Minnesota Pollution Control Agency

520 Lafayette Road North | St. Paul, Minnesota 55155-4194 | 651-296-6300

800-657-3864 | 651-282-5332 TTY | www.pca.state.mn.us | Equal Opportunity Employer

May 14, 2014

TO: Communities Interested in Adopting the Minimal Impact Design Standards (MIDS)

Dear Community Leaders:

As community leaders, you know that maintaining the vitality and quality of life of your community are important responsibilities. Protecting and restoring your highly valued water resources is extremely important.

A new set of tools have been developed to assist you in protecting your lakes, rivers and streams. These are tools that your community can use to manage stormwater.

Over the past four years, the Minnesota Pollution Control Agency (MPCA), along with a group of stakeholders, developed MIDS. MIDS represents the next generation of stormwater management in Minnesota. The emphasis today is on keeping the raindrop where it falls in order to minimize stormwater runoff and pollution and preserve natural resources. Low Impact Development (LID) is an approach to stormwater management that mimics a site's natural hydrology as the landscape is developed and preserves and protects environmentally-sensitive site features such as riparian buffers, wetlands, steep slopes, valuable (mature) trees, floodplains, woodlands and highly permeable soils.

MIDS contains four main components:

- Stormwater volume performance goals for new development, redevelopment and linear construction projects that will provide enhanced protection for Minnesota's water resources.
- The MIDS Design Sequence Flow Chart
- New calculator and credit calculations that will standardize the use of a range of innovative structural stormwater techniques.
- A Community Assistance Package which contains ordinance guidance that will help developers and communities implement MIDS.

All the Best Management Practices (BMPs) that are part of the MIDS project have been vetted through the MPCA and other stormwater professionals.

Why Adopt the MIDS Package?

- Adopting and implementing the MIDS performance goals, Design Sequence Flow Chart and calculator will protect and improve the quality of local water resources.
- MIDS is an approved approach for meeting the permit conditions for post-construction stormwater management for new development and redevelopment outlined in Minimum Control Measure (MCM) 5 of the general permit for small MS4s. Compliance with the permit will meet antidegradation requirements.
- Adopting MIDS in ordinances provides a framework to meet future volume control and pollutant reduction requirements.

- MIDS can be used to comply with the permanent stormwater management system requirements of the general permit for construction stormwater. Compliance with the permit will meet antidegradation requirements.
- MIDS can be used to achieve waste load reductions as specified in a Total Maximum Daily Load (TMDL). The MIDS redevelopment goal provides a city with a process to achieve a waste load reduction for every redevelopment project which could potentially be applied to a TMDL waste load allocation. If a city has a TMDL, MIDS is a built-in process to achieve reductions.
- Adopting and implementing the MIDS performance goals, Design Sequence Flow Chart and calculator will be the highest standard for the stormwater practice of MN Green Step Cities. MIDS will also be integrated into the Friends of the Mississippi River Blue Star Assessment.
- The MIDS calculator can be used to quantify load reductions for Clean Water Legacy and other grant applications.

For additional information on the MIDS project, go to: http://www.pca.state.mn.us/veiza8e or the Minnesota Stormwater Manual (which includes the MIDS work products): http://stormwater.pca.state.mn.us/index.php/Main_Page.

If you have questions, please contact Anne Gelbmann at 651-757-2384 or anne.gelbmann@state.mn.us or Scott Fox at 651-757-2368 or scott.fox@state.mn.us.

Sincerely,

Marni Karnowski, Manager
Stormwater Section
Municipal Division

MK/AG:wgp

Community Assistance Package

April 2014

Acknowledgements

The Minimal Impact Design Standards (MIDS) Community Assistance Package results from the contributions of many individuals and organizations.

The Minnesota Pollution Control Agency (MPCA) and the MIDS Work Group guided the project and developed the performance standards and credit calculator that are integral to the project. The development of the Community Assistance Package as part of the St. Croix MIDS Pilot Community Project was funded by a U.S. Environmental Protection Agency Clean Water Act Section 319 Grant to the MPCA. The grant was managed by the Washington Conservation District with input from the St. Croix MIDS Pilot Community Project Steering Committee. The St. Croix MIDS Pilot Community Project was established to help St. Croix Basin communities meet state water quality regulatory requirements and provide a real testing ground for the application of the new MIDS performance goals, credits and calculators, and the community assistance package. For information on the St. Croix MIDS Pilot Community Project, contact Jay Riggs, District Manager, Washington Conservation District, 651-275-1136 Ext. 20, jay.riggs@mnwcd.org.

St. Croix MIDS Pilot Community Project Steering Committee:
John Bilotta
John Chapman
Anne Gelbmann
Michele Hanson
Angie Hong
Torry Kraftson
Craig Mell
Matt Moore
Vanessa Perry
Nick Proulx
Jay Riggs
Deb Ryun
Jerry Spetzman
Julie Westerlund
Shawn Williams
Bruce Wilson

Washington Conservation District Staff contributors
Amy Carolan
Tara Kline
Karen Kill
Jay Riggs

St. Croix MIDS Pilot Communities:
Center City
Chisago City
East Bethel
Lindstrom

Pilot Community Facilitator:
John Bilotta, Northland NEMO

Primary drafters of ordinance provisions:
Jean Coleman, Attorney/Planner
CR Planning, Inc.
612-588-4904
jcoleman@crplanning.com

Jay Michels, CPESC
Emmons & Olivier Resources, Inc.
651-261-4546
jmichels@eorinc.com

Reviewers:
Anne Gelbmann, MPCA
Jim Hafner, City of Blaine
Randy Neprash, MCSC
Dan Petrik, DNR
Bruce Wilson, MPCA

The Community Assistance Package drew on example resources developed by several agencies, local governments and organizations. We would like to acknowledge the following for sharing their work:

City of Hanover, Minnesota
City of Stillwater, Minnesota
Center for Watershed Protection
Washington Conservation District
Stearns County, Minnesota

Minnesota Pollution Control Agency "From Policy to Reality: Model Ordinances for Sustainable Development" available at: http://greenstep.pca.state.mn.us/modelOrdinances.cfm

For more information about the MIDS project, contact Anne Gelbmann at 651-757-2384. Or visit the MIDS project website at: http://www.pca.state.mn.us/veiza8e.

Additional funding for the MIDS project came from the Clean Water Fund of the Clean Water Land and Legacy Amendment.

Contents

Minimal Impact Design Standards (MIDS) Background

The State of Minnesota has undertaken a major effort to promote Low Impact Development (LID) in conjunction with existing stormwater rate control practices to:

- Reduce runoff volumes and rates
- Improve runoff quality
- Develop a unified crediting system for practitioners and the MPCA to document pollutant load reductions

This effort is the Minimal Impact Design Standards (MIDS) project. MIDS represents the next generation of stormwater management.

Sparked by the anticipation of impending Municipal Separate Storm Sewer System (MS4) permit updates that included antidegradation compliance and outstanding resource value waters (ORVW) requirements, the MIDS concept was initiated by a unique coalition of the Minnesota Cities Stormwater Coalition, MS4 communities, the League of Minnesota Cities, the Builder's Association of the Twin Cities, environmental advocacy organizations, local watershed districts, the Stormwater Steering Committee of the Minnesota Pollution Control Agency (MPCA), and key state legislators interested in water quality protection. The support and testimony of the partnership's broad membership was critical to the successful legislative effort authorizing and funding the project.

The package includes performance goals, a calculator for determining stormwater credits for best management practices, and ordinance guidance for communities. Use of the MIDS community assistance package (CAP) can help your community measure progress toward water and natural resource protection and restoration goals.

The MIDS project is authorized under Minnesota Statutes enacted in 2009, Chapter 115 Water Pollution Control Act, 115.03 Powers and Duties.

> Subdivision 5c. Regulation of storm water discharges.
>
> (c) The agency *(Minnesota Pollution Control Agency)* shall develop performance standards, design standards, or other tools to enable and promote the implementation of low-impact development and other storm water management techniques. For the purposes of this section, "low-impact development" means an approach to storm water management that mimics a site's natural hydrology as the landscape is developed. Using the low-impact development approach, storm water is managed on-site and the rate and volume of predevelopment storm water reaching receiving waters is unchanged. The calculation of predevelopment hydrology is based on native soil and vegetation.

As authorized by statute, the Minnesota Pollution Control Agency is leading the effort to develop technical criteria and products. The MPCA worked closely with the MIDS Work Group and stakeholders throughout the state. Detailed information on the MIDS process is available at: http://www.pca.state.mn.us/veiza8e

MIDS includes several significant products to assist communities and permittees in complying with Small Municipal Separate Storm Sewer System (MS4) and Construction Stormwater permit (CSW) requirements. The products include:

- A clean water performance goal for new development and redevelopment that will provide enhanced protection for Minnesota's water resources.
    - In April 2011, MIDS Work Group members agreed on the following performance goal for new development: For new, nonlinear developments that create more than one acre of new impervious surface on sites without restrictions, stormwater runoff volumes will be controlled and the post-construction runoff volume shall be retained on site for 1.1 inches of runoff from impervious surfaces statewide.
    - In June, 2013 the MIDS Workgroup members agreed on the following performance goal for redevelopment: Nonlinear redevelopment projects on sites without restrictions that create one or more acres of new and/or fully reconstructed impervious surfaces shall capture and retain on site 1.1 inches of runoff from the new and/or fully reconstructed impervious surfaces.
    - In June, 2013 the MIDS Workgroup members agreed on the following performance goal for linear: Linear projects on sites without restrictions that create one acre or greater of new and/or fully reconstructed impervious surfaces, shall capture and retain the larger of the following:
        - 0.55 inches of runoff from the new and fully reconstructed impervious surfaces
        - 1.1 inches of runoff from the net increase in impervious area

      Mill and overlay and other resurfacing activities are not considered fully reconstructed.

    All projects shall first attempt to meet the volume reduction performance goal on site. However, if an applicant is unable to achieve the full performance goal due to site restrictions as attested by the local authority and documented by the applicant, the flexible treatment options approach shall be followed using the MIDS design sequence flow chart.
- A new calculator and credit calculations that will standardize the use of a range of "innovative" structural stormwater best management practices (BMPs)
- Design specifications for a variety of green infrastructure stormwater BMPs
- Ordinance guidance that will help developers and communities implement MIDS

This CAP is designed to help communities adopt local ordinances and implement BMPs as a step toward compliance with stormwater permits and water quality rules and regulations. However, communities discharging into a receiving water with an approved TMDL, should review the specific TMDL requirements for the receiving water as higher/additional stormwater treatment beyond MIDS may be necessary to meet the TMDL waste load allocation. Information on TMDLs can be found on the MPCA website: http://www.pca.state.mn.us/0agxa04 .

The CAP, and other MIDS components, will be included as part of future updates of the Minnesota Stormwater Manual, which is designed to provide state-of-the-art tools for improved stormwater management. Builders, developers, public works departments, city development commissions/city planners, design engineers and governmental reviewers should use these products for defining site development options and stormwater management expectations. The current Minnesota Stormwater Manual can be viewed at: http://stormwater.pca.state.mn.us/index.php/Main_Page.

Several concepts were key in the development of MIDS work products. These concepts are:

- **No net increase**

  Development stormwater controls will result in the same pre-development stormwater volume discharges for all new development and redevelopment to the extent possible. It is understood that this will require flexibility to accommodate certain considerations relating to set-aside lands, density of development, linear projects and geographic-based constraints.

- **Effective**

  Morphologic impacts on streams from increased volumes of runoff during small to moderate storms are prevented. MIDS techniques will be effective on a site-by-site basis, as well as on a broader watershed-wide scale.

- **Flexible**

  Diversity among Minnesota's municipalities shall be accommodated by the guidelines. The diversity in aquatic ecoregions and geology also present major challenges that require flexibility to achieve consistent stormwater management across the state.

- **Technically sound and scientifically based**

  MIDS methodologies must be technically sound, peer reviewed and defensible.

Pilot Community Testing of DRAFT Community Assistance Package

During 2012-2013, a DRAFT Community Assistance Package was tested with several pilot communities in the St. Croix Basin (Centre City, Lindstrom and Chisago City). The pilot communities represent both large and small communities.

How to Use the MIDS Community Assistance Package

This Community Assistance Package (CAP) is designed to help Minnesota communities review their existing approach to stormwater management and adopt changes to local policies and ordinances to better implement best management practices for improving the quality of stormwater discharges. The CAP and other MIDS project products will be included in future updates of the Minnesota Stormwater Manual which is designed to provide state-of-the-art tools for improved stormwater management.

This CAP contains a mixture of suggested ordinance language and ordinance guidance. The user should modify and expand on the suggested ordinance language as necessary to meet the unique conditions and needs of the community. When modifying the suggested ordinance language the community must ensure that the requirements of the NPDES/SDS Construction Stormwater Permit are not violated. If regulated by the MS4 Permit the community must also ensure that any modifications are also consistent with the requirements of the NPDES/SDS MS4 General Permit.

Communities should take the following steps in reviewing and improving their approach to stormwater management:

STEP ONE: Research existing stormwater guidance and regulations in Minnesota.

The Minnesota Stormwater Manual, the NPDES/SDS Construction Stormwater General Permit, your community's NPDES/SDS MS4 permit (if you are a regulated MS4 community), and TMDL studies are critical in understanding your communities needs for stormwater management.

The current Minnesota Stormwater Manual is available at: http://stormwater.pca.state.mn.us/index.php/Main_Page . Detailed information on the MIDS process is available at : http://www.pca.state.mn.us/veiza8e

The NPDES/SDS MS4 General Permit is available at: http://www.pca.state.mn.us/sbiza7c

The NPDES/SDS Construction Stormwater General Permit is available at: http://www.pca.state.mn.us/wfhya5b

Information on TMDLs can be found on the Minnesota Pollution Control Agency website: http://www.pca.state.mn.us/0agxa04 .

STEP TWO: Audit your existing policies and ordinances

Use the Natural Resource Planning Checklist (page 84 to evaluate your current comprehensive land use plan and other plans and determine if changes are necessary to incorporate Low Impact Development best practices. Similarly, review your local ordinances using the Code and Ordinance Worksheet (page 88 to evaluate your current approach to stormwater management and identify opportunities for improvement. It is helpful to review the following plans and ordinances:

- Zoning ordinance
- Subdivision ordinance
- Stormwater control ordinance or provisions
- Erosion and sediment control ordinances or provisions
- Shoreland ordinance or provisions
- Wetland ordinance or provisions
- Floodplain ordinance or provisions
- Comprehensive plan provisions related to water, stormwater, or erosion control
- County water plan
- Any policies not in the comprehensive plan that relate to stormwater and erosion control
- Checklists or fact sheets related to stormwater and erosion control
- Watershed District/Watershed Management Organization plans and rules that apply to your community

STEP THREE: Prepare changes to policies and ordinances

Based on the results of your audit of existing policies and ordinances, use the ordinance guidance materials in this document (pages 12 to 61), to draft changes to your community's policies and ordinances. Guidance for choosing the short, medium or long form is on page 13 .

STEP FOUR: Adopt changes to polices and ordinances

Work with your city council, town board, or county board to adopt the changes necessary to comply with MIDS. A sample resolution for adopting ordinance changes is included on page 82.

MIDS Stormwater Ordinance Guidance

Background

Pollution (i.e. sediment, nutrients, toxics, thermal stress, and debris) from stormwater is a significant problem in Minnesota's waterways. Entire waterbodies are degraded by stormwater runoff and erosion and sedimentation when Best Management Practices (BMPs) are not adequate or not installed and maintained properly. Regulation of stormwater and control of erosion and sediment go hand-in-hand in the protection of water quality and quantity. In addition, federal and state rules require that communities manage stormwater and ensure erosion and sediment control under the National Pollution Discharge Elimination System (NPDES) program of the federal Clean Water Act. Implementation of the NPDES standards, through effective regulation, incentives, and education, offer communities an opportunity to protect the environment, the economy, and social values in the community.

Through regulation of stormwater, erosion, and sedimentation, communities can enhance and protect water resources. Stormwater control consists of BMPs and permanent infrastructure to maintain runoff rates and volumes at or under the pre-development runoff rates and volumes. Management practices include design standards to reduce impervious surfaces and enhance infiltration, treatment of stormwater runoff for water quality, and discharge of stormwater runoff at pre-development runoff rates.

Erosion control consists of BMPs designed to intercept precipitation and prevent soil particles from moving. Management practices that prevent erosion include construction staging, protecting existing vegetation, and tracking of disturbed slopes. Products designed for this include straw, mulch, ground covers, fiber blankets, hydro-seeding, etc. Sediment control consists of BMPs designed to capture soil particles after they have been dislodged and have begun to be carried away from the site. Products designed for this include silt fences, check dams, sedimentation ponds, and similar devices.

Local governments are critical to enforcing stormwater and erosion and sediment control regulation because state and federal agencies simply cannot track the development activities happening to the landscape on a day-to-day basis. Local governments track local development through the building code, development ordinances, tax valuations, and general protection of health, safety, and welfare. Many communities have some form of stormwater performance standards and permitting processes in place. Analysis of our surface and ground water shows, however, that these standards frequently fail to protect water quality. More and more of Minnesota's lakes, rivers, and streams are being designated as impaired. As communities incorporate new permitting requirements into local regulation, they can take the opportunity to address specific local considerations and priorities in managing stormwater, erosion and sedimentation.

Minimal Impact Design Standards (MIDS)

Stormwater management has evolved substantially over the past 20 years. Historically, the goal was to move water off the landscape quickly and reduce flooding concerns. Now we are focusing on keeping the raindrop where it falls and mimicking natural hydrology in order to minimize the amount of pollution reaching our lakes, rivers and streams, and to recharge our ground waters while also reducing flooding. In order to successfully do so, standards are needed to create consistency in design and performance.

The Minnesota Legislature authorized the Minnesota Pollution Control Agency (MPCA) to "develop performance standards, design standards or other tools to enable and promote the implementation of low impact development and other stormwater management techniques." (Minnesota Statutes 2009, Section 115.03, subdivision 5c).

Minimal Impact Design Standards (MIDS) contains four components:

- Performance goals for new development, redevelopment and linear projects that will provide enhanced protection for Minnesota's water resources
- MIDS Design sequence flow chart
- New calculator and credit calculations that will standardize the use of a range of "innovative" structural stormwater techniques
- Ordinance guidance that will help developers and communities implement MIDS

The development of Minimal Impact Design Standards is based on low impact development (LID) — an approach to storm water management that mimics a site's natural hydrology as the landscape is developed.

Who should use this ordinance guidance?

The Short and Medium form ordinance guidance is designed to incorporate MIDS performance goals in a simple, concise format. This format should only be used by communities that have existing stormwater ordinances and are wishing to incorporate MIDS without undertaking complete ordinance revision AND that have stormwater staff to review applications or will be partnering with water quality professionals for review of applications (i.e. SWCD/WD/WMO staff, professional engineers trained in MIDS, certified professionals in stormwater quality). The alternative Long form is also available for communities wishing to undertake a complete ordinance revision.

Adoption, implementation, and enforcement of this ordinance guidance will assist in compliance with MPCA MS4 and CSW stormwater permitting requirements. However, if your community has a discharge into a receiving water with an approved TMDL, a higher/additional level of stormwater treatment may be necessary and the Long form model ordinance may be a better fit for your community. Information on in-process, public comment, and approved TMDLs can be found on the Minnesota Pollution Control Agency website: http://www.pca.state.mn.us/0agxa04.

Short Form Model MIDS Stormwater Ordinance Provisions

1. Statutory Authorization and Purpose

The MIDS performance standards are authorized under Minnesota Statutes enacted in 2009, Chapter 115 Water Pollution Control Act, 115.03 Powers and Duties.

> Subdivision 5c. Regulation of storm water discharges.
> (c) The agency (Minnesota Pollution Control Agency) shall develop performance standards, design standards, or other tools to enable and promote the implementation of low-impact development and other storm water management techniques. For the purposes of this section, "low-impact development" means an approach to storm water management that mimics a site's natural hydrology as the landscape is developed. Using the low-impact development approach, storm water is managed on-site and the rate and volume of predevelopment storm water reaching receiving waters is unchanged. The calculation of predevelopment hydrology is based on native soil and vegetation.

2. Stormwater Volume Reduction Performance Goals

Any applicant for a permit resulting in site disturbance that creates one or more acres of new impervious surface or fully reconstructs one or more acre of impervious surface must meet all of the following stormwater performance goals:

a. New development volume control

For new, nonlinear developments that create more than one acre of new impervious surface on sites without restrictions, stormwater runoff volumes will be controlled and the post-construction runoff volume shall be retained on site for 1.1 inches of runoff from all impervious surfaces on the site.

b. Redevelopment volume control

Nonlinear redevelopment projects on sites without restrictions that create one or more acres of new and/or fully reconstructed impervious surfaces shall capture and retain on site 1.1 inches of runoff from the new and/or fully reconstructed impervious surfaces.

c. Linear development volume control

Linear projects on sites without restrictions that create one acre or greater of new and/or fully reconstructed impervious surfaces, shall capture and retain the larger of the following:

- 0.55 inches of runoff from the new and fully reconstructed impervious surfaces on the site
- 1.1 inches of runoff from the net increase in impervious area on the site

Mill and overlay and other resurfacing activities are not considered fully reconstructed.

d. Flexible treatment options for sites with restrictions (as found in the MIDS Design Sequence Flowchart)

Applicant shall fully attempt to comply with the appropriate performance goals described above. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site. If full compliance is not possible due to any of the factors listed below, the applicant must document the reason. If site constraints or restrictions limit the full treatment goal, the following flexible treatment options shall be used:

Applicant shall document the flexible treatment options sequence starting with Alternative #1. If Alternative #1 cannot be met, then Alternative #2 shall be analyzed. Applicants must document the specific reasons why Alternative #1 cannot be met based on the factors listed below. If Alternative #2 cannot be met then Alternative #3 shall be met. Applicants must document the specific reasons why Alternative #2 cannot be met based on the factors listed below. When all of the conditions are fulfilled within an alternative, this sequence is completed.

