

Implementing the
MODEL STORMWATER ORDINANCE
To meet your community's water quality goals

Produced for
Northland Nonpoint Education for Municipal Officials (NEMO) Program

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Stormwater Model Ordinance Language

How and whether communities regulate stormwater affects the water quality of the community's lakes, rivers, streams, and wetlands. Communities in Minnesota regulate stormwater in a wide variety of ways; some communities have extensive stormwater ordinances, some have only the stormwater provisions in the Shoreland Ordinance, some include minimal stormwater provisions in their general development standards or erosion control standards. Recent changes in federal and state rules will increase the attention that communities must give to stormwater management, as implementation of the National Pollution Discharge Elimination Standards (NPDES) Phase II rules take effect. The implementation of the NPDES Phase II standards, coupled with education, offer communities an opportunity to create meaningful regulation that protects water quality, property values, and recreation and habitat resources in the community.

Background

Many communities do not have a separate stormwater ordinance. Stormwater is sometimes regulated through general development standards, sometimes as part of the subdivision ordinance, and sometimes only where state or federal requirements mandate stormwater controls (such as the Shoreland Ordinance or NPDES regulation). Communities should consider a separate stormwater ordinance to meet the community's goals for water resource protection. Water quality affects community property values and the viability of natural resources. As described in the Nonpoint Education for Municipal Official (NEMO) program's education materials, nonpoint pollution (i.e. sediment, nutrients, toxics, thermal stress, debris) from stormwater is the number one pollution problem in the nation. Nonpoint pollution is intermittently regulated and threatens the quality of our water resources. A stormwater ordinance sets a community-wide standard for managing stormwater, and complements education programs and incentives for maintaining water quality in the community.

In addition, U.S. Environmental Protection Agency (EPA) requires NPDES permits, and the Minnesota Pollution Control Agency (MPCA) has administered the program for many years. The Phase II NPDES standards include communities in the Municipal Separate Storm Sewer System (MS4) program, which require the development of stormwater and erosion and sediment control ordinances. MS4 communities are determined by the MPCA according to population, growth rate, discharge to sensitive waters, and other important factors that affect water quality. The effect of the new regulation is that stormwater plans and regulations must be in place for a large part of the State.

Model Ordinance Concept

Local governments are now coming to the understanding, supported by extensive study and scientific measurement, that management of stormwater before, during, and after construction is critical to protecting water quality. The planning and regulatory requirement of the NPDES Phase II rules offer an opportunity for communities to implement best management practices and proven technologies that make stormwater management a potential asset rather than another piece of costly infrastructure.

However, while the NPDES Phase II program will increase attention to stormwater management, the requirements offer only a basic set of regulatory tools and checkpoints, and do not address the unique needs of many Minnesota communities. Communities cannot rely solely on the NPDES regulations to meet local water quality goals. Communities must attend to the specific water resource protection tools that will protect their community assets, provide for local enforcement, and minimize regulatory burdens to developers, home and business owners, and the community at large.

NEMO Ordinance Education Goal

This stormwater ordinance model language is designed to assist local governments with applying the land use and water quality principles promoted in the NEMO program to their unique circumstances. The basic model ordinance language is adapted from a variety of existing model ordinances and design manuals from the MPCA, Department of Administration (Minnesota Planning), the Metropolitan Council, Dane County, Wisconsin, and other cold climate communities throughout the nation.

Applying NEMO Concepts to the Stormwater Regulation - Summary

The key NEMO land use/water quality points emphasized in the model stormwater ordinance are as follows:

- Providing standards for managing the velocity and volume of runoff;
- Making maximum use of infiltration, including standards and technologies, given the variety of soil types, topographies, and extent of existing development;
- Adapting standards and regulations for stormwater infrastructure for cold weather climates;
- Using buffers and vegetative management techniques; and
- Regulating the amount and types of impervious surfaces.

Stormwater Management Ordinance

XX.01 Statutory Authorization and Purpose

- A. Statutory Authorization.** This ordinance is adopted pursuant to the authorization and policies contained in Minnesota Statutes Chapters 103B, 105, 462, and 497, Minnesota Rules, Parts 6120.2500-6120.3900, and Minnesota Rules Chapters 8410 and 8420.
- B. Purpose.** The purpose of this ordinance is to set forth the minimum requirements for stormwater management that will diminish threats to public health, safety, public and private property and natural resources of the community by establishing performance standards including:
1. Protect life and property from dangers associated with flooding;
 2. Protect public and private property from damage resulting from runoff or erosion Protecting life and property from dangers associated with flooding;
 3. Ensure the annual runoff rates and volumes from post development site conditions mimic the annual runoff rates and volumes from predevelopment site conditions;
 4. Ensure site design minimizes the generation of stormwater and maximizes pervious areas for stormwater treatment;
 5. Promote regional stormwater management by watershed;
 6. Provide a single, consistent set of performance standards that apply to all developments;
 7. Protect water quality from nutrients, pathogens, toxics, debris, and thermal stress;
 8. Ensure no increase in temperature of stormwater post-construction in order to protect cold water resources;
 9. Promote infiltration and groundwater recharge;
 10. Providing a vegetated corridor (buffer) to protect water resources from development;

Adapted from an Example of an Urban Storm Water Pollution Control Ordinance for New Developments. (MPCA, 2002), Draft Model Environmental Management Ordinance (BWSR, 1998), Minneapolis Stormwater Ordinance (1999), Dane County Erosion Control and Stormwater Management Ordinance (2001), Maryland Design Manual (2000).

Generally, stormwater ordinances address two topics.

- 1. It identifies when and how developers or landowners must create a stormwater management plan. The ordinance identifies how the plan must meet performance standards for management, identify specific technologies and mitigation methods, and provide for ongoing maintenance*
- 2. It identifies enforcement procedures regarding the stormwater management plan. Enforcement includes the process for submitting and approving plans, points of enforcement by the local government, and financial assurances required by the community.*

Communities with Municipal Separate Storm Sewer Systems (MS4) as defined under the NPDES Phase II requirements have distinct issues to cover in a stormwater ordinance. For more information on the stormwater planning requirements of MS4 communities, go to the MPCA website at <http://www.pca.state.mn.us/water/stormwater/index.html>

11. Protect functional values of natural water courses and wetlands;
12. Provide plant and animal habitat and support riparian ecosystems;
13. Achieve an 80% reduction in sediment load rates to community waters compared to no controls for all new development, a 40% reduction in sediment load rates compared to no controls for all redevelopment and street reconstruction, and a 20% reduction in sediment load rates compared to no controls for existing developments;

C. Scope. No person shall develop any land for residential, commercial, industrial, or institutional uses without having provided stormwater management measures that control or manage runoff from such developments.

D. Definitions. Unless specifically defined below, words or phrases used in this Chapter shall be interpreted so as to give them the same meaning as they have in common usage and to give this Chapter its most reasonable application. For the purpose of this Chapter, the words “must” and “shall” are mandatory and not permissive. All distances, unless otherwise specified, shall be measured horizontally.

As used in this Chapter (see appendix of model ordinance), the following words and terms shall have the meanings ascribed to them in this Section . . .

The text in Section D. does not include definitions, due to the large number of terms that communities may wish to define. A compilation of definitions is provided in Appendix B of this model ordinance.

XX.02. STORMWATER MANAGEMENT

The following standards shall apply to all developments within the community:

A. Stormwater Management Plan. Every applicant for a building permit that involves disturbing 20,000 sq. ft. of land, subdivision approval, or a permit to allow land disturbing activities must submit a stormwater management plan to the community. No building permit, subdivision approval, or permit to allow land disturbing activities shall be issued until approval of this plan. All plans shall be consistent with National Pollution Discharge Elimination Permit (NPDES) requirements, and the filing or approval requirements of relevant Watershed Districts, Watershed Management Organizations, Ditch Authorities, Soil and Water Conservation Districts, or other regulatory bodies. All stormwater mitigation and management technologies shall be consistent with the Community Stormwater Management Design Manual (Design Manual). The Design Manual is the compilation of design, performance, and review criteria approved by the community and adopted by the council for stormwater management practices.

1. **General Policy on Stormwater Runoff Rates** - Site plans for new development of any kind will be assessed for stormwater quantity control and stormwater quality management. The general policy on stormwater runoff rates is to reduce the impacts of development by maintaining pre-development hydrological conditions. When a site is designed for new or renewed development, the hydrologic regime can be altered in the following ways:
 - a. Increased runoff volume
 - b. Increased imperviousness
 - c. Increased flow frequency, duration, and peak runoff rate
 - d. Reduce infiltration (groundwater recharge)
 - e. Modification of the flow pattern
 - f. Faster time to peak, due to shorter time of concentration through storm sewers
 - g. Loss of storage
 - h. Accelerated channel erosion

Section A. sets a 20,000 sq. ft. threshold for stormwater management plans. Communities may need to adjust this threshold up or down. 20,000 sq. ft. is an appropriate general threshold for urban areas or within the subwatershed of a sensitive natural area (such as a lake, trout stream, erosion-prone bluff or river bank, or high-quality wetland). The maximum threshold is one acre, as this is the minimum size area that is covered under NPDES Phase II permits.

Section A. references other regulatory authorities or oversight agencies that may have review or approval powers regarding how a development affects water quality or natural resources. Communities should note the specific names of the agencies or entities that overlap the regulatory authority of the local government rather than use the general list provided here.

Section A. references a Design Manual. Rather than incorporate recommended stormwater management technologies in the ordinance, communities can create or reference a separate design manual. The manual can define the appropriate stormwater management designs for each community, and be modified as new approaches are recognized. A list of model design manuals is included in Appendix C.

