

5.30 Operation and Maintenance

5.31 Discussion

All of the proposed and existing structural features of the storm water management system that provide removal of sediment or other pollutants from storm water must be maintained. Once a certain volume of sediment collects in the treatment structures they become ineffective. Inspection of these features is necessary if an efficient, effective maintenance (i.e., cleaning) program is to be developed.

5.32 Conclusions

Sections 4.44 and 4.45 of the plan address the development of formal inspection and maintenance plans for trap manholes and storm water ponds (includes sedimentation basins and forebays). The implementation plan lists inspection and maintenance as an annual task and assigns an estimated cost to the task for budgeting purposes.



6.0 Implementation Plan and Prioritization

6.10 Prioritization Process and Implementation Plan

The prioritizing of task completion that is presented in the implementation plan was developed by giving consideration to:

- the relative importance of the task,
- the availability of funding,
- the availability of staff,
- time required to obtain and analyze test results at pilot installations,
- phased improvements, and
- dependence on action by entities outside of the City.

In the case of the education program, the primary concern was to provide an initial large-scale effort to distribute basic educational materials to all citizens. Other factors considered were: the time of year the activity would have to occur (staff availability) and spreading the cost somewhat evenly over the main implementation period (for Alternatives 1 and 2).

The policy, ordinance and program revisions were scheduled based on the relative importance of each and the staff time required. Only one major ordinance or policy consideration was scheduled per year.

The capital improvements were scheduled based on the relative importance of the wetlands being protected, availability of funds, the need to wait for other projects affecting a wetland to be completed, testing the effectiveness of pilot installations (the trap manhole program) and dependence on action by the state legislature to change the WCA mitigation requirements.

6.20 Responsibility

The implementation plan lists the division or department in the City that would perform a given task. Many of the policy, ordinance and program recommendations will require the efforts of multi-disciplinary teams. In these cases, the City division or department best suited to serve as the team leader is listed.

6.30 Funding

Possible sources of funding for each task are shown in the implementation plan. Staff will pursue all know possibilities for grants in an attempt to reduce the cost to the City. In addition, other options such as partnering, cost-sharing and sponsorships will be considered.



Cost Summary for Implementation Plan and Wetland Protection and Management Plan

Table 6.10
(1 of 6)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total Category Cost
Education Alternative #1	\$78,300	\$62,800	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$199,100
Cost to City (with grant)	\$19,575	\$15,700	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$93,275
Education Alternative #2	\$86,745	\$71,655	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$216,400
Cost to City (with grant)	\$21,685	\$17,915	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$97,600
Education Alternative #3		\$53,940	\$22,425	\$62,640	\$20,535	\$31,860	\$7,000	\$7,500	\$7,000	\$7,500	\$210,400
Programs/Ordinances	\$13,300	\$26,750	\$15,750	\$12,250	\$12,250	\$12,250	\$12,250	\$12,250	\$12,250	\$12,250	\$141,550
Wetland Capital Improvements	\$48,700	\$58,200	\$116,700	\$132,700	\$90,700	\$102,700	\$113,800	\$145,900	\$60,400	\$4,000	\$873,400
Yearly Totals*	\$62,000	\$138,890	\$154,875	\$197,590	\$123,485	\$146,810	\$133,050	\$165,650	\$79,650	\$23,750	\$1,225,350⁽¹⁰⁾

All costs in 1996 dollars.

* Assuming Education Alternative #3

Footnotes

- (1) Hire half-time coordinator for 2 years, obtain Twin Cities Water Quality Initiative Program (TCWQIP) grant. All costs shown in 1996 dollars.
- (2) Hands-on teaching materials for schools and youth organizations.
- (3) Pay for soil test on up to 2000 residential properties to encourage owners to test for fertilizer needs.
- (4) Could be set up at schools, libraries, etc.
- (5) Build a dock on a wetland that can hold up to 20 people - would be utilized for educational purposes.
- (6) 1040 hours per year.
- (7) Assign staff to coordinate program - obtain TCWQIP grant. All costs shown in 1996 dollars.
- (8) 1040 hours per year.
- (9) Assign staff to coordinate - do not obtain TCWQIP grant. All costs shown in 1996 dollars.
- (10) Assumes Education Alternative #3. If Education Alternative #1 is assumed, the total cost to the City would be \$1,108,225. If Education Alternative #2 is assumed, the total cost to the City would be \$1,111,250.

