

APPENDIX G. ALTERNATIVE STORMWATER TREATMENT OPTIONS

The following is based off the flexible treatment options process developed by the Minnesota Pollution Control Agency's Minimal Impact Design Standards (MIDS) Community Assistance Package. The City of St. Cloud encourages the use of the MIDS calculator to show volume reduction from alternative practices and pollutant removal documentation. The MIDS calculator is located: <http://stormwater.pca.state.mn.us/index.php/Calculator>

Projects must fully attempt to comply with the appropriate volume reduction requirement as described in the City's Land Development Code Article 19.12. 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 factors listed below, the applicant must document the reason and submit to the City Engineer for review and approval. If site constraints or restrictions limit the full volume reduction requirement, the following flexible treatment options shall be used.

Documentation of the flexible treatment options sequence starting with Alternative #1 shall be provided to the City Engineer; 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 can be considered. Applicants must document the specific reasons why Alternative #2 cannot be met based on the factors listed below.

If Alternative #3 is not feasible or approved, then Alternative #4 shall be met. When all of the conditions are fulfilled within an alternative, this sequence is completed.

Volume reduction techniques that will be considered shall include infiltration; reuse & rainwater harvesting; canopy interception & evapotranspiration; and/or additional techniques included in the Minimal Impact Design Standards (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 include:

- a) Karst geology
- b) Shallow bedrock
- c) High groundwater
- d) Hotspots or contaminated soils
- e) Drinking Water Source Management Areas or within 200 feet of drinking water well
- f) Zoning, setbacks or other land use requirements
- g) Excessive cost
- h) Poor soils (infiltration rates that are too low or too high, problematic urban soils)

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

- a) Achieve at least half of the volume reduction required.
- b) Remove 75% of the annual TP load from the increase in impervious surfaces if the site is new development or from the new and/or fully reconstructed impervious surfaces for a redevelopment site.
- c) 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:

- a) Achieve volume reduction to the maximum extent practicable.
- b) Remove 60% of the annual TP load from the increase in impervious surfaces if the site is new development or from the new and/or fully reconstructed impervious surfaces for a redevelopment site.
- c) 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 mitigation, as approved by the City Engineer, equivalent to the volume reduction requirement for the construction activity, can be used in areas selected in the below order of preference. Off-site mitigation projects shall be completed within 24 months after the start of the original construction activity.

- a) Locations that yield benefits to the same receiving water that receives runoff from the original construction activity.
- b) Locations within the same Department of Natural Resources (DNR) catchment area as the original construction activity.
- c) Locations in the next adjacent DNR catchment area up-stream.
- d) Locations anywhere within the City.

Alternative #4: Pay into the City's Stormwater Impact Fund:

- a) The remaining volume reduction not met onsite will be subject to the stormwater impact fee. The fee is determined by multiplying the remaining stormwater volume by the fixed cost multiplied by an administrative multiplier.

$$\text{Stormwater Impact Fund Fee} = (\text{Volume}) \times (\text{Fixed Cost} \times \text{Multiplier})$$

$$= (V) \times (FC \times M)$$

Where:

V = Remaining required volume reduction not met on-site.

FC = The fixed cost, as set in ordinance section 575, Public Utilities Department Fees, is determined by the average expected cost per cubic foot of volume reduction needed to construct off-site BMPs.

M = The multiplier, as set in ordinance section 575, Public Utilities Department Fees, is determined by the expected cost to administer, design and provide long-term maintenance on installed BMPs.