA is required to publish a list of impaired waters; lakes and streams in the state that are not meeting federal water quality standards. For each water body on the list, the MPCA is required to conduct a study to determine the allowable Total Maximum Daily Load (TMDL) for each pollutant that exceeds the standards. The 2016 MPCA list of impaired waters identifies 2,660 TMDL reports needed for 1,808 lakes, rivers and streams in the state. Local governments are required to incorporate completed TMDL studies into their Local Surface Water Management Plans and review their SWPPPs to determine if additional BMPs are needed to comply with the TMDL waste load allocation. At this time, there are no listed waters within the City of Lauderdale. Table 2.4 identifies impaired waters that ultimately received discharge from the City of Lauderdale.

In response to these multiple regulatory activities, the MPCA published the *Minnesota Stormwater Manual*, providing stormwater management tools and guidance. The Manual presents a unified statewide approach to stormwater practices.

3.8 MINNESOTA DEPARTMENT OF NATURAL RESOURCES (DNR)

Originally created in 1931 as the Department of Conservation, the DNR has regulatory authority over the natural resources of the state. DNR divisions specialize in waters, forestry, fish and wildlife, parks and recreation, land and minerals, and related services. The Division of Waters administers programs in lake management, shoreland management, dam safety, floodplain management, wild and scenic rivers, the Public Waters Inventory (PWI), and permitting of development activity within public waters.

3.9 MINNESOTA DEPARTMENT OF HEALTH (MDH)

The MDH manages programs to protect public health, including implementation of the Safe Drinking Water Act (SDWA). The MDH has regulatory authority for monitoring water supply facilities such as water wells, surface water intakes, water treatment, and water distribution systems. The MDH is also responsible for the development and implementation of the wellhead protection program. It should be noted that the City does not have jurisdictional areas within the source water protection area for surface water intakes identified in the source water assessments conducted by the Minnesota Department of Health.

3.10 MINNESOTA ENVIRONMENTAL QUALITY BOARD (EQB)

The EQB is comprised of five citizen members and the heads of ten state agencies that play an important role in Minnesota's environment and development. The EQB develops policy, creates long-range plans and reviews proposed projects that may significantly influence Minnesota's environment.

3.11 MINNESOTA DEPARTMENT OF TRANSPORTATION (MNDOT)

Within the City, MnDOT administers several state highway systems. MnDOT approval is required for any construction activity within state right-of-ways. MnDOT also administers a substantial amount of funding for transportation projects completed in the City. Anticipated activities of MnDOT are periodically published in their State Transportation Improvement Plan (STIP).

3.12 U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

The EPA develops and enforces the regulations that implement environmental laws enacted by Congress, however the MPCA bears responsibility for implementing many of the resulting programs within Minnesota. The NPDES program and the Impaired Waters List are both the result of the Clean Water Act, administered by the EPA.

3.13 U.S. ARMY CORP OF ENGINEERS (USACE)

Under Section 404 of the Clean Water Act, including subsequent modifications, the EPA and the USACE regulate the placement of fill into all wetlands of the U.S. In 1993, there was a modification of the definition of "discharge of dredged material" to include incidental discharges associated with excavation. This modification meant that any excavation done within a wetland required the applicant to go through Section 404 permitting procedures. In 1998, however, this decision was modified so that excavation in wetlands is now regulated by the USACE only when it is associated with a fill action.

3.14 FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

FEMA manages federal disaster mitigation and relief programs, including the National Flood Insurance Program (NFIP). This program includes floodplain management and flood hazard mapping. Lauderdale is within an unmapped area and does not contain any designated regulatory floodplains.

3.15 NATURAL RESOURCES CONSERVATION SERVICE (NRCS)

The Natural Resources Conservation Service (NRCS) is a division of the U.S. Department of Agriculture. Formerly named the Soil Conservation Service (SCS), the NRCS provides technical advice and engineering design services to local conservation districts across the nation. The *Soil Survey of Washington and Ramsey Counties Minnesota* was published by the Soil Conservation Service in 1977. The SCS also developed hydrologic calculation methods that are widely used in water resources design.

3.16 U.S. GEOLOGICAL SURVEY (USGS)

The USGS provides mapping and scientific study of the nation's landscape and natural resources. USGS maps provide the basis for many local resource management efforts.

3.17 U.S. FISH AND WILDLIFE SERVICE (USFWS)

The USFWS works to conserve and protect the nation's fish, wildlife, plants and habitat. The USFWS developed the National Wetlands Inventory (NWI) beginning in 1974, to support federal, state and local wetland management work.

Section 4 – Related Studies, Plans and Reports

4.1 CITY OF LAUDERDALE – 1997 AND 2008 LOCAL SURFACE WATER MANAGEMENT PLANS

Under Minnesota Statute 103B.235, the City of Lauderdale most recently published Local Surface Water Management Plans in 1997 and 2008. Both the 1997 and 2008 LSWMP versions describe existing and proposed land use, define drainage areas and stormwater runoff characteristics, define water quality protection methods, identify regulated areas, and set forth an implementation program for the City.

Specifically, the 1997 LSWMP version served as a guide for the repair and upgrade of the City's storm drainage system. This LSWMP included an extensive Capital Improvement Plan (CIP) for stormwater management system upgrades, which the city implemented. In addition, the plan included descriptions and costs for the City's four phase street and utility reconstructions.

The LSWMP is a compilation of information from a number of sources including: Lauderdale's 1979 Drainage Report, various utility plans, Ramsey County, past consulting engineers' work, MnDOT, and City staff field inspections, surveys and recommendations. A comprehensive stormwater modeling analysis including stormwater quantity, storm sewer capacity, and water quality calculations is also presented in the plan.

4.2 CRWD WATERSHED MANAGEMENT PLAN – AMENDED 2015

The Capitol Region Watershed District (CRWD) Watershed Management Plan (WMP) was completed in 2010, and associated watershed rules were amended in April 2015. At the beginning of the management plan process, stakeholders were asked to identify concerns pertinent to manage the watershed. The identification of these issues allowed the CRWD to formulate goals and implementation strategies for the watershed management plan. The issues discussed in the WMP are grouped into the following topics:

- Education and Outreach
- Urban Stormwater Management
- Monitoring and Data Assessment
- Future Trends
- Funding and Organization
- Regulations and Enforcement
- Ecosystem Health

The implementation plan was structured around these issues to protect and improve the District's water resources. Important water resources identified by the District are: the Mississippi River, Como Lake, Lake McCarrons, Loeb Lake, Crosby Lake, Trout Brook Storm Sewer, historic streams, wetlands, groundwater, and springs.

The CRWD WMP requires that cities address the following in their Local Surface Water Management Plan:

- Stormwater Pollution Prevention Program (SWPPP) policies, goals and actions, in accordance with MPCA requirements;

- Impaired waters, TMDLs and Lake Management Plan;
- The local unit of government's stormwater management requirements, including erosion and sediment controls;
- Responsibilities for maintenance and repair of public and private stormwater management systems;
- Flood control and water quality issues;
- Spill containment; and
- A plan for implementing these components.

4.3 RCWD WATERSHED MANAGEMENT PLAN – AMENDED 2016

The 2010 Rice Creek Watershed District (RCWD) Watershed Management Plan (WMP) provides the guidance and implementation strategies for the RCWD to manage its water and natural resources set forth in Minnesota Statutes 103B.235 and Minnesota Rule 8410. The 2010 WMP was amended in November 2016 to update and extend the implementation programs identified in the 2010 plan. This WMP will be amended in 2020 to incorporate new goals for the District.