Education Program

(2 of 6)

Alternative #1 ^(f)	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Responsible Division	Possible Funding Source	Comments
1 Develop, print, & distribute color informational brochure to all City addresses	\$34,000										Engineering	a, b, c	
2 Develop, print, distribute resource bibliography	\$5,000										Engineering	a, b, c	
3 Develop web page	\$2,000		\$500		\$500		\$500		\$500		Engineering	a, b, c	
4 Develop, print, & distribute watershed-specific information door hangers	\$6,000										Engineering	a, b, c	
5 Utility billing insert			\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	Engineering	a, b	Miscellaneous information items/reminders
6 Briefing articles			\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	Engineering	a, b	Miscellaneous information items/reminders
7 Assemble wetland teaching trunks ⁽²⁾		\$2,000									Engineering	a, b, c	
8 Assemble and distribute media packets	\$500										Engineering	a, b, c	
9 Purchase and distribute teaching posters to schools		\$3,000									Engineering	a, b, c	
10 Cable TV information video		\$5,000									Engineering	a, b, c	
11 Fund 2000 soil tests ⁽³⁾	\$7,000	\$7,000									Environmental Services	a, b, c	
12 Develop traveling education display ⁽⁴⁾		\$7,500									Engineering	a, b, c	
13 Wetland teaching platform ⁽⁵⁾		\$10,000									Engineering	a, b, c	
14 Organize "Clean Water Week"		\$4,000									Engineering	a, b, c	
15 Coordinator ⁽⁶⁾	\$19,800	\$20,300									Engineering	a, b, c	
16 Staff time	\$4,000	\$4,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	Engineering	a, b, c	
17 Total Cost	\$78,300	\$62,800	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000			Total = \$199,100
18 Total Cost to City (with Grant)	\$19,575	\$15,700	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000			Total Cost to City = \$93,275

Funding Sources: a) Storm Water Drainage Utility b) General Fund c) Twin Cities Water Quality Initiative Program Grant d) Board of Water and Soil Resources Grant

Education Program

(3 of 6)

Alternative #2 ⁽⁷⁾		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Respon- sible Division	Possible Funding Sources	Comments
1	Develop, print, & distribute color informational brochure to all City addresses	\$34,000										Engineering	a, b, c	
2	Develop print, distribute resource bibliography	\$5,000										Engineering	a, b, c	
3	Develop web page	\$2,000		\$500		\$500		\$500		\$500		Engineering	a, b, c	
4	Develop, print, & distribute watershed - specific information door hangers	\$6,000										Engineering	a, b, c	
5	Utility billing insert			\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	Engineering	a, b	Miscellaneous information items/reminders
6	Briefing articles			\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	Engineering	a, b	Miscellaneous information items/reminders
7	Assemble wetland teaching trunks ⁽²⁾		\$2,000									Engineering	a, b, c	
8	Assemble and distribute media packets	\$500										Engineering	a, b, c	
9	Purchase and distribute teaching posters to schools		\$3,000									Engineering	a, b, c	
10	Cable TV information video		\$5,000									Engineering	a, b, c	
11	Fund 2000 soil tests ⁽³⁾	\$7,000	\$7,000									Environmental Services	a, b, c	
12	Develop traveling education display ⁽⁴⁾		\$7,500									Engineering	a, b, c	
13	Wetland teaching platform ⁽⁵⁾		\$10,000									Engineering	a, b, c	
14	Organize "Clean Water Week"		\$4,000									Engineering	a, b, c	
15	Staff time ⁽⁶⁾	\$32,245	\$33,155	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	Engineering	a, b, c	
16	Total Cost	\$86,745	\$71,655	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000			Total = \$216,400
17	Total Cost to City (with Grant)	\$21,685	\$17,915	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000	\$7,500	\$7,000			Total Cost to City = \$97,600

Funding Sources: a) Storm Water Drainage Utility b) General Fund c) Twin Cities Water Quality Initiative Program Grant d) Board of Water and Soil Resources Grant

Education Program

(4 of 6)