Volume reduction techniques considered shall include infiltration, reuse & rainwater harvesting, and canopy interception & evapotranspiration and/or additional techniques included in the MIDS calculator and the Minnesota Stormwater Manual.

Higher priority shall be given to BMPs that include volume reduction. Secondary preference is to employ filtration techniques, followed by rate control BMPs.

Factors to be considered for each alternative will include:

i. Karst geology
ii. Shallow bedrock
iii. High groundwater
iv. Hotspots or contaminated soils
v. Drinking Water Source Management Areas or within 200 feet of drinking water well
vi. Zoning, setbacks or other land use requirements
vii. Excessive cost
viii. Poor soils (infiltration rates that are too low or too high, problematic urban soils)

Alternative #1: Applicant attempts to comply with the following conditions:

i. Achieve at least 0.55” volume reduction from all impervious surfaces if the site is new development or from the new and/or fully reconstructed impervious surfaces for a redevelopment site.
ii. Remove 75% of the annual TP load from all impervious surfaces if the site is new development or from the new and/or fully reconstructed impervious surfaces for a redevelopment site.

iii. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site.

Alternative #2: Applicant attempts to comply with the following conditions:

i. Achieve volume reduction to the maximum extent practicable.

ii. Remove 60% of the annual TP load from all impervious surfaces if the site is new development or from the new and/or fully reconstructed impervious surfaces for a redevelopment site.

iii. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site.

Alternative #3: Off-site Treatment. Mitigation equivalent to the performance of 1.1 inches of volume reduction for new development or redevelopment as described above in this section, (including banking or cash) can be performed off-site to protect the receiving water body. Off-site treatment shall be achieved in areas selected in the following order of preference:

i. Locations that yield benefits to the same receiving water that receives runoff from the original construction activity.

ii. Locations within the same Department of Natural Resource (DNR) catchment area (Hydrologic Unit 08) as the original construction activity.

iii. Locations within the next adjacent DNR catchment area upstream.

iv. Locations anywhere within the community's jurisdiction.

The MIDS Design Sequence Flowchart can be found in the Minnesota Stormwater Manual: http://stormwater.pca.state.mn.us/index.php/Flexible_treatment_options

3. Site Design and MIDS Calculator

a. Better site design

Wherever possible, new development projects shall be designed using the Better Site Design Techniques of the current version of the Minnesota Stormwater Manual available at: http://stormwater.pca.state.mn.us/index.php/Better_site_design.

b. MIDS calculator

Final site design and choice of stormwater treatment practices shall be based on outcomes of the MIDS Calculator in the Minnesota Stormwater Manual and shall meet the performance goals outlined above in this section. The MIDS Calculator is available at http://stormwater.pca.state.mn.us/index.php/Calculator.

Medium Form Model MIDS Stormwater Ordinance Provisions

1. Statutory Authorization and Purpose

The MIDS performance standards are authorized under Minnesota Statutes enacted in 2009, Chapter 115 Water Pollution Control Act, 115.03 Powers and Duties.

> Subdivision 5c. Regulation of storm water discharges.
>
> (c) The agency (Minnesota Pollution Control Agency) shall develop performance standards, design standards, or other tools to enable and promote the implementation of low-impact development and other storm water management techniques. For the purposes of this section, "low-impact development" means an approach to storm water management that mimics a site's natural hydrology as the landscape is developed. Using the low-impact development approach, storm water is managed on-site and the rate and volume of predevelopment storm water reaching receiving waters is unchanged. The calculation of predevelopment hydrology is based on native soil and vegetation.

2. Stormwater Volume Reduction Performance Goals

Any applicant for a permit resulting in site disturbance that creates one or more acres of new impervious surface or fully reconstructs one or more acre of impervious surface must meet all of the following stormwater performance goals:

a. New development volume control

For new, nonlinear developments that create more than one acre of new impervious surface on sites without restrictions, stormwater runoff volumes will be controlled and the post-construction runoff volume shall be retained on site for 1.1 inches of runoff from all impervious surfaces on the site.

b. Redevelopment volume control

Nonlinear redevelopment projects on sites without restrictions that create one or more acres of new and/or fully reconstructed impervious surfaces shall capture and retain on site 1.1 inches of runoff from the new and/or fully reconstructed impervious surfaces.

c. Linear development volume control

Linear projects on sites without restrictions that create one acre or greater of new and/or fully reconstructed impervious surfaces, shall capture and retain the larger of the following:

- 0.55 inches of runoff from the new and fully reconstructed impervious surfaces on the site.
- 1.1 inches of runoff from the net increase in impervious area on the site.

Mill and overlay and other resurfacing activities are not considered fully reconstructed.

d. Flexible treatment options for sites with restrictions (as found in the MIDS Design Sequence Flowchart)

Applicant shall fully attempt to comply with the appropriate performance goals described above. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site. If full compliance is not possible due to any of the factors listed below, the applicant must document the reason. If site constraints or restrictions limit the full treatment goal, the following flexible treatment options shall be used:

Applicant shall document the flexible treatment options sequence starting with Alternative #1. If Alternative #1 cannot be met, then Alternative #2 shall be analyzed. Applicants must document the specific reasons why Alternative #1 cannot be met based on the factors listed below. If Alternative #2 cannot be met then Alternative #3 shall be met. Applicants must document the specific reasons why Alternative #2 cannot be met based on the factors listed below. When all of the conditions are fulfilled within an alternative, this sequence is completed.

Volume reduction techniques considered shall include infiltration, reuse & rainwater harvesting, and canopy interception & evapotranspiration and/or additional techniques included in the MIDS calculator and the Minnesota Stormwater Manual.

Higher priority shall be given to BMPs that include volume reduction. Secondary preference is to employ filtration techniques, followed by rate control BMPs.

Factors to be considered for each alternative will include:

i. Karst geology
ii. Shallow bedrock
iii. High groundwater
iv. Hotspots or contaminated soils
v. Drinking Water Source Management Areas or within 200 feet of drinking water well
vi. Zoning, setbacks or other land use requirements
vii. Excessive cost
viii. Poor soils (infiltration rates that are too low or too high, problematic urban soils)

Alternative #1: Applicant attempts to comply with the following conditions:

i. Achieve at least 0.55” volume reduction from all impervious surfaces if the site is new development or from the new and/or fully reconstructed impervious surfaces for a redevelopment site.
ii. Remove 75% of the annual TP load from all impervious surfaces if the site is new development or from the new and/or fully reconstructed impervious surfaces for a redevelopment site.

iii. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site.

Alternative #2: Applicant attempts to comply with the following conditions:

i. Achieve volume reduction to the maximum extent practicable.

ii. Remove 60% of the annual TP load from all impervious surfaces if the site is new development or from the new and/or fully reconstructed impervious surfaces for a redevelopment site.

iii. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site.

Alternative #3: Off-site Treatment. Mitigation equivalent to the performance of 1.1 inches of volume reduction for new development or redevelopment as described above in this section, (including banking or cash) can be performed off-site to protect the receiving water body. Off-site treatment shall be achieved in areas selected in the following order of preference:

i. Locations that yield benefits to the same receiving water that receives runoff from the original construction activity.

ii. Locations within the same Department of Natural Resource (DNR) catchment area (Hydrologic Unit 08) as the original construction activity.

iii. Locations within the next adjacent DNR catchment area upstream.

iv. Locations anywhere within the community's jurisdiction.

The MIDS Design Sequence Flowchart can be found in the Minnesota Stormwater Manual:
http://stormwater.pca.state.mn.us/index.php/Flexible_treatment_options

e. Minnesota Stormwater Manual

All volume control practices and site design specifications shall conform to the current version of the Minnesota Stormwater Manual.

f. Site erosion and sediment control requirements

All erosion and sediment control requirements shall conform to the current requirements of NPDES/SDS Construction Stormwater permit.

g. Watershed district/WMO requirements

All stormwater management and erosion and sediment control activities shall comply with all applicable requirements of the watershed districts or watershed management organizations in which the project is located. In the case of provisions in this ordinance and requirements of watershed districts or watershed management organizations that overlap or conflict, the strictest provisions shall apply to the activities.

3. Site Design and MIDS Calculator

a. Better site design

Wherever possible, new development projects shall be designed using the Better Site Design Techniques of the current version of the Minnesota Stormwater Manual available at: http://stormwater.pca.state.mn.us/index.php/Better_site_design

b. MIDS calculator

Final site design and choice of stormwater treatment practices shall be based on outcomes of the MIDS Calculator in the Minnesota Stormwater Manual and shall meet the performance goals in section 2 above of the Medium form . The MIDS Calculator is available at http://stormwater.pca.state.mn.us/index.php/Calculator

4. Review Process

The community shall review applications with the assistance of a qualified water quality professional to ensure conformance with the provisions of the ordinance.

5. Operation, Inspections, and Maintenance

a. Applicant's responsibility

The applicant is responsible for operation, inspections, and maintenance during and after construction for all privately-owned practices on the site.

Operation, inspections, and maintenance shall conform to the Minnesota Stormwater Manual.

b. Community inspections

The community reserves the right to conduct inspections on a regular basis to ensure that both stormwater and erosion and sediment control measures are properly installed and maintained prior to construction, during construction, and at the completion of the project.

c. Right-of-entry

The issuance of a permit under the ordinance should constitute a right-of-entry for the community or its agent to enter the construction site during active construction and when construction is complete.

6. Enforcement and Financial Securities

a. Enforcement

The community shall designate an enforcement entity to ensure compliance with all provisions of the ordinance. The designated enforcement entity shall have all those powers available to it under state law including, but not limited to, stop work orders, denial or revocation of approvals, use of financial securities for remedial action by the community, fines, and criminal or civil enforcement action and penalties.

b. Financial securities

The community shall require financial securities from the applicant in an amount sufficient to cover the estimated costs of permitted and remedial work as established in a set financial security schedule determined by the community. Financial securities shall not be released until all permitted and remedial work is completed. Financial securities may be used by the community to complete work not completed by the applicant.

7. Definitions

Words or phrases used in this ordinance shall have the meanings as defined by the NPDES/SDS MS4 General Permit and NPDES/SDS Construction Stormwater General Permit, available at http://www.pca.state.mn.us/sbiza7c and http://www.pca.state.mn.us/wfhya5b. If not defined in the Permit, then words or phrases shall have the same meaning as they have in common usage and to give this ordinance it's most reasonable application. For the purpose of this ordinance, the words "must" and "shall" are mandatory and not permissive.

What is a typical fee schedule for Stormwater and Erosion Control Financial Securities?

A typical fee schedule for financial securities for erosion and sediment control activity requires that the applicant provide a security for the performance of the work in an amount of whichever is greater:

- $3,000 per gross acre OR
- $6,000 per gross acre for work done in special or impaired waters OR
- $1,500 for each single or twin family home.

This amount typically applies to the maximum acreage of soil that will be simultaneously exposed during the project's construction.

A fee schedule for stormwater management is often based on a specific estimate of the cost to construct the stormwater management practice. Typically the fee is 125% of the estimated construction cost for the stormwater management practice.

Background Information for Long Form Users

Background

Pollution (i.e. sediment, nutrients, toxics, thermal stress, and debris) from stormwater is a significant problem in Minnesota's waterways. Federal and state rules require many communities to manage stormwater and ensure erosion and sediment control under the National Pollution Discharge Elimination System (NPDES) and State Disposal System (SDS) Construction Stormwater General Permit program. Through regulation of stormwater, erosion, and sedimentation communities can enhance and protect water resources.

Minimal Impact Design Standards (MIDS)

MIDS contains four components:

- Performance goals for new development, redevelopment and linear projects that will provide enhanced protection for Minnesota's water resources.
- MIDS Design sequence flow chart.
- New calculator and credit calculations that will standardize the use of a range of "innovative" structural stormwater techniques.
- Ordinance guidance that will help developers and communities implement MIDS.

The development of Minimal Impact Design Standards is based on low impact development (LID) — an approach to storm water management that mimics a site's natural hydrology as the landscape is developed.

Concepts for Stormwater Management

The following key concepts are emphasized in this ordinance guidance:

- Implementing MIDS performance goals and MIDS calculator
- Providing standards for managing the velocity and volume of runoff
- Maximizing infiltration given the variety of soil types, topographies, and extent of existing development
- Using buffers and vegetative management to treat stormwater runoff on-site
- Better site planning to reduce impervious surfaces where possible
- Scheduling land disturbing activities to prevent erosion and sedimentation
- Maintaining soil stability through effective use of BMPs
- Implementing an inspection, maintenance, and enforcement program

Building upon the requirement of the Minnesota Pollution Control Agency's (MPCA) NPDES/SDS Construction Stormwater and MS4 General Permits, this ordinance guidance provides language and recommendations explaining how stormwater and erosion and sediment control regulation can be implemented and enforced when land disturbing activities take place. Adoption, implementation and enforcement of MIDS will help community's measure progress toward water and natural resource protection and restoration goals.

By providing a method to demonstrate progress toward a reduction in pollutant discharge, MIDS and this ordinance guidance are intended to assist in meeting total maximum daily load (TMDL) requirements for impaired waters. However, if your community has a discharge into a receiving water with an approved TMDL, a higher/additional level of stormwater treatment may be necessary and the Long form ordinance guidance may be a better fit for your community. Information on in-process, public comment, and approved TMDLs can be found on the Minnesota Pollution Control Agency website: http://www.pca.state.mn.us/0agxa04.

Long Form MIDS Stormwater Ordinance Provisions

1. Authorization, Findings, Purpose, Scope, and Interpretation

a. Statutory authorization

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

ii. This ordinance is intended to meet the current construction site erosion and sediment control and post-construction stormwater management regulatory requirements for construction activity and small construction activity (NPDES Permit) as defined in 40 CFR pt. 122.26(b)(14)(x) and (b)(15), respectively.

iii. This ordinance is intended to meet the Minimal Impact Design Standards (MIDS) developed under Minnesota Statutes 2009, section 115.03, subdivision 5c.

b. Findings

The community finds that uncontrolled stormwater runoff and construction site erosion from land development and land disturbing activity can have significant adverse impacts upon local and regional water resources diminishing the quality of public health, safety, public and private property and natural resources of the community. Specifically, uncontrolled soil erosion and stormwater runoff can:

i. Threaten public health, safety, property and general welfare by increasing runoff volumes and peak flood flows and overburdening storm sewers, drainage ways and other storm drainage systems.

ii. Diminish the capacity of lakes and streams to support fish, aquatic life, recreational and water supply uses by increasing pollutant loadings of sediment, suspended solids, nutrients, heavy metals, toxics, debris, bacteria, pathogens, biological impairments, thermal stress and other pollutants.

iii. Degrade physical stream habitat by increasing stream bank erosion, increasing stream bed scour, diminishing groundwater recharge, diminishing stream base flows and increasing stream temperatures.

MIDS Statutory Authority

Minnesota Statutes, section 115.03, Subd. 5c.
Regulation of stormwater discharges.
(c) The agency shall develop performance standards, design standards, or other tools to enable and promote the implementation of low-impact development and other stormwater management techniques. For the purposes of this section, "low-impact development" means an approach to stormwater management that mimics a site's natural hydrology as the landscape is developed. Using the low-impact development approach, stormwater is managed on-site and the rate and volume of predevelopment stormwater reaching receiving waters is unchanged. The calculation of predevelopment hydrology is based on native soil and vegetation.

What is NPDES?

NPDES stands for National Pollutant Discharge Elimination System. NPDES is a program for issuing, modifying, revoking, reissuing, terminating, monitoring, and enforcing permits under the Clean Water Act. In Minnesota, NPDES permits are issued by the Minnesota Pollution Control Agency. NPDES permits include, among others, those for Construction Stormwater and Municipal Separate Storm Sewer Systems.

iv. Undermine floodplain management efforts by increasing the incidence and levels of flooding.

v. Alter wetland communities by changing wetland hydrology and increasing pollutant loads.

vi. Impact groundwater by reducing recharge and increasing potential pollutant loading.

c. Purpose

The general purpose of this guidance is to establish an ordinance with regulatory requirements for land development and land disturbing activities aimed at minimizing the threats to public health, safety, public and private property and natural resources within the community from construction site erosion and post-construction stormwater runoff. Specific purposes are to establish performance goals that will:

i. Meet MIDS performance goals.

ii. Assist in meeting NPDES/SDS Municipal Separate Storm Sewer System (MS4) and Construction Stormwater General Permit requirements.

iii. Assist in meeting Total Maximum Daily Load (TMDL) plan wasteload allocations for impaired waters through quantification of load reductions.

iv. Protect life and property from dangers associated with flooding.

v. Protect public and private property and natural resources from damage resulting from stormwater runoff and erosion.

vi. Ensure the annual stormwater runoff rates and volumes from post development site conditions mimic and/or reduce the annual runoff rates and volumes from predevelopment site conditions.

vii. Ensure site design minimizes the generation of stormwater and maximizes pervious areas for stormwater treatment.

viii. Provide a single, consistent set of performance goals that apply to all developments.

ix. Protect water quality from pollutant loadings of sediment, suspended solids, nutrients, heavy metals, toxics, debris, bacteria, pathogens, biological impairments, thermal stress and other pollutants.

x. Promote infiltration and groundwater recharge.

Alphabet Soup: MIDS, Antidegradation, ORVW, and TMDL

While antidegradation requirements are aimed at maintaining non-impaired waters, total maximum daily load (TMDL) plans are designed to improve impaired waters. In Minnesota, National Pollutant Discharge Elimination System (NPDES) stormwater permits include requirements related to wasteload allocations under an approved TMDL for MS4 permittees (Minn. R Chapter 7090). Adoption and implementation of MIDS components can assist MS4 communities in compliance with MS4 TMDL requirements, particularly through use of the MIDS Calculator for quantification of stormwater load reductions.

Water Quality/Quantity Treatment Beyond NPDES/SDS & MIDS Standards

The requirements of NPDES/SDS permits and MIDS may be inadequate for meeting local water quality or quantity goals. Communities, counties, watershed organizations and others may set customized standards in response to the condition of waters within their jurisdiction. Designing customized ordinances and rules may be necessary to meet TMDL and water quality protection and improvement goals.

xi. Provide vegetated corridors (buffers) to protect water resources from development.

xii. Protect functional values of all types of natural waterbodies (e.g., rivers, streams, wetlands, lakes, seasonal ponds).

xiii. Sustain or enhance biodiversity (native plant and animal habitat) and support riparian ecosystems.

d. Scope

Land shall not be developed for any use without having provided stormwater management measures and erosion and sediment control measures that control or manage stormwater runoff from such developments.

e. Greater restrictions

i. Relationship to WD/WMO Requirements - All stormwater management and erosion and sediment control activities shall comply with all applicable requirements of the watershed districts or watershed management organizations in which the project is located. In the case of provisions in this ordinance and requirements of watershed districts or watershed management organizations that overlap or conflict, the strictest provisions shall apply to the activities.

ii. Relationship to Existing Easements, Covenants, and Deed Restrictions – The provisions of this ordinance are not intended to repeal, abrogate, or impair any existing easements, covenants, or deed restrictions. However, where this ordinance imposes greater restrictions the provisions of this ordinance shall prevail.

f. Severability

The provisions of this ordinance are severable, and if any provision 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.

Why do some projects require permanent stormwater management and erosion and sediment control while others require only erosion and sediment control?

Most developments will require either an ESC Plan or a SWPPP. The ESC Plan covers the site preparation and construction period of time and includes erosion and sediment control practices. Erosion and sediment control problems can be caused by stormwater runoff as well as other causes such as wind and the movement of water through natural streams and lakes.

A SWPPP covers stormwater runoff impacts during and after construction. A SWPPP includes erosion prevention measures, sediment controls and permanent stormwater management systems that, when implemented, will decrease soil erosion and sediment transport on a parcel of land and decrease off-site pollution.
An ESC plan provides a baseline level of protection during site disturbance and stabilization for small projects. Larger projects, where a SWPPP would be required, also require erosion and sediment control to avoid soil loss during construction. However, due to the larger size of these projects they tend to result in more significant long-term impacts if stormwater management is not conducted during and after construction.

2. Applicability

A community's ordinance, developed under this guidance, shall require that a Stormwater Pollution Prevention Plan (SWPPP) or an Erosion and Sediment Control (ESC) Plan be completed, submitted for review, and approved by the community. Applicants will complete either a SWPPP or an ESC Plan, but not both, as described in Sections a. and b. immediately below.

a. Stormwater management

An approved Stormwater Management Permit including a Stormwater Pollution Prevention Plan (SWPPP) shall be required prior to any proposed land development activity that meets any of the criteria in i. through v. immediately below, unless otherwise exempted in this ordinance in section 3.

i. Any land development activity that may ultimately result in the disturbance of one or more acres of land, including smaller individual sites that are part of a common plan of development that may be constructed at different times.

ii. Land development activity involving greater than [insert sq.ft or cu yds.] (Examples: 10,000 sq. ft of land disturbance or 50 cubic yards of earth movement) that discharges to an impaired or special water as described in Appendix A of the NPDES/SDS Construction Stormwater General Permit.

iii. A subdivision plat.

iv. The construction of any new public or private road.

v. Any land development activity, regardless of size, that the community determines is likely to cause an adverse impact to an environmentally sensitive area or other property.

b. Erosion and sediment control permit/plan

An Erosion and Sediment Control (ESC) Permit including an Erosion and Sediment Control Plan shall be required prior to any proposed land disturbing activity that meets any of the criteria in i. through iv. immediately below, unless otherwise exempted in this ordinance in section 3.

i. Disturbs a total land surface area of between 3,000 square feet and one acre.

ii. Involves excavation or filling, or a combination of excavation and filling, in excess of 50 cubic yards of material.

iii. Involves the laying, repairing, replacing, or enlarging of an underground utility, pipe or other facility, or the disturbance of road ditch, grass swale or other open channel for a distance of 300 feet or more.

iv. Is a land disturbing activity, regardless of size, that the community determines is likely to cause an adverse impact to an environmentally sensitive area or other property, or may violate any other erosion and sediment control standard set forth in this ordinance.