The WMP incorporates components of previous plans, as well as numerous recent assessments and studies that inform water management within the District. The RCWD organizes its 2010 WMP into eight management categories that address requirements set forth in Minnesota Rule 8410, and that highlight the District's prioritized goals. These management categories are:

1. Education, Data and Information
2. Lakes
3. Wetlands
4. Drainage Systems and Waterways
5. Excess Runoff
6. District Facilities
7. Open Space
8. Groundwater

The above management goals fit into the District's strategic plan, which set guiding principles for the District rather than focusing on individual capital improvements and projects. Goals include to:

- Repair and maintain drainage systems for agriculture drainage;
- Support and implement environmental education programs;
- Work with counties and cities to ensure groundwater conservation measures are implemented;
- Maintain habitat for native wildlife through healthful water and land;
- Develop and maintain land and water conservation initiatives, through use of conservation easements, cost-share agreements, and management agreements; and
- Promote research that promotes and refines conservation efforts within the district.

Chapter V, Goal and Policies, details the methods by which the District's objectives and policies will be implemented. Figure 2.2 identifies the jurisdictional boundaries of RCWD within the City of Lauderdale.

4.4 MWMO WATERSHED MANAGEMENT PLAN – AMENDED 2016

The Mississippi Watershed Management Organization (MWMO) 2011 Watershed Management Plan (WMP) was amended in 2016. Water resources management issues addressed in the WMP include groundwater

quality protections and improvement, in addition to the goals of surface water protection and water quality improvement. The plan uses information and data from past studies and actions to address a variety of issues determined as significant by the MWMO's Task Force, Citizen Advisory Committee (CAC), Technical Advisory Committee (TAC), and the Board of Commissioners.

The MWMO WMP directs its member organizations to implement the MWMO's Standards Language or an equivalence to it.. In addition, local governments are responsible for:

- Maintaining existing and proposed storm drain conveyance systems, including stormwater detention ponds, sewers, inlet, and outlet drainage structures;
- Issuing building and grading permits;
- And, performing inspections to ensure compliance during construction.

The MWMO also provides education within the community, a robust water quality monitoring department, and technical support in the realm of water resource planning and implementation. Lauderdale will seek opportunities to partner with the MWMO through the following project and activity areas:

1. Capital Projects
2. Communications and Outreach
3. Monitoring
4. Planning
5. Watershed Assessment

The MWMO does not issue permits or provide approval letters for construction projects but relies on the existing permitting and enforcement bodies of its member communities. However, if the MWMO determines that a member organization is not carrying out its enforcement and permitting responsibilities, the MWMO may at its discretion assume the permitting and enforcement responsibilities and hold the member organization accountable for costs associated with activities they failed to perform.”¹

4.5 THE BRIDAL VEIL CREEK SUBWATERSHED DESK STUDY – 2006

The MWMO, in partnership with Ramsey Conservation District, and in consultation with St. Anthony Park Community Council started monitoring three wetlands (a.k.a Kosota Pond) in 2008 to collect baseline water quality and macroinvertebrate data. MWMO also collected bathymetry data on all three wetlands. All of the data are now being organized in a watershed bulletin document by MWMO's water quality monitoring staff and will be available to the City and St. Anthony Park Community Council's environmental committee.

MWMO is measuring flows in the Bridal Veil Creek Subwatershed and intermittently monitors water quality at the outfall of the river when access to the outfall is possible.

This study was funded by a grant from the MWMO to the St. Anthony Park Community Council to conduct a comprehensive review of information available on the Bridal Veil Creek (BVC) watershed. The purpose of the study was to undertake a desk review and analysis of all known, prior hydrologic and drainage studies; environmental and biological inventories, histories, pollution and ecosystem studies and reports; and other relevant materials and information in the BVC watershed to be summarized in a narrative report.

¹ Excerpts from the Mississippi Watershed Management Organization Watershed Management Plan – Amended in 2016

One dominant theme in the watershed is the interest by local community groups to clean up the watershed, establish greenways, reduce water pollution, restore natural areas and improve quality of life by enhancing recreational opportunities. In order to achieve this goal, watershed management, landscape-level planning and ecological restoration at ecosystem and site scales will be necessary. This study recommends a multi-scale approach to ecological restoration and management, including actions at the following levels:

- Landscape scale – involves land use planning to improve connectivity of natural areas and enhance recreational opportunities.
- Community scale – involves active management of selected natural areas.
- Site scale – involves individual yards and roadsides, native landscaping and exotic species control as well as site specific stormwater management techniques.²

4.6 CRWD EUSTIS STREET REGIONAL MODELING TECHNICAL REPORT – 2016

In March 2016, the CRWD produced a regional modeling report to assess capacity and potential flooding concerns of a concrete swale drainage system located near 1568 Eustis Street, in Lauderdale. City staff stated that the parking lot adjacent to the concrete swales frequently floods during heavy rain events. To assess the performance of the concrete swale drainage system, a hydraulic model was created using XP-SWMM. In addition, water quality performance of several wet and dry ponds in the City's system was assessed using the P8 (Program for Predicting Pollution Particle Passage through Pits, Puddles and Ponds) Urban Catchment Model. The water quality components assessed were total suspended solids (TSS) and total phosphorus (TP).

Based on model results, several mitigation alternatives were proposed in the study:

- Expansion of Seminary Pond and sheet pile wall;
- Expansion of Gasperre Pond;
- Construction of an earthen berm in the ravine close to the swales;
- Convert Seminary Pond from dry to wet pond and install rain gardens north of Larpenteur Avenue.

Recommendations included in this study involving the City of Lauderdale are identified in the Assessment (Section 6) and Implementation (Section 8) sections of this LSWMP.

4.7 RAMSEY COUNTY GROUNDWATER QUALITY AND PROTECTION DRAFT PLAN – AMENDED 2010

Ramsey County produced the *Ramsey County Groundwater Protection Draft Plan* in May 1996, which was amended in 2010. This plan suggests roles and responsibilities of county and local governments in groundwater management in the County. There are several recommendations outlined in the county plan that include:

- participation in wellhead protection programs,
- sensitive geologic area programs,
- well sealing programs, and
- aquifer protection programs³.

The City will continue to coordinate the implementation of the plan's recommendation with Ramsey County and the local WMOs.

² Summarized excerpts from the Bridal Veil Creek Subwatershed Desk Study, 2006

³ Excerpts from the Ramsey County Groundwater Protection Plan

Section 5 – Water Resources Related Agreements

5.1 CONVEYANCE

Multiple interagency stormwater conveyance agreements have been made by the City of Lauderdale. In March of 1954, Lauderdale entered into an agreement with Roseville and the Minnesota Highway Department authorizing the discharge of stormwater through the Highway 280 system (Minnesota Highway Department Agreement No. C-1245). In March of 1973, the City entered into an agreement with Roseville to share the cost of operating improvement 72-15, consisting of an additional gravity outlet and pump station in Walsh Lake. Copies of these conveyance agreements are included in Appendix B for reference.

5.2 WATERSHED MANAGEMENT

The *Joint and Cooperative Agreement for the Mississippi Watershed Management Organization* was executed by the Minneapolis Park and Recreation Board and the cities of Minneapolis, Columbia Heights, Fridley, Hilltop, St. Paul, St. Anthony Village and Lauderdale in January 2002, and was updated most recently in 2012. This agreement established the authority and responsibilities of the MWMO Board. A copy of the latest agreement (2012) is included in Appendix B for reference.