A.1. .concludes with a statement regarding a general policy of maintaining pre-development hydrological conditions (both volume and velocity). Not all the conditions noted in subsections a. through h. can be maintained at pre-development levels. Where a condition cannot be maintained, the plan should specifically address mitigation.

2. **Stormwater Management Plan Requirements** - The minimum requirements of the Stormwater Plan shall be consistent with the most recent version of the Minnesota Pollution Control Agency's NPDES Construction Permit Requirements
- a. Identification and description
 - i. Project name;
 - ii. Project type (residential, commercial, industrial, road construction, or other);
 - iii. Project location;
 - iv. County parcel identification number (legal description);
 - v. Names and addresses of the record owner, developer, land surveyor, engineer, designer of the plat, and any agents, contractors, and subcontractors who will be responsible for project implementation;
 - vi. Identification of the entity responsible for long term maintenance of the project. This includes a maintenance plan and schedule for all permanent stormwater practices;
 - vii. Phasing of construction with estimated start date, time frames and schedules for each construction phase, and completion date;
 - viii. Copies of permits or permit applications required by any other governmental entity or agencies including mitigation measures required as a result of any review for the project (e.g. wetland mitigation, EAW, EIS, archaeology survey, etc.)
 - b. Existing Conditions - A complete site plan and specifications, signed by the person who designed the plan shall be drawn to an easily legible scale, shall be clearly labeled with a north arrow and a date of preparation, and shall include, at a minimum, the following information:
 - i. Project map – An 8.5 by 11 inch United States Geological Survey (USGS) 7.5 minute quad or equivalent map indicating site boundaries and existing elevations.
 - ii. Property lines and lot dimensions.

Many of the stormwater plan requirements included in the model ordinance are directed toward urban developments or large rural developments. Communities also should consider ordinance language that addresses small new developments, new accessory buildings, and additions to existing homes or businesses in shoreland areas or sensitive watersheds. Communities can work with their SWCD to create technical assistance and education programs directed to help homeowners who are building in sensitive areas, but do not have the resources to complete a full stormwater management plan.

Also in reference to policy in A.1., the calculation of predevelopment hydrologic conditions usually uses the past 10 years of land use on the site as a baseline. In some cases, maximum protection is required (i.e sensitive water resource, habitat, or vegetation) and therefore, the community should consider using the more conservative "pre-settlement" runoff rates for these watersheds.

- iii. Existing zoning classifications for land within and abutting the development, including shoreland, floodway, flood fringe, or general floodplain, and other natural resource overlay districts.
- iv. All buildings and outdoor uses including all dimensions and setbacks.
- v. All public and private roads, interior roads, driveways and parking lots.
- vi. Identify all natural and artificial water features (including drain tiles) on site and within 1/2 mile of project boundary, including, but not limited to lakes, ponds, streams (including intermittent streams), and ditches. Show ordinary high water marks of all navigable waters, 100-year flood elevations and delineated wetland boundaries, if any. If not available, appropriate flood zone determination or wetland delineation, or both, may be required at the applicant's expense.
- vii. Map of watershed drainage areas, soil types, infiltration rates, depth to bedrock, and depth to seasonal high water table.
- viii. Steep slopes where areas of 12% or more existing over a distance for 50 feet or more.
- ix. Bluff areas where the slope rises at least 25 feet above the toe of the bluff and the grade of the slope from the toe of the bluff to a point 25 feet or more above the toe of the bluff averages 30% or greater.
- x. Wooded area and tree survey as defined by the zoning authority.
- xi. Agricultural Land preservation area(s), County Biological Survey sites, or other officially designated natural resource.
- xii. Hydrologic calculations for volume runoff, velocities, and peak flow rates by watershed, for the 2.0-yr, 10-yr, and 100-yr 24-hour storm events. These shall include:
 - Pre-existing peak flow rates.
 - Assumed runoff curve numbers.
 - Time of concentration used in calculations.

- If a flood insurance study has been done by the National Flood Insurance Program, the 100-year flood elevation with and without the floodway.
- xiii. Bankfull discharge rate (1.5 year recurrence interval) of creek or stream if there is a waterway on the site or if the site discharges directly to the waterway.
- c. Proposed Conditions - A complete site plan and specifications, signed by the person who designed the plan shall be drawn to an easily legible scale, shall be clearly labeled with a north arrow and a date of preparation, and shall include, at a minimum, the following information:
 - i. Project map – An 8.5 by 11 inch United States Geological Survey (USGS) 7.5 minute quad or equivalent map indicating site boundaries, proposed elevations, and areas not to be disturbed;
 - ii. Property lines and lot dimensions of plat.
 - iii. The dimensions and setbacks of all buildings and easements.
 - iv. The location and area of all proposed impervious surfaces including public and private roads, interior roads, driveways, parking lots, pedestrian ways, and rooftops. Show all traffic patterns and types of paving and surfacing materials.
 - v. Location, size, and approximate grade of proposed public sewer and water mains.
 - vi. Elevations, sections, profiles, and details as needed to describe all natural and artificial features of the project.
 - vii. Identify all natural and artificial water features on site and within 1/2 mile of project boundary, including, but not limited to lakes, ponds, streams (including intermittent streams), and ditches. Show ordinary high water marks of all navigable waters, 100-year flood elevations and delineated wetland boundaries, if any. If not available, appropriate flood zone determination or wetland delineation, or both, may be required at the applicant's expense.

A.2.c.ix. Refer to the NPDES Construction Permit for temporary basin design standards.

Many of the proposed conditions noted in Section A.2.c. will be addressed in the applicant's plat, subdivision, or PUD application. Including these provisions in the stormwater plan is not meant to be duplicative, but is intended to link the design of the site to water quality objectives. For example, appropriate street and right-of-way (ROW) widths, discrete use of sidewalks, consideration of appropriate setbacks and driveway lengths, and use of green space as green infrastructure (swales, rain gardens, etc, as noted in Section A.3.f..) are critical elements to managing stormwater and protecting water quality. Developers should identify these elements in their stormwater plan in order for the community to assess the impact of the development on water quality.

- viii. Hydrologic calculations for volume runoff, velocities, and peak flow rates by watershed, for the 2.0-yr, 10-yr, and 100-yr 24-hour storm events. These shall include:
- Post construction peak flow rates with no detention.
 - Post construction peak flow rates with detention.
 - Assumed runoff curve numbers.
 - Time of concentration used in calculations.
 - If a flood insurance study has been done by the National Flood Insurance Program, the 100-year flood elevation with and without the floodway.
- ix. Hydrologic calculations for retaining soil particles greater than 5 microns (80% reduction) for new construction sites and greater than 20 microns (40% reduction) for redevelopment sites resulting from a one-year 24-hour storm event.
- x. Bankfull discharge rate (1.5 year recurrence interval) of creek or stream if there is a waterway on the site or if the site discharges directly to the waterway.
- xi. Locations of all stormwater management practices, infiltration areas, and areas not to be disturbed during construction
- xii. Steep slopes where areas of 12% or more existing over a distance for 50 feet or more.
- xiii. Location of temporary sedimentation basins - If more than 10 acres are disturbed and drained to a single point of discharge temporary sediment basins must be installed, however, if the site has sensitive features as determined by the community or the potential of off site impacts, then temporary sediment basins must be installed to protect the resource. This is determined on a site by site basis. When site restrictions do not allow for a temporary sediment basin, equivalent measures such as smaller basins, check dams, and vegetated buffer strips can be included.

- xiv. Location and engineered designs for structural stormwater management practices including stormwater treatment devices that remove oil and floatable material (e.g., basin outlets with submerged entrances).
 - xv. Normal water level, high water level, and emergency overflow elevations for the site.
 - xvi. For discharges to cold water fisheries, a description and plans to control temperature from stormwater runoff.
 - xvii. Floodway and flood fringe boundary, if available.
- d. All proposed stormwater practices, hydrologic models, and design methodologies shall be reviewed by community and certified for compliance by the community in accordance with their plans and specifications.

B. Stormwater Management Performance Standards and Design Criteria

The applicant shall consider reducing the need for stormwater management performance standards by incorporating the use of natural topography and land cover such as natural swales and depressions as they exist before development to the degree that they can accommodate the additional flow of water without compromising the integrity or quality of the receiving waterbody. The development shall minimize impact to significant natural features. Review the site for steep slopes (greater than 12%), wetlands, wooded areas of significance, rare and endangered species habitat, areas designated by the County Biological Survey, metro greenways, or County parks and open space. These areas should not be developed. The development shall limit impervious surface coverage. Impervious surface coverage of a site shall not exceed twenty five percent (25%) of the site area unless stormwater is conveyed to an approved, on-site or regional stormwater ponding/retention facility designed to accommodate the increased runoff prior to discharge from the site into public waters or wetlands. In designated shoreland areas the development shall meet the impervious surface requirements of the Shoreland Ordinance regardless of

Section B. NEMO guidelines note that a watershed with 25% impervious coverage is a degraded watershed. The maximum impervious surface threshold in 3.e. should be set by the community in accordance with their goals for watershed protection. Based on scientific research, NEMO recommends high priority watersheds be less than 10% impervious surfaces, moderate priority watersheds be 10% – 25% impervious surfaces, and low priority watersheds be 25% or greater with the adoption of best management practices and restoration projects, if possible

Section B uses a slope gradient of 12% to define steep slopes. State shoreland rules use a grade of 12% to define highly erodible soils. Steep slopes outside of shoreland areas are sometime defined under different grade standards, but 12% should cover most situations with erodible soils.