Alternative #3 ⁽⁹⁾	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Respon- sible Division	Possible Funding Sources	Comments
1		\$34,000									Engineering	a, b	
2			\$5,000								Engineering	a, b	
3				\$2,000		\$500		\$500		\$500	Engineering	a, b	
4				\$6,000							Engineering	a, b	
5			\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	Engineering	a, b	Miscellaneous information items/reminders
6			\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	Engineering	a, b	Miscellaneous information items/reminders
7				\$2,000							Engineering	a, b	
8		\$500									Engineering	a, b	
9				\$3,000							Engineering	a, b,	
10				\$5,000							Engineering	a, b,	
11		\$7,000	\$3,500	\$3,500							Environmen- tal Services	a, b	
12					\$7,500						Engineering	a, b	
13						\$10,000					Engineering	a, b	
14						\$4,000					Engineering	a, b	
15		\$12,440	\$8,925	\$26,140	\$8,035	\$12,360	\$2,000	\$2,000	\$2,000	\$2,000	Engineering	a, b	
16		\$53,940	\$22,425	\$52,640	\$20,535	\$31,860	\$7,000	\$7,500	\$7,000	\$7,500			Total Cost = \$210,400

Policies, Ordinances and Programs

	Wetland Policies Ordinances & Programs	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Respon- sible Division	Possible Funding Sources	Comments
1	Vegetative Buffer Zone Policy		\$7,000									Engineering	a, b	Considerable staff time from Public Works, Planning, Legal, Environmental Services
2	Wetland Modification Assessment Policy	\$500										Engineering	a, b	Revise policy
3	Aquatic Plant Chemical Treatment Policy		\$5,000 (database) \$5,000 (sampling)	\$5,000 (sampling)	\$5,000 (sampling)	\$5,000 (sampling)	\$5,000 (sampling)	\$5,000 (sampling)	\$5,000 (sampling)	\$5,000 (sampling)	\$5,000 (sampling)	Environmental Services	a, b	Database development and water quality sampling program
4	Wetland Ordinance	\$1,300										Engineering	a, b	Revise ordinance to adopt WPMP
5	Fertilizer and Pesticide Management Ordinance			\$3,500								Planning	a, b	Develop new ordinance
6	Private Trap Manhole/ Pond Maintenance Ordinance	\$5,500	\$750	\$750	\$750	\$750	\$750	\$750	\$750	\$750	\$750	Engineering	a, b	\$2,000 to establish data base using summer intern - Public Works, Legal, Environmental Services involved in ordinance draft
7	Weed Ordinance		\$1,000									Environmental Services	a, b	Dependent on adoption of buffer policy (revise ordinance)
8	Shore Area Ordinance		\$1,000									Planning	a, b	Dependent on adoption of buffer policy (revise ordinance)
9	Street Sweeping Program	\$250										Street Maintenance	a, b	No additional cost - utilize map developed by the Wetland Advisory Committee
10	Public Storm Water Trap Manhole Maintenance Program	\$1,000										Street Maintenance	a, b	Formalize inspection - no additional cost - current maintenance task
11	Public Storm Water Pond Maintenance Program	\$1,000											a, b	Formalize inspection - no additional cost - current maintenance task
12	Park Turf Maintenance Policy		\$500									Park Maintenance	a, b	Possible cost - dependent on adoption of buffer policies
13	Invasive and Exotic Species Vegetation Control Program	\$1,750	\$750	\$750	\$750	\$750	\$750	\$750	\$750	\$750	\$750	Park Maintenance	a, b	Purple loosestrife control via beetles
14	Adopt-A-Wetland Program	\$750	\$750	\$750	\$750	\$750	\$750	\$750	\$750	\$750	\$750	Park Maintenance	a, b	Program administration
15	Wetland Banking Program	\$1250										Engineering	a, b	40 hours when a project occurs
16	Monitoring and Evaluation Program		\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	Engineering		
17	Total Cost	\$13,300	\$26,750	\$15,750	\$12,250	\$12,250	\$12,250	\$12,250	\$12,250	\$12,250	\$12,250			Total Cost = \$141,550

Funding Sources: a) Storm Water Drainage Utility b) General Fund c) Twin Cities Water Quality Initiative Program Grant d) Board of Water and Soil Resources Grant