3. Exemptions

The following activities shall be exempt from all of the requirements of this ordinance:

a. Emergency work necessary to protect life, limb, or property.

b. Routine agricultural activity such as tilling, planting, harvesting, and associated activities. Other agricultural activities are not exempt including activities such as construction of structures.

c. Silvicultural activity.

4. Permit Review Process

a. Pre- application meeting

The community shall facilitate a pre-application meeting with the applicant, community staff (or their authorized representative), and staff of relevant partner agencies (e.g. SWCD, WD, WMO, etc.). The community should consider having a mandatory meeting prior to submission of a permit application. The purposes of the meeting are to understand the general parameters of the proposed project and to convey the requirements of meeting the provisions of the ordinance.

The importance of the Pre-Application Meeting

The pre-application meeting allows the community staff to understand the proposed project and allows the potential applicant the chance to discuss site requirements with community staff. Pre-application meetings reduce economic risk for the applicant because the basic requirements are understood prior to initiating an application. The meetings also smooth the application review process because community staff and applicants all understand the project and requirements. If possible, it is best to include all reviewing agencies in this meeting as well as state and local transportation departments and utilities.

b. Application completeness review

The community shall make a determination regarding the completeness of a permit application within [ex: ten (10)] days of the receipt of the application and notify the applicant in writing if the application is not complete including the reasons the application was deemed incomplete.

c. Application review

The applicant shall not commence any construction activity subject to this ordinance until a permit has been authorized by the community. A complete review of the permit application shall be done within [x number of business days] of the receipt of a complete permit application from the applicant. The community will work with the necessary state, county, and local agencies to complete the review. The community shall review all information in the permit application including proposed stormwater practices, hydrologic models, and design methodologies and certify compliance with this ordinance.

d. Permit authorization

If the community determines that the application meets the requirements of this ordinance, the community may issue approval authorizing the project or activity. The approval shall be valid for one year. Approval will be in written form from the community to the applicant.

e. Permit denial

If the community determines the application does not meet the requirements of this ordinance the application must be denied. If the application is denied, the applicant will be notified of the denial in writing including reasons for the denial. Once denied, a new application must be resubmitted for approval before any activity may begin. All land use and building permits shall be suspended until the applicant has an authorized permit.

f. Plan information requirements

The minimum information requirements of the application shall be consistent with the erosion and sediment control requirements in the most recent version of the NPDES/SDS Construction Stormwater General Permit and shall include a fully completed Application Checklist. The application information must also include permanent treatment information showing the proposed project meets the MIDS performance goals.

g. Modification of permitted plans

The applicant must amend an approved ESC Plan or SWPPP to include additional requirements such as additional or modified BMPs designed to correct problems whenever:

i. There is a change in design, construction, operation, maintenance, weather or seasonal conditions that has a significant effect on the discharge of pollutants to surface water or underground water.

ii. Inspections or investigations by site operators, local, state or federal officials indicate the plans are not effective in eliminating or significantly minimizing the discharge of pollutants to surface water or underground water or that the discharges are causing water quality standard exceedances.

iii. The plan is not achieving the general objectives of minimizing pollutants in stormwater discharges associated with construction activity.

Who is Involved in Reviewing a Permit Application?

The permit application under this ordinance is reviewed by the community. Typically, the community's engineer reviews the site plans and site information to ensure that the proposed project satisfies the requirements of the ordinance.

The proposed project may be reviewed by a number of other soil- or water-related organizations in addition to the community. The requirements for other permits and reviews will depend on the project location, site size, the water resources present, and activities proposed. The other organizations may include:

- County
- Soil & Water Conservation District
- Watershed District or Watershed Management Organization
- Department of Natural Resources
- Minnesota Pollution Control Agency
- Metropolitan Council
- Army Corps of Engineers
- Board of Water and Soil Resources

h. Permit completion

Before work under the permit is deemed complete, the permittee must submit as-builts, a long term maintenance plan and information demonstrating that the stormwater facilities conform to design specifications.

5. Site Design and MIDS Calculator

a. Site design process

i. **Better Site Design**

Whenever possible, new development projects shall be designed using the Better Site Design Techniques of the current version of the Minnesota Stormwater Manual available at http://stormwater.pca.state.mn.us/index.php/Better_site_design. Better Site Design involves techniques applied early in the design process to preserve natural areas, reduce impervious cover, distribute runoff and use pervious areas to more effectively treat stormwater runoff. Site design should address open space protection, impervious cover minimization, and runoff distribution and minimization, and runoff utilization through considerations such as:

1. Open space protection and restoration
   - (a) conservation of existing natural areas (upland and wetland)
   - (b) reforestation
   - (c) re-establishment of prairies
   - (d) restoration of wetlands
   - (e) establishment or protection of stream, shoreline and wetland buffers
   - (f) re-establishment of native vegetation into the landscape
2. Reduction of impervious cover
   - (a) reduce new impervious through redevelopment of existing sites and use of existing roadways, trails etc.
   - (b) minimize street width, parking space size, driveway length, sidewalk width
   - (c) reduce impervious surface footprint (e.g. two story buildings, parking ramp)

Better Site Design

A major difference between the traditional development process and the MIDS development process is the use of Better Site Design Techniques and site design using low impact development (LID) best management practices.

Traditional development typically treats raindrops as waste products to be conveyed elsewhere. The "traditional" development process relies on NURP and ponding as its major tool of stormwater management. Over the years we've found that ponding alone is not as effective as desired for comprehensive stormwater management.

Better Site Design focuses on utilizing and treating rainfall as soon as it hits the ground. The focus is not on conveying runoff, but on reducing and controlling runoff volume and mimicking natural hydrology using a wide variety of stormwater management and treatment methods. Better Site Design methods may include reducing impervious surface, conserving natural areas, and treating stormwater close to where it originates.

3. Distribution and minimization of runoff
   (a) utilize vegetated areas for stormwater treatment (e.g. parking lot islands, vegetated areas along property boundaries, front and rear yards, building landscaping)
   (b) direct impervious surface runoff to vegetated areas or to designed treatment areas (roofs, parking, driveways drain to pervious areas, not directly to storm sewer or other conveyances)
   (c) encourage infiltration and soil storage of runoff through grass channels, soil compost amendment, vegetated swales, raingardens, etc.
   (d) plant vegetation that does not require irrigation beyond natural rainfall and runoff from the site
4. Runoff utilization
   (a) capture and store runoff for use for irrigation in areas where irrigation is necessary

ii. **Stormwater criteria**

The following general criteria shall be incorporated in site design for stormwater runoff to protect surface and ground water and other natural resources by maintaining pre-development hydrological conditions:

1. Reduce impacts on water
2. Protect soils
3. Preserve vegetation
4. Decrease runoff volume
5. Decrease erosion and sedimentation
6. Decrease flow frequency, duration, and peak runoff rates
7. Increase infiltration (groundwater recharge)
8. Maintain existing flow patterns
9. Reduce peak flows
10. Store stormwater runoff on-site
11. Avoid channel erosion

iii. **Erosion and sediment control criteria**

The following general criteria shall be incorporated in site design for erosion and sediment control:

1. Minimize disturbance of natural soil cover and vegetation
2. Minimize, in area and duration, exposed soil and unstable soil conditions
3. Protect receiving water bodies, wetlands and storm sewer inlets
4. Protect adjacent properties from sediment deposition
5. Minimize off-site sediment transport on trucks and equipment
6. Minimize work in and adjacent to waterbodies and wetlands
7. Maintain stable slopes
8. Avoid steep slopes and the need for high cuts and fills
9. Minimize disturbance to the surrounding soils, root systems and trunks of trees adjacent to site activity that are intended to be left standing
10. Minimize the compaction of site soils

b. MIDS calculator

Final site design and choice of permanent stormwater volume reduction practices shall be based on outcomes of the MIDS Calculator (or other model that shows the performance goal can be met) and shall meet the performance goals in section 6 of this ordinance. The MIDS calculator is available at http://stormwater.pca.state.mn.us/index.php/Calculator

6. Stormwater Volume Reduction Performance Goals

Any applicant for a permit resulting in site disturbance that creates one or more acres of new impervious surface or fully reconstructs one or more acre of impervious surface must meet all of the following stormwater performance goals:

a. New development volume control

For new, nonlinear developments that create more than one acre of new impervious surface on sites without restrictions, stormwater runoff volumes will be controlled and the post-construction runoff volume shall be retained on site for 1.1 inches of runoff from all impervious surfaces on the site.

What is the MIDS Calculator?

The MIDS Calculator is an integral part of the MIDS package. It includes new modeling methods and credit calculations that standardize the use of a range of innovative structural stormwater techniques. Communities will use the calculator to determine stormwater volume control measures. The volume control measures will then be incorporated in site design using Better Site Design Techniques from the Minnesota Stormwater Manual.

More specifically, the calculator:

- Provides an incentive for using low impact development (LID) techniques
- Determines the stormwater volume control required on the site
- Determines annual TP and TSS removal
- Provides volume and pollutant removal credit for BMPs in parallel and in series
- Focuses on pollutant removals for sites with Hydrologic Soil Group D soils
- Does not replace existing models, such as HydroCAD, for calculating and showing conformance to stormwater peak runoff rate requirements

b. Redevelopment volume control

Nonlinear redevelopment projects on sites without restrictions that create one or more acres of new and/or fully reconstructed impervious surfaces shall capture and retain on site 1.1 inches of runoff from the new and/or fully reconstructed impervious surfaces.

c. Linear development volume control

Linear projects on sites without restrictions that create one acre or greater of new and/or fully reconstructed impervious surfaces, shall capture and retain the larger of the following:

- 0.55 inches of runoff from the new and fully reconstructed impervious surfaces on the site
- 1.1 inches of runoff from the net increase in impervious area on the site

Mill and overlay and other resurfacing activities are not considered fully reconstructed.

d. Flexible treatment options for sites with restrictions (as found in the MIDS Design Sequence Flowchart)

Applicant shall fully attempt to comply with the appropriate performance goals described above. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site. If full compliance is not possible due to any of the factors listed below, the applicant must document the reason. If site constraints or restrictions limit the full treatment goal, the following flexible treatment options shall be used:

Applicant shall document the flexible treatment options sequence starting with Alternative #1. If Alternative #1 cannot be met, then Alternative #2 shall be analyzed. Applicants must document the specific reasons why Alternative #1 cannot be met based on the factors listed below. If Alternative #2 cannot be met then Alternative #3 shall be met. Applicants must document the specific reasons why Alternative #2 cannot be met based on the factors listed below. When all of the conditions are fulfilled within an alternative, this sequence is completed.

Volume reduction techniques considered shall include infiltration, reuse & rainwater harvesting, and canopy interception & evapotranspiration and/or additional techniques included in the MIDS calculator and the Minnesota Stormwater Manual.

Higher priority shall be given to BMPs that include volume reduction. Secondary preference is to employ filtration techniques, followed by rate control BMPs.

Factors to be considered for each alternative will include:

i. Karst geology
ii. Shallow bedrock
iii. High groundwater
iv. Hotspots or contaminated soils

v. Drinking Water Source Management Areas or within 200 feet of drinking water well
vi. Zoning, setbacks or other land use requirements
vii. Excessive cost
viii. Poor soils (infiltration rates that are too low or too high, problematic urban soils)

Alternative #1: Applicant attempts to comply with the following conditions:

i. Achieve at least 0.55" volume reduction from all impervious surfaces if the site is new development or from the new and/or fully reconstructed impervious surfaces for a redevelopment site.
ii. Remove 75% of the annual TP load from all impervious surfaces if the site is new development or from the new and/or fully reconstructed impervious surfaces for a redevelopment site.
iii. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site.

Alternative #2: Applicant attempts to comply with the following conditions:

i. Achieve volume reduction to the maximum extent practicable.
ii. Remove 60% of the annual TP load from all impervious surfaces if the site is new development or from the new and/or fully reconstructed impervious surfaces for a redevelopment site.
iii. Options considered and presented shall examine the merits of relocating project elements to address, varying soil conditions and other constraints across the site.

Alternative #3: Off-site Treatment. Mitigation equivalent to the performance of 1.1 inches of volume reduction for new development or redevelopment as described above in this section, (including banking or cash) can be performed off-site to protect the receiving water body. Off-site treatment shall be achieved in areas selected in the following order of preference:

i. Locations that yield benefits to the same receiving water that receives runoff from the original construction activity.
ii. Locations within the same Department of Natural Resource (DNR) catchment area (Hydrologic Unit 08) as the original construction activity.
iii. Locations within the next adjacent DNR catchment area upstream.
iv. Locations anywhere within the community's jurisdiction.

The MIDS Design Sequence Flowchart can be found in the Minnesota Stormwater Manual:
http://stormwater.pca.state.mn.us/index.php/Flexible_treatment_options

7. Stormwater Management Rate Control

For all development sites (new development, redevelopment and linear development) the site design shall provide on-site treatment during construction and post-construction to ensure no increase in offsite peak discharge for the 2-year, 24-hour storm event, the 10-year, 24-hour storm event, and the 100-year, 24-hour storm event.

8. Other Design Standards

a. Minnesota Stormwater Manual

All volume control for water quality and quantity and site design specifications shall conform to the current version of the Minnesota Stormwater Manual.

b. Site erosion and sediment control requirements

All erosion and sediment control requirements shall conform to the current requirements of NPDES/SDS Construction Stormwater General Permit.

c. Watershed district/WMO requirements

All stormwater management and erosion and sediment control activities shall comply with all applicable requirements of the watershed districts or watershed management organizations in which the project is located. In the case of provisions in this ordinance and requirements of watershed districts or watershed management organizations that overlap or conflict, the strictest provisions shall apply to the activities.

9. Inspections and Maintenance

a. Inspections and record keeping

i. Applicant responsibilities

The applicant is responsible for inspections and record keeping during and after construction for all privately-owned stormwater treatment practices on the site.

ii. Community inspections

The community reserves the right to conduct inspections on a regular basis to ensure that both temporary and permanent stormwater management and erosion and sediment control measures are properly installed and maintained prior to construction, during construction, and at the completion of the project. The community should consider that mandatory inspections be conducted as follows:

1. Before any land disturbing activity begins
2. Before or during the installation of permanent stormwater treatment systems
3. At the time of footing inspections
4. At the completion of the project
5. Prior to the release of financial securities

b. Right of entry and inspection

i. Powers - The issuance of a permit constitutes a right-of-entry for the community or its contractor to enter upon the construction site. The applicant shall allow the community and their authorized representatives, upon presentation of credentials, to:

1. Enter upon the permitted site for the purpose of obtaining information, examination of records, conducting investigations or surveys
2. Bring such equipment upon the permitted development as is necessary to conduct such surveys and investigations
3. Examine and copy any books, papers, records, or memoranda pertaining to activities or records required to be kept under the terms and conditions of the permit
4. Inspect the stormwater pollution control measures
5. Sample and monitor any items or activities pertaining to stormwater pollution control measures
6. Correct deficiencies in stormwater and erosion and sediment control measures

c. Fees

A charge of $____ per hour will be assessed to the applicant for any inspections under this section by the community.

d. Enforcement tools/stop work orders

The community shall reserve the right to issue construction stop work orders when cooperation on inspections is withheld or when a violation has been identified that needs immediate attention to protect human health and/or the environment. The following example highlights a scenario on a site where a stop work order could be utilized. If stormwater and/or erosion and sediment control management measures malfunction and breach the perimeter of the site, enter streets, other public areas, or waterbodies the community should assess the need for issuing a stop work order. The applicant shall immediately develop a cleanup and restoration plan, obtain the right-of-way from the adjoining property owner if necessary, and implement the cleanup and restoration plan within 48 hours. If in the discretion of the community, the applicant does not repair the damage caused by the stormwater runoff the community can complete the remedial work required and charge the cost to the applicant. If payment is not made within thirty days, payment will be made from the applicant's financial securities. An inspection by the community must follow before the construction project work can resume.

i. **Construction stop work order -** The community may issue construction stop work orders until stormwater management measures meet specifications and the applicant repairs any damage caused by stormwater runoff. An inspection by the community must follow before the construction project work can resume.

ii. **Other actions to ensure compliance -** The community can take any combination of the following actions in the event of a failure by applicant to meet the terms of this ordinance:

1. Withhold inspections or issuance of certificates or approvals.
2. Revoke any permit issued by the community to the applicant.
3. Conduct remedial or corrective action on the development site or adjacent site affected by the failure.
4. 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.
5. Bring other actions against the applicant to recover costs of remediation or meeting the terms of this ordinance.
6. 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.

e. Long term inspection and maintenance of stormwater facilities

i. **Private stormwater facilities**

1. 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. At a minimum, all private stormwater facilities shall be inspected annually and maintained in proper condition consistent with the performance goals for which they were originally designed.
2. Facility Access - Access to all stormwater facilities must be inspected annually and maintained as necessary. The applicant shall obtain all necessary easements or other property interests to allow access to the facilities for inspection or maintenance for both the responsible party and the community.
3. Removal of Settled Materials - All settled materials including settled solids, shall be removed from ponds, sumps, grit chambers, and other devices, and disposed of properly.
4. Inspections - All stormwater facilities within the community shall be inspected by the community during construction, during the first year of operation, and at least once every five years thereafter.

ii. **Public stormwater facilities**

1. Acceptance of Publicly Owned Facilities - Before work under the permit is deemed complete; the permittee must submit as-builts and a maintenance plan demonstrating at the time of final stabilization that the stormwater facilities conform to design specifications. A final inspection shall be required before the community accepts ownership of the stormwater facilities.
2. Inventory of Stormwater Facilities - Upon adoption of this ordinance, the 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 on an appropriate schedule based on the stormwater management practice.
3. Maintenance - The community shall perform maintenance of publicly owned stormwater facilities in accordance with their comprehensive stormwater management plan and other regulatory requirements.

10. Financial Securities

a. Amount

The community shall require financial securities from the applicant in an amount sufficient to cover the entirety of the estimated costs of permitted and remedial work based on the final design as established in a set financial security schedule determined by the community.

b. Release

Financial securities shall not be released until all permitted and remedial work is completed.

c. Use by community

Financial securities may be used by the community to complete work not completed by the applicant.

d. Form of security

The form of the securities shall be one or a combination of the following to be determined by the community:

What is a typical fee schedule for Stormwater and Erosion Control Financial Securities?

A typical fee schedule for financial securities for erosion and sediment control activity requires that the applicant provide a security for the performance of the work in an amount of whichever is greater:

- $3,000 per gross acre OR
- $6,000 per gross acre for work done in special or impaired waters OR
- $1,500 for each single or twin family home.

This amount typically applies to the maximum acreage of soil that will be simultaneously exposed during the project's construction.

A fee schedule for stormwater management is often based on a specific estimate of the cost to construct the stormwater management practice. Typically the fee is 125% of the estimated construction cost for the stormwater management practice.

i. **Cash deposit -** The first [$xxx] of the financial security for erosion and sediment control shall be by cash deposit to the community. The cash will be held by community in a separate account.

ii. **Securing deposit -** Deposit, either with the community, a responsible escrow agent, or trust company, at the option of the community, either:

1. An irrevocable letter of credit or negotiable bonds of the kind approved for securing deposits of public money or other instruments of credit from one or more financial institutions, subject to regulation by the state and federal government wherein said financial institution pledges funds are on deposit and guaranteed for payment.
2. Cash in U.S. currency.
3. Other forms and securities (e.g., disbursing agreement) as approved by the community.

e. Community indemnity

This security shall save the community free and harmless from all suits or claims for damages resulting from the negligent grading, removal, placement or storage of rock, sand, gravel, soil or other like material within the community.

f. Maintaining the financial security

If at any time during the course of the work the amount falls below 50% of the required deposit, the applicant shall make another deposit in the amount necessary to restore the cash deposit to the required amount. If the applicant does not bring the financial security back up to the required amount within seven (7) days after notification by the community that the amount has fallen below 50% of the required amount the community may:

i. **Withhold inspections -** Withhold the scheduling of inspections and/or the issuance of a Certificate of Occupancy.

ii. **Revoke permits -** Revoke any permit issued by the community to the applicant for the site in question or any other of the applicant's sites within the community's jurisdiction.

g. Action against the financial security

The community may access financial security for remediation actions if any of the conditions listed below exist. The community shall use the security to finance remedial work undertaken by the community, or a private contractor under contract to the community, to reimburse the community for all direct costs incurred in the process of remedial work including, but not limited to, staff time and attorney's fees.

i. **Abandonment -** The applicant ceases land disturbing activities and/or filling and abandons the work site prior to completion of the grading plan.

ii. **Failure to implement the SWPPP or ESC Plan** - The applicant fails to conform to the grading plan and/or the SWPPP as approved by the Community.

iii. **Failure to perform -** The techniques utilized under the SWPPP fail within one year of installation.

iv. **Failure to reimburse community -** The applicant fails to reimburse the community for corrective action taken.

h. Proportional reduction of the financial security

When more than one-third of the applicant's maximum exposed soil area achieves final stabilization, the community can reduce the total required amount of the financial security by one-third. When more than two-thirds of the applicant's maximum exposed soil area achieves final stabilization, the community can reduce the total required amount of the financial security to two-thirds of the initial amount. This reduction in financial security will be determined by the community.

i. Returning the financial security

The security deposited with the community for faithful performance of the SWPPP or the ESC Plan and any related remedial work shall be released one full year after the completion of the installation of all stormwater pollution control measures as shown on the SWPPP or ESC Plan.

j. Emergency action

If circumstances exist such that noncompliance with this ordinance poses an immediate danger to the public health, safety and welfare, as determined by the community, the community may take emergency preventative action. The community shall also take every reasonable action possible to contact and direct the applicant to take any necessary action. Any cost to the community may be recovered from the applicant's financial security.