conveyance systems. Proposed design, suggested location and phased implementation of effective, practicable stormwater management measures for plans shall be designed, engineered and implemented to achieve the following results:

1. **Volume Control** - At a minimum, the first half-inch of runoff from a 24-hour storm is infiltrated unless the site is within 2,000 feet of a special water where the first 1-inch of runoff from a 24-hour storm event shall be infiltrated. Calculations shall use the appropriate Hydrologic Soil Group Classification and saturated infiltration rates unless specific rates are measured by a registered soil scientist.
2. **Sediment Control**
 - a. For new construction, design practices to retain soil particles greater than 5 microns on the site (80% reduction) resulting from a one-year 24-hour storm event, according to approved procedures, and assuming no sediment resuspension;
 - b. For redevelopment and street reconstruction resulting in exposed surface parking lots and associated traffic areas, design practices to retain soil particles greater than 20 microns on the entire site (40% reduction) resulting from a one-year 24-hour storm event, according to approved procedures, and assuming no sediment resuspension. Under no circumstances shall the site's existing sediment control level or trapping efficiency be reduced as a result of the redevelopment.
3. **Oil and grease control** - For all stormwater plans for commercial or industrial developments and all other uses where the potential for pollution by oil or grease, or both, exists, the first 0.5 inches of runoff will be treated using the best oil and grease removal technology available. This requirement may be waived by the plan reviewer only when the applicant can demonstrate that installation of such practices is not necessary.
4. **Runoff rate control – hydrologic calculations** - All runoff calculations shall be according to the methodology described in the Natural Resources Conservation Service's Technical Release 55, "Urban Hydrology for Small Watersheds" (commonly known as TR-55), or other methodology approved by the community. For agricultural land subject to this section, the maximum runoff curve number

Section B.1 includes a reference to special waters. Appendix A of the NPDES construction permit defines special waters and additional BMP requirements to be use on projects draining to a discharge point on the project that is within 2,000 feet of a special water and flows to that special water. The NPDES language on special waters is included in Appendix A of this ordinance.

Section B.2. Some communities have set a goal for existing sites as well as new construction and redevelopment. These communities require an existing development to retain soil particles greater than 40 microns on the site (20% reduction) resulting from a one-year 24-hour storm event in order to improve water quality.

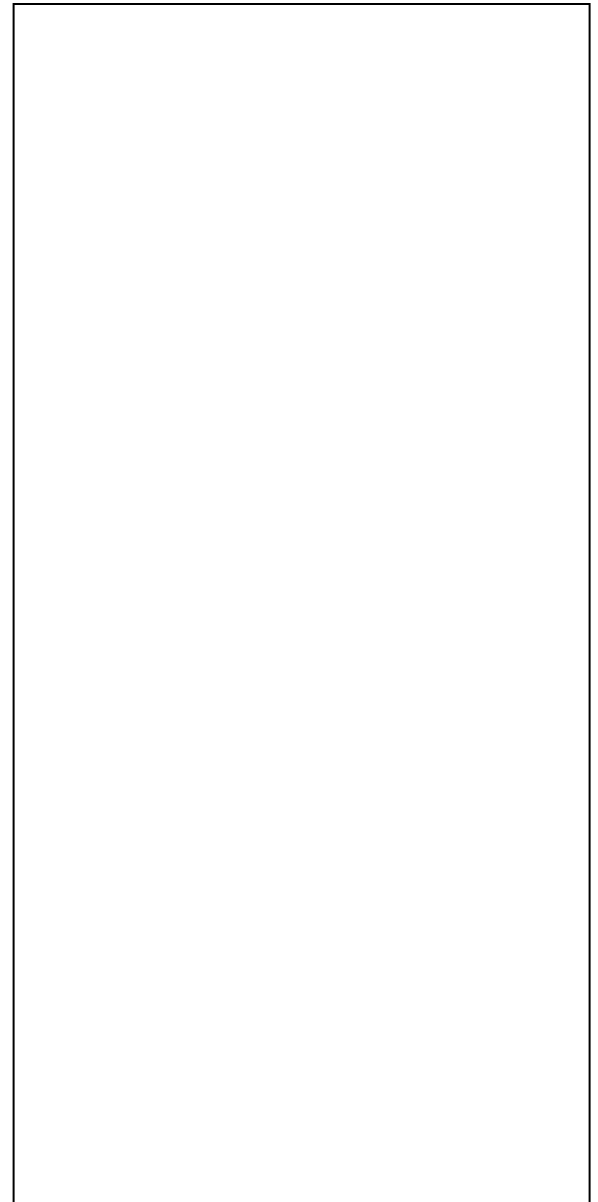
Section B.4. Some communities use curve numbers related to pre-settlement conditions. In this case, a meadow-continuous grass, protected from grazing and generally mowed for hay is a similar scenario used in TR-55. This number relates to a maximum runoff curve number of 30 for HSG A, 58 for HSG B, 71 for HSG C, and 78 for HSG D. Woods in good condition relates to a maximum runoff curve number of 30 for HSG A, 55 for HSG B, 70 for HSG C, and 77 for HSG D.

(RCN) used in such calculations shall be 51 for Hydrologic Soil Group (HSG) A, 68 for hydrologic soil group B, 79 for HSG C, and 84 for HSG D. The TR-55-specified curve numbers for other land uses shall be used. Heavily disturbed sites will be lowered one permeability class for hydrologic calculations. Lightly disturbed areas require no modification. Where practices have been implemented to restore soil structure to pre-developed conditions, no permeability class modification is required.

5. **Runoff rate control - design standards** - All stormwater facilities shall be designed, installed and maintained to effectively accomplish the following:
 - a. Maintain predevelopment peak runoff rates for the 2-year, 24-hour storm event.
 - b. Maintain predevelopment peak runoff rates for the 10-year, 24-hour storm event. At a minimum the storm sewer conveyance system shall be designed for this storm event. Low areas must have an acceptable overland drainage route with the proper transfer capacity when the storm event is exceeded.
 - c. Safely pass the 100-year, 24-hour storm event.
6. **Outlets** - Discharges from new construction sites must have a stable outlet capable of carrying designed flow at a non-erosive velocity. Outlet design must consider flow capacity and flow duration. This requirement applies to both the site outlet and the ultimate outlet to stormwater conveyance or waterbody.
7. **Minimize impervious surface area and maximize infiltration** - The project shall use existing natural drainage ways and vegetated soil surfaces to convey, store, filter, and retain stormwater runoff before discharge into public waters or a stormwater conveyance system (permanent pool areas of wet ponds tend to lose infiltration capacity and will not be accepted as an infiltration practice). The applicant shall limit the impervious surface of the developed site or subdivision by incorporating the following design considerations, consistent with zoning, subdivision, and PUD requirements:
 - a. Narrowing street widths
 - b. Reducing parking lot space
 - c. Sidewalk locations

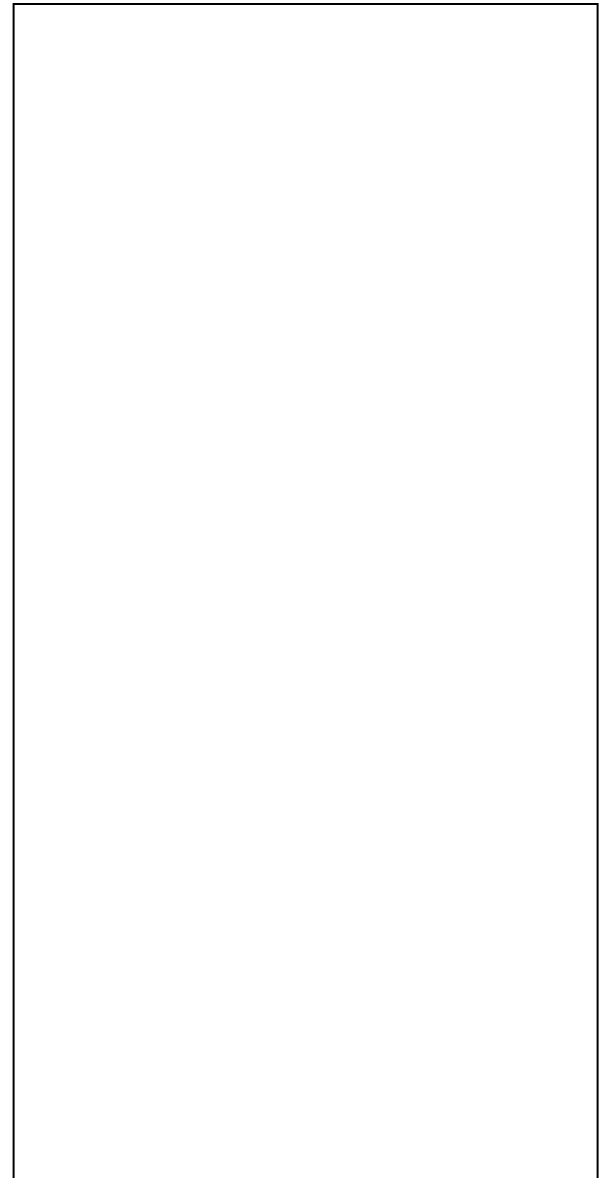
Section B. 7. discusses alternative design standards to reduce impervious surfaces and manage stormwater. These and other alternative design standards that reduce impervious area may be found in Better Site Design: A Handbook for Changing Development Rules in Your Community. Center for Watershed Protection, August 1998. Many of these design issues are addressed in greater detail in the subdivision ordinance or general development.