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Section 6 – Current Assessment

6.1 OFFICIAL CONTROLS

Codes and ordinances (official controls) are necessary tools supporting implementation of this Local Surface Water Management Plan. Many of the stated goals and policies specifically reference City codes that exist or need to be created. The City’s MS4 permit includes a summary of ordinances required to comply with NPDES requirements.

After adoption of this Local Surface Water Management Plan, all applicable portions of City Code will need to be updated to achieve consistency with local watershed plans. Per Minnesota Statute, this implementation step must be completed within 180 days after adoption of this plan. In addition, over time, codes must be updated to remain consistent with City goals, policies, and practices. Table 6.1 assesses the status of City codes related to surface water management.

TABLE 6.1 – SURFACE WATER MANAGEMENT RELATED CODES

Code Section	Description	Status
7-4-2 A	Permit Requirement	No update is necessary
8-2-2-9	Discharge of Surface Water Prohibited	Update as needed as required by MS4 permit
8-2-2-10	Prohibited Discharge Inspection	Update as needed as required by MS4 permit
8-3	Storm Water Utility	No update is necessary
8-4-6	Storm Water Management Plan Approval Procedures	Update as needed to comply with local WMO plan approval procedures
8-4-7	Plan Review Procedure	Update as needed to comply with local WMO plan review procedural requirements
8-4-8	Approval Standards	Update as needed to comply with local WMO plan approval standards
8-4-9 F	Site Erosion Control	Update as needed as required by MS4 permit
8-4-9 G	Site Sediment Control	Update as needed as required by MS4 permit
8-4-9 J	Storm Water Management Criteria for Permanent Facilities	Update as needed as required by MS4 permit and to comply with local WMO Rules
8-4-9 K	Design Standards	Update as needed to comply with local WMO design standards
8-4-9 L	Wetlands	Update as needed to comply with local WMO wetland management standards
8-5	Stormwater Illicit Discharge and Illicit Connection to the Storm Sewer System	Update as needed as required by MS4 permit

6.2 HYDROLOGIC AND HYDRAULIC MODEL

The City is divided into three major drainage districts as shown in Map 1 in Appendix A, namely Walsh Lake, Highway 280, and St. Anthony major drainage districts. The Walsh Lake and St. Anthony major drainage districts are further divided into numbered sub-districts, to account for specific watershed features that impact the functionality of the stormwater system, such as: stormwater basins, low points, or ditches.

The 2008 Lauderdale Local Surface Water Management Plan included a summary of results from HydroCAD and XPSWMM models, which in combination provide hydrologic and hydraulic modeling for the full extent of the City, with the exception of the major drainage to Highway 280. For the purposes of this LSWMP, the Highway 280 major drainage district is not modelled in detail as the City is not responsible for the design, maintenance, and daily operations of the MnDOT Highway 280 stormwater system. The City has a long-standing agreement with MnDOT (detailed in Appendix B) to allow flow from Lauderdale to discharge to MnDOT right-of-way, pending MnDOT review and approval. Should there be questions about the hydrologic and hydraulic context of this area, the MnDOT Water Resources Engineering Department maintains a detailed stormwater model of the Highway 280 stormwater system. Some hydrologic characteristics of the Highway 280 major drainage district are included in Appendix A.

The St. Anthony major drainage district (southern portion of the City) is modelled in the HydroCAD model. The XPSWMM model focuses on the northern portion of the City. This model was created as part of the City's four phase street and utility reconstruction project completed between 2000 and 2004. The City used the XPSWMM model to accurately represent the hydraulic characteristics of the complex storm sewer pipe network tributary to Walsh Lake. The XPSWMM modeling program has the capability to model complex pipe systems. Appendices A and D to this LSWMP provide the tributary areas, high water levels, storage volumes, and stormwater pond discharge rates out of these basins. The stormwater infrastructure characteristics within the City have changed very little since 2008. Thus, the hydrologic and hydraulic results presented in Appendix A of this LSWMP are very similar to those in the 2008 Plan. The major change is the use of NOAA Atlas 14 rainfall precipitation frequency estimates, resulting in a much larger 100-yr storm event.

In addition to these modeling efforts, Barr Engineering completed the Eustis Street Regional Modeling Report in March 2016. The purpose of this report was to determine the capacity and flooding concerns of a concrete swale drainage system near 1568 Eustis Street; this system consists of two concrete swales which drain into two outlet pipes. The concern about this area stems from the fact that the parking lot adjacent to the concrete swales frequently floods, requiring apartment building tenants to avoid a portion of the parking lot. The XP-SWMM analysis indicates that the parking lot near 1568 Eustis Street is partially inundated during the 100-year, 24-hour design event. There are several design alternatives that Barr evaluated as part of the Eustis report, including the construction of an earthen berm in ravine, the expansion of Gasperre Pond, the expansion of Seminary Pond and construction of a sheet pile wall, and the expansion of Seminary Pond and Earthen Berm. Two other alternatives that were analyzed include expansion of storage in the concrete and grass swales, or a combined flood mitigation alternative, which would include some combination of previously listed alternatives. The full study can be requested from Capitol Region Watershed District.

6.3 WETLAND MANAGEMENT

In 1999, all wetlands within the Capitol Region Watershed District were inventoried and their functions and values were assessed. This inventory included two wetlands in Lauderdale, namely Gasperre Pond (N202923-1-A) and Seminary Pond (N202923-2-A). The assessment information can be found in Appendix F of the Capitol Region Watershed District 2010 Watershed Management Plan. Wetland functions evaluated included Vegetative Diversity/Integrity, Maintenance of Hydrologic Regime, Flood and Stormwater Storage/Attenuation, Water Quality/Shoreline Protection, Groundwater Interaction, Wildlife Habitat, Fisheries Habitat, and Aesthetics/Recreation.

The City will include the completion of a wetland inventory and assessment for the remaining wetlands in Lauderdale, namely Walsh Lake, in the City's implementation item discussed in Section 8. An estimated cost

for the completion of the wetland inventory and assessment is included in Section 8. Some level of financial assistance from the local WMOs could also be requested. Within the RCWD boundary, the RCWD is identified as the Local Government Unit (LGU) responsible for the administration and enforcement of the Wetland Conservation Act (WCA). Within other areas of the City (within CRWD and MWMO boundaries), the City acts as the LGU. The WCA requires anyone proposing to drain, fill, or excavate a wetland first to try to avoid disturbing the wetland; second, to try to minimize any impact on the wetland; and, finally, to replace any lost wetland acres, functions, and values. Certain wetland activities are exempt from the act, allowing projects with minimal impact or projects located on land where certain pre-established land uses are present to proceed without regulation.

In 2017, Barr submitted a wetland delineation report to the City of Lauderdale and the USACE for Seminary Pond. This pond was originally constructed as a dry basin to provide flood mitigation benefits. CRWD is hoping to improve water quality and flood control performance of this pond by deepening it and converting it to a wet pond. In addition to adding an iron enhanced filtration bench to remove dissolved phosphorus. Seminary Pond is a regulated wetland under the Wetland Conservation Act. Thus, Barr prepared both an existing and proposed conditions Minnesota Routine Assessment Methodology (MNWRAM) based on the proposed design to determine effects of converting this pond to a wet pond and adding proposed features. Findings are further discussed in a technical memorandum entitled "Seminary Pond Wetland Function Assessment Comparison" which can be requested from the CRWD. In summary, the results of this report indicate that there are no wetland functions that would decrease as a result of the project.