Capital Improvements and Maintenance

(6 of 6)

	Wetland Capital Improvements	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Responsible Division	Possible Funding Sources	Comments
1	Lower Penn Lake		\$30,000									Engineering	a, b	Rebuild existing sediment basin (maintenance project)
2	Running Pond	\$30,000 Imp. Proj \$7,500 Parks										Engineering	a, b	Sediment basin Parks and Recreation participation
3	Duck Pond			\$10,000								Engineering	a, b	Sediment basin
4	Ancel Glen Pond			\$35,000								Engineering	a, b	Forebay
5	Wright's Lake*				\$127,000							Engineering	a, b, d	Forebay - (wetland mitigation cost is included)
6	Skriebakken Pond*					\$85,000						Engineering	a, b, d	Forebays (three)
7	Brookside Pond*						\$40,000					Engineering	a, b, d	Forebay
9	Upper Bryant Pond			\$66,000								Engineering	a, b, d	Repair & enlarge existing forebay
10	Tamhill Pond							\$20,000				Engineering	a, b, d	Forebay (in conjunction with purple loosestrife control program)
11	Girard Lake/Pond								\$81,000			Engineering	a, b	Sediment basins (in conjunction with purple loosestrife control program)
12	Barthel's Pond							\$30,000				Engineering	a, b, d	Forebay
13	Trap Manholes 70-03,58,02	\$11,200 (two)										Engineering	a, b	Improvement project (wetlands on the preserve list)
14	Trap Manholes 65-03(two), 37-04 (three)		\$28,000 (five) (Pilot)	\$5,000 (Sampling)	\$5,000 (Sampling)	\$5,000 (Sampling)						Engineering	a, b	Improvement project Pilot program (five trap manholes)
15	Remainder of Trap Manholes						\$62,000	\$62,000	\$62,000	\$56,000		Engineering	a, b	Improvement projects-eleven per year
16	Trap Manhole Maintenance		\$200	\$700	\$700	\$700	\$700	\$1,800	\$2,900	\$4,000	\$4,000	Street	a, b	Annual Expense (in addition to existing maintenance costs)
17	Cost Totals	\$48,700	\$58,200	\$116,700	\$132,700	\$90,700	\$102,700	\$113,800	\$145,900	\$60,000	\$4,000			Total: \$873,400

* Need permits, WCA mitigation involved; should wait for legislative change

Funding Sources: a) Storm Water Drainage Utility b) General Fund c) Twin Cities Water Quality Initiative Program Grant d) Board of Water and Soil Resources Grant

7.0 Special Considerations

7.10 Minnesota River Valley Wetlands

As stated in the Executive Summary, this plan does not address the wetlands in the City that are located below the bluff of the Minnesota River Valley. These wetlands are not included for a number of reasons.

The entire area below the bluff is designated as a conservation area in the City's Comprehensive Plan. As such, the area would remain in a natural condition to protect habitat, wildlife and open space. The major impacts to the wetlands in the river valley are inundation due to flooding of the Minnesota River and the discharge of storm water from the City's storm sewer outfalls.

The river valley is owned by either the US Fish and Wildlife Service (USF&WS), the City of Bloomington, or private citizens. Much of land is slated for acquisition by the USF&WS to be managed as part of the Minnesota Valley National Wildlife Refuge.

In meetings with staff of the USF&WS and the MDNR, the primary concern that was identified was the pollutants carried to the wetlands by storm water runoff. It was agreed that this issue that can be most effectively addressed in the City's comprehensive surface water management plan.

7.20 Regional Storm Water Quality

One of the primary issues that the City's comprehensive surface water management plan will consider is that of treating storm water runoff via regional facilities (i.e., providing basins to treat the storm water runoff from large areas of the City -- 100 to 500 acres, for example). The current storm water management system configuration utilizes many of the natural wetlands for storm water detention to reduce flooding problems in upland areas. These wetlands also provide a secondary benefit of water quality treatment for the storm water runoff. However, the wetlands' natural capacity to assimilate nutrients and capture pollutants is often exceeded due to the volume of water that is routed through the wetlands.