- d. Reducing setbacks and driveways
 - e. Maximizing open space while incorporating smaller lot sizes to conserve natural areas and reduce the amount of stormwater runoff generated at the site
 - f. Using landscaping and soils to treat and infiltrate stormwater runoff.
 - g. Eliminate curb and gutter where practicable, and use vegetated swales or equivalent.
 - h. Look for vegetated areas that can filter sheet flow, removing sediment and other pollutants, and increasing the time of concentration.
 - i. Disconnect impervious areas by allowing runoff from small impervious areas to be directed to pervious areas where it can be infiltrated or filtered.
 - j. All runoff from downspouts, driveways and other impervious areas shall be directed to pervious surfaces, where feasible, or unless the applicant can demonstrate that the practice is likely to result in groundwater contamination.
 - k. Increase buffers around streams, steep slopes, and wetlands to protect from flood damage and provide additional water quality treatment.
 - l. Use shared parking facilities consistent with zoning requirements.
 - m. Install semi-permeable/permeable or porous paving.
8. **Pond Requirements** – For all projects creating more than one acre of impervious surface, ponding shall be required. At a minimum all pond design specifications shall conform to the current version of the approved Community Design Manual and the current requirements found in the NPDES construction permit. In addition the following are required:
- a. All stormwater ponds shall be provided with a forebay area to provide for the settlement of fine sand sized particles.
 - b. Pond side slopes shall not exceed 4 feet horizontal to 1 foot vertical (4:1) and should provide a bench just at the normal water level with side slopes no less than 10 feet horizontal to 1 foot vertical (10:1) for safety considerations.
 - c. All public and private owned stormwater management facilities shall provide an unobstructed access path (minimum of 20 feet) capable of supporting light truck traffic during normal weather for the purpose of conducting inspections of the facility and maintenance thereof. No private stormwater facility may be



approved unless an easement is provided to community allowing for access for maintenance and inspection. Maintenance agreements before, during, and after development are also required.

- d. To provide proper protection for adjacent property within the first tier from the pond, the design storm interval for the ponding area is a 100-year, 24-hour storm with correctly sized conveyances for 100-yr, 24-hour storm flows consistent with standards used by the cities, townships, counties, state, and federal agencies in planning for the flood protection of homes and public facilities. As an additional safety factor, the lowest floor and low opening elevation of a structure in a development should be at least three feet above the 100-year 24-hour elevation of the pond. The low floor and low opening elevation of structures that are adjacent to ponds should be certified by the builder during basement construction to ensure adequate freeboard. An emergency overflow system must be established for the health and safety of the area. If the area is landlocked (no natural drainage outlet), the low floor and low opening elevation of structures should be five feet above the calculated high water level. In consideration of the groundwater table, the low floor and low opening elevation of structures should be four feet above the normal groundwater elevation. The table below gives the recommended flood control and freeboard criteria.
- e. Floodplain filling shall be consistent with a state and FEMA approved floodplain ordinance and shall not cause a net decrease in flood storage capacity below the projected 100-year flood elevation unless it is shown that the proposed filling, together with the filling of all other properties on the affected reach of the waterbody to the same degree of encroachment as proposed by the applicant, will not cause high water or unduly aggravate flood flows to the point of flooding on other properties. The allowable fill area shall be calculated by a professional engineer registered in the State of Minnesota.



Condition	Water Bodies with Piped Outlets (includes graded areas that will create ponded conditions during the 100-yr storm event)	Landlocked Water Bodies	Flowing Channels Passing Through Roadways
New Road Construction (low point in roadway)	No Lower than the 100-yr flood level	1 foot above the 100-yr 24-hr elevation	No lower than the 50-yr flood level. Overflow swale for flows over the 50-yr flood level to protect downstream roadway embankment
Existing Roadways(low point in roadway)	If the existing road is below the 100-yr flood level, the community should require a variance for the road. This will allow for proper review of safety standards.	No lower than 10 inches below 100-yr 24-hr elevation	No lower than the 50-yr flood level.
New construction and additions to existing structures (low floor elevation and lowering opening of building) (NOTE: Areas delineated as a state approved FEMA floodplain ordinance will likely have additional standards for the lowest floor including basement elevations in the ordinance. If the structure is in a floodplain, often the floodplain ordinance will have more restrictive standards requiring the lowest floor including basement elevation to start at one foot above the mapped 100 year floodplain.)	Minimum of 3 feet above 100-yr, 24-hr storm event. Additional recommendations: 1. At least 1 foot above the emergency overflow elevation. 2. At least 4 feet above normal groundwater elevation. 3. At least 2 feet above hydric or mottled soils elevation.	Minimum of 5 feet above 100-yr 24-hr elevation.	N/A
Existing Structures (low floor elevation and low opening of building)	Existing structures should require a proper review of safety standards, but in any event must be a minimum of 2 feet above the 100-yr, 24-hr storm event.	Minimum of 5 feet above 100-yr 24-hr elevation.	N/A

The starting water surface elevation and the duration storm used to determine the flood level depends on the watershed characteristics. Usually several duration storms are analyzed and the "critical event" is the duration that causes the highest flood stage. If the basin has an outlet the duration is typically the 24 hr precipitation and 10-day runoff events. The starting elevation can be the average summer or spring elevation. If data are insufficient to calculate an average, use the outlet elevation or the Ordinary High Water Level (OHW).

Landlocked lakes (lakes without an outlet) present a different situation. The 24 hr storm event is then inappropriate for determining the 100-yr flood elevation. Washington County (Minnesota) has developed a process for identifying basins where the appropriate duration storm is the 10-day runoff event. The starting water surface elevation is the OHW and the storm is the 100-yr 10-day runoff event; if the computed elevation exceeded the run out elevation, the 10-day event elevation can be used as the 100-yr flood elevation. If the elevation is below the runout elevation, the 10-day event would be inappropriate. Washington County then develops a long term XP-SWMM or HEC-HMS model. The model is calibrated to 50 yrs of data. Some of the data points are estimated using georectified historical aerial photos and Washington County's 2-ft digital elevation models. The model is run using 55-60 yrs of precipitation data. A statistical analysis on the peak annual elevations is generated by the long term model. The first 5 years of precipitation data are adequate to give a good estimate of the starting water surface elevation.

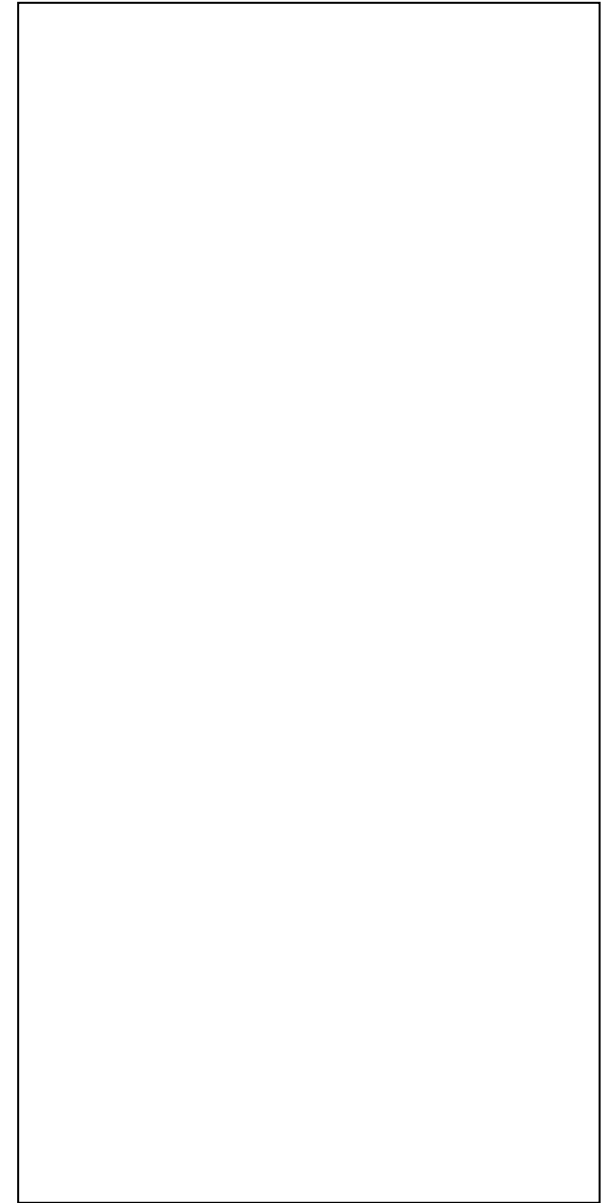
9. **Minimum Protection for Rivers, Lakes and Wetlands** - Rivers, streams, lakes, and wetlands shall be protected from runoff generated during construction and after completion of the development. Runoff shall not be discharged directly into wetlands without appropriate quality and quantity runoff control, depending on the individual wetland's vegetation. Wetlands must not be drained or filled, wholly or partially, unless replaced by either restoring or creating wetland areas of at least equal public value. Compensation, including the replacement ratio and quality of replacement should be consistent with the requirements outlined in the Board of Water and Soil Resources rules that implement the Minnesota Wetland Conservation Act 1991 including any and all amendments to it.
10. **Buffer protection for Rivers, Streams, Lakes, and Wetlands** – A minimum 40-foot buffer strip around wetlands, and a 100-foot buffer along streams, rivers, lakes, and special waters identified in the NPDES construction permit shall be maintained at all times using native vegetation. Buffer width shall be increased by at least two feet for every one percent of slope for the surrounding land along rivers, streams, and lakes and four feet for every one percent slope for wetlands. The community may allow buffer area averaging in cases where averaging will provide additional protection to either the resource or environmentally valuable adjacent upland habitat, provided that the resources total buffer area remains the same. Care should be taken in averaging so that the buffers usefulness is not short circuited. Detailed buffer design is site specific, and therefore, the community can require a larger buffer than the minimum specified. The applicant shall maintain the buffer for the first year after completion of the project. Drain tiles will short circuit the benefits of buffers - Therefore, drain tiles on the project site shall be identified and rendered inoperable.
11. **Special Waters Requirements**
- There shall be no increase in either the volume or rate of stormwater runoff for the one and two year 24-hour storm event including trout streams.
 - If the soil is not suitable for stormwater infiltration and/or evaporation/transpiration techniques (soils with permeability values less than

Native Minnesota plant species have root systems and growth characteristics that are well suited to buffer functions. By way of comparison, deep rooted native grasses have a root system that dramatically greater than turf grass. Useful guides for species selection includes the Minnesota Department of Transportation's seeding manual, and the Minnesota Pollution Control Agency's Plants for Stormwater Design. Good plant species selection stresses diversity and allows plant succession and zoning of species from wet soil preference to drier upland species. The Minnesota Department of Natural Resources requires permits when vegetation is introduced downgrade of a water's "ordinary high water mark." The Minnesota Department of Natural Resources' area hydrologist defines the ordinary high water mark. Planting permits are obtained from the Minnesota Department of Natural Resources regional fisheries offices.