6.4 IMPAIRED WATERS AND TMDLS

Section 303(d) of the Federal Clean Water Act requires that states create impaired waters lists for waterbodies that do not meet water quality standards due to the presence of a particular pollutant or stressor. Impaired waters lists are published biannually, following monitoring and assessment of the waterbody. Total Maximum Daily Loads (TMDLs), developed for impaired water bodies, specify the maximum pollutant amount that the waterbody can receive to meet water quality standards. A TMDL is the sum of waste load allocations, load allocations, and a margin of safety. Waste load allocations are expressed in numeric form, and municipal stormwater sources fall under waste load allocations because they are regarded as point sources. Load allocations are those loads that do not fall under NPDES permit areas.

There are no waterbodies within the City of Lauderdale currently identified on the Minnesota Impaired Waters List. However, five waterbodies in adjacent communities receiving discharge from Lauderdale are currently identified on the state list of Impaired Waters: South Long Lake, North Long Lake, Pike Lake, Mississippi River, and Rice Creek. Two sections of the Mississippi River are impaired; the first is the section from Crow River to Upper Saint Anthony Falls, and the second is the section from Lower St. Anthony Falls to Lock and Dam #1. The section of Rice Creek that is listed is between Long Lake and Locke Lake, which is part of the Upper Mississippi River TMDL, and the City is a regulated MS4 on this TMDL. Information for impaired waters identified in adjacent communities receiving flows from Lauderdale are identified in Table 2.4 in Section 2.6.4. The absence of a waterbody from the 303(d) list does not necessarily mean the waterbody is meeting its designated use(s). It may be that it has either not been sampled or there is not enough data to make an impairment determination.

As part of the NPDES program, the City of Lauderdale is required to review all discharges from their MS4 system to impaired waters, as defined by the current USEPA approved 303(d) list. As a part of this review they are required to do the following:

1. Review the Impaired Waters List to determine whether there are any impaired waters located within five miles of the City's boundaries that receive discharge from the City's MS4. For waters that are impaired only for mercury, the review process stops here.
2. Identify the location(s) of discharge(s) from the City's MS4 to the impaired waters. Discharges may include pipes, outlets, ditches, swales, street gutters, or other discrete conveyances for stormwater runoff.
3. Delineate the watershed area within the City's jurisdiction that discharges to each impaired water.
4. Prepare an impaired water evaluation addressing the hydrology, land use, and other characteristics of each watershed area delineated.
5. Prepare an impaired waters report. This report will address the results of the impaired waters evaluation along with a determination of whether changes to the City's SWPPP are warranted to reduce the impact from the City's MS4 stormwater discharge to each impaired water.
6. The City will incorporate the changes identified in the impaired waters report into the City's SWPPP and be reported through the annual reporting process.

At some point, a strategy would be developed that would lead to attainment of the applicable water quality standard for these impaired waters. The process of developing this strategy is commonly known as the Total Maximum Daily Load (TMDL) process and involves the following phases: 1) Assessment and listing, 2) TMDL study, 3) Implementation plan development and implementation, and 4) Monitoring effectiveness of implementation efforts.

Responsibility for implementing the requirements of the Federal Clean Water Act falls to the U.S. Environmental Protection Agency. In Minnesota, the EPA delegates much of the program responsibility to the Minnesota Pollution Control Agency (MPCA). Information on the MPCA program can be obtained at the following web address: <http://www.pca.state.mn.us/water/tmdl/index.html>.

Discussion regarding the directives for impaired waters and ultimately TMDL studies addressing the impairments for the waterbodies listed in Table 2.4 is presented in the implementation section (Section 8) of the LSWMP. This section will identify how the City intends to be involved in these directives and the City's strategy for implementing these directives.

6.5 NPDES PERMITTING PROCESS

The MPCA has designated the City of Lauderdale as an NPDES Phase II MS4 community (MN Rules 7090). The NPDES State Disposal System (SDS) General Permit (MNR040000) for discharges of stormwater associated with Municipal Separate Stormwater Systems (MS4s) was issued initially in 2003, and the permit is updated every five years. At the time of the 2018 LSWMP update for the City of Lauderdale, the 2013 Draft MS4 permit is still in effect. As new MS4 general permits are issued, the City will update its Stormwater Pollution Prevention Plan (SWPPP) and LSWMP as necessary. The City's SWPPP will address six minimum control measures:

1. Public education and outreach
2. Public participation/involvement
3. Illicit discharge detection and elimination
4. Construction site stormwater runoff control
5. Post-construction stormwater runoff control
6. Pollution prevention in municipal operations

The City's SWPPP contains several best management practices within each of the listed control measures. These were identified using a self-evaluation and input process with City staff.

Many of the goals and policies discussed in this Local Water Management Plan are directly related to requirements listed in the NPDES program. As a result, the Goals and Policies section of this plan repeatedly references items listed in the City's SWPPP. Per the requirements of the MS4 Permit, the City will review their SWPPP and update as necessary on an annual basis.

The City will coordinate water resource education effort with outside agencies to complete the City's goals as outlined in their MS4 SWPPP, which may include fulfilling their public education requirements by obtaining educational information and assistance from local WMO's.

6.6 SUMMARY OF STORMWATER MANAGEMENT GOALS AND POLICIES

A summary of the stormwater management policies, including those policies identified in the RCWD, CRWD, and MWMO Watershed Management Plans being applicable to Lauderdale, is included in Chapter 7. Where a specific watershed policy directly impacts the City of Lauderdale, the policy will be incorporated into the City's stormwater management policies in Section 7 of this LSWMP.

6.7 COMPARISON OF REGULATORY STANDARDS

The City will be responsible for implementation and enforcement of watershed management standards within the MWMO jurisdictional boundary except MnDOT projects. Standards applied will be equivalent to the MWMO's standards listed in the appendix. The City is also committed to coordinating project review efforts to facilitate RCWD and CRWD permit process. See Figure 2.2 for the location of the jurisdictional boundaries for these WMOs.

Each WMO has established standards governing stormwater management and protection of natural resources. The governing document for these standards for each WMO is identified as follows:

- **Rice Creek Watershed District Rules**— adopted December 14, 2016
- **Capitol Region Watershed District Rules** – adopted September 6, 2006 and revised April 1, 2015
- **MWMO Watershed Management Plan Section 3.1.3** - adopted 2011-2021 (11-09-2016 Amended Version)

6.8 WATER RESOURCE RELATED PROBLEMS AND POSSIBLE CORRECTIVE ACTIONS

An assessment of specific existing and potential water resource-related problems is summarized below. These problems have been identified based on current information available to the City and includes problems identified in any of the documents listed in Section 4 (related studies, plans, and reports). Possible corrective actions have been listed for each problem and those to which the City commits itself are incorporated into an implementation program (Section 8).

In addition to these specific problems, the WMPs for the three WMOs having jurisdiction in Lauderdale also identify general stormwater management issues that apply across the jurisdiction or to a smaller sub-area of their jurisdiction. The City will be incorporating corrective actions to address the applicable general issues

into the LSWMP goals and policies (Section 7) and/or stormwater management standards (Section 8), which conform to the goals and policies and stormwater management standards of the WMOs.

