

**MINNEHAHA CREEK WATERSHED DISTRICT
BOARD OF MANAGERS**

**REVISIONS
PURSUANT TO MINNESOTA STATUTES § 103D.341**

**Adopted April 24, 2014
Effective June 6, 2014**

STORMWATER MANAGEMENT RULE

1. **POLICY.** It is the policy of the Board of Managers to:

- (a) Promote abstraction of precipitation and stormwater runoff where feasible for the purposes of improving water quality, increasing groundwater recharge, reducing flooding, and promoting the health of native and designed plant communities and landscapes;
- (b) Preserve, maintain and improve the aesthetic, physical, chemical and biological composition of surface waters and groundwater within the District;
- (c) Limit or reduce stormwater runoff from drainage within the watershed to decrease the negative effects of land-disturbing activities on surface water quality and flooding;
- (d) Protect and maintain existing groundwater flow, promote groundwater recharge and improve groundwater quality and aquifer protection;
- (e) Promote the preservation and use of native vegetation for the purpose of stormwater runoff abstraction and pollutant load reduction;
- (f) Promote nondegradation of water quality from new development and improvement in water quality from redevelopment; and
- (g) Promote the management of stormwater on site for the purposes of providing local groundwater recharge and maintaining natural hydrology.

2. **REGULATION.** No one may create new or replace existing impervious surface or change the contours of a parcel of land in a way that affects the direction, peak rate, volume, or water quality of runoff flows from the parcel or subdivide a parcel of one acre or more in size into three or more lots without first submitting a stormwater management plan to the District and securing a permit from the District approving the plan. New development is subject to sections 3 and 7-11 below (see Table 2). Redevelopment is subject to sections 3-5 and 7-11 below (see Tables 3 and 4). Subdivision of land is subject to section 3-5 and 7-11, as applicable. Linear Transportation Projects are subject to sections 3 and 6-11 below (see Table 5).

Activity subject to this rule on adjacent sites under common or related ownership shall be considered in the aggregate, and the requirements applicable to the activity under this rule will be

determined with respect to all development that has occurred on a site, or on adjacent sites under common or related ownership, since the date this rule took effect (January 2005).

The following activities are exempt from this rule:

(a) **SINGLE FAMILY HOMES:** Construction or reconstruction of a single- family home.

(b) **NEW DEVELOPMENT:** New development for a residential, commercial, industrial or institutional use (see Table 2):

(1) that will result in less than 20 percent impervious surface over the site; or

(2) on a site of less than one acre.

(c) **REDEVELOPMENT:** Redevelopment for a residential, commercial, industrial or institutional use (see Table 3):

(1) on a site that is less than five acres in size that will result in at least a ten percent reduction in impervious surface; or

(2) on a site of five acres or greater where the proposed activity disturbs less than 40 percent of the site and results in at least a ten percent reduction in impervious surface.

(d) **LINEAR TRANSPORTATION PROJECTS:** Construction of a new or reconstruction of an existing road, trail, sidewalk, utility, or other linear transportation project (see Table 5):

(1) that will create less than 10,000 square feet of new impervious surface; or

(2) for the construction of sidewalks and trails that will not exceed 12 feet in width and will be bordered on the downgradient side(s) by a pervious buffer averaging at least one-half the width of the sidewalk or trail.

3. STORMWATER MANAGEMENT PLAN GENERAL REQUIREMENTS. A stormwater management plan submitted to the District must meet the following requirements, subject to the provisions in sections 4-8:

(a) **PHOSPHORUS CONTROL.**

(1) **NEW DEVELOPMENT/LINEAR TRANSPORTATION PROJECTS:**

Activity subject to this rule for new development or linear transportation projects shall result in no net increase in phosphorus loading from existing conditions, except that:

- i. For a parcel in existing use for row crop agriculture or feedlot, new development shall result in no net increase in phosphorus loading from the site as modeled in meadow condition.

(2) REDEVELOPMENT: Phosphorus control must be provided in accordance with subsection 3(c)(2), where applicable.

(b) RATE CONTROL.

(1) Activity subject to this rule shall result in no net increase in the peak runoff rate for the 1-, 10- and 100-year design storms where stormwater discharges across the downgradient site boundary, compared to the rate for the site in its existing condition, except that:

- i. For a parcel in use for row crop agriculture or feedlot, new development shall result in no net increase in the peak runoff rate from the site as modeled in meadow condition.

(2) Peak runoff rates for the 1-, 10- and 100-year design storms may not increase within a specific drainage area of the site so as to create or exacerbate drainage or erosion problems.

(c) VOLUME CONTROL.