NPDES construction permit also requires special provisions for projects that involve environmental review, endangered and threatened species and historical sites.

HSG C soils (less than 2.5 inches per hour) as defined by the Natural Resources Conservation Service), the community may require reduced volume control.

- c. The permanent storm water management system must be designed such that the discharge from the project will minimize any increase in the temperature of trout stream receiving waters resulting from the 1, and 2-year 24-hour precipitation events. This includes all tributaries of designated trout streams within the section that the trout stream is located. Projects that discharge to trout streams must minimize the impact using one or more of the following measures, in order of preference:
 - i. Minimize new impervious surfaces.
 - ii. Minimize the discharge from connected impervious surfaces by discharging to vegetated areas, or grass swales, and through the use of other non-structural controls.
 - iii. Infiltration or evapotranspiration of runoff in excess of pre-project conditions (up to the 2-year 24-hour precipitation event).
 - iv. If ponding is used, the design must include an appropriate combination of measures such as shading, filtered bottom withdrawal, vegetated swale discharges or constructed wetland treatment cells that will limit temperature increases. The pond should be designed to draw down in 24 hours or less.
 - v. Other methods that will minimize any increase in the temperature of the trout stream.
- d. If the proposed project site includes a special water tributary that currently experiences erosion and/or sedimentation problems, the applicant must work with community to include channel modifications in the project that will also address the existing erosion and/or sedimentation problem.
- e. Permanent buildings erected on sites that border directly on and all tributaries directly to a special water shall not be occupied until the permanent vegetative cover has been established. Such cover must meet this ordinance's definition of "final stabilization".



12. **Regional Ponding** - The local authority may establish off-site stormwater management and associated fees, provided that provisions are made to manage stormwater by an off-site facility, and provided that all of the following conditions for the off-site facility are met:
- a. The facility is in place;
 - b. The facility is designed and adequately sized to provide a level of stormwater control that at least meets the ordinance standards
 - c. The local approval authority is satisfied that the facility has a legally obligated entity responsible for its long-term operation and maintenance.

C. Stormwater and Urban Runoff Pollution Control

1. Illegal Disposal

- a. No person shall throw, deposit, place, leave, maintain, or keep or permit to be thrown, placed, left, maintained or kept, any refuse, rubbish, garbage, or any other discarded or abandoned objects, articles, or accumulations, in or upon any street, alley, sidewalk, storm drain, inlet, catch basin conduit or drainage structure, business place, or upon any public or private plot of land in community, so that the same might be or become a pollutant, except in containers, recycling bags, or other lawfully established waste disposal facility.
- b. No person shall intentionally dispose of grass, leaves, dirt, or other landscape debris into a water resource buffer, street, road, alley, catch basin, culvert, curb, gutter, inlet, ditch, natural watercourse, flood control channel, canal, storm drain or any fabricated natural conveyance.

2. Illicit Discharges and Connections

- a. No person shall cause any illicit discharge to enter the municipal storm water system unless such discharge: (1) consists of non-storm water that is authorized by an NPDES point source permit obtained from the MPCA; or (2) is associated with fire fighting activities; or (3) is otherwise in compliance with community chapter referral, if necessary).
- b. No person shall use any illicit connection to intentionally convey non-storm water to community storm water system.

3. **Good Housekeeping Provisions** - Any owner or occupant of property within community shall comply with the following good housekeeping requirements:
- a. No person shall leave, deposit, discharge, dump, or otherwise expose any chemical or septic waste in an area where discharge to streets or storm drain system may occur. This section shall apply to both actual and potential discharges.
 - i. For pools, water should be allowed to sit seven days to allow for chlorine to evaporate before discharge. If fungicides have been used, water must be tested and approved for discharge to the wastewater treatment plant.
 - b. Runoff of water from residential property shall be minimized to the maximum extent practicable. Runoff of water from the washing down of paved areas in commercial or industrial property is prohibited unless necessary for health or safety purposes and not in violation of any other provisions in community codes.
 - c. Storage of Materials, Machinery, and Equipment
 - i. Objects, such as motor vehicle parts, containing grease, oil or other hazardous substances, and unsealed receptacles containing hazardous materials, shall not be stored in areas susceptible to runoff.
 - ii. Any machinery or equipment that is to be repaired or maintained in areas susceptible to runoff shall be placed in a confined area to contain leaks, spills, or discharges.
 - d. Removal of Debris and Residue - Debris and residue shall be removed, as noted below:
 - i. All motor vehicle parking lots shall be swept, at a minimum of twice a year to remove debris. Such debris shall be collected and properly disposed. However, parking lots are not required to be swept for one month following a day on which precipitation of one-half inch or more occurs.
 - ii. Fuel and chemical residue or other types of potentially harmful material, such as animal waste, garbage or batteries, which is located in an area susceptible to runoff, shall be removed as soon as possible and disposed of properly. Household hazardous waste may be disposed of through

community collection program or at any other appropriate disposal site and shall not be place in a trash container.

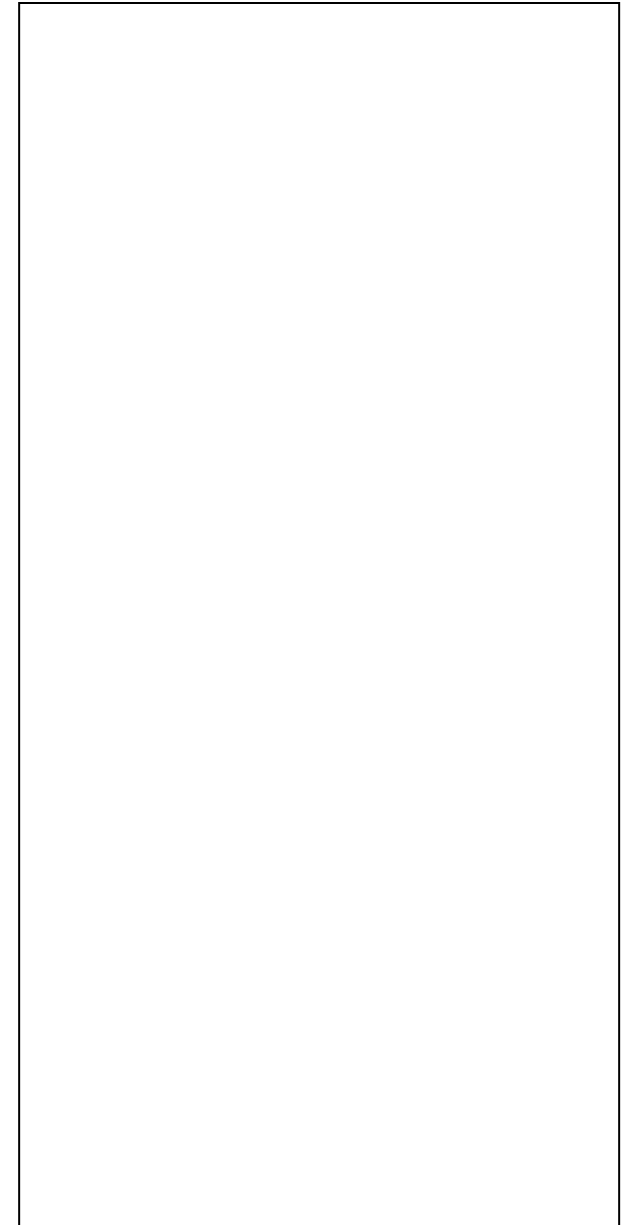
- D. Review** - Community shall review the stormwater management plan. This review shall be completed within fourteen (14) days of receiving the plan from the developer.
1. **Permit Required.** If community determines that the stormwater management plan meets the requirements of this ordinance, community shall issue a permit valid for a specified period of time, that authorizes the land disturbance activity contingent on the implementation and completion of this plan.
 2. **Denial.** If community determines that the stormwater management plan does not meet the requirements of this ordinance, community shall not issue a permit for the land disturbance activity. This plan must be resubmitted for approval before the land disturbance activity begins. All land use and building permits shall be suspended until the developer has an approved stormwater management plan.
- E. Modification of Plan.** An approved stormwater management plan may be modified on submission of an application for modification to community, and after approval by the community. In reviewing such an application, the community may require additional reports and data.
- F. Variance Requests.** The community may grant a variance on a case-by-case basis. The content of a variance shall be specific, and shall not affect other approved provisions of a SWPPP.
1. The variance request shall be in writing and include the reason for requesting the variance.
 2. Economic hardship is not sufficient reason for granting a variance.
 3. Community shall respond to the variance request in writing and include the justification for granting or denying the request.
- G. Financial Securities.** The applicant shall install or construct, or pay community fees for all stormwater management performance standards necessary to maintain design criteria as given under Section A, B, and C. As designated by the community under a stormwater utility fee, an applicant may be required to provide an in-kind or monetary contribution to the development and maintenance of community stormwater

Section G. discusses a stormwater utility fee. Creation and administration of a stormwater utility is a reasonable option for all cities to consider. Other types of management entities may be substituted for a stormwater utility in non-urban areas, such as watershed districts, lake associations, and fee-based management of stormwater facilities by SWCDs.

management facilities designed to serve multiple land disturbing and development activities undertaken by one or more persons.