11. Enforcement Actions

Notification of Failure of the Permit

The community shall notify the permit holder of the failure of the permit's measures.

i. Initial Contact - The initial contact will be to the party or parties listed on the application and/or the SWPPP as contacts. Except during an emergency action, forty-eight (48) hours after notification by the community or seventy-two (72) hours after the failure of erosion and sediment control measures, whichever is less, the community at its discretion, may begin corrective work. Such notification should be in writing, but if it is verbal, a written notification should follow as quickly as practical. If after making a good faith effort to notify the responsible party or parties, the community has been unable to establish contact, the community may proceed with corrective work. There are conditions when time is of the essence in controlling erosion. During such a condition the community may take immediate action, and then notify the applicant as soon as possible

ii. Erosion Off-site - If erosion breaches the perimeter of the site, the applicant shall immediately develop a cleanup and restoration plan, obtain the right-of-entry from the adjoining property owner, and implement the cleanup and restoration plan within forty-eight (48) hours of obtaining the adjoining property owner's permission. In no case, unless written approval is received from the community, may more than seven (7) calendar days go by without corrective action being taken. If in the discretion of the community, the permit holder does not repair the damage caused by the erosion, the Community may do the remedial work required. When restoration to wetlands and other resources are required, the applicant should be required to work with the appropriate agency to ensure that the work is done properly.

iii. Erosion into Streets, Wetlands or Water Bodies - If eroded soils (including tracked soils from construction activities) enter or appear likely to enter streets, wetlands, or other water bodies, cleanup and repair shall be immediate. The applicant shall provide all traffic control and flagging required to protect the traveling public during the cleanup operations.

iv. Failure to do Corrective Work - When an applicant fails to conform to any provision of this policy within the time stipulated, the community may take the following actions.

Enforcement Actions

It is likely that your community has general enforcement provisions in zoning, subdivision, or other regulations. It is important to include enforcement provisions that are specific to stormwater and erosion control activities. Permitted stormwater and erosion control activities differ in important ways from other land use activities: they respond to rain events that are not predictable; the management activities required differ from those undertaken during construction to those required after construction is complete; control measures continue long into the future; and specific expertise is required by the person conducting inspections.

1. Stop Work Order - Issue a stop work order, withhold the scheduling of inspections, and/or the issuance of a Certificate of Occupancy.
2. Permit Revocation - Revoke any permit issued by the community to the applicant for the site in question or any other of the applicant's sites within the community's jurisdiction.
3. Correction by Community - Correct the deficiency or hire a contractor to correct the deficiency.
   a. The applicant will be required to reimburse the community for all costs incurred in correcting stormwater pollution control deficiencies. If payment is not made within thirty (30) days after costs are incurred by the community, payment will be made from the applicant's financial securities as described in Section 8 above.
   b. If there is an insufficient financial amount in the applicant's financial securities as described in Section 8above, the community may assess the remaining amount against the property. As a condition of the permit, the owner shall waive notice of any assessment hearing to be conducted by the community, concur that the benefit to the property exceeds the amount of the proposed assessment, and waive all rights by virtue of Minnesota Statute 429.081 to challenge the amount or validity of assessment.

12. Definitions

Words or phrases used in this ordinance shall have the meanings as defined by Appendix B of the Minnesota Construction Stormwater Permit No: MN R100001 (Construction Permit) available at http://www.pca.state.mn.us/wfhya5b:

If not defined in the Construction Permit, then words or phrases shall be interpreted to have the meaning they have in common usage.

Words or phrases shall be interpreted so as to give this ordinance its most reasonable application.

For the purpose of this ordinance, the words "must", "shall", and "will" are mandatory and not permissive.

a. **"Applicant"** means the owner of land submitting an application under the provisions of this ordinance for a stormwater and/or erosion control permit to be issued by the community.

b. **"Best management practices (BMPs)"** means the most effective and practicable means of erosion prevention and sediment control, and water quality management practices that are the most effective and practicable means to control, prevent, and minimize degradation of surface water, including avoidance of impacts, construction-phasing, minimizing the length of time soil areas are exposed, prohibitions, pollution prevention through good housekeeping, and other management practices published by state or designated area-wide planning agencies.

c. **"Better Site Design"** means the control and management of stormwater quantity and quality through the application of Better Site Design Techniques as outlined in the current version of the Minnesota Stormwater Manual: http://stormwater.pca.state.mn.us/index.php/Main_Page Better Site Design includes: preservation of natural areas; site reforestation; stream and shoreland buffers; open space design; disconnection of impervious cover; rooftop disconnection; grass channels; stormwater landscaping; compost and amended soils; impervious surface reduction; and trout stream protection.

d. **"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.

e. **"Construction activity"** includes construction activity as defined in 40 CFR pt. 122.26(b)(14)(x) and small construction activity as defined in 40 CFR pt. 122.26(b)(15) and construction activity as defined by Minn. R. 709.0080, subp. 4. 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 stormwater 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. Construction activity does not include a disturbance to the land of less than five (5) acres for the purpose of routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of the facility. (NOTE – The community may wish to change this to a smaller disturbance area. A smaller area is more restrictive than the state/federal requirements, so it would be allowable for a local government.)

f. **"Development, new"** Any development that results in the conversion of land that is currently prairie, agriculture, forest, or meadow and has less than 15% impervious surface. Land that was previously developed, but now razed and vacant, will not be considered new development.

g. **"Dewatering"** means the removal of surface or ground water to dry and/or solidify a construction site to enable construction activity. Dewatering may require a Minnesota Department of Natural Resources (DNR) water appropriation permit, and if dewatering water is contaminated, discharge of such water may require an individual MPCA NPDES/SDS permit.

h. **"Energy dissipation"** means methods employed at pipe outlets to prevent erosion caused by the rapid discharge of water scouring soils. Examples include, but are not limited to: concrete aprons, riprap, splash pads, and gabions that are designed to prevent erosion.

i. **"Erosion prevention"** means measures employed to prevent erosion. Examples include but not limited to: soil stabilization practices, limited grading, mulch, temporary erosion protection or permanent cover, and construction phasing.

j. **"General contractor"** means the party who signs the construction contract with the owner or operator to construct the project described in the final plans and specifications. Where the construction project involves more than one contractor, the general contractor could be the party responsible for managing the project on behalf of the owner or operator. In some cases, the owner or operator may be the general contractor. In these cases, the owner may contract an individual as the operator who would become the co-permittee.

k. **"Green Infrastructure"** means a wide array of practices at multiple scales that manage wet weather and that maintains or restores natural hydrology by infiltrating, evapotranspiring, or harvesting and using stormwater. On a regional scale, green infrastructure is the preservation or restoration of natural landscape features, such as forests, floodplains and wetlands, couples with policies such as infill and redevelopment that reduce overall imperviousness in a watershed. On a local scale, green infrastructure consists of site and neighborhood-specific practices, such as bioretention, trees, green roofs, permeable pavements and cisterns.

l. **"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.

m. **"Land Disturbance"** means any activity that result in a change or alteration in the existing ground cover (both vegetative and non-vegetative) and/or the existing soil topography. Land disturbing activities include, but are not limited to, development, redevelopment, demolition, construction, reconstruction, clearing, grading, filling, stockpiling, excavation , and borrow pits.

Routine vegetation management, and mill and overlay/resurfacing activities that do not alter the soil material beneath the pavement base, are not considered land disturbance. In addition, other maintenance activities such as catch basin and pipe repair/replacement, lighting, and pedestrian ramp improvements shall not be considered land disturbance for the purposes of determining permanent stormwater management requirements

n. **"Linear Project"** means construction or reconstruction of roads, trails, sidewalks, and rail lines that are not part of a common plan of development or sale. Mill, overlay and other resurfacing projects are not considered to be reconstruction.

o. **"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.

p. **"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 from a two-year 24 hour storm event.

q. **"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.

r. **"Operator"** means the person 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 operator must be names on the permit as the Permittee.

s. **"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, easement, or mineral rights license holder, the party or individual identified as the lease, easement or mineral rights license holder; or the contracting government agency responsible for the construction activity.

t. **"Permanent cover"** means surface types that will prevent soil failure under erosive conditions. Examples include: gravel, asphalt, concrete, rip rap, roof tops, perennial cover, or other landscaped material that will permanently arrest soil erosion. A uniform perennial vegetative cover (e.g., evenly distributed, without large bare areas) with a density of 70% of the native background vegetative cover for the area must be established on all unpaved areas and areas not covered by permanent structures, or equivalent permanent stabilization measures. Permanent cover does not include the practices listed under temporary erosion protection.

u. **"Permittee"** means a person or persons, firm, or governmental agency or other entity that signs the application submitted to the MPCA and is responsible for compliance with the terms and conditions of the construction permit.

v. "**Public waters"** means all water basins and watercourses that are described in Minn. Stat. 103G.005 subd. 15.

w. **"Redevelopment"** means any development that is not considered new development.

x. **"Retain"** means manage stormwater on site using a low-impact development approach so that the rate and volume of predevelopment stormwater reaching receiving waters is unchanged.

y. **"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.

z. **"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, bio rolls, rock logs, compost logs, storm drain inlet protection, and temporary or permanent sedimentation basins.

aa. **"Small construction activity"** means small construction activity as defined in 40 CFR 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.

bb. **"Stabilized"** means exposed ground surface has been covered by appropriate materials such as mulch, staked sod, riprap, erosion control blanket, mats or other material that prevents erosion from occurring. Grass, agricultural crop or other seeding alone is not stabilization. Mulch materials must achieve approximately 90 percent ground coverage (typically 2 ton/acre).

cc. **"Standard plates"** means general drawings showing a common or repeated construction activity or practice.

dd. "**Stormwater"** is defined under Minn. R. 7077.0105, subp. 41(b), and includes precipitation runoff, stormwater runoff, snowmelt runoff, and any other surface runoff and drainage.

ee. **"Stormwater Pollution Prevention Plan"** (SWPPP) means a plan for stormwater discharge that includes erosion prevention BMPs, , sediment control BMPs and permanent stormwater management systems that, when implemented, will decrease soil erosion on a parcel of land and decrease off-site nonpoint pollution.

ff. **"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, except that surface waters do not include treatment basins or ponds that were constructed from upland. .

gg. **"Temporary erosion protection"** means methods employed to prevent erosion during construction activities. Examples of temporary erosion protection include; straw, wood fiber blanket, wood chips, vegetation, mulch and rolled erosion control products.

hh. **"Underground waters (Groundwater)"** 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 groundwater shall be synonymous with underground water.

ii. **"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.

jj. "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 ground water 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:

i. A predominance of hydric soils.

ii. 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.

iii. Under normal circumstances support a prevalence of such vegetation.

MIDS Illicit Discharge Ordinance Guidance

Federal and state rules and permits require regulated MS4 communities to develop, implement, and enforce a program to detect and eliminate illicit discharges to their stormwater conveyance system under the National Pollution Discharge Elimination System (NPDES) program. Through the development of an illicit discharge and elimination program communities can reduce the transport of pollutants in stormwater and enhance and protect waters and natural resources. The foundation of an effective illicit discharge detection and elimination program is a comprehensive ordinance prohibiting illicit discharges (as well as situations which could cause an illicit discharge) from entering the communities MS4. To provide an effective tool for the community to prohibit and address illicit discharges an ordinance should address the following items:

- Clearly prohibit non-stormwater discharges to the communities MS4 or watercourses
- Clearly define non-stormwater, illicit discharges and illicit connections
- Outline exemptions to the discharge prohibition
- Provide the community with regulatory authority to access facilities for illicit discharge inspections and monitoring
- Provide the community with regulatory authority to conduct enforcement to stop an illicit discharge and require corrective actions

The EPA has developed a Model Illicit Discharge and Illicit Connection Ordinance which can be found at the following website: http://www.epa.gov/npdes/pubs/idde_appendix-b.pdf.

Communities are encouraged to utilize this model when developing their Illicit Discharge Ordinance.

MIDS Subdivision Ordinance

Background

Pollution (i.e. sediment, nutrients, toxics, thermal stress, and debris) from stormwater is a significant problem in Minnesota's waterways. Federal and state rules require communities to manage stormwater and ensure erosion and sediment control under the National Pollution Discharge Elimination System (NPDES) program. Through regulation of stormwater, erosion, and sedimentation, communities can enhance and protect water resources.

Minimal Impact Design Standards (MIDS)

The Minnesota Legislature authorized the Minnesota Pollution Control Agency to "develop performance standards, design standards or other tools to enable and promote the implementation of low impact development and other stormwater management techniques." (Minnesota Statutes 2009, section 115.03, subdivision 5c).

Minimal Impact Design Standards (MIDS) contains four components:

- Performance goals for new development, redevelopment and linear projects that will provide enhanced protection for Minnesota's water resources
- MIDS Design sequence flow chart
- New calculator and credit calculations that will standardize the use of a range of "innovative" structural stormwater techniques
- Ordinance guidance that will help developers and communities implement MIDS

The development of Minimal Impact Design Standards is based on low impact development (LID) — an approach to storm water management that mimics a site's natural hydrology as the landscape is developed.

Subdivision Ordinance

A community's subdivision ordinance includes a number of provisions outlining when and how the subdividing of parcels is allowed. This ordinance guidance does not provide language for an entire subdivision ordinance since most communities have already adopted subdivision ordinances. The following language does, however, address several aspects of how subdivision regulation can affect a community's water quality goals, and how to implement MIDS concepts in local regulation. This ordinance guidance draws upon the Minnesota NEMO Model Subdivision Ordinance and the City of Stillwater subdivision ordinance.

An alternative to traditional subdivision is conservation subdivision, often used by communities to encourage natural resource protection through flexibility in design. Examples of conservation subdivision ordinances are included starting on page 62.

MIDS Model Subdivision Ordinance

1. Statutory Authorization, Policy, and Purpose

a. Statutory authorization

This ordinance enacts certain regulations and requirements for the platting of land within the community pursuant to the authority contained in Minnesota Statutes, Section 462.351 to 462.365, as amended.

b. Policy

Community adopts this ordinance to safeguard the best interests of the community and to assist subdividers of land in harmonizing their interests with those of the community. Each new subdivision of land becomes a permanent unit in the basic structure of the community. Piecemeal planning of subdivisions creates an undesirable, disconnected patchwork of land uses, poor circulation of traffic, and inadequate protection of natural features and water quality. Subdivision of land must therefore be consistent with community interests as presented in the community's adopted Comprehensive Land Use Plan and Water Plan. All subdivisions of land submitted for approval to the City Council by the Planning Commission shall comply with the regulations of this ordinance.

c. Purpose

It is the purpose of this ordinance to:

i. Set design standards necessary to protect the public health, safety, comfort, convenience and general welfare.

ii. Implement Comprehensive Land Use Plan and Water Plan policies and goals.

iii. Preserve and protect wetlands, drainage areas, woodland and significant tree stands, ravines, blufflands and sloped areas.

iv. Use natural drainage systems and when ponding areas are created, integrate these areas into subdivision landscape plans.

v. Implement stormwater quantity control and stormwater quality management that use Better Site Design Techniques as outlined in the current version of the Minnesota Stormwater Manual: http://stormwater.pca.state.mn.us/index.php/Better_site_design, which includes: preservation of natural areas; site reforestation; stream and shoreland buffers; open space design; disconnection of impervious cover; rooftop disconnection; grass channels; stormwater landscaping; compost and amended soils; impervious surface reduction; and trout stream protection.

MIDS Model Subdivision Ordinance Contents

vi. Encourage well-planned, efficient and attractive subdivisions by establishing standards for design and construction.
vii. Provide for the health and safety of residents by requiring properly designed streets, sewage and water systems.
viii. Secure the right of the people to access public lands and water.
ix. Locate neighborhood parks and trail systems to provide convenient access between residential lots and parks, open space and other destinations in the community.
x. Provide for the coordinated planning of public facilities with land already developed and areas yet to develop.
xi. Coordinate the subdivision design and provision of public facilities with adjacent land areas.
xii. Ensure that improvements are paid for by those benefiting from their construction.

2. Scope

This ordinance applies to the subdivision of a lot, tract or parcel of land into two or more lots, tracts or other division of land for the purpose of sale or of building development, whether immediate or future, including the resubdivision or replatting of land or lots.

3. Preliminary Plat Data Required

a. Identification and description

The following data regarding identification and description of the preliminary plat shall be provided by the applicant:

i. Proposed name of subdivision, which name shall not duplicate the name of any plat heretofore recorded in the County.
ii. Location by section, township and range, or by other appropriate legal description.
iii. Names and addresses of all owners and subdividers having control of the lands included in the preliminary plat, the designer of the plat and the surveyor.
iv. A graphic scale, of not less than one inch to 100 feet.
v. North point.
vi. Date of preparation.

b. Existing conditions

The following data regarding existing conditions shall be provided by the applicant:

i. A boundary line survey, including measured distances and angles, which shall close by latitude and departure with an error of closure not exceeding one foot in 7,500 feet.
ii. Total acreage computed to one-tenth of an acre.

iii. Location and names of existing or platted streets or other public ways, parks and other public open spaces, permanent buildings and structures, easements and section and corporate lines within the tract and to a distance of 100 feet beyond the tract of land identified in the plat.

iv. The preliminary plat must cover all contiguous land under control of the owner, even those portions not proposed for development or subdivision. The plat must also show the existing land uses, existing zoning, and Comprehensive Plan designations for adjoining land.

v. Where the proposed subdivision is a rearrangement or a replat of any former plat, the lot and block arrangement of the original plat along with its original names shall be indicated by dotted or dashed lines; any revised or vacated roadways of the original plat shall be indicated.

vi. Location and size of existing paved streets, railroads, sewers, water mains, gravel pits, culverts or other underground facilities within the tract and to a distance of 100 feet beyond the tract, together with data relating to grades, invert elevations and the location of catch basins, manholes and hydrants.

vii. The boundary lines of adjoining platted or unplatted land within 100 feet of the tract, and the owner's names of such adjoining land.

viii. A natural resources inventory based upon a topographic map, with contour intervals not greater than 2 feet, to be superimposed on the preliminary plat. The inventory shall include but not be limited to the following features:

1. Existing vegetation areas including forests and woodlands
2. Wetlands and wetland vegetation
3. Subwatershed boundaries and receiving waters
4. Geologic features such as rock outcrops
5. Slopes, soil, and groundwater characteristics
6. Existing lakes, streams, ponds, drainage swales, run-off settling areas
7. All land within Floodplain, Shoreland Management, and Natural Area overlay districts

ix. The percentage of land covered with impervious surfaces.

x. All other existing condition information required under the community's Shoreland, Stormwater, Erosion and Sediment Control, Floodplain, and other ordinances.

xi. Topographic and stormwater management information on all surrounding properties.

c. Development design

The following data regarding proposed development design features of the preliminary plat shall be provided by the applicant:

i. Concept plan: The developer shall submit for review by the Planning Commission and City Council a concept plan depicting the subdivision proposal for informal review prior to filing a formal preliminary plat application. On the basis of the concept plan, the City shall informally advise the developer as promptly as possible of the extent to which the proposed subdivision generally conforms to the design standards of this Chapter and shall discuss possible modifications necessary to secture approval of the plan. Concept plan review does not convey any legal development rights to the applicant.

ii. Plans showing the location, size and type of sanitary or other sewerage disposal facilities; water mains and hydrants and other utilities.

iii. Green infrastructures, and other proposed improvements such as walks, plantings, park facilities; and the proposed grading of lots and blocks.

iv. An analysis of the natural features and mass grading indicating the relationship of the proposed use with the existing natural condition; which natural features and areas will be preserved, and the location of all proposed conservation easements; changes that affect viewshed or physical impacts to adjoining land; and indicating what soil erosion and sedimentation controls are to be employed.

v. New landscaping features including plantings and berming shall be clearly and accurately described.

vi. An analysis showing the amount of post-construction impervious surface.

vii. An analysis showing use of the Minimal Impact Design Standards (MIDS) Calculator (or other applicable model or calculator) to meet stormwater volume performance goals.

viii. Plan indicating how the design utilizes MIDS best management practices.

ix. Layout of proposed streets, showing right-of-way widths and types of pavement.

x. Proposed names of streets conforming to the street name system established pursuant by the community.

xi. Locations of alleys, pedestrian ways and utility easements.

xii. Proposed center line grades of all new streets and alleys, and a complete set of profiles showing both existing and proposed grade lines.

xiii. The location, size and proposed improvements for proposed parks, playgrounds, churches or school sites or other special uses of land to be considered for dedication to public use, or to be dedicated by deed or covenant for the use of all property owners in the subdivision and any conditions of such dedication or reservation.

xiv. A vicinity sketch, at a legible scale, to show the relation of the plat to its surroundings and surrounding zoning districts.

xv. Layout, numbers and approximate dimensions of lots and the number or letter of each block.

xvi. The location of minimum front and side street building setback lines.

xvii. For developments with one and two family dwellings, the location on each lot of an attached or detached garage containing at least one parking stall, which could be built in addition to the dwelling within ordinance setback standards.

d. Additional requirements

Surveys, plans and supporting data set forth in this Subsection 3.c. shall be prepared in accordance with rules and regulations established by the community's engineer, approved by the Council.