TABLE 6.2 – NATURAL RESOURCES AND WATER QUALITY PROBLEMS

	Problem, Issue, or Concern	Possible Corrective Action
6.7.1.1	Degraded water quality within Walsh Lake	<ul style="list-style-type: none"> • Harvesting aquatic weeds as necessary. • Cooperate with the efforts of the Rice Creek Watershed District to implement water quality treatment measures to improve the water quality of Walsh Lake; these include enhancing areas upstream to include depressional storage or the creation of raingardens or biofiltration areas, using green areas better to provide treatment. The City will coordinate with RCWD to implement these items.
6.7.1.2	Disconnection of historic Bridal Veil Creek natural corridor	<ul style="list-style-type: none"> • Cooperate with the efforts of organizations such as the MWMO, Southeast Como Improvement Association (SECIA), St. Anthony Park Community Council (SAPCC), and MnDNR to re-establish a natural corridor between Bridal Veil Pond and the Seminary Pond area.
6.7.1.3	Lack of native upland and wetland plant diversity in the Seminary Pond area	<ul style="list-style-type: none"> • Cooperate with the efforts of organizations such as the MWMO, CRWD, SECIA, SAPCC and MnDNR to initiate a native plant restoration project in the Seminary Pond area to control exotic plant species and improve native plant diversity.
6.7.1.4	Absence of natural stream section downstream of Seminary Pond	<ul style="list-style-type: none"> • Cooperate with the efforts of organizations such as the MWMO, CRWD, SECIA, SAPCC and MnDNR to replace the existing concrete channel with a natural channel design.
6.7.1.5	Loss of natural infiltration characteristics within the Bridal Veil Creek system	<ul style="list-style-type: none"> • Cooperate with the efforts of organizations such as the MWMO, SECIA, SAPCC and MnDNR to locate and construct infiltration BMPs in the vicinity of Seminary Pond.
6.7.1.6	Erosion issues in the ravine draining into Seminary Pond from Fulham Street	<ul style="list-style-type: none"> • Coordinate funding with the City of Falcon Heights to stabilize the existing ravine section using bioengineering techniques.
6.7.1.7	Address potential for high TSS volumes in Walsh Lake and Seminary Pond	<ul style="list-style-type: none"> • Train street, service, public works, building, and parks and recreation staff to identify sources of illicit discharge.
6.7.1.8	Degraded water quality within Seminary Pond	<ul style="list-style-type: none"> • Convert pond from dry to wet pond and install iron-enhanced sand filter bench.

TABLE 6.3 – FLOODING AND STORMWATER RATE CONTROL PROBLEMS

	Problem, Issue, or Concern	Possible Corrective Action
6.7.2.1	Existing conveyance system on Eustis Street between Larpenteur Avenue and Pond 1	<ul style="list-style-type: none">• With the reconstruction of Eustis Street, the existing system should be replaced by a continuous storm sewer system tying into the existing storm sewer south of Pond 1. Coordinate with CRWD as a potential partner to address.
6.7.2.2	Risk of flooding homes along Pleasant Street, adjacent to Walsh Lake	<ul style="list-style-type: none">• Work with the City of Roseville to rehabilitate or replace existing lift station – to be financed by Roseville.• Analyze the possibility of grading an overland EOF to the west.
6.7.2.3	Risk of street and parking lot flooding adjacent to Eustis Street between Como Avenue and Idaho Avenue where the outlet of Seminary Pond is located	<ul style="list-style-type: none">• Analyze the system to see if storage alternatives or a different channel configuration could eliminate the street and parking lot flooding.• Expand storage in Gasparre and Seminary Ponds where available• Coordinate with CRWD as a potential partner to address.

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Section 7 – Goals and Policies

7.1 SUMMARY

Surface water management issues within the City are primarily defined by the requirements of current or pending programs. The goals and policies outlined in this plan are grouped by their relationship to the key issues listed below:

- Section 7.2 Land Development and Redevelopment – Goals and policies to prevent flooding and adverse impacts to water resources from land disturbance and impervious surfaces.
- Section 7.3 Resource Management – Goals and policies for managing Lauderdale's wetlands, lakes, and groundwater, to preserve the functions and values of these resources.
- Section 7.4 Citywide Program Elements – Goals and policies for managing water resources and drainage systems on a citywide scale, to effectively achieve surface water management goals.
- Section 7.5 Support of Other Agencies – Goals and policies to coordinate local surface water management with the work of watershed management organizations and state agencies.

The goals and policies listed below are consistent with the NPDES MS4 General Permit and the City of Lauderdale's SWPPP. These goals are also in alignment with those identified by the WMOs in their WMPs.

7.2 LAND DEVELOPMENT AND REDEVELOPMENT

Overall Goal: Manage land disturbance from new development, redevelopment, street reconstruction projects, or any other public or private land disturbing activity that creates new impervious or fully reconstructed surfaces to prevent flooding and adverse impacts to water resources through the cooperation with the stormwater management standards identified by the WMOs with jurisdiction in Lauderdale. To make this process effective, the City will strive through an up-front stormwater assessment and planning process to incorporate best management practices that focus on treating runoff at the source and not in typical end of pipe treatments. The incorporation of these Best Management Practices will coincide with the guidance provided in the Minnesota Stormwater Manual.

The upfront stormwater assessment and planning processes implemented at the project submittal stage will include guidance and recommendations for projects to include volume management features at the most ideal locations throughout a projects corridor. At a minimum, the City will look to provide pretreatment of stormwater before it enters the existing stormwater system. Volume management will apply to projects that disturb greater than 1 acre of land or 10,000 sq ft of land adjacent to a water body (wetland, stream, public water, public water wetland).

7.2.1 RUNOFF RATE

Goal: Control the rate of stormwater runoff from development to reduce downstream flooding and erosion.

Policy: The City will enforce their stormwater management ordinance (see Section 8-4) to ensure that the peak rate of runoff from regulated land development or redevelopment does not exceed existing rates for the 2-year, 10-year, and 100-year rainfall events. Rate control below existing rates may be necessary where downstream capacity issues are identified, which will require coordination with the local WMOs.

Policy: The City will require that the maximum duration for rainfall critical event analysis shall be 24 hours. The City will require the use of the hydrograph method of analysis, the MSE Type III storm distribution, and NOAA Atlas-14 rainfall data.

Policy: For new construction, the City will ensure that stormwater features have emergency overflow spillways sufficiently stabilized to convey flows greater than the 100-year critical storm event.

7.2.2 FLOOD PREVENTION AND FLOODPLAIN MANAGEMENT

Goal: Provide adequate storage and conveyance of runoff and control development in flood prone areas to protect the public safety and minimize property damage.

Policy: The City will require that the low floor elevation of new structures provide a minimum of 2-feet of freeboard above the 100-year High Water Level (HWL) or 1-foot of freeboard above the emergency overflow of an adjacent pond.

Policy: While no designated floodplains exist in Lauderdale, consistent with the policy in Section 3.4 (General Compliance Requirements) of the MWMO WMP, the City requires that encroachment into floodways that reduces conveyance capacities or expedites flood flows not be allowed.

7.2.3 RUNOFF VOLUME

Goal: Reduce pollutant loads and impacts to water bodies and encourage groundwater recharge, by reducing the volume of stormwater runoff from development and redevelopment areas.

Policy: The City will review and update City code as necessary to ensure that volume control standards are consistent with current engineering practices and current regulations of local and state agencies having jurisdiction within the City.

Policy: For all projects except Public Linear Projects within RCWD or MWMO, calculate water quality treatment volume by multiplying the area of new or reconstructed impervious surface by 1.1 inches, and divide by a total phosphorus removal factor (values indicated below in Table 7.1). For Public Linear Projects within RCWD or MWMO, the required water quality treatment volume is the area of new impervious surface multiplied by 0.75 inches. For all projects within CRWD, stormwater runoff shall be retained onsite in the amount equivalent to 1.1 inches of runoff over the impervious surfaces of development.

Policy: Per the MS4 Permit, new development and redevelopment projects with land disturbances of greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, within the permittee's jurisdiction and that discharge to the City's MS4 must be in compliance with the Post-Construction Stormwater Management requirements of Part III D.5 of the MS4 Permit. Refer to the MS4 Permit for further information.