H. Inspections and Enforcement. Follow up inspections will be performed by the community on a regular basis during construction to ensure that stormwater management plan measures are properly installed and maintained. In all cases the inspectors will attempt to work with the applicant or developer to maintain proper stormwater management.

1. **Construction stop order** -The community may issue construction stop orders until stormwater management measures meet specifications. A second stormwater management inspection must then be scheduled and passed before the final inspection will be done.
2. **Perimeter breach** - If stormwater management measures malfunction and breach the perimeter of the site, enter streets, other public areas, or waterbodies, the applicant shall immediately develop a cleanup and restoration plan, obtain the right-of-way from the adjoining property owner, and implement the cleanup and restoration plan within 48 hours of obtaining permission. If in the discretion of the community, the applicant does not repair the damage caused by the stormwater runoff the community can do the remedial work required and charge the cost to the applicant.
3. **Actions to ensure compliance** -The community can take the following action in the event of a failure by applicant to meet the terms of this ordinance:
 - a. Withhold inspections or issuance of certificates or approvals
 - b. Revoke any permit issued by the community to the applicant
 - c. Conduct remedial or corrective action on the development site or adjacent site affected by the failure
 - d. Charge applicant for all costs associated with correcting the failure or remediating damage from the failure. If payment is not made within thirty days, payment will be made from the applicant's financial securities.
 - e. Bring other actions against the applicant to recover costs of remediation or meeting the terms of this ordinance.



- f. Any person, firm or corporation failing to comply with or violating any of these regulation, shall be deemed guilty of a misdemeanor and be subject to a fine or imprisonment or both. Each day that a separate violation exists shall constitute a separate offense.

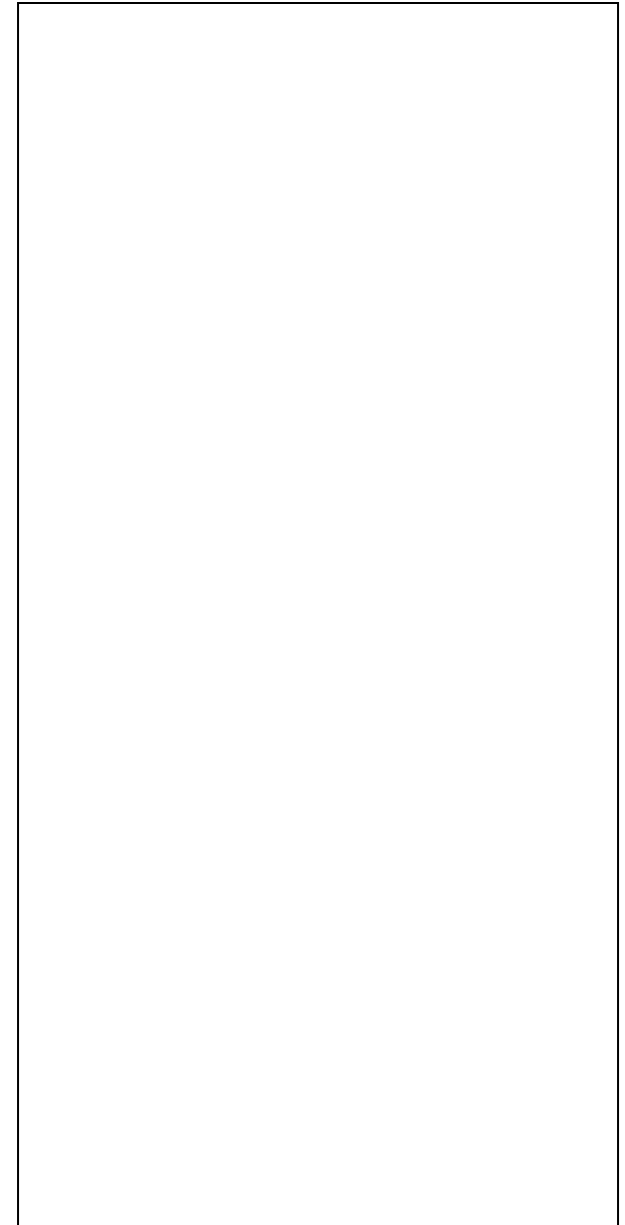
I. Maintenance of Stormwater Facilities. The community requires that stormwater facilities be maintained.

1. **Private Stormwater Facilities** - All private stormwater facilities shall be maintained in proper condition consistent with the performance standards for which they were originally designed.
2. **Removal of settled materials** - All settled materials from ponds, sumps, grit chambers, and other devices, including settled solids, shall be removed and properly disposed of on a five (5) year interval. One to five (5) year waivers from this requirement may be granted by the community when the owner presents evidence that the facility has additional capacity to remove settled solids in accordance with the original design capacity.
3. **Maintenance plan required** - No private stormwater facilities may be approved unless a maintenance plan is provided that defines who will conduct the maintenance, the type of maintenance and the maintenance intervals.
4. **Maintenance-friendly design** - All stormwater facilities must be designed to minimize the need for maintenance, to provide easy vehicle and personnel access for maintenance purposes, and be structurally sound. It shall be the responsibility of the applicant to obtain any necessary easements or other property interests to allow access to the facilities for inspection or maintenance.
5. **Inspection** - The community shall inspect all stormwater facilities during construction, during the first year of operation, and at least once every five years thereafter.
6. **Maintenance of Publicly Owned Stormwater Facilities** - The community shall annually perform the maintenance of the in place stormwater facilities within the community as provided for in the local water management plan or watershed management plan of affected watershed management organizations if there is no approved local water management plan. Further, the community shall notify the

owners of other publicly owned stormwater facilities if scheduled maintenance is needed according to periodic site inspections or maintenance plans on file.

J. Inventory Of Stormwater Facilities. Upon adoption of this Chapter, community shall inventory and maintain a database for all private and public stormwater facilities within community requiring maintenance to assure compliance with this ordinance. The community shall notify owners of public and private stormwater facilities of the need for conducting maintenance at least every five years, starting in _____.

K. Severability. The provisions of this ordinance are severable, and if any provisions of this ordinance, or application of any provision of this ordinance to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this ordinance must not be affected thereby.



APPENDIX A. SPECIAL WATERS

A. GENERAL REQUIREMENTS

All requirements in this Appendix are in addition to **BMPs** already specified in the permit. Where provisions of Appendix A conflict with requirements elsewhere in the permit the provisions in Appendix A take precedence. All **BMPs** used to comply with this Appendix must be documented in the **SWPPP** for the project. If the terms and conditions of this Appendix cannot be met, an individual permit will be required in accordance with Minn. R. ch. 7001.

B. REQUIREMENTS FOR DISCHARGES TO SPECIAL WATERS

Additional **BMPs** together with enhanced runoff controls, are required for discharges to the following special waters (part B.1 through B.8 of Appendix A). The **BMPs** identified for each special water are required for those areas of the project draining to a discharge point on the project that is within 2000 feet of a special water and flows to that special water.

1. **Wilderness areas:** Boundary Waters Canoe Area Wilderness; Voyageurs National Park; Kettle River from the site of the former dam at Sandstone to its confluence with the Saint Croix River; Rum River from Ogechie Lake spillway to the northernmost confluence with Lake Onamia. Discharges to these waters must incorporate the **BMPs** outlined in C.1, C.2, C.3 and C.4 of this appendix.
2. **Mississippi River:** Those portions from Lake Itasca to the southerly boundary of Morrison County that are included in the Mississippi Headwaters Board comprehensive plan dated February 12, 1981. Discharges to these waters must incorporate the **BMPs** outlined in C.1, C.2 and C.3 of this appendix.
3. **Scenic or recreational river segments:** Saint Croix river, entire length; Cannon River from northern city limits of Faribault to its confluence with the Mississippi River; North Fork of the Crow River from Lake Koronis outlet to the Meeker-Wright county line; Kettle River from north Pine County line to the site of the former dam at Sandstone; Minnesota River from Lac qui Parle dam to Redwood County state aid highway 11; Mississippi River from county state aid highway 7 bridge in Saint Cloud to northwestern city limits of Anoka; and Rum River from state aid Highway

27 bridge in Onamia to Madison and Rice streets in Anoka. Discharges to these waters must incorporate the **BMPs** outlined in C.1, C.2 and C.3 of this appendix.