4. Final Plat Data Required

The final plat shall contain the following information and shall be in the form set forth in this subsection:

a. Recordable form

The final plat shall be in recordable form in accordance with provisions of State law and County regulations.

b. County requirements

All information, except topographical data and sewer locations, required by the County Registrar of Titles and County Recorder.

c. Section lines

Municipal, township, county or section lines accurately tied to the lines of the subdivision by distance and angles.

5. Final Plat Certifications

The final plat shall contain the following certifications:

a. Adoption and dedication

Notarized certification by owner, and by any mortgage holder of record, of the adoption of the plat and the dedication of streets and other public areas.

b. Survey

Notarized certification by a registered land surveyor to the effect that the plat represents a survey made by the surveyor, and that monuments and markers shown therein exist as located and that all dimensional and geodetic details are correct.

c. Taxes

Certification showing that all taxes and special assessments or fees imposed in lieu thereof, due on the property, have been paid in full.

d. Certificates of approval

Space for certificates of approval to be filled in by the signatures of community officials, including the Engineer and Clerk.

e. Private restrictions and trusteeships

Private restrictions and trusteeships and their duration; should such restrictions and trusteeships be of such length as to make the lettering of same on the plat impracticable, and thus necessitate the preparation of a separate instrument. Reference to such

instrument shall be made on the plat and the book and page number referring to the instrument shall be added to the plat after the restrictions or trusteeship has been recorded.

f. Approval form

The form for approval of County authorities as required.

6. Subdivision Design Standards and General Requirements

a. Conservation and preservation of natural features

The design of all subdivisions is required to retain and maintain natural features to the fullest extent possible. The City Council shall require measures to preserve or to mitigate the impacts upon sensitive natural features and water quality. The subdivision design shall comply, where applicable, with the requirements of the community's natural resource protection ordinances which may include: Erosion and Sediment Control ordinance; Natural Area overlays; Shoreland ordinance; Wetland ordinance; and Floodplain ordinance. The Planning Commission shall consider the degree to which a reasonable effort has been demonstrated to preserve and conserve natural features, including mitigation measures, and the degree to which minimum adverse impact upon the natural features will be realized as the result of the proposed development. Natural features include, but are not limited to:

i. Natural topography
ii. Wetlands, lakes, and rivers
iii. Groundwater
iv. Bluffs
v. Native trees, shrubs and grasses
vi. Wooded areas
vii. Individual trees of 6 inches of diameter and greater whether native or non-native
viii. Biologically significant areas

b. Compliance with zoning and other ordinances

Subdivisions shall be consistent with the Community Zoning Map and Zoning Ordinance, the Stormwater and Erosion Control Ordinance, the Shoreland Ordinance, the Floodplain Ordinance, the SSTS Ordinance, and all other applicable ordinances.

c. Streets and public lands

The Planning Commission in its review of a preliminary plat will take into consideration the requirements of Community and the best use of the land as identified in the Comprehensive Plan, and the consequences of land use decisions as described in the Water Plan. Particular attention will be given to the arrangement, location and widths of streets, the methods of minimizing impervious surfaces

and other management of stormwater and the maintenance of watershed functions, lot size configuration, and general consistency with Comprehensive Plan and Water Plan goals and policies.

d. Large tracts

Where the parcel is subdivided into larger tracts than for building lots, such parcels shall be divided so as to allow for the opening of major streets and the ultimate extension of adjacent minor streets. This subpart can be waived only if adjacent parcels are permanently protected under conservation easements.

e. Unplatted strips/private easements

Subdivisions showing unplatted strips or private easements controlling access to public ways shall not receive approval.

7. Design Standards for Streets and Alleys

a. Collector streets and thoroughfares

The arrangement of thoroughfares and collector streets shall facilitate staged development patterns consistent with Comprehensive Plan preferred land uses. Thoroughfare and collector streets shall connect with streets already dedicated in adjoining or adjacent subdivisions, or provide for future connections to adjoining unsubdivided tracts. The arrangement of thoroughfares and collector streets shall be considered in relation to the reasonable circulation of traffic, to the need for multi-modal transportation to topographic conditions, to minimizing impervious surfaces and run-off of storm water, to public convenience and safety, and in appropriate relation to the proposed use of the area to be served. A number of options are available for meeting the varied goals of this ordinance, provided in the Community Street Design Manual.

b. Minor streets

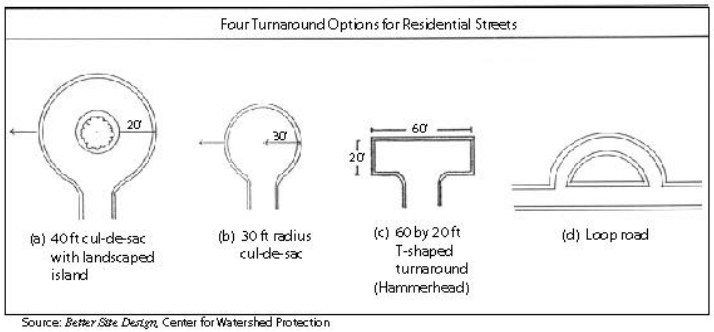
Minor streets shall be so planned as to discourage through traffic, to encourage pedestrian and non-motorized modes of travel, and to allow connectivity. Minor streets shall use traffic calming techniques, narrow traffic lanes or queuing lanes, and pedestrian-oriented curb return radii. Examples of appropriate low-volume minor streets are provided in the Community Street Design Manual. Dead-end streets are prohibited.

c. Cul-de-sacs

Cul-de-sacs are discouraged, but will be permitted where topography, design or other identifiable conditions prevent the use of loop roads or traditional grid patterns, and the cul-de-sacs meet the community's design standards.

i. Each cul-de-sac shall have a terminus of nearly circular shape with a minimum right-of-way diameter of 100 feet and a minimum outside roadway diameter of 70 feet. The property line at the intersection of the turn-around and the straight portion of the street shall be rounded as a radius of not less than 20 feet. Landscaped islands designed to treat stormwater

runoff in the terminus are encouraged. Cul-de-sacs in low-density residential areas, serving no more than ten residences, may consider alternative turn arounds such as 'hammerheads."



ii. Cul-de-sac streets exceeding 500 feet in length, measured along the center line from the intersection of origin to the end of the right-of-way, shall be permitted only if through streets cannot be provided due to topography or surrounding development, and shall meet the following additional standards:

1. adequate provision shall be made for looping utility systems
2. the street design shall incorporate features such as curves, signage and/or additional turn-arounds sufficient to minimize traffic backtracking, limit speeding and provide for convenient turning of services vehicles
3. the cul-de-sac does not prevent connectivity to adjacent lands that are designated in the Comprehensive Plan or zoning ordinance for future staged growth

iii. Access lanes shall be provided for any cul-de-sac street upon the determination that a secondary access is necessary to protect the public health, safety and welfare, based on a review of the following factors:

1. fire and building Ordinance requirements
2. existing and proposed access routes for emergency service vehicles
3. the width of the street and the likelihood of obstruction of the street in the event of a disaster
4. the type of construction proposed and the number of dwelling units served by the street

iv. When required, access lanes shall normally be designed to be 12 feet in width and paved to support 7 tons, unless an alternative is approved by Community.

d. Right-of-way width

For all public ways hereafter dedicated and accepted, the minimum right-of-way widths for streets and thoroughfares shall encourage multimodal traffic as appropriate for each street's functional classification and preferred adjacent land use, allow necessary space for snow storage, and incorporate stormwater management and conveyance systems consistent with the Stormwater Ordinance and the community's water quality goals. The minimum dimensions for rights-of-way shall be 30 feet wider than the project street width. Where existing or anticipated traffic on thoroughfares warrants greater widths of right-of-way, or where stormwater management requires larger ROW widths, such widths may be required.

e. Street design

Street designs shall meet the criteria for the appropriate functional classification as presented in the Better Site Design Manual (examples provided below), and shall be designed to be safe at the designated speed limits, maintain traffic flow consistent with functional classifications, accommodate multi-modal traffic including pedestrian traffic as appropriate for the surrounding land uses, and accommodate green infrastructure including the use of infiltration to manage stormwater, enhancing the urban forest and meeting the community's tree preservation goals, and limiting risk to the community's natural environment.

i. Maximum and minimum paving widths by functional classification are listed below.

Classification	Minimum	Maximum
Thoroughfare	30 feet	44 feet
Collector street	24 feet	36 feet
Minor street	20 feet	32 feet
Marginal access street	20 feet	28 feet
Alley	12 feet	16 feet
Pedestrian way	4 feet	8 feet

ii. Minimum width streets shall have appropriate limitations on on-street parking and/or speed limits. Departures are allowed from the above standards only upon demonstration of a specific safety need, inconsistency with adjoining land use, or physical limitation of grading or natural environment.

f. Grades

The grades in all streets, thoroughfares, collector streets and minor streets in any subdivision shall not be greater than the maximum grades for each classification as follows:

Thoroughfare	5%
Collector street	6%
Minor street	7%

i. There shall be a minimum grade on all streets and thoroughfares of not less than four-tenths of 1%, and wherever possible grades within 30 feet of minor street intersections with thoroughfares and collector streets shall not exceed 3%.

ii. All streets with a grade exceeding 3% shall incorporate specific design elements to divert stormwater from the street. Designs that divert stormwater into pervious surfaces, rain gardens, or other means of using infiltration are encouraged.

g. Deflecting streets

Where horizontal street lines within a block deflect from each other at any one point more than ten degrees, there shall be a connecting curve with a radius adequate to insure a sight distance of not less than 200 feet for minor and collector streets, and of such greater radii as the Planning Commission shall determine for thoroughfare and other special cases. A tangent of at least 100 feet shall be introduced between reverse curves on thoroughfare and collector streets and 50 feet on other streets.

h. Differing gradients

Differing connecting street gradients shall be connected with vertical parabolic curves. Minimum length, in feet, of these curves for thoroughfare streets shall be 15 times the algebraic difference in the percent of grade of the two adjacent slopes. For minor and collector streets, the minimum length shall be seven and one-half times the algebraic difference in the percent of the two adjacent slopes.

i. Square corners

Under normal conditions, streets shall be laid out so as to intersect as nearly as possible at right angles, except where topography or other conditions justify variations. The minimum angle of intersection of streets shall be 80 degrees. Street intersection jogs with an offset of less than 125 feet shall be avoided.

j. Access roads

Wherever the proposed subdivision contains or is adjacent to the right-of-way of a thoroughfare or limited access highway, provision shall be made for a marginal access street approximately parallel and adjacent to the boundary of such right-of-way, or for a street at a distance suitable for the appropriate use of land between such street and the right-of-way of the thoroughfare or limited access highway. Such distance shall be determined with due consideration of the minimum distance required for approach connections to future grade separations, grade crossings or for lot depths.

k. Half streets

Dedication of half streets will not be approved, except where it is essential to the reasonable development of the subdivision and in conformity with the other requirements of these regulations, where it is found that it will be practical to require the dedication of the other half when the adjoining property is subdivided, or where it becomes necessary to acquire the remaining half by condemnation so it may be improved in the public interest.

l. Provision for future division

When a tract is subdivided into larger than building lots or parcels, as set forth in the Zoning Ordinance, such lots or parcels shall be so arranged as to permit the logical location and openings of future streets and appropriate resubdivision, with provision for adequate utility connections for such resubdivisions.

8. Design Standards, Easements

a. Utilities

An easement for utilities at least six feet wide, shall be provided along each side of a side line of lots and along any other lot line as may be deemed necessary to form a continuous right-of-way at least 12 feet in width. Utility easements shall connect with easements established in adjoining properties. If necessary for the extension of water or sewer lines or similar utilities, easements of greater width may be required along lot lines or across lots.

b. Dedication for watercourse

Where a subdivision is traversed by a watercourse, drainage way, channel or stream, a stormwater easement, utility right-of-way or park dedication, whichever the Planning Commission may deem the most appropriate, conforming substantially with the lines of such water courses shall be provided, together with such further width or construction, or both, as will be adequate for the management of stormwater consistent with the Stormwater and Erosion Control Ordinance and the most recent version of the Minnesota Pollution Control Agency's Stormwater Manual.

c. Stormwater infiltration and management

Stormwater easements shall be provided for all stormwater facilities.

9. Green Infrastructure Dedication

a. Purpose and findings

Community has determined that the health, safety, and general welfare of the community requires that sufficient land in any new development be dedicated to green infrastructure, including parks, trails, open space, wetlands, habitat, and watershed protection areas. Minnesota Statutes Section 462.358, Subd. 2b provides that municipal subdivision regulations may require that a reasonable portion of any proposed subdivision be dedicated to the public or preserved for conservation purposes or for public use as parks, playgrounds, trails, wetlands, or open space, and that the municipality may alternatively accept an equivalent amount in cash. The community therefore requires that any subdivision of land include a dedication to green infrastructure. Specifically, Community finds that:

i. The preservation and development of parks, playgrounds, open space areas, and areas managed for habitat and watershed protection within Community are essential to maintaining a healthy and desirable environment for residents and persons employed within Community. Further, the value and attractiveness of residential and commercial/industrial developments to landowners, developers, purchasers, employers, and employees is significantly enhanced by the presence of such green infrastructure.

ii. New developments place a burden upon Community's parks and open space system. New facilities must be developed concurrently with development in order to maintain the current level of service and the quality of the environment for all.

Therefore, new developments shall be required to contribute toward Community's park system in rough proportion to the relative burden they will place upon the park system, in order to maintain the existing level of service to the community.

iii. Development of land for schools creates additional demand on the community's park and recreational land and facilities, to the extent that the school serves students who do not live within Community.

b. Dedication required

The community has determined that dedication of land or other resources for the community's green infrastructure is a necessary component of subdividing and developing land.

i. At the time of subdivision, the developer shall dedicate land for public use as parks, playgrounds, recreation facilities, trails, habitat, public open space, or watershed protection in an amount equal to the development's proportional share of Community's park and green infrastructure system. Any land dedicated shall be in a location and of a character consistent with and suitable for meeting the green infrastructure needs identified by Community's Comprehensive Land Use Plan, Parks and Trails Plan, and Water Plan. Generally, land located within flood plains or wetlands and stormwater detention ponds shall not be accepted to meet the proportional share of required land dedication. Permanently protected (using conservation easements) buffer areas outside of wetlands or floodplains, watershed protection areas, and stormwater rain gardens, shall generally be accepted.

ii. If Community determines that land is not needed in the area of the proposed subdivision, the community may alternatively accept payment of an equivalent amount in cash. Any such cash payment shall be used solely for the acquisition and improvement of land for parks, playgrounds, trails, public open space, watershed protection, or as otherwise provided by statute. The undeveloped land value shall be used to determine the cash payment required in lieu of land dedication up to a maximum cash payment of $_____ per dwelling unit for residential development or $_____ per acre for commercial/industrial development or schools.

iii. If Community Council determines that land is needed in the development, but in a lesser amount than the required proportionate share, the Council may require payment of cash in lieu of land dedication based on a pro-rata share of the land dedication that otherwise would be required.

iv. The dedication requirements based on the development's proportional share of Community park system are presumptively appropriate. A developer may request a deviation from the presumptive requirements based upon the anticipated impact of that particular subdivision. The request must be made to Community Council as part of an application for final plat approval.

10. Basic Improvements Required

a. Policy

As soon as practicable after approval of the proposed plat the developer shall arrange for the installation of telephone, electrical and natural gas service and for the installation of all of the following improvements within the subdivision:

i. sanitary sewage disposal
ii. street grading and paving
iii. stormwater management and conveyance systems
iv. boulevard sodding
v. drainage
vi. water
vii. sidewalks, if required

b. Supervision

Except for telephone, electrical and natural gas service, the installation of the above improvements shall be under the control and supervision of Community Engineer who shall specify the manner in which such installations shall be made.

c. Monuments

No final plat shall be approved by the Council unless the owner or subdivider shall have placed the installed survey monuments of a permanent character at all points as shown on the final plat as required by the Engineer and the County Surveyor. All United States, state, county or other official bench marks, monuments or triangulation stations in or adjacent to the property shall be preserved in precise position.

11. Erosion Control

a. Required Stormwater Pollution Prevention Plan (SWPPP)

Prior to commencing any earth disturbing activity in a subdivision, the subdivider shall prepare and submit to Community Engineer a SWPPP consistent with NPDES/SDS Construction Stormwater General Permit requirements and the community's Stormwater and Erosion Control Ordinance. Development shall not proceed without approval from the Engineer. The plan shall be approved if it complies with the Zoning, Subdivision, Stormwater and Erosion Control ordinances.

12. Development Agreement

In order to effectuate the provisions of this Section, the owner or subdivider shall enter into a development agreement with Community providing for the installation of the improvements required by this Section. The development agreement shall provide for, among other things, security to Community in the form of a surety bond, or cash in lieu thereof, in such amount as Community Engineer shall deem to be adequate to insure the satisfactory completion of the improvements. The development agreement shall be satisfactory in form and substance to Community Attorney.

Examples of Conservation Subdivision Ordinances

Conservation Subdivision Ordinances are an alternative to conventional subdivision processes. They are used by communities who desire flexibility in subdivision design coupled with natural resource protection. Conservation Subdivision Ordinances often incorporate low-impact design elements and should be considered by communities wishing to comply with MIDS.

Following are two example conservation subdivision ordinances:

The City of Hanover example, on pages 63-70, provides guidance for higher-density or urban community considering an alternative subdivision process. The City of Hanover Conservation Subdivision Ordinance was developed with funding and staff assistance from the Minnesota Pollution Control Agency.

The Stearns County example, on pages 71 through 80, provides guidance for low-density development pattern or more rural settings. Stearns County also provides an example of linking conservation subdivision with a transfer of development rights (TDR) program.

ARTICLE 62

CD, CONSERVATION DESIGN OVERLAY DISTRICT

SECTION

20-62-01: PURPOSE AND INTENT

A. The Conservation Design Overlay District is established for the purposes of regulating development consistent with the city Comprehensive Plan and Surface Water Management Plan. The Conservation Design Overlay District is intended:

1. To maintain the City's rural character by protecting and enhancing important landscape elements, including woodlands, hedgerows, drainage corridors, wetlands, floodplains, shorelands, meadows, pastures, steep slopes and viewsheds as described in the city's conservation design guidance document.

2. To conserve land for the purpose of creating ecological corridors (contiguous managed landscapes) to protect existing wildlife habitat and to connect patches of wildlife habitat to support greater biodiversity and maintain ecosystem processes.

3. To create a system of interconnected ecological and trail corridors throughout the community for the benefit of current and future residents.

4. To allow for the continuation of agricultural uses in those areas best suited for such activities and when such activities are compatible with adjoining residential uses.

5. Conserve existing landscape character by minimizing views of new development from existing roads, thereby reducing perceived density.

6. Provide development flexibility for landowners to reflect their varying circumstances and individual characteristics of their properties.

7. Provide greater efficiency in the siting of services and infrastructure, including the opportunity to reduce road length and width, utility runs, and the impervious cover required for residential development.

8. To provide for a diversity of lot sizes, building densities, and housing choices to accommodate a variety of age and income groups, and residential preferences.

9. Protect water quality and reduce erosion and sedimentation by retaining existing vegetation and minimizing development on steep slopes.

10. To reduce traffic speeds and pedestrian safety.

11. To cluster houses and roads in less environmentally sensitive areas and on soils less conducive to infiltration.

12. Incorporate stormwater management practices that reduce runoff and treat runoff through disperse treatment facilities located close to the source of runoff.

B. All development with the Conservation Design Overlay District shall be by planned unit development according to: 1) the platting procedures as established in the Subdivision Ordinance (Chapter 30); 2) the planned unit development procedures established in Article 59 of this chapter; and 3) the provisions found in this article.

20-62-02: APPLICABILITY

A. The Conservation Design Overlay District, further defined herein, is hereby established as a part of this chapter. The Conservation Design Overlay District shall be an overlay district such that any parcel lying in the overlay district shall also lie within one or more of the underlying zoning districts. Regulations and procedures set forth in underlying zoning districts shall apply unless specifically addressed in Article 59 (PUD) of this chapter, or this article, or if determined by the City Council to be inconsistent with the purpose and intent outline in section 20-62-01 of this article, approved by the City Council as part of the final planned unit development plans.

B. For purposes of determining the application of this article, the boundaries of the Conservation Design Overlay District shall be established and shown on the official zoning map of the city, on file in the office of the city clerk and zoning administrator.

C. Structures existing on or before the effective date hereof shall be exempt from the standards set forth with the Conservation Design Overlay District until such time as the parcel is subdivided.

D. Parcels lying in the Conservation Design Overlay District may be developed according to the regulations of the underlying or base zoning district or according to the regulations of this article.

20-62-03: GENERAL DESIGN STANDARDS

A. All development under this article shall be pursuant to an approved final PUD plan. The procedures and regulations set forth in Article 59 (Planned Unit Development) shall apply unless specifically addressed in this section. If a final PUD plan is approved by the City Council, the underlying zoning for the subject property shall be rezoned to the PUD zoning district though the overlay district shall remain the conservation design overlay district. The permitted uses and all other regulations governing uses on the subject land shall then be those found in the PUD zoning district and documented by the PUD plans and agreement. The following subsections are requirements for all PUDs in the Conservation Design Overlay District unless exceptions, as part of a PUD, are otherwise approved by the City Council. The City Council must determine that the exceptions are consistent with the goals, policies, and plans of the Comprehensive Plan and the Surface Water Management Plan; the exceptions are generally compatible and would not be materially injurious to existing or future uses of surrounding properties; and the exceptions do not have an undue adverse impact on existing or planned city facilities and services, including streets, utilities, parks, police and fire and the reasonable ability of the city to provide such service in an orderly, timely manner.