TABLE 7.1 – TP REMOVAL FACTORS FOR BMPs

BMP	BMP Design Variation	TP Removal Factor
Infiltration	Infiltration Feature	1.00
Water Reuse	Irrigation	1.00
Biofiltration	Underdrain	0.65
Filtration	Sand or rock filter	0.50
Stormwater Wetlands	Shallow Wetland	0.40
	Pond/Wetland	0.55
Stormwater Ponds	Wet Pond	0.50
	Multiple Pond	0.60

Goal: Reduce the volume of stormwater runoff from existing developed areas.

Policy: The City will coordinate efforts with the local WMO to minimize impervious surfaces where feasible when reconstructing streets and other paved surfaces and provide volume control mitigation per WMO requirements.

Policy: Where practical, the City will encourage the use of infiltration systems that promote water conservation and reuse to reduce discharge volumes and conserve groundwater in existing developed areas, taking into consideration site limitations such as soil conditions, depth to groundwater, safety, snow removal, and maintenance issues.

7.2.4 NUTRIENT AND SEDIMENT LOADING

Goal: Reduce the nutrient and sediment loads discharged from land development or redevelopment.

The following policies are consistent with SWPPP minimum control measure MCM 5 (post-construction storm water management) and MCM 6 (pollution prevention/good housekeeping for municipal operations).

Policy: The City will strive for the non-degradation of receiving waters within the City by enforcing current stormwater management standards, in cooperation with the local WMOs' stormwater management standards.

Policy: The City will defer the enforcement of nutrient and sediment load requirements to those of either the RCWD or CRWD. Under no circumstances shall overall treatment of a development or redevelopment site fall below 50% post-development removal for phosphorous and 90% post-development removal for total suspended solids.

Policy: The City will require that developments incorporate non-point source pollution reduction BMPs to achieve 90% total suspended solids removal from the runoff generated by a Nationwide Urban Runoff Program (NURP) water quality storm (2.5" rainfall), or on an annual basis.

Policy: The City will review and update the stormwater management ordinance (see City Code Section 8-4) as necessary to ensure that water quality treatment standards are consistent with current engineering practices and current regulations of local and state agencies having jurisdiction within the City.

Policy: The City will enforce their stormwater management ordinance (see City Code Section 8-4) requiring outlet skimming up to the 1-year storm event HWL in all new stormwater ponds.

7.2.5 EROSION AND SEDIMENT CONTROL

Goal: Prevent sediment from construction sites from entering the City's surface water resources.

The following policies are consistent with SWPPP MCM 4 (construction site stormwater runoff and control) and MCM 5 (post-construction stormwater management).

Policy: The City will implement, update and enforce the Erosion and Sediment Control Ordinance (*Title 8, Chapter 4 – Stormwater Management*) as outlined in the NPDES, MS4 permit.

Policy: The City will require that erosion and sediment control practices are consistent with the standards identified in the current MPCA Construction General Permit and the Minnesota Stormwater Manual.

Policy: The City will require that a wetland assessment be prepared for any project that includes a wetland not already assessed. Minnesota Routine Assessment Methodology (current version) is the required method of assessment for evaluating wetland functions and values.

7.3 RESOURCE MANAGEMENT

Goal: Protect the City's wetlands, lakes, streams, groundwater, and natural areas to preserve the functions and values of these resources for future generations through the Wetland Conservation Act, buffer standards, groundwater protection rules and coordination with outside agencies.

7.3.1 WETLAND MANAGEMENT

Goal: Protect and preserve wetlands to maintain or improve their function and value.

Policy: RCWD will administer WCA LGU responsibilities within its district boundary to ensure no net loss of wetland functions and values. The City will administer WCA LGU responsibilities within other areas of the City, within the CRWD and MWMO boundaries.

Policy: The City will require that runoff from development and redevelopment projects be pre-treated prior to discharge to wetlands.

Policy: The City will work to improve the wetland functions and values of Seminary Pond, which will partially be accomplished through the Seminary Pond Improvement Project.

Policy: The City will require that, prior to development activities or public projects, a wetland delineation must be completed, including a field delineation and report detailing the findings of the delineation.

Policy: The City will require that a wetland assessment be prepared for any project that includes a wetland not already assessed. Minnesota Routine Assessment Methodology (current version) is the required method of assessment for evaluating wetland functions and values.

7.3.2 LAKE MANAGEMENT

Goal: Improve water quality and protect resource values of lakes.

Policy: The City will cooperate with the RCWD to identify possible activities to improve water quality in Walsh Lake.

Policy: The City will identify potential partnerships with CRWD to address water quality improvements for Seminary Pond.

7.3.3 STREAM MANAGEMENT

Goal: Improve water quality, provide wildlife habitat and protect the resource value of streams.

Policy: The City will support the efforts of the MWMO to restore the historic natural stream section within the Bridal Veil Creek system in the vicinity of Seminary Pond.

7.3.4 GROUNDWATER RECHARGE AND PROTECTION

Goal: Protect groundwater resources and groundwater-dependent surface water and natural resources.

Policy: The City will cooperate with Ramsey County, the Minnesota Department of Health, and the local WMOs to identify and protect critical groundwater resources areas.

Policy: The City will cooperate with other agencies once the Ramsey County Groundwater Protection Plan is adopted, to implement recommendations identified in this report.

Policy: The City will support the efforts of the MWMO to restore lost infiltration features within the Bridal Veil Creek system. Where possible, the City will partner with the MWMO to utilize grant funding programs and other opportunities to work with the MWMO. These include, the Capital Project Grant program, which is a new grant set up to target innovative stormwater management, watershed assessments (i.e. developing management goals for the Bridal Veil Creek and identifying opportunities to improve their ecological function), and coordination over TMDL implementation within the MWMO.

7.3.5 NATURAL AREA MANAGEMENT

Goal: Protect and enhance natural areas within the City to provide wildlife habitat and water resource benefits.

Policy: The City will support programs to maintain and restore the resource value of natural areas and enhance water based recreational opportunities.

Policy: The City will support the efforts of the MWMO to re-establish a natural corridor between Bridal Veil Pond and the Seminary Pond area.

Policy: The City will work to control noxious invasive plants within the City, in cooperation with Ramsey County for the control of Japanese knotweed in the Gasperre/Seminary Pond areas of Lauderdale.

7.4 CITYWIDE PROGRAM ELEMENTS

Overall Goal: Manage water resources and drainage systems on a citywide scale, including monitoring and maintenance of drainage systems, targeted pollution prevention, public education, system reconstruction projects, and equitable collection of supporting funds.

7.4.1 POLLUTION PREVENTION

Goal: Detect and address urban pollutants discharged to storm sewers.

The following policies are consistent with SWPPP MCM 3 (illicit discharge detection and elimination) and MCM 6 (pollution prevention/good housekeeping for municipal operations).

Policy: The City will enforce its ordinance requiring that animal waste is disposed of on public property.

Policy: The City will actively implement the NPDES Stormwater Pollution Prevention Plan as stated in the most current version of the MS4 permit.

Policy: The City will maintain an effective spill response plan.

Policy: The City will complete employee training in the operation, maintenance and inspection of stormwater facilities, as included in the SWPPP.

Policy: The City will monitor stormwater system facilities for pollutants as outlined in the City's SWPPP.

Policy: Illicit connections and discharges to the City of Lauderdale's Municipal Separate Storm Sewer System (MS4) are prohibited. Refer to the City of Lauderdale's City Ordinances *Title 8, Chapter 5- Stormwater Illicit Discharge and Illicit Connections to the Storm Sewer System*, for further information.