The comprehensive surface water management plan will address how the City will determine the ability of the wetlands to function as storm water runoff quality treatment facilities, where changes should be made to protect certain wetlands and where certain wetlands might be modified to enhance their storm water runoff quality treatment function to benefit downstream water bodies or watercourses. That analysis may result in the revision of some of the wetland rankings developed in this plan.

7.30 Comprehensive Surface Water Management Plan

As indicated in Sections 7.10 and 7.20, the City's comprehensive surface water management plan and the wetland protection and management plan will work together to provide management guidance for all of the City's water resources. The wetland protection and management plan will be included in the comprehensive surface water management plan by reference.



8.0 Plan Amendments

This plan extends for five years following the year in which it is approved and adopted. The plan shall remain in effect pending approval and adoption of a succeeding plan. Plan amendment procedure will follow the Minnesota Rules Chapter 8420, part 8420.0650, subp. 5, "Amendments to the plan become effective upon completion of the same process required for the original plan."



Glossary

2,4 - D	A herbicide containing 2,4 Dichloraphenoxy - acetic acid.
Action Category Definitions	There are three action categories based on the recommended type of action to be taken for a wetland. Category “A” wetlands are recommended for capital improvements, category “B” wetlands are recommended for best management practices, and category “C” wetlands are recommended for preservation.
Algaecide	A chemical agent that destroys algae in water.
Aquatic Macrophyte	Macroscopic plants in a water environment.
Aquifer	A saturated permeable geologic unit that can transmit significant quantities of water under ordinary hydraulic gradients.
Best Management Practice (BMP)	A practice or combination of practices that are determined to be the most effective and practical (including technological, economic, and institutional considerations) means of controlling point and nonpoint pollutant levels compatible with environmental quality goals.
Biological Oxygen Demand	The amount of oxygen utilized when the organic matter in a given volume of water is degraded biologically.
Bounce	The increase in water surface elevation of a water body that occurs as a result of a storm water or snowmelt runoff event.
Buckthorn	A small exotic tree/shrub introduced into the United States in the early 1900’s as an ornamental planting and for creating dense hedgerows. Because buckthorn is a very adaptable plant, it often invades woodland and wetland areas, reducing the diversity and integrity of natural areas.
Capital Improvement	A repair or improvement project which is budgeted and paid for with City funds.
Copper Sulfate	Chemical used to control algae in impounded waters, lakes and ponds. Usually kills most vegetation within 3 to 5 days.
Detention Basin	A natural or manmade basin that temporarily stores storm water runoff to control peak discharge rates.



Diquat	A chemical used to control submergent vegetation and duckweed.
Direct Contact Lake	A water body used for recreation such as swimming, water-skiing, diving, etc.
Dissolved Oxygen	The amount of soluble oxygen in a given volume of water.
Drain	Any method for removing or diverting waters from wetlands. The methods include, but are not limited to, excavation of an open ditch, installation of subsurface drainage tile, filling, diking, or pumping.
Drainage Area	An approximate boundary which storm water runoff does not cross based on topography and storm sewer structures. Storm water within this area usually either exits at one outlet point or flows to one water body within the drainage area. Bloomington has 22 drainage areas.
Easement	The right which the public or an individual has in the lands of another. An easement does not give the grantee a right to the land - only a right to use the land for a specified purpose. The owner of the land may also use it for any purpose that does not interfere with the specified use by the grantee.
Endothal Salts	Active ingredients found in some aquatic herbicides.
Enzyme	A protein that can initiate or accelerate specific chemical reactions in the metabolism of plants and animals.
Erosion	Wearing away of the lands or structures by running water, glaciers, wind, and waves
Eurasian Watermilfoil	An exotic submerged aquatic plant that often forms dense surface mats, which shade native plants and interfere with water recreation.
Eutrophication	The process by which a body of water becomes highly productive either naturally or by pollution rich in dissolved nutrients (such as phosphates). Eutrophic lakes are often shallow, with a seasonal deficiency in dissolved oxygen.
Excavation	The displacement or removal of the sediment or other materials by any method.
Fertilizers	Liquid or solid products containing nitrogen, phosphorus and potassium that enhance the growth and development of plants.
Fill	Any solid material added to, or re-deposited in, a wetland that would alter its cross-section or hydrological characteristics, obstruct flow patterns, change the wetland boundary, or convert the wetland to a non-wetland.