B. Ownership: the tract of land may be held in single and separate ownership or in multiple ownerships. However, when a tract is held in multiple ownerships, it shall be planned as a single entity with common authority and common responsibility as demonstrated through all property owners being signatories on the PUD application.

C. Density and calculation of allowed dwelling units.

1. The maximum net density is 1.6 dwelling units per net buildable acre.

2. The number of dwelling units permitted on a site shall be based on net buildable area (NBA) using the following method:

   From the gross acreage of the site, subtract the unbuildable areas:

   Gross Acreage of Site: _____acres

   Unbuildable Area:
   Land within existing road right of way: _____acres

Land within existing utility[1] and railroad right of way _____acres
Land within the 100-year floodplain _____acres
Land within wetlands, ponds and lakes _____acres
Land having a slope of 18 percent or greater _____acres

Total unbuildable area _____acres

Net buildable Area (NBA) _____acres

Where two or more categories overlap, the overlapping area shall be counted only once.

To determine the number of dwelling units permitted, the net buildable area shall be multiple by the maximum net density, rounding to the nearest whole number.

_____Acres NBA multiple by _____ (max. net density) =
_____permitted dwelling units

D. Allowed Residential Uses: PUD developments in the conservation design overlay district are allowed to have a mixture of housing types, provided that the provisions of this article are met. The total number and location of housing units and housing types for each PUD shall be established by the City Council at the time of final PUD plan approval for the specific property.

E. Dimensional standards: there are no minimum standards for:

1. Lot size
2. Lot width (flag and butt lots permitted)
3. Lot frontage
4. Lot depth
5. Structure size (square feet):
6. Structure width

[1] Power and fuel pipeline easements are considered unbuildable areas. Existing drainage and sewer/water utility easements are not considered unbuildable.

7. Structure setbacks

F. In no instance may a building (principal or accessory) lie within an area of the lot encumbered by an easement.

G. Separation Distances.

The property lines of all lots shall conform to the following setbacks in order to allow for buffer screening or to minimize conflicts:

1. Existing or proposed arterial street rights-of-way: 25 feet.

2. Subdivision perimeter boundaries: 25 feet.

3. Cropland or pasture land: 50 feet.

4. Buildings or barnyards housing livestock: 100 feet.

5. Wetlands: 30 feet from the ordinary high water mark (if public wetland) or delineated wetland edge.

H. Open Space

1. Required Open Space. The City Council may require that up to 50% of the total area of each PUD shall be designated as open space. The required amount of open space is in addition to any land that would be used to satisfy the public park dedication requirements found in the subdivision chapter.

2. Open Space Priorities. Open space shall generally be located and designed to incorporate the following areas listed in order of priority:
   a. Existing high and medium quality ecological resources identified in the comprehensive plan ecological resources map.
   b. Land within ecological corridors identified in the comprehensive plan ecological resources map. Corridors shall be designed according to the standards in Article 58.
   c. Slopes over 12 percent, particularly those adjoining rivers, streams wetlands, and drainage areas, due to the potential for soil disturbance leading to erosion that is detrimental to water quality.
   d. Natural drainageways.

3. Other Open Space Areas. Depending on the individual parcel and its location, these areas may also be important areas for open space designation.

a. Other healthy woodlands, particularly those performing important ecological functions such as soil stabilization and protection of streams, wetlands and wildlife habitats.
b. Areas where precipitation and stormwater treatment are most likely to recharge local groundwater resources because of topographic and soil conditions affording high rates of infiltration and percolation.
c. Hedgerows, groups of trees, specimen trees, and other unique or significant vegetation features.
d. Historic or culturally important structures and sites.
e. Visually prominent topographic features such as knolls, hilltops and ridges, and scenic views as seen from public roads.

4. Open Space Design Standards. The following open space design standards shall also be considered in designing the PUD:
a. Open space should be interconnected wherever possible to provide a continuous network of open space land within the PUD and throughout the City. It should coordinate and maximize boundaries with open space on adjacent tracts.
b. The four-step design process described in the comprehensive plan shall be used to designate and lay out the open space area.
c. Incorporate public trails and/or public open space designated in the comprehensive plan. Active recreation facilities may contribute to applicable park dedication requirements.
d. Designated public access trails shall be protected by an access easement owned by the city.
e. Open space uses may include: natural/passive and active recreation areas, agriculture, stormwater management facilities, neighborhood greens, trail links, boulevards (e.g. with infiltration facilities), and cul-de-sac Islands.
f. Open space should be distributed throughout the development to serve and enhance as many dwelling units as possible. At least 75 percent of the lots should directly abut or face open space land across a street. Non-adjoining lots shall be provided with convenient access to the open space through access strips at least 30 feet wide. Access to open space used for agriculture may be restricted or prohibited for public safety and to prevent interference with agricultural operations. Use of single loaded roads (e.g. parcels on one side only) shall be minimized.
g. Views of new dwellings from exterior roads and abutting properties should be minimized by the use of changes in topography, existing vegetation, or additional landscaping. Ridge and hilltops should be contained within open space areas wherever possible. Trees should not be removed from ridge and hilltops.

h. The entire area set aside as open space shall be maintained in perpetuity. This restriction shall run with the land and be binding on successors and assigns of the landowner.

i. The boundaries of designated open space areas shall be clearly delineated and labeled on PUD plans. These areas shall be delineated in the field with signage or other measures approved by the city.

j. Agricultural open space uses should use conservation practices consistent with those described in the "National Handbook of Conservation Practices," published by the United States Department of Agriculture Natural Resources Conservation Service, or "Alternative Stormwater Best Management Practices Guidebook" published by the Valley Branch Watershed District.

5. Landscape Design Standards.

a. Street trees may be planted, but are not required, along internal streets passing through common open space.

b. Irregular spacing is encouraged for street trees, to avoid the urban appearance that regular spacing may invoke.

c. The selection of vegetation should be guided by the "ecological system summaries and class factsheets" for native plant communities published by the Minnesota Department of Natural Resources. Selected factsheets representing desired native plant communities are available from the City.

d. A planted buffer area at least 25 feet in width shall be established within all separation areas between exterior arterial or major collector roads and property lines.

e. Planted buffers between clusters of residential lots are encouraged to enhance privacy and a rural appearance between lots.

f. Buffers consisting of an informal arrangement of native plant species combined with infrequent mowing are strongly encouraged, to create a low-maintenance, natural landscape.

g. Planted buffers are also encouraged along natural drainage areas to minimize erosion.

h. Mass grading for open space and other common landscaped areas and stormwater management areas shall be avoided to reduce compaction and impacting water infiltration rates. Soil testing and decompaction may be required if site construction activities negatively impact soil permeability.

I. Low Impact Design Standards

1. Low impact development (LID) site design and stormwater management techniques shall be incorporated into all proposed developments. The primary goal of LID is to reduce the amount of stormwater runoff and to mimic the pre-settlement site hydrology through storage, infiltration, evaporation, and maintenance of natural drainage patterns.
   a. Site Planning and design methods include:
      1. Disconnecting impervious surfaces
      2. Treatment of water close to the source
      3. Avoiding mass grading and soil compaction
      4. Reducing road widths. Road edges shall have concrete edge.
      5. Use of joint/shared parking facilities/driveways
      6. Reducing the length and width of driveways
      7. Preserving areas with highly permeable soils for infiltration
      8. Reduced parking spaces
      9. One-way boulevards with infiltration swales.
      10. Use alternatives to the traditional cul-de-sac as appropriate depending on site conditions and public safety needs.
      11. Avoidance of environmentally sensitive features.
   b. Stormwater management techniques include
      1. Reduce volume through use of infiltration practices such as bio-infiltration (raingardens), vegetated swales, permeable pavement, infiltration basins and trenches.
      2. Reduce volume through on-site storage for reuse (irrigation, gray water)
      3. Make stormwater treatment facilities visible and attractive site amenities.
      4. Use flat or slotted curbing to convey water into the stormwater system.
   c. Better Site Design/Low Impact Development practices as identified in the Minnesota Stormwater Manual published by the Minnesota Pollution Control Agency and the Alternative Stormwater Best management Practices Guidebook published by the Valley Branch Watershed District shall be used to design sites and meet the performance standards

Stearns County, Minnesota, Conservation Design Overlay District

7.1 Conservation Design Overlay, Natural Resources

7.1.1 Purpose

The purpose of the Natural Resources Conservation Design Overlay is to encourage residential development that conserves the environmental resources of Stearns County. Townships identify overlay areas with specific natural resource value, within which development is allowed only by locating dwelling units on non-standard lots and preserving portions of the development site that have conservation value. Conservation design enhances land development and resource conservation opportunities, meeting the following objectives and goals of the Stearns County Comprehensive Plan:

Implementation Plan, Action Item #4, Conservation Design Options.
One of the common themes that emerged during the planning process was the desire of many township officials and landowners to have some additional flexibility in siting residential dwellings on land that is less suitable for farming. There was also a strong desire to limit the creation of 20- and 40-acre single-family lots, which take excessive amounts of land out of agriculture, forestry or resource conservation. The concept of a conservation overlay option in the A-40 zoning district was developed to address these concerns.

Implementation Plan Action Item #5, Conservation Design in the Avon Hills Land Use District.
Conservation design has already been identified as a preferred strategy for the Avon Hills area, however, the distinctive topography, forest cover and concentration of natural resources in this area suggests a somewhat different approach; one that considers natural resources first in any planning process.

Avon Hills Natural Resource Area Policy Area Policy 1:
Encourage open space protection through techniques such as conservation easements, parkland acquisition, and limited residential development emphasizing conservation design.

Avon Hills Natural Resource Area Policy Area Policy 3:
Continue to work with area residents and townships, including those townships adjacent to the policy area, to develop appropriate strategies for resource protection in each township.

Implementation Plan, Action Item #8. Consider Transitions from Large-Lot Zoning.
The conservation design options discussed in this section would allow similar or higher densities to those allowed by the R-20 and T-20 districts. The County will consider replacing these districts with a variety of conservation design options (i.e., the A-40 or Avon Hills options above) or with other zoning districts that will better protect agricultural and natural resources.

7.1.2 Applicability

Conservation design is the preferred and permitted subdivision standard within natural resource conservation design overlay areas, and is a preferred standard in residential districts outside overlay areas. Within conservation design overlay areas, conventional subdivisions require a conditional use permit.

A. **Design.** Natural resources conservation design shall be allowed in all zoning districts eligible for the Natural Resource Conservation Design Overlay, as described in *Section 10.3 of this ordinance.*

7.1.3 Density Standards

The following standards apply to subdivisions within a designated natural resource conservation design overlay.

A. **Minimum size.** The minimum natural resource conservation design development shall be 60 acres in non-residential zoning districts, and in residential zoning districts shall be two (2) single family residential dwelling sites, exclusive of density bonuses or transfers.

B. **Density transfer.** The number of Residential Dwelling Unit sites that can be transferred within a proposed subdivision site in order to develop a conservation design development shall be consistent with the residential density limitations of the underlying primary zoning district, except as noted below.

C. **Density bonus.** As an incentive to encourage conservation design development, the number of residential divisions allowed may be increased as follows, provided the proposed development meets the standards contained in Section 7.6 and 7.32 of this ordinance.

(1) **Conservation design bonus.** In all zoning districts where the overlay is applied, the number of residential dwelling sites may be increased up to a gross density for the subdivision site of two dwelling sites per quarter quarter section, or two per 40 acres. Where allowed density is already equal or greater than a gross density of two units per quarter quarter section, no additional density may be awarded except through participation in the County's Transfer of Development Rights program, as provided for in this Section.

(a) Fractions of less than ½ shall be reduced to the nearest whole number and fractions of ½ or greater shall be increased to the nearest whole number.

(b) Bonus development rights shall be used within the conservation design overlay in which the bonus was granted and shall not be transferred to a parcel outside the overlay.

(2) **Participation in TDR.** In agricultural and transitional zoning districts, up to two additional dwelling units per 40 acres can be transferred into a proposed subdivision site if the dwelling unit rights are acquired via the Natural Resource Transfer of Development Rights program and meet all the approvals and standards for such transfers as required in Section 11 of this ordinance. In residential zoning districts, the gross site density can be increased up to

50% greater than maximum base district density through transfers acquired in the Natural Resource Transfer of Development Rights program.

D. **Density limited by site conditions.** In no event shall the County allow bonus dwelling units or density transfers into a natural resource conservation design subdivision if the transferred eligible dwelling units:

(1) cannot be sited consistent with the building siting requirements or minimum lot size of the underlying primary zoning district or Section 7.32 of this ordinance
(2) undermine the township's natural resource overlay plan, as described in Section 10.3 of this ordinance
(3) undermine the natural resource protection goals of the Stearns County Comprehensive Plan
(4) result in the subdivision exceeding the approved yield plan for the subject subdivision as described in Section 7.6.4 of this ordinance

7.1.4 Required Conservation Design Process

To meet conservation design goals, the following process shall be used to create a conservation design subdivision. The preliminary plat must be based upon the following process, unless a conditional use permit authorizes a conventional subdivision.

A. **First step, develop yield plan**. In order to determine the total potential density of the subdivision, a yield plan must be created and approved by the County Board. The yield plan must be consistent with the Township's conservation overlay plan and shall be used to develop the preliminary plat, as described in *Ordinance Number 230, or successor ordinance*. The yield plan shall be developed in the following manner:

(1) **Identify natural resource conservation design goals**. The applicant must identify specific natural resource conservation goals for the subdivision and provide a general description of conservation areas on the proposed site. Conservation areas must include land on the *County Biological Survey* or the *Areas of Biological Significance Map*, shore and bluff impact zones, wetlands, floodplains, all characteristics required by the Township's conservation overlay plan, and must to the greatest extent possible be contiguous with protected resources adjacent to the site. Other goals can include, but are not limited to: protection of woodlands, specific plant or animal habitat or communities, shoreland areas, wetland buffers, steep slopes, and high quality viewsheds.

(2) **Designate conservation areas**. Based on the conservation areas identified in the first step, the second step in developing a yield plan is to identify primary and secondary resources and designate protected conservation areas. The primary and secondary resources and conservation areas must be consistent with the County's and the Township's natural resource protection goals, including the following:

(a) Primary conservation areas must include land on the *County Biological Survey* or the *Areas of Biological Significance Map*, wetlands, floodplains, shore and bluff impact zones, and all priority natural resources identified in the Township's natural resource overlay plan.
(b) Primary conservation areas must include connections to open space located on adjacent sites.
(c) The applicant can designate other possible resources as primary or secondary conservation areas including mature woodlands, restoration areas, plant or animal communities or habitat, and greenway corridors. Agricultural resources can be designated for protection, including tillable farmland, pasture lands, wind energy resource areas, and rural viewsheds.
(d) **Use of conservation area designation.** All primary and secondary resources do not have to be included within the protected conservation area, but shall be a limitation on the density approved in the yield plan and on home and building envelope placement as described in *Section 7.32 of this ordinance*.

(3) **Yield plan components**. The yield plan shall identify:

(a) The total number of housing units sought by the applicant, not to exceed a gross density of four units per forty acres. The applicant must separately identify the number of units being transferred via the TDR program, and whether development rights have been contractually secured or are being sought.
(b) A listing of the primary and secondary resources for conservation.
(c) A map showing all areas within the proposed development that lie outside the conservation areas and are at least one acre in size.

B. **Second step, map conservation areas.** After creating the yield plan, the applicant shall map all primary and secondary conservation areas for the property in question and properties within 1/2mile.

(1) In order to facilitate mapping of conservation areas, the Department shall supply maps showing the following resources:

(a) Soil types, including tillable farmland and areas with a LESA score greater than 65
(b) Significant natural areas as shown on the *County Biological Survey*
(c) Woodlands
(d) Wetlands and floodplain
(e) Historic, archaeological and cultural features
(f) Steep Slopes
(g) Shore and bluff impact zones
(h) Protected natural areas on sites adjacent to the proposed development site.
(i) Greenways or natural resource corridors designated by the County or the Department of Natural Resources.

(2) **Additional information.** The developer or property owner shall supply the following information:

(a) Certified acres
(b) Most recent Farm Service Agency air photos showing the tract number, wetlands, highly erodible areas, etc.
(c) Indicate the location of natural drainage ways, County and private ditches and tile drainage systems
(d) Forms 578 and 156EZ; or successor forms, which can be obtained from the Farm Service Agency
(e) Other information necessary to ensure compliance with the township Natural Resource Overlay Plan, the County Comprehensive Plan, or the conservation goals identified in *Section 7.6.10 (A) of this ordinance*

C. **Third step, identify building locations.** The third step requires locating potential home sites that avoid the designated primary conservation areas and, to the extent practicable, the secondary conservation areas. All buildings and building envelopes shall be located so as to meet the goals contained in *Section 7.32 of this ordinance.*

D. **Fourth step, identify street, infrastructure locations.** After the home sites are designated, the developer or property owner shall identify the location of streets, trails, stormwater facilities, wastewater treatment and other infrastructure associated with the development. The street and infrastructure locations shall protect priority natural resources consistent with the township's and subdivision's conservation goals.

E. **Fifth step, draw lot lines.** Based upon the home site and street locations, the lot lines may be drawn. Lots shall meet standards for the base zoning district and overlay districts. Flexibility on base zoning district lot size can be granted for the purpose of meeting natural resource conservation goals, provided that setback and septic standards can still be met.

F. **Submit with preliminary plat.** The Applicant shall submit the yield plan, map of primary and secondary conservation areas, locations of buildings and building envelopes, and the protected conservation area to the Planning Commission as part of the preliminary plat, to be considered as described in *10.3 of this ordinance and Ordinance 230; or successor Ordinance*.

7.1.5 Conventional Subdivision Review

Conventional subdivision including a standard plat or administrative subdivision is a conditional use within Conservation Design Overlay areas. A conditional use permit shall not be required for non-building subdivisions. The Planning Commission shall include the following criteria in their review of conventional subdivision applications:

A. The conventional subdivision meets the natural resource conservation standards of this ordinance and the township natural resource overlay plan.
B. The conventional subdivision supports the goals and policies of the Stearns County Comprehensive Plan.
C. The conventional subdivision maintains the rural character of the area as compared to a conservation design subdivision.

D. The conventional subdivision, under the strict application of building siting standards in *Section 7.32 of this ordinance*, will still protect the priority natural resource amenities and use the land as efficiently as a conservation design development. For instance, in an natural resource conservation design overlay the applicant for conventional development must demonstrate that the conventional subdivision, which does not have a requirement for permanently protected natural resources, still results in an efficient use of land for natural resource conservation purposes, relative to what would occur under conservation design development in which a minimum of 80% of the land will be permanently protected.

E. No density bonus is allowed for a conventional subdivision.

7.1.6 Conservation Design Development Consideration Process

A. The conventional subdivision meets the natural resource conservation standards of this ordinance and the township natural resource overlay plan.

B. A preliminary subdivision plat shall be filed and processed in accordance with the procedures for processing a subdivision plat established in *Stearns County Subdivision Ordinance Number 230; or successor ordinance*.

C. The approved preliminary plat shall be the site plan for the conservation design development whenever there is modification or variation from the standards of the primary zoning district or any applicable overlay district.

D. Any request for a change to a site plan for a conservation design development shall be administered in the same manner as to that required for a new conservation design development.

E. Modifications to a conservation design development shall be considered in the same manner as for approval pursuant to *Section 7.6.7 A of this ordinance.*

7.1.7 Required Conservation Areas

A minimum of 80% of the total acreage included in the subdivision application must be designated protected conservation areas, and must meet the following standards:

A. **Protection must be permanent.** Protections on designated conservation areas must be permanent. Conservation easements are considered to be permanent protection. Deed restrictions or covenants are not considered to be permanent protection.

(1) **Protection terms.** The protection mechanism shall restrict future development and use of the conservation area to those consistent with the open space uses and natural resource conservation development goals identified in the preliminary plat and the township natural resource overlay plan.

(2) **Allowed uses on protected land**. The conservation easement(s) on protected conservation areas must allow land uses that are consistent with open space uses and natural resource conservation and must not allow uses that would conflict with the natural resource conservation design goals.

(3) **Authorized conservation easement holders.** A conservation easement must be held and enforced by a third party who is not the owner of the parcel. The conservation easement shall be held by an entity authorized to hold conservation easements under *Minnesota Statutes Chapter 84C; or successor statute*, which includes federally-recognized non-profit conservation organizations and units of government. The authorized entity may be Stearns County.

(4) **Board Approval.** The County Board shall approve:

(a) The granting of any easement to a qualified third party.
(b) All actions taken by a homeowners' association regarding the conservation area not authorized in the covenant or management plan.

(5) The conservation easement shall contain appropriate provisions for the proper assignment of the easement in the event that the conservation organization becomes unwilling or unable to continue carrying out its functions.

7.1.8 Ownership of Conservation Areas

Conservation areas within natural resource conservation design development shall be owned, administered and maintained by any of the following methods, either individually, or in combination, subject to approval by the Board:

A. **Homeowner's association.** The protected conservation areas and any associated facilities may be held in common ownership by a homeowner's association. The homeowner's association shall be formed and operated under the following provisions:

(1) The developer shall create a homeowner's association, including its bylaws and methods for maintaining the conservation area before final plat approval.
(2) Membership in the homeowner's association shall be mandatory for all purchasers of lots within the development and all successors or assigns. The conditions and timing of transferring control of the homeowner's association from developer to lot owners shall be identified.
(3) The homeowner's association shall be responsible for maintenance of insurance and taxes on the conservation area.
(4) The members of the homeowner's association shall share equitably the cost of maintaining the conservation area. Shares shall be defined by the homeowner's association bylaws.
(5) Notification to the easement holder of any transfer of title.

