Chapter 9: Permanent Stormwater Treatment Practices

9.1 – Introduction

Permanent Treatment Practices are BMPs intended to treat stormwater runoff for the long-term. Some of these BMPs can be designed to achieve both stormwater quantity and quality management objectives.

Montgomery County has adopted the following stormwater design and best management practices:

- Tennessee Department of Environment and Conservation Erosion Prevention and Sediment Control Handbook
- Tennessee Guide to the Selection & Design of Storm Water Best Management Practices
- The Nashville-Davidson County Metropolitan Stormwater Management Manual Volume 2 (Procedures); most current edition.
- The Nashville-Davidson County Metropolitan Stormwater Management Manual Volume 4 (Best Management Practices); most current edition.
- A collection of Best Management Practices approved by the Building Commissioner for use in the County that comply with the goals of the County MS4 permit and/or the Construction General Permit.

9.2 - Calculations for BMPs

Montgomery County requires the use of the MWS Low Impact Development Site Design Tool to evaluate the effectiveness of BMPs that are used to reach the 80% Total Suspended Solids (TSS) threshold. This tool uses set Green Infrastructure Practices to obtain the target goals for a LID site.

Other commercial BMPs are available for use. The manufacturer's efficiency rating should be evaluated before use. All commercial BMPs must be approved by the Stormwater Coordinator before use.

Some BMPs will not meet Montgomery County's pollutant reduction goals alone, and may be used with another BMP to meet the goal. As an example, water may pass through one treatment device, into another in a "treatment train" to achieve added treatment. It is necessary to calculate the cumulative pollutant removal from series BMPs with an equation that accounts for the fact that the majority of the heavy (easily removed) suspended pollutants and particulate matter are removed by the first structural control in a series. The runoff that enters the second and subsequent controls contains sediment with much smaller particles, which are more difficult for

the control to remove. Thus, the second control has a pollutant removal efficiency that is less than it would ordinarily have. The following equation accounts for the cumulative pollutant removal of BMPs in a series.

TR = A + (1- A)*B

Where:
TR = Total Removal
A = 1st structural control in series
B = 2nd structural control in series

Note: When runoff flows from a more efficient structure (one with a higher removal rate) to a less efficient structure (one with a lower removal rate), the cumulative pollutant removal of a structure does not increase. The reason is that a structure with a lower removal efficiency that follows a structure with higher removal efficiency does not have an appreciable effect on cumulative pollutant reduction.

Example Calculation

A site is planned to have a manufactured pretreatment device that will provide for 50% TSS removal, followed by a dry detention basin designed, built, and maintained as required to achieve a 60% TSS removal. The calculation is as follows:

TR = AMD + (1- AMD)* BDD

Where:
TR = Total Removal
AMD = 1st structural control—manufactured device
BDD = 2nd structural control—dry detention basin

TR = 0.5 + (1-0.5)*0.6
TR = 0.5 + (0.5)*0.6
TR = 0.5 + 0.3
TR = 0.8

Total Removal equals 80%. The site meets Montgomery County's requirements of 80% TSS removal for this site.