Floodplain	The areas adjoining a watercourse or a water body that are covered by flood water for a given storm water or snowmelt runoff event.
Floodplain Wetland	A wetland located in the floodplain of a watercourse, with no well defined inlets or outlets, including tile systems, ditches, or natural water courses. This may include the floodplain itself when it exhibits wetland characteristics.
Forebay	An area located immediately adjacent to, or in a shallow portion of, a wetland that traps sediment and debris.
Fritz-zyme 360	The trade name of an enzyme based algaecide.
Geology	The science of the origin, history, and structure of the earth, as recorded in the rocks; together with the forces and processes now operating to modify rocks.
Glacial Drift	Poorly sorted sediment that was deposited by glaciers.
Glyphosate Salts	Active ingredients in certain aquatic herbicides.
Herbicides	An agent used to destroy or inhibit plant life, includes algaecides
Heterotrophic Bacteria	Bacteria that obtain nourishment chiefly or entirely from complex organic substances.
Hydric soils	Soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part.
Hydrologic	The applied science concerned with the waters of the earth in all their states - - their occurrences, distribution, and circulation through the unending hydrologic cycle of precipitation; consequent runoff, stream flow, infiltration, and storage; eventual evaporation; and precipitation.
Hydrophytic vegetation	Macrophytic plant life growing in water, soil, or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.
Impacted Wetland	A wetland that has been drained or filled, partially or wholly, and is subject to replacement.
Indirect Contact Lakes	A water body used for recreation such as boating, fishing, or commercial uses.



Infiltration	The entrance of water into the soil or other porous material through the interstices or pores of a soil or other porous medium.
Invasive-Exotic Species	Plant and animal species non-native to North America, which in the absence of natural predators and controls, often out-compete native species. These species can reduce the diversity and integrity of biological systems.
Isolated Wetland	A wetland that is not connected to other water bodies via watercourse or storm sewer.
Manmade Pond	A water body created for water storage, water quality, or aesthetics; may or may not have properties of a natural wetland.
Monotypic Vegetation	A vegetative community containing only one type, e.g. a genus or plant community consisting of a single species.
Nitrates	Salts and esters of nitric acid.
No Net Loss	No reduction in the area and value of a wetland from existing conditions.
Non-point Source Pollution	Pollution originating at a variety of non-localized sources, such as street runoff, septic systems, atmospheric deposition, or groundwater.
OHWL	Ordinary High Water Level - The boundary of public waters, which is the elevation delineating the highest water level which has been maintained for a sufficient period of time to leave evidence upon the landscape; commonly the point where the natural vegetation changes from predominantly aquatic to predominantly terrestrial. For watercourses, the OHWL is the elevation of the top of the channel bank. The OHWL is set by the Minnesota Department of Natural Resources (MDNR).
Ordinance	A law of a municipal body.
Percent Impervious	Estimated percent of impervious surface within a drainage basin based on land use.
Pesticides	Compounds used to destroy insect pests. In a broader usage, pesticides is a term commonly used to describe fungicides, insecticides, rodenticides, algacides, and herbicides.
Phosphorus	A highly reactive element. Concentrations of phosphorus in water can affect water quality and algae growth.
Policies	A written course or plan of action designed to influence future decisions.