7.4.2 MONITORING AND MAINTENANCE

Goal: Maintain the function and effectiveness of stormwater management structures through monitoring and maintenance.

The following policies are consistent with SWPP MCM 3 (illicit discharge detection and elimination), MCM 5 (post-construction stormwater management), and MCM 6 (pollution prevention/good housekeeping for municipal operations).

Policy: The City will continue to conduct street sweeping twice annually, as consistent with the City's SWPPP.

Policy: The City will continue inspection and maintenance of the city's stormwater conveyance and ponding system as outlined in the City's SWPPP.

Policy: The City will inspect and monitor the construction and installation of all new stormwater facilities and require that such facilities be surveyed to create as-built drawings.

7.4.3 PUBLIC EDUCATION

Goal: Inform and educate residents about stormwater pollution, the effects of urban runoff and the need to protect natural resources.

The following policies are consistent with SWPPP MCM 1 (public education and outreach).

Policy: The City will implement a public education and outreach program as identified in the City's NPDES permit.

Policy: The City will coordinate public education work with the Ramsey Conservation District and local WMOs.

Policy: The City will promote citizen and volunteer efforts to protect, restore and enhance local water and natural resources.

Policy: The City will use available opportunities through its newsletter, public meetings, website, Comprehensive Plan, or interpretive elements at parks and open space sites to inform its residents about the value of local water resources, the effects of stormwater runoff, and opportunities for stewardship of water and natural resources.

Policy: The City will continue to have signs at the entrances to public parks and well-travelled walkways, highlighting the importance of disposing of pet waste.

7.4.4 FUNDING

Goal: Secure adequate funding to support implementation of the Local Surface Water Management Plan.

Policy: The City will fund implementation of the plan with revenue from the stormwater utility. The City will periodically review utility rates to ensure that funding is adequate and fees are equitably distributed.

Policy: The City will seek grant funds or other resources to assist with special projects or implementation of plan goals.

7.5 SUPPORT OF OTHER AGENCIES

Overall Goal: Cooperate and coordinate local surface water management with the work of local WMOs and state agencies.

Goal: Facilitate WMO review of development projects and enforcement of watershed standards.

Policy: The City will coordinate development review activities with the appropriate local WMO. The City will defer to the CRWD and RCWD for review and enforcement of stormwater management standards for construction projects in accordance with the permit programs of these organizations. The City will review, permit and enforce watershed standards on development projects in the MWMO, and provide MWMO the opportunity to review projects being considered for a variance. The City will notify and include the applicable WMO in development concept reviews. This policy is consistent with SWPPP MCM 4 (construction site stormwater runoff control) and MCM 5 (post-construction stormwater management).

Goal: Cooperate with other organizations to complete management plans and studies for water resources in Lauderdale.

Policy: The City will work with local WMOs, Ramsey County, and others when appropriate and as resources are available to participate in resource management plans or studies that benefit water and natural resources in Lauderdale.

Goal: Cooperate with other organizations working to protect groundwater resources.

Policy: The City will cooperate with the County and WMOs to implement the recommendations of the Ramsey County Groundwater Quality and Protection Plan, to protect groundwater quality by reducing the potential for transport of stormwater pollutants into the groundwater, and maintaining the functions of groundwater recharge areas.

Goal: Cooperate with watershed districts in addressing existing TMDLs and new TMDL as they are identified for the Mississippi River.

Policy: The City will cooperate with the Mississippi Watershed Management Organization and Capitol Region Watershed District in an assessment of current and future demands on the stormwater infrastructure and how it might affect future Capitol Improvement Projects (CIP). These evaluations could include:

- Analyzing the effect of a proposed project on the downstream conveyance system and drainage area.
- Identify any future problems that may arise from additional project related stormwater demands on the system.
- An analysis on potential stormwater Best Management Practices they may be included with CIP projects that will reduce volume demands on the stormwater conveyance system and drainage areas and pretreat water entering the system.

Policy: The City will continue to enforce its pet waste policies, in an effort to help meet the goals of the Upper Mississippi River Bacteria TMDL.

Section 8 – Implementation

8.1 OVERVIEW

The City has developed an implementation program based on the information developed in earlier sections of this Local Surface Water Management Plan. This program reflects the needs and concerns of many stakeholders including the City Council, City Staff, citizens, watershed management organizations, and funding capabilities.

This Section summarizes the implementation items identified in Sections 6 and 7 of this LSWMP, prioritizes these items, and presents a preliminary cost estimate to complete the items based on the best available information. It should be noted that estimated costs presented in the section are preliminary only and are presented for long-term budget planning purposes.

8.2 IMPLEMENTATION ACTIVITIES

The City's current, overall Capital Improvement Plan includes several projects that address issues identified in Section 6 and goals and policies identified in Section 7. A summary of those projects is provided in Table 8.1, showing proposed start year, priority level, and budgeted cost. Project effectiveness will be measured by assessing whether or not these projects have been implemented by the date listed in this table. The City will use the implementation project information presented in Table 8.1 to update their current CIP, as necessary. The City updates the Capital Improvement Plan on an annual basis.

8.3 OTHER FUTURE IMPLEMENTATION ACTIVITIES

This section includes other future implementation activities not identified in Table 8.1 above. These activities generally include coordination efforts with other agencies or potential future activities that have yet to be finalized. These future implementation activities identified below are relevant to overall stormwater management within the City and should be considered in future Capital Improvement Plan discussions. Specific information regarding the most current local WMO cost share programs can be found on their websites, as follows:

- Rice Creek Watershed District: www.ricecreek.org/grants
- Capitol Region Watershed District: www.capitolregionwd.org/our-work/grants
- Mississippi Watershed Management Organization: www.mwmo.org/stewardshipfund.html

8.3.1 COORDINATE WITH THE RCWD TO ADDRESS DEGRADED WATER QUALITY IN WALSH LAKE

As part of the 2002 Utility and Street Improvement Project, the City removed approximately 500 cubic yards of sediment that had deposited near pond inlets. The City is interested in partnering with the RCWD to complete both in-lake vegetation management and water quality retrofit projects aimed at improving the water quality of Walsh Lake. The RCWD identifies specific programs on their website (www.ricecreek.org) that could be applied toward partnering with Lauderdale, including:

- RCWD – Urban Stormwater Remediation Cost-Share Program
- RCWD – Water Quality Grant Program