(1) The stormwater management plan must provide for the abstraction of the first one inch of rainfall from the site's impervious surface. Credit toward compliance with the one inch volume control standard will be calculated by the applicant using industry accepted hydrologic models and Appendix A: Volume Abstraction Credit Schedule, following guidance provided in the Minnesota Pollution Control Agency's *Minnesota Stormwater Manual*.

(2) Where an applicant demonstrates that it is infeasible to meet the one inch abstraction requirement through use of volume control credits pursuant to subsection 3(c)(1), the stormwater management plan must provide for abstraction of runoff to the greatest extent feasible, and at least 0.5 inches, and phosphorus control in an amount equivalent to that which would be achieved through abstraction of one inch of rainfall from the site's impervious surfaces. To demonstrate infeasibility of providing abstraction pursuant to 3(c)(1), the applicant must submit a completed Abstraction Analysis containing at a minimum the following information:

- i. A narrative that lists and explains the variables that limit the feasibility of providing one inch of volume control for runoff from the site's impervious surface. These variables may include but are not limited to unified soil classification, soil contamination, proximity to bedrock,

proximity to groundwater, proximity to existing utilities, spatial constraints, zoning requirements, and financial considerations.

ii. A narrative and conceptual plan(s) that describes and discusses how reasonable modifications to the size, scope, configuration or density of the project would influence the feasibility of providing one inch of volume control for runoff from the sites impervious surface.

iii. An explanation of efforts undertaken by the applicant to accommodate or remove the constraints that influence the feasibility of providing one inch of volume control for runoff from the site's impervious surface.

(3) The volume of runoff draining to a landlocked receiving area may not increase due to a project unless the applicant can demonstrate that any additional runoff volume from the project will be effectively abstracted. In addition, the applicant shall either own or have proper rights over the landlocked property receiving runoff from the project area. Back-to-back 100-year runoff events will be used to analyze holding capacity and high-water elevation for landlocked areas.

(d) BEST MANAGEMENT PRACTICES (BMPs).

(1) BMPs addressing the potential water resource impacts associated with the proposed activity must be incorporated to limit creation of impervious surface, maintain or enhance on-site infiltration and peak flow control and limit pollutant generation on and discharge from the site. BMPs may include site design, structural and non-structural practices.

(2) BMPs must be designed and installed in accordance with generally accepted design practices and guidance contained in the Minnesota Pollution Control Agency's *Minnesota Stormwater Manual* and its subsequent revisions.

(e) HIGH WATER ELEVATION.

(1) All applications shall provide at least two vertical feet of separation between low openings of structures and the 100-year high water elevations of stormwater BMPs and waterbodies.

4. REDEVELOPMENT REQUIREMENTS – DECREASE OR NO CHANGE IN IMPERVIOUS SURFACE. A stormwater management plan submitted to the District that proposes through redevelopment to decrease or result in no net increase in impervious surface must meet the following requirements (see Table 3):

(a) For sites that are one acre or less, Best Management Practices are required in accordance with subsection 3(d);

(b) For sites that are between one acre and five acres and the proposed activity disturbs less than 40 percent of the site, Best Management Practices are required in accordance with subsection 3(d);

(c) For sites that are between one acre and five acres and the proposed activity disturbs 40 percent or more of the site, the stormwater management plan must meet the volume control requirement in subsection 3(c) and the phosphorus control requirement in subsection 3(a)(2), where applicable;

(d) For sites that are greater than five acres and the proposed activity disturbs less than 40 percent of the site, Best Management Practices are required in accordance with subsection 3(d);

(e) For sites that are greater than five acres and the proposed activity disturbs 40 percent or more of the site, the stormwater management plan must meet the volume control requirement in subsection 3(c) and the phosphorus control requirement in subsection 3(a)(2), where applicable.

5. REDEVELOPMENT REQUIREMENTS – INCREASED IMPERVIOUS SURFACE. A stormwater management plan submitted to the District that proposes to increase impervious surface through redevelopment must meet the following requirements (see Table 4):

(a) For sites that are one acre or less, Best Management Practices are required in accordance with subsection 3(d);

(b) For sites that are greater than one acre and the proposed activity disturbs less than 40 percent of the site and results in an increase in impervious surface of less than 50 percent, the phosphorus control requirements of subsection 3 (a), rate control requirements of subsection 3(b) and volume control requirements of subsection 3(c) apply to the area of increased impervious surface;

(c) For sites that are greater than one acre and the proposed activity disturbs 40 percent or more of the site, or results in an increase in impervious surface of 50 percent or more, the phosphorus control requirements of subsection 3(a), rate control requirements of subsection 3(b), and volume control requirements of subsection 3(c) apply to the entire site.