Prairie Pothole	Shallow, marshy wetlands found particularly in the Dakotas and central Canadian provinces.
Precipitation	The total measurable supply of water from all forms of falling moisture, including dew, rain, mist, snow, hail, and sleet; usually expressed as depth of liquid water on a horizontal surface in a day, month, or year; and designated as daily, monthly, or annual precipitation.
Preserve or Preservation	A wetland management category. Wetlands in this category offer a unique functional value or characteristic that the City wishes to retain. Steps will be taken to insure that the particular function or characteristic of the wetland is protected.
Programs	A prearranged or desired plan or course of action.
Purple Loosestrife	An exotic herbaceous perennial of Eurasian origin responsible for the degradation of many prime wetland habitats throughout the temperate regions of the United States and Canada. Large monotypic stands reduce the biotic diversity of wetland systems by replacing native plant species and thereby eliminating the natural foods and cover essential to many wetland wildlife inhabitants, including waterfowl.
Sedimentation Basin	An area located in the upland area adjacent to a wetland that traps and sediment and debris.
Shore Area	All land in the City lying within a defined distance from a given public water body, as measured from the Ordinary High Water Level (OHWL). The development, use, and alteration on the shore area is regulated by sections 19.87.01-19.87.08 of the City code. The affected water bodies, and the size of the shore area for each one, can be found in Table 1 of section 19.87.03 of the City code.
Shore Area Impact Zone	All land in the City lying within a defined distance from a given public water body, as measured from the Ordinary High Water Level (OHWL). The development, use, and alteration of the shore impact zone is regulated by sections 19.87.01-19.87.08 of the City code. The affected water bodies, and the size of the shore area for each one, can be found in Table 1 of section 19.87.03 of the City code. Land in the shore area impact zone (that half of the shore area closest to the public water) is more strictly regulated than that in the shore area.
Standard Plate Count	A standard method for counting total aerobic bacterial growth of cultures incubated for 48 hours at 32 degrees centigrade in a petri dish containing standard plate agar.
Succession	The process of plants adapting to and modifying the abiotic components, and in doing so, establishing increasingly complex systems with the more complex stage gradually replacing its less complex predecessor.
Surfactant	A surface active substance. As an additive to herbicide formulations, surfactants improve the surface adhesion of the herbicide to the target plant surface.



Suspended Solids	The non-soluble compounds, materials and matter in a given volume of water.
Trap Manhole	A manhole designed to capture sediment carried by storm water runoff, as well as other pollutants like oil and debris.
Vegetative Buffer Zone	An upland area adjacent to a wetland that is covered with natural vegetation.
Water Body	An area of standing water such as a pond, wetland or lake.
Watercourse	Flowing water such as a creek, stream or river.
Watershed	The surface drainage area that contributes water to a water body or watercourse.
Watershed Management Organization	A watershed district wholly within the metropolitan area, or a joint powers entity established wholly or partly within the metropolitan area by special law or by agreement, that performs some or all of the functions of a watershed district for a watershed and that has the characteristics and the authority specified under Minnesota Statutes, section 103B.211. Lake improvement or conservation districts are not watershed management organizations.
Wellhead Protection	The process of mitigating the potential for contamination of a well or well field by instituting controls on land use in the area where the well receives its groundwater.
Wet Meadow	Wetlands dominated by herbaceous vegetation (frequently sedges of the genus <i>Carex</i>) and with waterlogged soil near the surface but without standing water for most of the year.
Wet Prairie	A herbaceous wetland dominated by grasses rather than sedges and with waterlogged soil near the surface but without standing water for most of the year.
Wetlands	Transitional lands between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow areas. Wetlands must: have a predominance of hydric soils; be inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for life in saturated soil conditions; and under normal circumstances, support a prevalence of hydrophytic vegetation.
Wetland Banking	A system of identifying wetlands restored or created for replacement credit, providing for, and facilitating and tracking, the exchange of wetland banking credits for projects that require replacement plans.



Wetland Classification	Two commonly used methods for classifying wetlands have been developed. Circular 39 definitions, developed by the USF&WS in 1956, classify wetlands by “type 1, type 2, etc.”. National Wetland Inventory (NWI) definitions, developed by Cowardin for the USF&WS in 1979, classify wetlands using a tier system. More detailed Circular 39 and NWI descriptions can be found in Appendix D.
Wetland Creation	Construction of a wetland in an area that was not a wetland in the past.
Wetland Mitigation	The practice of allowing unavoidable losses of wetland in exchange for their replacement elsewhere through restoration or creation of new wetlands.
Wetland Restoration	Re-establishment of an area that was historically wetland but currently provides no or minimal wetland functions due to manmade alteration such as filling or drainage.
Wetland Type	A wetland classified according to Wetlands of the United States, USF&WS. Refer to the Circular 39 and NWI wetland types found in Appendix D for a more detailed description.
Yellow Lotus	A floating, leafed plant which contains a distinct yellow flower. It is a protected wildflower in Minnesota. No removal is allowed.