4. **Lake Superior:** (prohibited and restricted) Discharges to Lake Superior must incorporate the **BMPs** outlined in C.1, C.2 and C.3 of this appendix.
5. **Lake Trout Lakes:** Identified in Minn. R. 7050.0470, including those inside the boundaries of the Boundary Waters Canoe Area Wilderness and Voyageurs National Park. Discharges to these waters must incorporate the **BMPs** outlined in C.1, C.2, C.3 and C.4 of this appendix.
6. **Trout Lakes:** identified in Minn. R. 6264.0050, subp. 2. Discharges to these waters must incorporate the **BMPs** outlined in C.1, C.2, C.3, and C.4 of this appendix.
7. **Scientific and natural areas:** Boot Lake, Anoka County; Kettle River in sections 15, 22, 23, T 41 N, R 20, Pine County; Pennington Bog, Beltrami County; Purvis Lake-Ober Foundation, Saint Louis County; Waters within the borders of Itasca Wilderness Sanctuary, Clearwater County; Iron Springs Bog, Clearwater County; Wolsfeld Woods, Hennepin County; Green Water Lake, Becker County; Blackdog Preserve, Dakota County; Prairie Bush Clover, Jackson County; Black Lake Bog, Pine County; Pembina Trail Preserve, Polk County; and Falls Creek, Washington County. Discharges to these waters must incorporate the **BMPs** outlined in C.1, C.2, C.3 and C.4 of this appendix.
8. **Trout Streams:** listed in Minn. R. 6264.0050, subp. 4. Discharges to these waters must incorporate the **BMPs** outlined in Appendix A C.1, C.2, C.3, and C.5 of this appendix.

C. ADDITIONAL BMPS FOR SPECIAL WATERS

For the BMPs described in C.2, C.4 and C.5 of this Appendix:

Where the proximity to bedrock precludes the installation of any of the permanent **storm water** management practices outlined in Appendix A, other treatment such as grassed swales, smaller ponds, or grit chambers is required prior to discharge to **surface waters**.

For work on road projects where the lack of right of way precludes the installation of any of the permanent **storm water** management practices outlined in Appendix A, other treatment such as grassed swales, smaller ponds, or grit chambers is required prior to discharge to **surface waters**.

1. During construction.
 - a. All exposed soil areas with a slope of 3:1 or steeper, that have a continuous positive slope to a special water must have **temporary erosion protection** or **permanent cover** within 3 days after the area is no longer actively being worked. All other slopes that have a continuous positive slope to a special water must have **temporary erosion protection** or **permanent cover** within 7 days after the area is no longer actively being worked.
 - b. Temporary sediment basin requirements described in Part III.B.1-5 must be used for common drainage locations that serve an area with five (5) or more acres disturbed at one time.
2. Post construction. The **water quality volume** that must be treated by the project's permanent **storm water** management system described in Part III.C. shall be one (1) inch of runoff from the new **impervious surfaces** created by the project.
3. Buffer zone. An undisturbed buffer zone of not less than 100 linear feet from the special water (not including tributaries) shall be maintained at all times. Exceptions from this requirement for areas, such as water crossings or limited water access, are allowed if the **Permittee** fully documents in the **SWPPP** the circumstances and reasons that the buffer encroachment is necessary. All potential water quality, scenic and other environmental impacts of these exceptions must be minimized and documented in the **SWPPP** for the project.
4. Enhanced runoff controls. The permanent **storm water** management system must be designed such that the pre and post project runoff rate and volume from the 1, and 2-year 24-hour precipitation events remains the same.
5. Temperature Controls. The permanent **storm water** management system must be designed such that the discharge from the project will minimize any increase in the temperature of trout stream receiving waters resulting from the 1, and 2-year 24-hour precipitation events. This includes all tributaries of designated trout streams within the section that the trout stream is located. Projects

that discharge to trout streams must minimize the impact using one or more of the following measures, in order of preference:

- (a) Minimize new **impervious surfaces**.
- (b) Minimize the discharge from connected **impervious surfaces** by discharging to vegetated areas, or grass swales, and through the use of other non-structural controls.
- (c) Infiltration or evapotranspiration of runoff in excess of pre-project conditions (up to the 2-year 24-hour precipitation event).
- (d) If ponding is used, the design must include an appropriate combination of measures such as shading, filtered bottom withdrawal, vegetated swale discharges or constructed **wetland** treatment cells that will limit temperature increases. The pond should be designed to draw down in 24 hours or less.
- (e) Other methods that will minimize any increase in the temperature of the trout stream.

D. REQUIREMENTS FOR DISCHARGING TO WETLANDS

If the project has any **storm water** discharges with the potential for significant adverse impacts to a **wetland** (e.g., conversion of a natural **wetland** to a **storm water** pond), the **Permittee(s)** must demonstrate that the **wetland** mitigative sequence has been followed in accordance with D.1 or D.2 of this appendix.

1. If the potential adverse impacts to a **wetland** on a specific project site have been addressed by permits or other approvals from an official statewide program (U.S. Army Corps of Engineers 404 program, Minnesota Department of Natural Resources, or the State of Minnesota Wetland Conservation Act) that are issued specifically for the project and project site, the **Permittee** may use the permit or other determination issued by these agencies to show that the potential adverse impacts have been addressed. For the purposes of this permit, de minimus actions are determinations by the permitting agency that address the project impacts, whereas a non-jurisdictional determination does not address project impacts.

2. If there are impacts from the project that are not addressed in one of the permits or other determinations discussed in Appendix A, Part D.1 (e.g., permanent inundation or flooding of the **wetland**, significant degradation of water quality, excavation, filling, draining), the **Permittee** must minimize all adverse impacts to **wetlands** by utilizing appropriate measures. Measures used must be based on the nature of the **wetland**, its vegetative community types and the established hydrology. These measures include in order of preference:
 - a. Avoid all significant adverse impacts to **wetlands** from the project and post project discharge.
 - b. Minimize any unavoidable impacts from the project and post project discharge.
 - c. Provide compensatory mitigation when the **Permittee** determines that there is no reasonable and practicable alternative to having a significant adverse impact on a **wetland**. For compensatory mitigation, wetland restoration or creation shall be of the same type, size and whenever reasonable and practicable in the same watershed as the impacted wetland.

E. DISCHARGES REQUIRING ENVIRONMENTAL REVIEW

This permit does not replace or satisfy any environmental review requirements, including those under the Minnesota Environmental Policy Act (MEPA) or the National Environmental Policy Act (NEPA). The **owner** must complete any environmental review required by law, including any required Environmental Assessment Work Sheets or Environmental Impact Statements, Federal environmental review, or other required review.

F. DISCHARGES AFFECTING ENDANGERED OR THREATENED SPECIES

This permit does not replace or satisfy any review requirements for Endangered or Threatened species, from new or **expanded discharges** that adversely impact or contribute to adverse impacts on a listed endangered or threatened species or adversely modify a designated critical habitat. The **owner** must conduct any required review and coordinate with appropriate agencies for any project with the potential of affecting threatened or endangered species, or their critical habitat.

G. DISCHARGES AFFECTING HISTORIC PLACES OR ARCHEOLOGICAL SITES

This permit does not replace or satisfy any review requirements for Historic Places or Archeological Sites, from new or **expanded discharges** which adversely affect properties listed or eligible for listing in the National Register of Historic Places or affecting known or discovered Archeological Sites. The **owner** must be in compliance with National Historic Preservation Act and conduct all required review and coordination related to historic preservation, including significant anthropological sites and any burial sites, with the Minnesota Historic Preservation Officer.

APPENDIX B. DEFINITIONS

1. "**Best Management Practices (BMPs)**" means erosion and **sediment control** and water quality management practices that are the most effective and practicable means of controlling, preventing, and minimizing degradation of **surface water**, including avoidance of impacts, construction-phasing, minimizing the length of time soil areas are exposed, prohibitions, and other management practices published by state or designated area-wide planning agencies.

Individual **BMPs** found in this permit are described in the current version of **Protecting Water Quality in Urban Areas**, Minnesota Pollution Control Agency 2000. **BMPs** must be adapted to the site and can be adopted from other sources. However, they must be similar in purpose and at least as effective and stringent as MPCA's **BMPs**. (Other sources include manufacturers specifications, **Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices**, U.S. Environmental Protection Agency 1992, and **Erosion Control Design Manual**, Minnesota Department of Transportation, et al, 1993).

2. "**Commissioner**" means the **Commissioner** of the Minnesota Pollution Control Agency or the **Commissioner's** designee.
3. "**Common Plan of Development or Sale**" means a contiguous area where multiple separate and distinct land disturbing activities may be taking place at different times, on different schedules, but under one proposed plan. One plan is broadly defined to include design, permit application, advertisement or physical demarcation indicating that land-disturbing activities may occur.
4. "**Construction Activity**" For this permit, **construction activity** includes **construction activity** as defined in 40 C.F.R. part 122.26(b)(14)(x) and **small construction activity** as defined in 40 C.F.R. part 122.26(b)(15). This includes a disturbance to the land that results in a change in the topography, existing soil cover (both vegetative and non-vegetative), or the existing soil topography that may result in accelerated **storm water** runoff, leading to soil erosion and movement of sediment into **surface waters** or drainage systems. Examples of construction activity may include clearing, grading, filling and excavating. **Construction activity** includes the disturbance of less than one acre of total land area that is a part of a larger **common plan of development or sale** if the larger common plan will ultimately disturb one (1) acre or more.