6. LINEAR TRANSPORTATION PROJECT REQUIREMENTS (see Table 5).

(a) The construction of a new road, trail, sidewalk, utility, or other linear transportation project that will create 10,000 square feet or more of impervious surface must meet the phosphorus control requirements in accordance with subsection 3(a), rate control requirements in accordance with subsection 3(b) and volume control requirements in accordance with subsection 3(c);

(b) Linear Reconstruction Projects that will increase the impervious area within the project limits by between 10,000 square feet and one acre from existing conditions must meet the phosphorus control requirements in accordance with subsection 3(a) and rate control requirements in accordance with subsection 3(b) for the area of increased impervious surface;

(c) Linear Reconstruction Projects that will increase the impervious area within the project limits by one acre or more from existing conditions must meet the phosphorus control requirements in accordance with subsection 3(a), rate control requirements in accordance with subsection 3(b), and volume control requirements in accordance with subsection 3(c) for the area of increased impervious surface.

7. REGIONAL STORMWATER MANAGEMENT.

(a) An applicant may comply with this rule by providing equal or greater phosphorus control, rate control, or volume control through a regional or subwatershed plan approved by the District; such a plan must provide for an annual accounting to the District of treatment capacity created and utilized by projects or land-disturbing activities within the drainage and treatment area of the plan.

(b) District approval of a regional or subwatershed plan will be based on a determination that:

(1) the use of a regional facility in place of onsite stormwater management will not result in adverse impacts to local groundwater or natural resources located upstream of the regional facility, including, but not limited to, reduced water quality, altered wetland hydrology, changes to stream velocities or baseflow, erosion, or reduced groundwater recharge; and

(2) the plan incorporates onsite BMPs as necessary to mitigate impacts and provide local benefits not provided by the regional facility.

(c) Individual project sites utilizing a regional facility to meet phosphorus, rate, or volume control requirements must incorporate BMPs on the project site in accordance with subsection 3(d).

(d) The applicant, before commencing any land-altering activity, must demonstrate that it holds the legal rights necessary to discharge to the stormwater facility or facilities in the plan, and that the facility or facilities are subject to a maintenance document satisfying the requirements of section 11.

8. IMPACT ON DOWNSTREAM WATERBODIES.

(a) No new point source may discharge to a waterbody without pretreatment for sediment and nutrient removal. Pretreatment may be provided by non-structural means. An activity changing flow that discharges from an existing point source is not a new point source.

(b) No activity subject to this rule may alter a site in a manner that results in a(n):

(1) Increase in the bounce in water level for any downstream lake or wetland beyond the limits specified in Table 1 below based on management classification, during a rainfall event of critical duration with a return frequency of 1, 10, or 100 years.

(2) Increase in the duration of inundation for any downstream lake or wetland beyond the limits specified in Table 1 below based on management classification, during a precipitation event of critical duration with a return frequency of 1, 10, or 100 years.

(3) Change in the elevation of the runout control of any lake or wetland beyond the limits specified in Table 1 below based on management classification.

Table 1: Impacts on downstream waterbodies

Wetland Management Class/ Waterbody	Permitted Bounce for 1-, 10-, and 100-Year Event	Inundation Period for 1-Year Event	Inundation Period for 10- and 100-Year Event	Runout Control Elevation
Preserve	Existing	Existing	Existing	No change
Manage 1	Existing plus 0.5 feet	Existing plus 1 day	Existing plus 2 days	No change
Manage 2	Existing plus 1.0 feet	Existing plus 2 days	Existing plus 14 days	0 to 1.0 ft above existing runout
Manage 3	No limit	Existing plus 7 days	Existing plus 21 days	0 to 4.0 ft above existing runout
Lakes	Existing	N/A	N/A	No change

9. FINANCIAL ASSURANCE.

(a) A performance bond, letter of credit or other financial assurance, consistent with the District Financial Assurance Rule, may be required for any project that requires the installation of stormwater best management practices. The financial assurance shall be maintained until the stormwater best management practice has been constructed and stabilized in accordance with District rules and as shown on a set of as built drawings submitted to the District.