Abbreviations and Acronyms

BMP	Best Management Practice
BWSR	Board of Water and Soil Resources
HCD	Hennepin Conservation District
LGU	Local Government Unit
MDNR	Minnesota Department of Natural Resources
MPCA	Minnesota Pollution Control Agency
Mn/DOT	Minnesota Department of Transportation
MNRAM	Minnesota Routine Assessment Method for Evaluating Wetland Functions
NPDES	National Pollutant Discharge Elimination System Program
NWI	National Wetland Inventory (Cowardin)
USC	United States Code
USCOE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
U.S. EPA	United States Environmental Protection Agency
USF&WS	United States Fish and Wildlife Service
WCA	Wetland Conservation Act



Index

A

Adopt-A-Wetland Program • 97, 110, 111. *See* Appendix G
Aquatic Plant Chemical Treatment Policy • 88
Aquatic Treatment in Bloomington Waters
 permit requirements • 91
Aquatic Weed Treatment Locations Map • 38
Aquatic Weed Treatment Ordinance • 95

B

Bloomington
 history • 1, 2
Bloomington History • *See* Presettlement Vegetation Map
Buckthorn and Purple Loosestrife Infestation Areas Map •
 103

C

Capital Improvements • 115
City
 ordinances • 92
 programs • 97
City Water Body/Drainage Area Map • xii
Comprehensive Surface Water Management Plan • 125

D

Drainage Areas • 21. *See* Appendix A
 11th Avenue • 23
 Brookside • 26
 Bush Lake • 29
 France Avenue Sump • 32
 Hampshire Pond • 35
 Hopkins Road • 38
 Hyland Hills - Colorado Ponds • 41
 Lower Nine Mile Creek • 44
 Mall of America • 47
 Overlook Lake • 50
 Oxboro Lake • 53
 Penn Lake • 56
 Riley - Purgatory Creek • 59
 Skriebakken • 62
 Smith Pond - Wrights' Lake • 65
 South Glen • 68
 South West Marsh Lake • 71
 Upper Nine Mile Creek • 74
 West Marsh Lake • 77
 York - Nine • 80

E

Education Program • 97. *See* Implementation Plan and
 Prioritization
Erosion Control Ordinance • 95

F

Flood Plain Ordinance • 96

G

Guidance for Evaluating Urban Storm Water and
 Snowmelt Runoff • *See* Appendix D

I

Individual wetland inventory data summary sheets • *See*
 Appendix A
Invasive and Exotic Species Control Program • 105

L

Lawn fertilizer application control ordinance • 93
Legal Requirements • 5

M

Maps • vi
Minneapolis 15 Minute Quad. Map • 4
Minnesota River Valley Wetlands • 125
Minnesota Routine Assessment Method, MNRAM. *See*
 Appendix C. • 11
Minnesota Rules
 part 8410.0170, subpart 4 • 5
 Section 8420.0650 • x

O

Operation and Maintenance • 121

P

Park Turf Maintenance Program • 104
Pond Restoration Assessment Policy
 existing • *See* Appendix E
Presettlement Vegetation Map • 3
Private Storm Sewer Facility Maintenance Ordinance • 94
Proposed Capital Improvements Map • vii. 115
Public Trap manholes Maintenance Program • 102

R

Regional Storm Water Quality • 125

S

Shoreland Ordinance • 96
Storm Water Pond Maintenance Program • 103
Street Sweeping Program • 101



U

USGS Minneapolis 15 minute Quad Map • 4

V

Vegetative Buffer Zone Policy • 83

W

Water Body Wetlands

agency jurisdiction • 8

Water Quality Studies • 91

Watercourse Wetlands

agency jurisdiction • 9

Watershed Districts and Management Organizations Map •
6

Weed Ordinance • 95. *See* Appendix F

Wetland Advisory Committee • 7

work plan • *See* Appendix B

Wetland Banking Locations

Lake Girard Park • 112

Smith Pond • 113

Wetland Banking Policy • 112

Wetland Classifications

Bloomington management classification • 20

Bloomington primary use • 15

Minnesota 7050 Rules • 14

wetland quality • 19

wetland sensitivity • 15

Wetland Management and Protection Plan

Goals • x

plan requirements, watershed districts • 5

Wetland Modification Assessment Policy • 86

Wetland Modification Policy • *See* Appendix E

Wetland Types

Circular 39 • *See* Appendix D

National Wetland Inventory • *See* Appendix D