B. **Third party ownership.** The developer or homeowner's association may transfer title for any protected conservation area subject to the following:

(1) Notification to easement holder of any transfer of title.

(2) The transfer of any title shall be to an entity that can use the conservation area land consistent with the natural resource conservation design goals and provisions of the permanent restrictions.
(3) The transferor (developer, homeowner's association, landowner) demonstrates to the satisfaction of the Board that the third party entity has resources to maintain the land in a manner consistent with the conservation design theme and the provisions of the conservation easement. Conservation subdivisions that have an agricultural conservation goal can be transferred to a third party for the express purpose of agricultural use.

7.1.9 Maintenance of Conservation Areas

The conservation design subdivision process shall include creation of a plan for maintenance of the protected conservation areas. The maintenance plan shall meet the following standards:

A. **Board Approval**. The maintenance agreement shall be acceptable to the County Board.
B. **Describe Conservation Areas**. All lands included as protected conservation areas and all improvements thereto shall be described and identified as to location, size, use, maintenance and control on the preliminary plat.
C. **Subdivision Agreement**. The developer shall enter into a subdivision agreement that shall identify the method and extent of protection and all provisions of the easement, deed restriction, or other protection vehicle. The agreement shall also identify all assessments or financial security for ensuring ongoing maintenance and control of the conservation areas.
D. The fee-title owner shall be responsible for the maintenance and control of conservation areas, except as directly stipulated and provided for in a conservation easement held by a qualified third party.
E. Failure to comply with the subdivision agreement easement shall constitute a violation of this ordinance.

7.1.10 Performance Standards for Natural Resource Conservation Design Developments

Natural resource conservation design development must meet the following standards.

A. **General standards**

(1) Individual lots, buildings and streets shall be designed and located to minimize impact on the protected natural resources or systems and to maximize opportunities for uses consistent with the natural resource priorities of the township's overlay plan.
(2) Diversity and originality in lot layout and individual building design shall be encouraged to achieve the best possible relationship between development and the land.
(3) The subdivision design shall protect floodplains, wetlands, steep slopes, and shore and bluff impact zones, from clearing, grading, filling and construction impacts.
(4) The design shall be consistent with the designated conservation goals as submitted with the preliminary plat.
(5) The design should maintain or create an upland buffer of natural native species of at least 100 feet in depth adjacent to lakes, wetlands, rivers and streams.

(6) The design should avoid siting new construction on prominent hilltops or ridges.
(7) The design shall protect, to the maximum extent possible, rural roadside character through retaining existing trees or native vegetation between housing and roads, setting back development from roads, or designating new landscaping as a buffer.

B. **Residential lot standards**

(1) The area, configuration and location of protected conservation areas shall, to the greatest extent possible, be designed as a single block with logical and straightforward boundaries. Long thin strips and small blocks of open space should be avoided.
(2) Yards abutting the boundaries of the entire conservation design development site shall meet the minimum setback requirements for the primary zoning district or any applicable overlay zoning district.

- Protected conservation areas shall, to the maximum extent possible, connect to and be contiguous with conservation areas on adjacent sites. The conservation area shall connect to high priority natural resource sites on adjacent sites, as defined by the township's natural resource conservation plan.

(3) The setback requirements for all property lines except for road right-of-way that are not abutting the boundaries of the entire conservation design development may be reduced by 50%. Encroachments are not allowed within the setback area.

C. **Protected Conservation Area Standards**

(1) The minimum size of the protected conservation area shall be 80% of the total lot area of the conservation design development, except where the township conservation design standards require a larger conservation area.
(2) The conservation area land shall be surveyed.
(3) The required protected conservation area shall be undivided and permanently restricted from further development by means of a permanent conservation easement. Infrastructure that is consistent with specific conservation goals, such as agricultural facilities other than feedlots, may be allowed.
(4) Road rights of way and land under the ordinary high water level may not be counted towards the required minimum protected conservation area.
(5) No more than 50% of the protected conservation area may consist of wetlands or slopes greater than 50%.
(6) The conservation easement shall be recorded in the Office of the County Recorder.

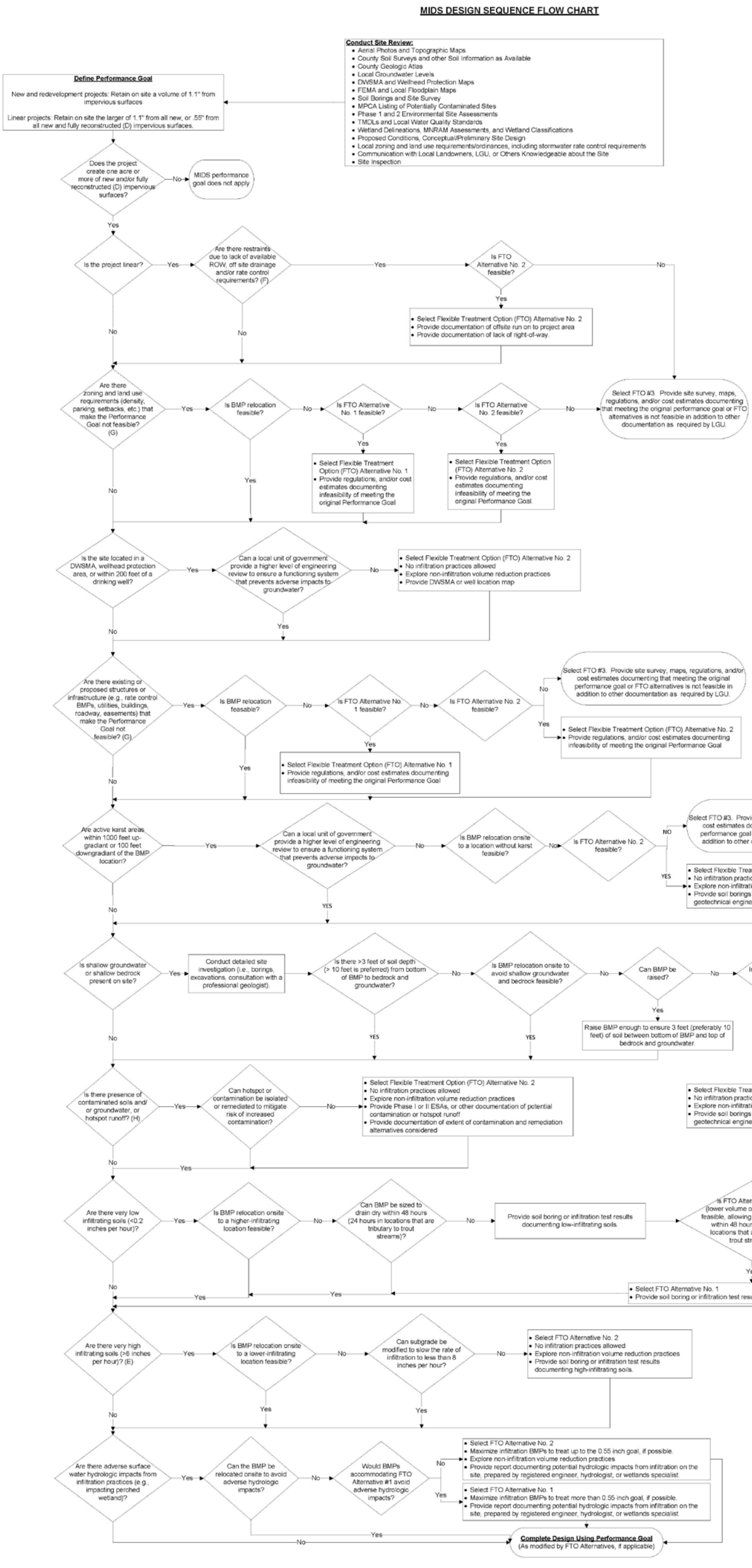
D. **Street standards.** The right of way width for each road shall be wide enough to provide for all public services, including roadway drainage, trails and walkways, utilities and snow storage.

E. **Subsurface sewage treatment and drinking water systems.** Community subsurface sewage treatment systems and/or community drinking water systems may be required where soil types and other environmental sensitivities, such as shallow bedrock formations and susceptibility to nitrate nitrogen contamination, are such that additional measures may be necessary to protect the public health, safety and welfare.

F. Subsurface sewage treatment systems, either community or individual systems, and community drinking water supply systems may be placed within the protected conservation area, provided that the systems can be placed within conservation areas consistent with the natural resource goals of the conservation design development.

(1) A subordinate service district, a customer owned utility or other entity acceptable to the Board shall be responsible for the management of any community wastewater systems and any community drinking water supply system.
(2) Subsurface sewage treatment systems, either community or individual systems, and community drinking water supply systems may be placed within the protected conservation area, provided that the systems can be placed within conservation areas consistent with the natural resource goals of the conservation design development.

MIDS Design Sequence Flowchart



Sample Resolution Adopting Comprehensive Plan or Ordinance Changes

Communities may adopt comprehensive plan changes or an ordinance change by a majority vote of the members of the local government decision making body[1]. Below is a sample resolution that can be modified by communities adopting plan or ordinance changes.

SAMPLE RESOLUTION __:

RESOLUTION APPROVING THE ADOPTION OF ZONING ORDINANCE (or Subdivision Ordinance, or Comprehensive Plan, etc.) CHANGES BY _____(community name), _____ COUNTY, MINNESOTA

WHEREAS, _____ (community name) intends to adopt changes to its zoning ordinance (or Subdivision Ordinance, or Comprehensive Plan, etc.) as shown in Attachment A to this resolution; and (Attachment A should include the language that is being changed.)

WHEREAS, _____ (community name) conducted a public process considering and developing these changes; and

WHEREAS, these changes will achieve protection of our local water resources; and

WHEREAS, Minnesota Statutes 2009, Chapter 115.03 Subdivision 5c. authorized the Minnesota Pollution Control Agency (MPCA) to develop performance standards, design standards, and other tools to enable and promote the implementation of low-impact development and other storm water management techniques; and

WHEREAS, pursuant to the authority in Minnesota Statutes, Chapter 115.03 Subdivision 5c, MPCA developed a set of performance goals, design standards, and policy development guidance provisions known as the Minimal Impact Design Standards (MIDS); and

WHEREAS, _____ (community name) followed the MIDS standards and provisions in the development of the policy or ordinance changes in Attachment A to this resolution.

[1] Note: For municipalities, the adoption or amendment of any portion of a zoning ordinance which changes all or part of the existing classification of a zoning district from residential to either commercial or industrial requires a two-thirds majority vote of all members of the governing body. It is not likely that this will be the case for communities adopting changes for MIDS.

Also, some communities may have adopted the requirement of a super-majority for certain actions.

NOW THEREFORE BE IT RESOLVED that _____ (community name) hereby adopts the changes in Attachment A.

PASSED BY THE _____THIS_____DAY

OF_____, 201_.

APPROVED:

_____

Chair of Authorizing Body

ATTEST:

_____

Natural Resource Planning Checklist

PRIORITY COMMUNTIES IN WASHINGTON COUNTY

WASHINGTON CONSERVATION DISTRICT

Putting the Pieces Together: Comprehensive Planning to Protect Open Space and Local Resources

A Step-by-Step Checklist for Local Officials

Phase I: Information Gathering/Compile the Pieces

Get the Process Started

☐ Completed ☐ Started

- ○ Gather local values, needs, and information
- ○ Attend training workshops
- ○ Coordinate with partner agencies and other stakeholders

Notes:

Use this checklist as a guide to evaluate where you are in the Open Space and Rural Character Planning process. Some steps will occur concurrently.

Prepare Base Map of Natural Resources and Rural Character

☐ Completed ☐ Started

- ○ Compile existing maps and data
- ○ Review the status of your Natural Resource Inventory that uses the Minnesota Land Cover Classification System (MLCCS)
- ○ Identify data gaps
- ○ Create new data sets as needed
- ○ Create maps of natural, cultural, and rural features

Notes:

Inventory ➡ Assessment ➡ Plan ➡ Implement

Integrating Natural Resources into the Comprehensive Planning Process 1

Putting the Pieces Together . . . to Protect Open Space and Local Resources

Review Plans and Policies that Influence the Comprehensive Plan

☐ Completed ☐ Started

- ○ Met Council Systems Statement
- ○ Watershed Management Plans
- ○ Transportation Plans
- ○ Wild and Scenic River Plans
- ○ Land and Water Legacy Program
- ○ County Comprehensive Plan
- ○ Other: _____
- ○ Other: _____
- ○ Other: _____
- ○ Other: _____

Notes:

_____

_____

_____

_____

Facilitate Public Involvement

☐ Completed ☐ Started

- ○ Hold public meetings and provide public education
- ○ Conduct visual preference survey
- ○ Define open space or other locally important characteristic
- ○ Develop criteria for land protection

Notes:

_____

_____

_____

Apply Criteria and Create Protection Prioritization Map

☐ Completed ☐ Started

- ○ Provide opportunity for public comment on draft map
- ○ Revise the map based on public feedback

Notes:

_____

_____

_____

_____

The Prioritization Map is also known as the "Natural Resource Assessment"

In this step, information collected in the inventory and the criteria developed during the public involvement process are used to rank and prioritize areas for protection.

Inventory ➡ Assessment ➡ Plan ➡ Implement

Putting the Pieces Together . . . to Protect Open Space and Local Resources

Bring Parallel Comprehensive Plan Processes Together

☐ Completed ☐ Started

- ○ Identify overlapping and/or conflicting priorities
- ○ Re-prioritize as needed

Notes:

_____

_____

_____

_____

_____

Phase II: Comprehensive Plan Writing/Putting the Pieces Together

Prepare Land Use Plan – How do we want to grow?

☐ Completed ☐ Started

Prepare Park and Open Space Plan – What do we want to protect?

☐ Completed ☐ Started

Prepare Water Resource Management Plan – How do we protect water resources as we grow?

☐ Completed ☐ Started

Prepare Transportation and Utilities Plan – How do we get to where we want to be?

☐ Completed ☐ Started

Draft Implementation and Capitol Improvement Plan – How do we get it done?

☐ Completed ☐ Started

Compile the Pieces into the DRAFT Comprehensive Plan

☐ Completed ☐ Started

Notes:

_____

_____

_____

The Comprehensive Plan is made up of four major components:

1. Park and Open Space Plan,
2. Water Resource Management Plan,
3. Transportation and Utilities Plan, &
4. Land Use Plan.

Planning to protect natural resources and rural character requires each of these plans to be closely coordinated and guided by the overall goals to preserve community character.

Inventory ➡ Assessment ➡ Plan ➡ Implement

Integrating Natural Resources into the Comprehensive Planning Process **3**

Putting the Pieces Together . . . to Protect Open Space and Local Resources

Phase III: Public Hearing and Metropolitan Council Review

Public Hearing

☐ Completed Date: _____

Incorporate Public Comments and Distribute Draft Comprehensive Plan for Metropolitan Council Review

☐ Completed Date: _____

Adopt Comprehensive Plan

☐ Completed Date: _____

Notes:

_____

_____

_____

Phase IV: Implementation

Prepare, Revise, and Adopt Ordinances

☐ Completed Date: _____

Funding and Grant Acquisition

☐ Completed Date: _____

Implement New Programs

☐ Completed Date: _____

Implementation
Takes commitment to all the hard work put into the comprehensive plan. Good luck!

Notes:

_____

_____

_____

_____

_____

☐ Started → **Where your Community Wants to be . . .**

Inventory → Assessment → Plan → Implement

Code and Ordinance Worksheet

The Code and Ordinance Worksheet on the following pages is a product of the Center for Watershed Protection. It is reprinted here and may be used under a license allowing non-commercial use. A fill-in form version of the Code and Ordinance Worksheet is available at: www.cwp.org.

The Worksheet is a useful tool for conducting a code audit (STEP TWO of the "How to use this package" process on page 11 of this document.) The CWP developed the worksheet to help communities evaluate their codes and ordinances relative the model development principles outlined in the Better Site Design Handbook.

The process of completing the Worksheet is more important than your community's final score. Some of the most important steps are filling in the notes sections for each question. The notes sections are where you will place portions of your codes and ordinances that relate to the question. Pulling these pieces together can help in understanding how stormwater is managed currently in your community.

CODE AND ORDINANCE WORKSHEET

About the Adobe Acrobat Form

Note: Acrobat Reader will not save the information entered into a form. Saving changes is only possible with a full version of Acrobat.

- The blue fields indicate that an answer is required.
- The gray fields are for notes and are not required, but highly recommended.
- The green fields will automatically summarize the points – no input is needed here.

To fill out a form:

1. Select the hand tool  .
2. Position the pointer inside a form field, and click. The I-beam pointer allows you to type text. If your pointer appears as a pointing finger, you can select an item from a list (i.e., YES or NO).
3. After entering text or making a selection, press Tab to accept the form field change and go to the next or previous field.
4. Once you have filled in the appropriate form fields, do both of the following:
   - Choose File > Export > Form Data to save the form data in a separate FDF file. Type a filename and click save.
   - Print the form so that you have a hard copy for your records.

And Most Importantly…
Send CWP a copy! Let us know how you did!

The Code and Ordinance Worksheet allows an in-depth review of the standards, ordinances, and codes (i.e., the development rules) that shape how development occurs in your community. You are guided through a systematic comparison of your local development rules against the model development principles. Institutional frameworks, regulatory structures and incentive programs are included in this review. The worksheet consists of a series of questions that correspond to each of the model development principles. Points are assigned based on how well the current development rules agree with the site planning benchmarks derived from the model development principles.

The worksheet is intended to guide you through the first two steps of a local site planning roundtable.

Step 1: Find out what the Development Rules are in your community.

Step 2: See how your rules stack up to the Model Development Principles.

The homework done in these first two steps helps to identify which development rules are potential candidates for change.

PREPARING TO COMPLETE THE CODE AND ORDINANCE WORKSHEET

Two tasks need to be performed before you begin in the worksheet. First, you must identify all the development rules that apply in your community. Second, you must identify the local, state, and federal authorities that actually administer or enforce the development rules within your community. Both tasks require a large investment of time. The development process is usually shaped by a complex labyrinth of regulations, criteria, and authorities. A team approach may be helpful. You may wish to enlist the help of a local plan reviewer, land planner, land use attorney, or civil engineer. Their real-world experience with the development process is often very useful in completing the worksheet.

Identify the Development Rules

Gather the key documents that contain the development rules in your community. A list of potential documents to look for is provided in Table 1. Keep in mind that the information you may want on a particular development rule is not always found in code or regulation, and maybe hidden in supporting design manuals, review checklists, guidance document or construction specifications. In most cases, this will require an extensive search. Few communities include all of their rules in a single document. Be prepared to contact state and federal, as well as local agencies to obtain copies of the needed documents.

Table 1: Key Local Documents that will be Needed to Complete the COW
Zoning Ordinance
Subdivision Codes
Street Standards or Road Design Manual
Parking Requirements
Building and Fire Regulations/Standards
Stormwater Management or Drainage Criteria
Buffer or Floodplain Regulations
Environmental Regulations
Tree Protection or Landscaping Ordinance
Erosion and Sediment Control Ordinances
Public Fire Defense Masterplans
Grading Ordinance

Identify Development Authorities

Once the development rules are located, it is relatively easy to determine which local agencies or authorities are actually responsible for administering and enforcing the rules. Completing this step will provide you with a better understanding of the intricacies of the development review process and helps identify key members of a future local roundtable. Table 2 provides a simple framework for identifying the agencies that influence development in your community. As you will see, space is provided not only for local agencies, but for state and federal agencies as well. In some cases, state and federal agencies may also exercise some authority over the local development process (e.g., wetlands, some road design, and stormwater).

USING THE WORKSHEET: HOW DO YOUR RULES STACK UP TO THE MODEL DEVELOPMENT PRINCIPLES?

Completing the Worksheet

Once you have located the documents that outline your development rules and identified the authorities responsible for development in your community, you are ready for the next step. You can now use the worksheet to compare your development rules to the model development principles. The worksheet is presented at the end of this chapter. The worksheet presents seventy-seven site planning benchmarks. The benchmarks are posed as questions. Each benchmark focuses on a specific site design practice, such as the minimum diameter of cul-de-sacs, the minimum width of streets, or the minimum parking ratio for a certain land use. You should refer to the codes, ordinances, and plans identified in the first step to determine the appropriate development rule. The questions require either a yes or no response or specific numeric criteria. If your development rule agrees with the site planning benchmark, you are awarded points.

Calculating Your Score

A place is provided on each page of the worksheet to keep track of your running score. In addition, the worksheet is subdivided into three categories:

- Residential Streets and Parking Lots (Principles No. 1 - 10)
- Lot Development (Principles No. 11 - 16)
- Conservation of Natural Areas (Principles No. 17 - 22).

For each category, you are asked to subtotal your score. This "**Time to Assess**" allows you to consider which development rules are most in line with the site planning benchmarks and what rules are potential candidates for change.

The total number of points possible for all of the site planning benchmarks is 100. Your overall score provides a general indication of your community's ability to support environmentally sensitive development. As a general rule, if your overall score is lower than 80, then it may be advisable to systematically reform your local development rules. A score sheet is provided at end of the Code and Ordinance Worksheet to assist you in determining where your community's score places in respect to the Model Development Principles. Once you have completed the worksheet, go back and review your responses. Determine if there are specific areas that need improvement (e.g., development rules that govern road design) or if your development rules are generally pretty good. This review is key to implementation of better development: assessment of your current development rules and identification of impediments to innovative site design. This review also directly leads into the next step: a site planning roundtable process conducted at the local government level. The primary tasks of a local roundtable are to systematically review existing development rules and then determine if changes can or should be made. By providing a much-needed framework for overcoming barriers to better development, the site planning roundtable can serve as an important tool for local change.