10. REQUIRED EXHIBITS.

(a) Plans certified by a professional engineer registered in the State of Minnesota and reflecting the following items shall accompany the permit application (one set of plans must be full size; one set must be reduced to a maximum size of 11" x 17"; provide electronic ArcGIS or CADD files when available):

- (1) Property lines and delineation of lands under ownership of the applicant.
- (2) Delineation of the subwatershed contributing runoff from off-site and proposed and existing subwatersheds on-site.
- (3) Proposed and existing locations, alignments, and elevations of stormwater facilities.
- (4) Delineation of existing on-site wetland, shoreland, and/or floodplain areas.
- (5) Existing and proposed normal, and 100 year high water elevations on-site.
- (6) Existing and proposed site contour elevations at two foot intervals, related to National Geodetic Vertical Datum (NGVD), 1929 datum.
- (7) Construction plans and specifications for all proposed stormwater management facilities.
- (8) Stormwater runoff volume and rate analyses for the 1-, 10- and 100- year design storms for existing and proposed conditions.
- (9) All hydrologic, water quality, and hydraulic computations completed to design the proposed stormwater management facilities including runoff volume abstractions.
- (10) Delineation of any flowage easements or other property interests dedicated to stormwater management purposes, including, but not limited to, county or judicial ditches.

(b) For applications proposing infiltration, a soil sampling plan and the resulting identification, description, permeability, and approximate delineation of site soils. Investigation methods shall include soil pits or hand augers. Borings at the location of the infiltration facility must extend at least five feet deeper than the proposed bottom elevation of the infiltration facility.

(c) For applications proposing tree preservation or planting, a site map showing existing trees larger than six inches in diameter, including species, diameter, and associated drip lines (canopy area). Tree map must designate trees to be removed and trees to be added.

(d) For applications proposing soil amendments, a soil amendment plan following guidance from the Minnesota Pollution Control Agency's *Minnesota Stormwater Manual*.

(e) For applications proposing capture and reuse, an operating plan and calculations that quantify the benefits of the proposed stormwater reuse system.

(f) Documentation indicating conformance with an existing municipal stormwater management plan. When a municipal plan does not exist, documentation that the municipality has reviewed the project.

(g) Documentation that the applicant has applied for a National Pollutant Discharge Elimination System (NPDES) Permit if required by the Minnesota Pollution Control Agency (MPCA).

(h) Abstraction analysis (if applicable) in accordance with subsection 3(c)(2).

(i) A declaration and maintenance agreement in conformance with section 11.

11. MAINTENANCE.

(a) All stormwater management structures and facilities must be designed for maintenance access and properly maintained in perpetuity to assure that they continue to function as designed. Permit applicants must provide a maintenance plan that identifies and protects the design, capacity and functionality of onsite and offsite stormwater management facilities; specifies the methods, schedule and responsible parties for maintenance; provides for the maintenance in perpetuity of the facility; and contains at a minimum the requirements in the District's standard maintenance declaration. The plan will be recorded on the deed in a form acceptable to the District. A public entity assuming the maintenance obligation may do so by filing with the District a document signed by an official with authority.

Table 2: Stormwater management requirements for new development

Site Size	Impervious Surface	Requirements
< 1 acre	N/A	None
≥ 1 acre	< 20% of site	None
	≥ 20% of site	Phosphorus Control, Rate Control, and Volume Control

Table 3: Stormwater management requirements for redevelopment resulting in a decrease or no change in impervious surface

Site Size	Site Disturbance	Impervious Surface Reduction	Requirements
≤ 1 acre	N/A	10% reduction in impervious surface	None
		0 - 9% reduction in impervious surface	Incorporate BMPs
> 1 acre - ≤ 5 acres	< 40% site disturbance	10% reduction in impervious surface	None
		0 - 9% reduction in impervious surface	Incorporate BMPs
	≥ 40% site disturbance	10% reduction in impervious surface	None
		0 - 9% reduction in impervious surface	Volume control required for site's impervious surface
> 5 acres	< 40% site disturbance	10% reduction in impervious surface	None
		0 - 9% reduction in impervious surface	Incorporate BMPs
	≥ 40% site disturbance	N/A	Volume control required for site's impervious surface
		N/A	Volume control required for site's impervious surface

Table 4: Stormwater management requirements for redevelopment resulting in an increase in impervious surface

Site Size	Site Disturbance	Impervious Surface Increase	Requirements	Treatment Scope
≤ 1 acre	N/A	N/A	Incorporate BMPs	N/A
> 1 acre	< 40% site disturbance	< 50% increase in impervious surface	Phosphorus Control, Rate Control, and Volume Control	Additional impervious surface
		≥ 50% increase in impervious surface		Entire site's impervious surface
	≥ 40% site disturbance	N/A	Phosphorus Control, Rate Control, and Volume Control	Entire site's impervious surface