TABLE 8.1 –IMPLEMENTATION PROJECTS

Activity #	Activity	Activity Description	Proposed Start	Priority Level	Budgeted Cost	Responsibility
1	Wetland Inventory and Assessment	Complete a Wetland Inventory and Assessment of wetlands in Lauderdale – cost will depend on level of detail, deliverables, and cost participation from the local WMOs	2018	Medium	\$3,500	City
2	Seminary Pond Ravine Stabilization	Stabilize the eroding ravine section upstream of Seminary Pond toward Fulham Street using bioengineering techniques – outside funding from various organizations should be sought	2020	Low	\$80,000	City and Watershed District(s)
3	Eustis Street Storm Sewer Improvements	Replace the existing overland conveyance system on Eustis St. between Larpenteur Ave. and Pond 1 with a continuous storm sewer system	2019	Medium	To be negotiated with the county.	City and Ramsey County
4	Reduce Walsh Lake Flood Risk	Reduce the flood risk to homes along Pleasant Street, adjacent to Walsh Lake – rehabilitation or replacement of the existing lift station (at the City of Roseville's cost) should be done prior to other improvements	2018	Medium	\$20,000	Cities of Lauderdale and Roseville
5	Review and Update City Code	Review city code and update as necessary to comply with local WMO and state stormwater management standards and rules	Ongoing	Medium	\$3,000	City
6	Complete Staff Training	Complete city staff training in the operation, maintenance and inspection of stormwater facilities	2018	Medium	\$1,000	City
7	General Inspection and Maintenance Program	General inspection and maintenance of the City's stormwater management system: <ul style="list-style-type: none"> • Annual street sweeping • Inspection and maintenance of ditches, ravines, and storm sewer • Inspection and maintenance of stormwater basins and outfalls • Inspection and maintenance of structural pollution devices 	Ongoing	High	\$50,000	City
8	Public Education and Outreach Program	Develop and maintain a public education and outreach program to provide stormwater management education opportunities for City residents	Ongoing	High	\$5,000 annually	City
9	Sanitary Infiltration/ Inflow Program	Continue program to detect and address infiltration or inflow connections into the sanitary sewer system	Ongoing	Medium	\$21,000	City
10	Seminary Pond Improvements	Convert Seminary Pond from a dry to wet pond with iron enhanced sand filter for TP removal	2022	High	\$500,000	City and Capitol Region Watershed District
11	Park Pollinator Project	Plant native grasses on big hill in park on Roselawn Avenue	2018	Medium	10,000	City/County
12	Invasive Species Project	Control invasive species in the Nature Area	2018	Medium	\$10,000	City

TABLE 8.2 – ORDINANCE-RELATED IMPLEMENTATION MEASURES

Activity #	Activity	Activity Description	Proposed Start	Priority Level	Budgeted Cost	Responsibility
1	Illicit Discharge Detection and Elimination Ordinance	Review city code and update to address the NPDES illicit discharge detection and elimination ordinance requirements as necessary	Ongoing	High	\$2,000	City
2	Site Erosion Control Ordinance	Review city code and update to address the NPDES construction site erosion control ordinance requirements as necessary	Ongoing	High	\$3,000	City
3	Stormwater Management Ordinance	Review city code and update to address the NPDES stormwater management ordinance requirements as necessary	Ongoing	High	\$3,000	City

8.3.2 FUTURE TOTAL MAXIMUM DAILY LOAD (TMDL) STUDIES

As discussed in Section 2.6.4, there are currently no water bodies within Lauderdale that are listed on the Minnesota Pollution Control Agency's list of impaired waters; lakes and streams in the state that do not meet federal water quality standards. However, drainage from Lauderdale ultimately discharges into a number of impaired waters: Pike Lake, North Long Lake, South Long Lake, Rice Creek, and the Mississippi River.

The City recognizes that the responsibility for completion and implementation of the TMDL studies lies with the primary stakeholders contributing to the impairment. The City intends to cooperate with the watersheds in the development of the TMDL studies, acknowledging that the watersheds will take the lead on these studies. It is the intention of the City to fully implement the items/actions identified in future TMDL Implementation Plans, funding the implementation items/actions as necessary.

8.3.3 NATIVE PLANT RESTORATION PROJECTS

Native plant restoration in the Seminary Pond area to control exotic plant species and improve native plant diversity is identified as an implementation item in the *Bridal Veil Creek Subwatershed Desk Study* published by the MWMO. Seminary Pond is located within Capitol Region Watershed District. The City will likely look to coordinate with this CRWD and other organizations to possibly combine native plant restoration projects in the Seminary Pond area with a stormwater project. The City is willing to provide assistance to these organizations as necessary once specific projects are identified.

8.3.4 REESTABLISHMENT OF NATURAL CORRIDOR

Reestablishing a natural corridor between Bridal Veil Pond and the Seminary Pond area is identified as an implementation item in the *Bridal Veil Creek Subwatershed Desk Study* published by the MWMO. The City will look for the MWMO and other organizations to initiate a project to reestablish the natural corridor between Bridal Veil Pond and the Seminary Pond area, as this action is regional in nature and will require substantial funding for land acquisition and site modifications. The City is willing to provide assistance to these organizations as necessary once specific projects are identified.

8.3.5 REDEVELOPMENT WATER QUALITY STANDARDS

Develop redevelopment water quality standards that seek to improve the existing water quality treatment capabilities of the site being redeveloped beyond current City redevelopment standards. A number of programs are identified in the local WMOs implementation plans that could provide partnering funds to address redevelopment water quality standards. A few of the available programs are as follows:

- MWMO – Stewardship Fund Program (Action, Planning or Mini Grants)
- CRWD – Urban Redevelopment
- CRWD – Stewardship Grant Program (for those projects that go above and beyond the required redevelopment stormwater standards)

8.3.6 URBAN WATER QUALITY RETROFIT PROJECTS

The City will look for opportunities in developed areas to install retrofit water quality improvement BMPs to improve the overall water quality in the City. A number of programs are identified in the local WMOs implementation plans that could provide partnering funds to locate, design, and install retrofit BMPs. A few of the available programs are as follows:

- MWMO – Greening for Water Quality Program
- MWMO – Stewardship Fund Program
- MWMO – Water Reuse and Conservation Program
- RCWD – Urban Stormwater Remediation Cost-Share Program
- RCWD – Water Quality Grant Program
- CRWD – Stewardship and Special Grant Programs

8.4 POTENTIAL FUNDING

Implementation of the proposed studies, programs, and improvements identified in this plan will affect City finances. To quantify this effect, a review of the ability of the City to fund these studies, programs, and improvements is required.

Below is a listing of various sources of revenue that the City will attempt to utilize:

- Existing stormwater utility
- Grant and partnership monies possibly secured from various agencies for projects
- General fund
- Project funds could be obtained from watershed district levies as provided for in Minnesota Statutes Chapter 103D.905 for those projects being completed by or in cooperation with the RCWD or CRWD.
- Special assessments for local improvements performed under authority of Minnesota Statutes Chapter 429.
- Revenue generated by Watershed Management Special Tax Districts provided for under Minnesota Statutes Chapter 473.882.
- Other sources potentially including tax increment financing, tax abatement, state aid, and others.

The City's stormwater utility is the primary source for the studies, programs, and improvements identified in this Plan.

Section 9 – Administration

9.1 REVIEW AND ADOPTION PROCESS

Review and adoption of this Local Surface Water Management Plan will follow the procedure outlined in Minnesota Statutes 103B.235:

‘After consideration but before adoption by the governing body, each local government unit shall submit its water management plan to the watershed management organization[s] for review for consistency with the watershed plan. The organization[s] shall have 60 days to complete its review.’

‘Concurrently with its submission of its local water management plan to the watershed management organization, each local government unit shall submit its water management plan to the Metropolitan Council for review and comment. The council shall have 45 days to review and comment upon the local plan. The council’s 45-day review period shall run concurrently with the 60-day review period by the watershed management organization. The Metropolitan Council shall submit its comments to the watershed management organization and shall send a copy of its comments to the local government unit.’

‘After approval of the local plan by the watershed management organization[s], the local government unit shall adopt and implement its plan within 120 days, and shall amend its official controls accordingly within 180 days.’

9.2 AMENDMENTS TO PLAN AND FUTURE UPDATES

This Local Surface Water Management Plan will be incorporated into the City’s 2040 Comprehensive Plan update and will be applicable until 2028, at which time an updated plan will be required. This timeline marks a change from previous updates; previously, Local Surface Water Management Plan updates were done when the water districts or water management organizations updated their Watershed Management Plans. Periodic amendments may be required to incorporate changes in local practices. In particular, changes to the three applicable Watershed Management Plans may require revisions to this plan. Plan amendments will be incorporated by following the review and adoption steps outlined above.