5. **“Dewatering”** means the removal of water for **construction activity**. It can be a discharge of appropriated surface or groundwater to dry and/or solidify a construction site. It may require Minnesota Department of Natural Resources permits to be appropriated and if contaminated may require other MPCA permits to be discharged.
6. **“Energy Dissipation”** means methods employed at pipe outlets to prevent erosion. Examples include, but are not limited to: concrete aprons, riprap, splash pads, and gabions that are designed to prevent erosion.
7. **“Erosion Prevention”** means measures employed to prevent erosion including but not limited to: soil stabilization practices, limited grading, mulch, temporary or **permanent cover**, and construction phasing.
8. **“Final Stabilization”** means that either:
 - a. All soil disturbing activities at the site have been completed and a uniform (e.g., evenly distributed, without large bare areas) perennial vegetative cover with a density of 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures (such as the use of riprap, gabions, or geotextiles) have been employed;
 - b. For individual lots in residential construction by either: (a) The homebuilder completing **final stabilization** as specified above, or (b) the homebuilder establishing temporary stabilization including perimeter controls for an individual lot prior to occupation of the home by the homeowner and informing the homeowner of the need for, and benefits of, **final stabilization**. (Homeowners typically have an incentive to put in the landscaping functionally equivalent to **final stabilization** as quick as possible to keep mud out of their homes and off sidewalks and driveways.); or
 - c. For construction projects on land used for agricultural purposes (e.g., pipelines across crop or range land) **final stabilization** may be accomplished by returning the disturbed land to its preconstruction agricultural use. Areas disturbed that were not previously used for agricultural activities, such as buffer strips immediately adjacent to **surface waters** and drainage systems, and areas which are not being returned to their preconstruction agricultural use must meet the **final stabilization** criteria in (a) or (b) above.

9. "**General Contractor**" means the party who signs the construction contract with the **owner** to construct the project described in the final plans and specifications. Where the construction project involves more than one contractor, the **general contractor** will be the party responsible for managing the project on behalf of the **owner**. In some cases, the **owner** may be the **general contractor**. In these cases, the **owner** may contract an individual as the **operator** who would become the Co-Permittee.
10. "**Homeowner Factsheet**" means a fact sheet developed by the MPCA to be given to homeowners at the time of sale by a builder to inform the homeowner of the need for, and benefits of, **final stabilization**.
11. "**Impervious Surface**" means a constructed hard surface that either prevents or retards the entry of water into the soil and causes water to run off the surface in greater quantities and at an increased rate of flow than prior to development. Examples include rooftops, sidewalks, patios, driveways, parking lots, storage areas, and concrete, asphalt, or gravel roads.
12. "**National Pollutant Discharge Elimination System (NPDES)**" means the program for issuing, modifying, revoking, reissuing, terminating, monitoring, and enforcing permits under the Clean Water Act (Sections 301, 318, 402, and 405) and United States Code of Federal Regulations Title 33, Sections 1317, 1328, 1342, and 1345..
13. "**Normal Wetted Perimeter**" means the area of a conveyance, such as a ditch, channel, or pipe that is in contact with water during flow events that are expected to occur once every year.
14. "**Notice of Termination**" means notice to terminate coverage under this permit after construction is complete, the site has undergone **final stabilization**, and maintenance agreements for all permanent facilities have been established, in accordance with all applicable conditions of this permit. **Notice of Termination** forms are available from the MPCA.
15. "**Operator**" means the person (usually the **general contractor**), designated by the **owner**, who has day to day operational control and/or the ability to modify project plans and specifications related to the **SWPPP**. The person must be knowledgeable in those areas of the permit for which the **operator** is responsible, (Part II.B. and Part IV.) and must perform those responsibilities in a workmanlike manner.

16. "**Owner**" means the person or party possessing the title of the land on which the construction activities will occur; or if the **construction activity** is for a lease holder, the party or individual identified as the lease holder; or the contracting government agency responsible for the **construction activity**.
17. "**Permanent Cover**" means **final stabilization**. Examples include grass, gravel, asphalt, and concrete.
18. "**Permittee**" means a person or persons, firm, or governmental agency or other institution that signs the application submitted to the MPCA and is responsible for compliance with the terms and conditions of this permit.
19. "**Saturated Soil**" means the highest seasonal elevation in the soil that is in a reduced chemical state because of soil voids being filled with water. **Saturated soil** is evidenced by the presence of redoximorphic features or other information.
20. "**Sediment Control**" means methods employed to prevent sediment from leaving the site. **Sediment control** practices include silt fences, sediment traps, earth dikes, drainage swales, check dams, subsurface drains, pipe slope drains, storm drain inlet protection, and temporary or permanent sedimentation basins.
21. "**Small Construction Activity**" means small construction activity as defined in 40 C.F.R. part 122.26(b)(15) . Small construction activities include clearing, grading and excavating that result in land disturbance of equal to or greater than one acre and less than five acres. **Small construction activity** includes the disturbance of less than one (1) acre of total land area that is part of a larger **common plan of development or sale** if the larger common plan will ultimately disturb equal to or greater than one and less than five (5) acres.
22. "**Stabilized**" means the exposed ground surface has been covered by appropriate materials such as mulch, staked sod, riprap, wood fiber blanket, or other material that prevents erosion from occurring. Grass seeding is not stabilization.
23. "**Standard Plates**" means general drawings having or showing similar characteristics or qualities that are representative of a construction practice or activity.

24. "**Storm water**" is defined under Minn. R. 7077.0105, subp. 41(b), and includes precipitation runoff, **storm water** runoff, snow melt runoff, and any other surface runoff and drainage.
25. "**Storm Water Pollution Prevention Plan**" means a plan for **storm water** discharge that includes **erosion prevention** measures and **sediment controls** that, when implemented, will decrease soil erosion on a parcel of land and decrease off-site nonpoint pollution.
26. "**Surface Water or Waters**" means all streams, lakes, ponds, marshes, **wetlands**, reservoirs, springs, rivers, drainage systems, waterways, watercourses, and irrigation systems whether natural or artificial, public or private.
27. "**Temporary Erosion Protection**" means methods employed to prevent erosion. Examples of temporary cover include; straw, wood fiber blanket, wood chips, and erosion netting.
28. "**Underground Waters**" means water contained below the surface of the earth in the saturated zone including, without limitation, all waters whether under confined, unconfined, or perched conditions, in near surface unconsolidated sediment or regolith, or in rock formations deeper underground. The term ground water shall be synonymous with underground water.
29. "**Waters of the State**" (as defined in Minn. Stat. § 115.01, subd. 22) means all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, reservoirs, aquifers, irrigation systems, drainage systems and all other bodies or accumulations of water, surface or underground, natural or artificial, public or private, which are contained within, flow through, or border upon the state or any portion thereof.
30. "**Water Quality Volume**" means ½ inch of runoff from the new **impervious surfaces** created by this project and is the volume of water to be treated in the permanent **storm water** management system, as required by this permit except as provided in Appendix A.C.2.
31. "**Wetland**" or "**Wetlands**" is defined in Minn. R. 7050.0130, subp. F and includes those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted

for life in **saturated soil** conditions. **Wetlands** generally include swamps, marshes, bogs, and similar areas. Constructed **wetlands** designed for wastewater treatment are not **waters of the state**.

Wetlands must have the following attributes:

- a. A predominance of hydric soils;
- b. 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 a **saturated soil** condition; and
- c. Under normal circumstances support a prevalence of such vegetation.

APPENDIX C. MODEL DESIGN MANUALS

- *Urban Small Sites BMP Manual, 2001, Metropolitan Council, <http://www.metrocouncil.org/environment/Watershed/BMP/manual.htm>*
- *Protection Water Quality in Urban Areas, March 2000, Minnesota Pollution Control Agency, www.pca.state.mn.us.*
- *Low Impact Design Center, <http://www.lowimpactdevelopment.org/>*
- *Low Impact Development Design Manual, 1997, Prince George's County, Maryland, Department of Environmental Resources*
- *Stormwater BMP Design Supplement for Cold Climates, 1997, Center for Watershed Protection, Ellicott City, MD., <http://www.cwp.org/>*
- *Design of Stormwater Filtering Systems, 1996, Center for Watershed Protection, Ellicott City, MD., <http://www.cwp.org/>*
- *Wet Extended Detention Pond Design, 1995, Center for Watershed Protection, Ellicott City, MD.*
- *Impervious Surface Reduction Study, 1995, Olympia, WA and Washington State Department of Ecology, <http://www.cwp.org/>*
- *Better Site Design: A Handbook for Changing Development Rules in Your Community, 1998, Center for Watershed Protection, Ellicott City, MD., <http://www.cwp.org/>*
- *Consensus Agreement on Model Development Principles to Protect Our Streams, Lakes, and Wetlands, 1998, Center for Watershed Protection, Ellicott City, MD., <http://www.cwp.org/>*
- *Maryland Stormwater Design Manual, Volumes I and II, October 2000, Maryland Department of the Environment. Baltimore, MD <http://www.mde.state.md.us/Programs/WaterPrograms/SedimentandStormwater/>*
- *Site Planning for Urban Stream Protection, 1995, Center for Watershed Protection, Ellicott City, MD, <http://www.cwp.org/>*
- *State of Minnesota Storm Water Advisory Group. June 1997. Storm-Water and Wetlands: Planning and Evaluation Guidelines for Addressing Potential Impacts*

- of Urban Storm Water and Snow-Melt Runoff on Wetlands. Minnesota Pollution Control Agency, www.pca.state.mn.us*
- *State of Minnesota Storm Water Advisory Group. September 1997. Buffer Zones. Minnesota Pollution Control Agency, www.pca.state.mn.us*
 - *Design Calculations for Wet Detention Ponds (Walker, 1987a).*
 - *Criteria for planning and design considerations are given in Chapter 4 of Protecting Water Quality in Urban Areas by the MPCA (1989). Stormwater BMP Design Supplement for Cold Climates, Center for Watershed Protection (December 1997), <http://www.cwp.org/>*