Table 5: Stormwater management requirements for linear transportation projects

Project Type	Impervious Surface Increase	Requirements	Treatment Scope
New Linear Transportation Project	< 10,000 square feet	None	N/A
	≥ 10,000 square feet	Phosphorus Control, Rate Control, and Volume Control	New impervious surface
Linear Reconstruction Project	< 10,000 square feet	None	N/A
	≥ 10,000 square feet and < 1 acre	Phosphorus Control and Rate Control	Additional impervious surface
	≥ 1 acre	Phosphorus Control, Rate Control, and Volume Control	Additional impervious surface

**APPENDIX A:
MCWD Volume Abstraction Credit Schedule**

Practice	Design Guidance	Credit	Calculation Methods
Surface Infiltration Basin	<i>Minnesota Stormwater Manual</i>	Volume provided	$AV^{(1)} = \text{Volume below overflow elevation}^{(2)}$
Underground Infiltration Trench	<i>Minnesota Stormwater Manual</i>	Void volume provided	$AV = \text{Volume below overflow elevation}^{(2)}$
Preservation of tree(s)	Not Applicable	Percent interception by species	$AV = \% \text{ Interception}^{(3)} * \text{tree canopy area}^{(4)} * 1 \text{ inch rainfall}$
Planting of New Tree(s)	Not Applicable	One-half percent interception by species ⁽⁵⁾	$AV = 0.5 * \% \text{ Interception}^{(3)} * \text{tree canopy area}^{(4)} * 1 \text{ inch rainfall}$
Soil Amendment(s)	<i>Minnesota Stormwater Manual</i>	0.5-inch credit over the area of soil amendment area ⁽⁶⁾	$AV = 0.5/12 * \text{area of soil amendment}$
Capture and Reuse of Stormwater	Submit pump design plans and hydrologic calculations	Volume capacity to capture and reuse runoff from a 1-inch rainfall event	Submit operating plan and calculations for reuse system to document annual volume reuse during dry, wet, and average years
Enhancement of Pervious Area ⁽⁷⁾ (wetland buffers, forest or prairie conservation or restoration)	Submit vegetation planting and maintenance plan	0.5-inch credit over the area of enhancement ⁽⁸⁾	$AV = 0.5/12 * \text{area of enhancement}$
Filtration	<i>Minnesota Stormwater Manual</i>	50% volume abstraction credit ⁽⁹⁾	$AV = 0.5 * \text{Volume below overflow elevation (filtered volume is not considered)}$

(1) AV = Abstraction Volume

(2) Volume infiltrated during a rainfall event shall not be credited towards the abstraction volume requirement. This is a simple approach for designers and for reviewers to verify conformance to the standard; a stormwater model is not needed for calculations. This is a conservative assumption because infiltration of stormwater in Minnesota is an evolving practice. MCWD will continue to research current trends, collect and analyze monitoring data, and utilize modeling and engineering methods to assess the effectiveness of the standards to achieve the water quality goals of the District.

(3) Percent rainfall interception shall be determined using results from the *City of Minneapolis, Minnesota Municipal Tree Resource Analysis*. Percentages for the species studied are listed below. If desired tree species is not listed, the applicant shall use the median value provided below or provide documentation by a certified arborist to support a different percent interception.

Average Percent Rainfall Interception by Tree Species

Species	Average Percent Rainfall Interception
Green Ash	13
Sugar Maple	8
Norway Maple	8
Littleleaf Linden	12
American Elm	18
Honeylocust	6
American Basswood	10
Northern Hackberry	6
Ginkgo	4
Silver Maple	16
Elm	21
White Ash	10
Basswood	14
Red Maple	7
Median	10

(4) Tree canopy area must be documented as part of the permit application submittal.

(5) Granting ½ credit for new trees is intended to encourage preservation of trees over tree removal and replacement.

(6) For SCS TR-55 cover type “open space (lawns),” compacted soil (HSG C, curve number 74) begins to generate runoff with a 0.9-inch rainfall. A HSG B soil (curve number 61) begins to generate runoff with a 1.5-inch rainfall. Therefore, preserving the infiltration capacity of HSG B soil through the use of soil amendments yields an approximate 0.5-inch volume reduction credit.

(7) Area shall not be subject to motorized vehicle, bicycle, or likely human foot traffic (i.e., parking lot islands, conventional landscaping).

(8) For SCS TR-55 cover type “herbaceous mixture,” additional rainfall of approximately 0.5 inches generates no runoff if the hydrologic condition is improved from “fair” to “good.” Credit will not be granted for “tree preservation” and “enhancement of pervious area.” The applicant must designate the desired abstraction practice.

(9) The *Minnesota Stormwater Manual* reports that nutrient removal (total phosphorus) is approximately half as effective for filtration as infiltration.