Code and Ordinance Worksheet

Table 2: Local, State, and Federal Authorities Responsible for Development in Your Community

Development Responsibility		State/Federal	County	Town
Sets road standards	Agency:			
	Contact Name:			
	Phone No.:			
Review/approves subdivision plans	Agency:			
	Contact Name:			
	Phone No.:			
Establishes zoning ordinances	Agency:			
	Contact Name:			
	Phone No.:			
Establishes subdivision ordinances	Agency:			
	Contact Name:			
	Phone No.:			
Reviews/establishes stormwater management or drainage criteria	Agency:			
	Contact Name:			
	Phone No.:			
Provides fire protection and fire protection code enforcement	Agency:			
	Contact Name:			
	Phone No.:			
Oversees buffer ordinance	Agency:			
	Contact Name:			
	Phone No.:			
Oversees wetland protection	Agency:			
	Contact Name:			
	Phone No.:			
Establishes grading requirements or oversees erosion and sediment control program	Agency:			
	Contact Name:			
	Phone No.:			
Reviews/approves septic systems	Agency:			
	Contact Name:			
	Phone No.:			
Review/approves utility plans (e.g., water and sewer)	Agency:			
	Contact Name:			
	Phone No.:			
Reviews/approves forest conservation/ tree protection plans	Agency:			
	Contact Name:			
	Phone No.:			

Development Feature	*Your Local Criteria*

1. Street Width

What is the minimum pavement width allowed for streets in low density residential developments that have less than 500 daily trips (ADT)? _____ feet

*If your answer is between **18-22 feet**, give yourself **4 points** • •*

At higher densities are parking lanes allowed to also serve as traffic lanes (i.e., queuing streets)? YES

*If your answer is **YES**, give yourself **3 points** • •*

Notes on Street Width (include source documentation such as name of document, section and page #):

2. Street Length

Do street standards promote the most efficient street layouts that reduce overall street length? YES

*If your answer is **YES**, give yourself **1 point** • •*

Notes on Street Length (include source documentation such as name of document, section and page #):

3. Right-of-Way Width

What is the minimum right of way (ROW) width for a residential street? _____ feet

*If your answer is **less than 45 feet**, give yourself **3 points** • •*

Does the code allow utilities to be placed under the paved section of the ROW? YES

*If your answer is **YES**, give yourself **1 point** • •*

Notes on ROW Width (include source documentation such as name of document, section and page #):

4. Cul-de-Sacs

What is the minimum radius allowed for cul-de-sacs? _____ feet

*If your answer is **less than 35 feet**, give yourself **3 points** • •*

*If your answer is **36 feet to 45 feet**, give yourself **1 point** • •*

Can a landscaped island be created within the cul-de-sac? YES

*If your answer is **YES**, give yourself **1 point** • •*

Are alternative turnarounds such as "hammerheads" allowed on short streets in low density residential developments? YES

*If your answer is **YES**, give yourself **1 point** • •*

Notes on Cul-de-Sacs (include source documentation such as name of document, section and page #):

Code and Ordinance Worksheet *Subtotal Page 5* 0

-5-

Development Feature	*Your Local Criteria*

5. Vegetated Open Channels

Are curb and gutters required for most residential street sections?	YES
*If your answer is **NO**, give yourself **2** points • •*	
Are there established design criteria for swales that can provide stormwater quality treatment (i.e., dry swales, biofilters, or grass swales)?	YES
*If your answer is **YES**, give yourself **2** points • •*	

Notes on Vegetated Open Channel (include source documentation such as name of document, section and page #):

6. Parking Ratios

What is the minimum parking ratio for a professional office building (per 1000 ft^2 of gross floor area)?	spaces
*If your answer is **less than 3.0 spaces**, give yourself **1** point • •*	
What is the minimum required parking ratio for shopping centers (per 1,000 ft^2 gross floor area)?	spaces
*If your answer is **4.5 spaces or less**, give yourself **1** point • •*	
What is the minimum required parking ratio for single family homes (per home)?	spaces
*If your answer is **less than or equal to 2.0 spaces**, give yourself **1** point • •*	
Are your parking requirements set as maximum or median (rather than minimum) requirements?	YES
*If your answer is **YES**, give yourself **2** points • •*	

Notes on Parking Ratios (include source documentation such as name of document, section and page #):

7. Parking Codes

Is the use of shared parking arrangements promoted?	YES
*If your answer is **YES**, give yourself **1** point • •*	
Are model shared parking agreements provided?	YES
*If your answer is **YES**, give yourself **1** point • •*	
Are parking ratios reduced if shared parking arrangements are in place?	YES
*If your answer is **YES**, give yourself **1** point • •*	
If mass transit is provided nearby, is the parking ratio reduced?	YES
*If your answer is **YES**, give yourself **1** point • •*	

Notes on Parking Codes (include source documentation such as name of document, section and page #):

Code and Ordinance Worksheet *Subtotal Page 6* 0

-6-

Development Feature	*Your Local Criteria*

8. Parking Lots

What is the minimum stall width for a standard parking space? _____ feet

*If your answer is **9 feet or less**, give yourself **1 point** • •*

What is the minimum stall length for a standard parking space? _____ feet

*If your answer is **18 feet or less**, give yourself **1 point** • •*

Are at least 30% of the spaces at larger commercial parking lots required to have smaller dimensions for compact cars? YES

*If your answer is **YES**, give yourself **1 point** • •*

Can pervious materials be used for spillover parking areas? YES

*If your answer is **YES**, give yourself **2 points** • •*

Notes on Parking Lots (include source documentation such as name of document, section and page #):

9. Structured Parking

Are there any incentives to developers to provide parking within garages rather than surface parking lots? YES

*If your answer is **YES**, give yourself **1 point** • •*

Notes on Structured Parking (include source documentation such as name of document, section and page #):

10. Parking Lot Runoff

Is a minimum percentage of a parking lot required to be landscaped? YES

*If your answer is **YES**, give yourself **2 points** • •*

Is the use of bioretention islands and other stormwater practices within landscaped areas or setbacks allowed? YES

*If your answer is **YES**, give yourself **2 points** • •*

Notes on Parking Lot Runoff (include source documentation such as name of document, section and page #):

Code and Ordinance Worksheet *Subtotal Page 7* 0

-7-

Development Feature	*Your Local Criteria*

• • **Time to Assess:** Principles 1 - 10 focused on the codes, ordinances, and standards that determine the size, shape, and construction of parking lots, roadways, and driveways in the suburban landscape. There were a total of **40** points available for Principles 1 - 10. What was your total score?

Subtotal Page 5 [0] + Subtotal Page 6 [0] + Subtotal Page 7 [0] = **0**

Where were your codes and ordinances most in line with the principles? What codes and ordinances are potential impediments to better development?

11. Open Space Design

Are open space or cluster development designs allowed in the community? *If your answer is **YES**, give yourself **3** points • •* *If your answer is **NO**, skip to question No. 12*	YES
Is land conservation or impervious cover reduction a major goal or objective of the open space design ordinance? *If your answer is **YES**, give yourself **1** point • •*	YES
Are the submittal or review requirements for open space design greater than those for conventional development? *If your answer is **NO**, give yourself **1** point • •*	YES
Is open space or cluster design a by-right form of development? *If your answer is **YES**, give yourself **1** point • •*	YES
Are flexible site design criteria available for developers that utilize open space or cluster design options (e.g., setbacks, road widths, lot sizes) *If your answer is **YES**, give yourself **2** points • •*	YES

Notes on Open Space Design (include source documentation such as name of document, section and page #):

Code and Ordinance Worksheet *Subtotal Page 8* **0**

Development Feature	*Your Local Criteria*
12. Setbacks and Frontages	
Are irregular lot shapes (e.g., pie-shaped, flag lots) allowed in the community?	YES
*If your answer is **YES**, give yourself **1** point • •*	
What is the minimum requirement for front setbacks for a one half (½) acre residential lot?	____ feet
*If your answer is **20 feet or less**, give yourself **1** point • •*	
What is the minimum requirement for rear setbacks for a one half (½) acre residential lot?	____ feet
*If your answer is **25 feet or less**, give yourself **1** point • •*	
What is the minimum requirement for side setbacks for a one half (½) acre residential lot?	____ feet
*If your answer is **8 feet or less**, give yourself **1** points • •*	
What is the minimum frontage distance for a one half (½) acre residential lot?	____ feet
*If your answer is **less than 80 feet**, give yourself **2** points • •*	
Notes on Setback and Frontages (include source documentation such as name of document, section and page #):	
13. Sidewalks	
What is the minimum sidewalk width allowed in the community?	____ feet
*If your answer is **4 feet or less**, give yourself **2** points • •*	
Are sidewalks always required on both sides of residential streets?	YES
*If your answer is **NO**, give yourself **2** points • •*	
Are sidewalks generally sloped so they drain to the front yard rather than the street?	YES
*If your answer is **YES**, give yourself **1** point • •*	
Can alternate pedestrian networks be substituted for sidewalks (e.g., trails through common areas)?	YES
*If your answer is **YES**, give yourself **1** point • •*	
Notes on Sidewalks (include source documentation such as name of document, section and page #):	
14. Driveways	
What is the minimum driveway width specified in the community?	____ feet
*If your answer is **9 feet or less (one lane) or 18 feet (two lanes)**, give yourself **2** points • •*	
Code and Ordinance Worksheet — *Subtotal Page 9*	0

-9-

Development Feature	*Your Local Criteria*
Can pervious materials be used for single family home driveways (e.g., grass, gravel, porous pavers, etc)?	YES
*If your answer is **YES**, give yourself **2** points • •*	
Can a "two track" design be used at single family driveways?	YES
*If your answer is **YES**, give yourself **1** point • •*	
Are shared driveways permitted in residential developments?	YES
*If your answer is **YES**, give yourself **1** point • •*	

Notes on Driveways (include source documentation such as name of document, section and page #):

15. Open Space Management

Skip to question 16 if open space, cluster, or conservation developments are not allowed in your community.

Does the community have enforceable requirements to establish associations that can effectively manage open space?	YES
*If your answer is **YES**, give yourself **2** points • •*	
Are open space areas required to be consolidated into larger units?	YES
*If your answer is **YES**, give yourself **1** point • •*	
Does a minimum percentage of open space have to be managed in a natural condition?	YES
*If your answer is **YES**, give yourself **1** point • •*	
Are allowable and unallowable uses for open space in residential developments defined?	YES
*If your answer is **YES**, give yourself **1** point • •*	
Can open space be managed by a third party using land trusts or conservation easements?	YES
*If your answer is **YES**, give yourself **1** point • •*	

Notes on Open Space Management (include source documentation such as name of document, section and page #):

16. Rooftop Runoff

Can rooftop runoff be discharged to yard areas?	YES
*If your answer is **YES**, give yourself **2** points • •*	
Do current grading or drainage requirements allow for temporary ponding of stormwater on front yards or rooftops?	YES
*If your answer is **YES**, give yourself **2** points • •*	

Notes on Rooftop Runoff (include source documentation such as name of document, section and page #):

Code and Ordinance Worksheet *Subtotal Page 10* 0

-10-

Development Feature	*Your Local Criteria*

• • **Time to Assess:** Principles 11 through 16 focused on the regulations which determine lot size, lot shape, housing density, and the overall design and appearance of our neighborhoods. There were a total of **36** points available for Principles 11 - 16. What was your total score?

Subtotal Page 8 0 + Subtotal Page 9 0 + Subtotal Page 10 0 = **0**

Where were your codes and ordinances most in line with the principles? What codes and ordinances are potential impediments to better development?

17. Buffer Systems

Is there a stream buffer ordinance in the community? YES

*If your answer is **YES**, give yourself **2** points • •*

If so, what is the minimum buffer width? feet

*If your answer is **75 feet or more**, give yourself **1** point • •*

Is expansion of the buffer to include freshwater wetlands, steep slopes or the 100-year floodplain required? YES

*If your answer is **YES**, give yourself **1** point • •*

Notes on Buffer Systems (include source documentation such as name of document, section and page #):

18. Buffer Maintenance

If you do not have stream buffer requirements in your community, skip to question No. 19

Does the stream buffer ordinance specify that at least part of the stream buffer be maintained with native vegetation? YES

*If your answer is **YES**, give yourself **2** points • •*

Does the stream buffer ordinance outline allowable uses? YES

*If your answer is **YES**, give yourself **1** point*

Code and Ordinance Worksheet *Subtotal Page 11* **0**

Development Feature	*Your Local Criteria*
Does the ordinance specify enforcement and education mechanisms?	YES
*If your answer is **YES**, give yourself **1** point • •*	

Notes on Buffer Systems (include source documentation such as name of document, section and page #):

19. Clearing and Grading

Is there any ordinance that requires or encourages the preservation of natural vegetation at residential development sites?	YES
*If your answer is **YES**, give yourself **2** points • •*	
Do reserve septic field areas need to be cleared of trees at the time of development?	YES
*If your answer is **NO**, give yourself **1** point • •*	

Notes on Buffer Maintenance (include source documentation such as name of document, section and page #):

20. Tree Conservation

If forests or specimen trees are present at residential development sites, does some of the stand have to be preserved?	YES
*If your answer is **YES**, give yourself **2** points • •*	
Are the limits of disturbance shown on construction plans adequate for preventing clearing of natural vegetative cover during construction?	YES
*If your answer is **YES**, give yourself **1** point • •*	

Notes on Tree Conservation (include source documentation such as name of document, section and page #):

21. Land Conservation Incentives

Are there any incentives to developers or landowners to conserve non-regulated land (open space design, density bonuses, stormwater credits or lower property tax rates)?	YES
*If your answer is **YES**, give yourself **2** points • •*	
Is flexibility to meet regulatory or conservation restrictions (density compensation, buffer averaging, transferable development rights, off-site mitigation) offered to developers?	YES
*If your answer is **YES**, give yourself **2** points • •*	

Notes on Land Cons. Incentives (include source documentation such as name of document, section and page #):

Code and Ordinance Worksheet *Subtotal Page 12* 0

Development Feature	*Your Local Criteria*

22. Stormwater Outfalls

Is stormwater required to be treated for quality before it is discharged?	YES
*If your answer is **YES**, give yourself **2** pointS • •*	
Are there effective design criteria for stormwater best management practices (BMPs)?	YES
*If your answer is **YES**, give yourself **1** point • •*	
Can stormwater be directly discharges into a jurisdictional wetland without pretreatment?	YES
*If your answer is **NO**, give yourself **1** point • •*	
Does a floodplain management ordinance that restricts or prohibits development within the 100-year floodplain exist?	YES
*If your answer is **YES**, give yourself **2** points • •*	

Notes on Stormwater Outfalls (include source documentation such as name of document, section and page #):

Code and Ordinance Worksheet — *Subtotal Page 13*: 0

• • **Time to Assess:** Principles 17 through 22 addressed the codes and ordinances that promote (or impede) protection of existing natural areas and incorporation of open spaces into new development. There were a total of 24 points available for Principles 17 - 22. What was your total score?

Subtotal Page 11 0 + Subtotal Page 12 0 + Subtotal Page 13 0 = 0

Where were your codes and ordinances most in line with the principles? What codes and ordinances are potential impediments to better development?

To determine final score, add up subtotal from each • ¶**Time to Assess**

Principles 1 - 10 (Page 8)	0
Principles 11 - 16 (Page 11)	0
Principles 17 - 22 (Page 13)	0
TOTAL	0

-13-

Code and Ordinance Worksheet

SCORING (A total of **100** points are available):	
Your Community's Score	
90- 100	• Congratulations! Your community is a real leader in protecting streams, lakes, and estuaries. Keep up the good work.
80 - 89	• Your local development rules are pretty good, but could use some tweaking in some areas.
79 - 70	• Significant opportunities exist to improve your development rules. Consider creating a site planning roundtable.
60 - 69	• Development rules are inadequate to protect your local aquatic resources. A site planning roundtable would be very useful.
less than 60	• Your development rules definitely are not environmentally friendly. Serious reform of the development rules is needed.

Note: While no longer required by the MPCA, a regulated MS4 permitee can use this form to document BMP's.

MIDS MS4 BMP Summary Sheet

MS4 Name: **Washington County**

Minimum Control Measure: 5-POST-CONSTRUCTION STORMWATER MANAGEMENT IN NEW DEVELOPMENT AND REDEVELOPMENT

Unique BMP Identification Number:

***BMP Title:** Minimal Impact Design Standards (MIDS)
***BMP Description:**
To promote consistency among entities managing stormwater in Minnesota, the [insert community name] adopts the MIDS performance standards and/or MIDS calculator. The MIDS project is authorized under Minnesota Statutes enacted in 2009, Chapter 115 Water Pollution Control Act, 115.03 Powers and Duties. Subdivision 5c. Regulation of storm water discharges. (c) The agency (Minnesota Pollution Control Agency) shall develop performance standards, design standards, or other tools to enable and promote the implementation of low-impact development and other storm water management techniques. For the purposes of this section, "low-impact development" means an approach to storm water management that mimics a site's natural hydrology as the landscape is developed. Using the low-impact development approach, storm water is managed on-site and the rate and volume of predevelopment storm water reaching receiving waters is unchanged. The calculation of predevelopment hydrology is based on native soil and vegetation. MIDS Performance Goals: New Development Performance Goal For new, nonlinear developments that create more than one acre of new impervious surface on sites without restrictions, stormwater runoff volumes will be controlled and the post-construction runoff volume shall be retained on site for 1.1 inches of runoff from impervious surfaces statewide.

Redevelopment Performance Goal
Nonlinear redevelopment projects on sites without restrictions that create one or more acres of new and/or fully reconstructed impervious surfaces shall capture and retain on site 1.1 inches of runoff from the new and/or fully reconstructed impervious surfaces.

Linear Project Performance Goal
Linear projects on sites without restrictions that create one acre or greater of new and/or fully reconstructed impervious surface, shall capture and retain the larger of the following:

- 0.55 inches of runoff from the new and fully reconstructed impervious surfaces
- 1.1 inches of runoff from the net increase in impervious area

Mill and overlay and other resurfacing activities are not considered fully reconstructed.

All projects shall first attempt to meet the volume reduction Performance Goal on site. However, if an applicant is unable to achieve the full Performance Goal due to site restrictions as attested by the local authority and documented by the applicant, the Flexible Treatment Options Approach shall be followed in the sequence below and through the MIDS Design Sequence Flow Chart.

Flexible Treatment Options Approach

Flexible Treatment Option #1
Applicant attempts to comply with the following conditions:

1. Achieve at least 0.55 inch volume reduction goal, and
2. Remove 75 percent of the annual total phosphorus load, and
3. Options considered and presented shall examine the merits of reloacting project elements to address varying soil conditions and other constraints across the site

Flexible Treatment Option #2
Applicant attempts to comply with the following conditions:

1. Achieve volume reduction to the maximum extent practicable (as determined by the Local Authority), and
2. Remove 60 percent of the annual total phosphorus load, and
3. Options considered and presented shall examine the merits of relocating project elements to address varying soil conditions and other constraints across the site.

Flexible Treatment Option #3

Off-site mitigation (including banking or cash or treatment on another project, as determined by the local authority) equivalent to the volume reduction performance goal can be used in areas selected in the following order of preference:

1. Locations that yield benefits to the same receiving water that receives runoff from the original construction activity.
2. Locations within the same Department of Natural Resources (DNR) catchment area as the original construction activity.
3. Locations in the next adjacent DNR catchment area up-stream.
4. Locations anywhere within the local authority's jurisdiction.

Stormwater BMP standards and requirements will be reviewed and revised as part of the Ordinance or other Regulatory Mechanism update process noted in this SWPPP.

***Measurable Goals:**

Adoption, implementation and documentation of MIDS Standards and procedures.

***Timeline/Implementation Schedule:**

Year 1. Develop strategy to incorporated MIDS into local ordinances or other regulatory mechanisms.
Year 2. Adopt, implement and document MIDS.
Year 2-5. Monitor program and revise/adjust as needed.

Specific Components and Notes:

***Responsible Party for this BMP:**

Name:
Department:
Phone:
E-mail:

**Indicates a REQUIRED field. Failure to complete any required field will result in rejection of the application due to incompleteness.*

Additional Resources

MPCA MIDS Webpage: http://www.pca.state.mn.us/veiza8e

Minnesota Stormwater Manual: http://stormwater.pca.state.mn.us/index.php/Main_Page

Center for Watershed Protection: http://www.cwp.org/

Washington Conservation District: http://www.mnwcd.org/

From Policy to Reality: Model Ordinances for Sustainable Development – http://greenstep.pca.state.mn.us/modelOrdinances.cfm

Nonpoint Education for Municipal Officials (NEMO): http://www.northlandnemo.org/

List of Acronyms

BMP
Best management practices

CFR
Code of Federal Regulations

CPESC
Certified Professional in Erosion and Sediment Control

DNR
Minnesota Department of Natural Resources

ESC
Erosion and sediment control

SSTS
Subsurface Sewage Treatment System

LID
Low impact development

MIDS
Minimal Impact Design Standards

MPCA
Minnesota Pollution Control Agency

MS4
Municipal Separate Storm Sewer System

MSWM
Minnesota Stormwater Manual

NEMO
Non-point Education for Municipal Officials

NPDES
National Pollutant Discharge Elimination System

ORVW
Outstanding Resource Value Waters

SDS
State Disposal System

TMDL
Total Maximum Daily Load

WCD
Washington Conservation District

WMO
Watershed Management Organization

SWPPP
Stormwater Pollution Prevention Plan

Primer on How to Use the MIDS Calculator

The MIDS Calculator User Guide and the link to download the calculator can be found in the Minnesota Stormwater Manual:
http://stormwater.pca.state.mn.us/index.php/MIDS_calculator