CHAPTER 5

TECHNICAL STANDARDS AND CRITERIA FOR STORMWATER MANAGEMENT

Effective stormwater management is accomplished through the development of performance standards and criteria for individual sites that consider basin-wide runoff impacts. Traditionally, the approach to stormwater management treated each site as a separate entity and did not address the impact of post-development runoff from individual sites on the entire watershed. Prior to early 1980, alternatives to the traditional stormwater management approach were not considered. Watershed planning during the past decade utilized an approach known as the "release rate method" to address the impact of post-development runoff from individual sites on the entire watershed.

In an effort to simplify the regulations and requirements for rural watersheds like Chatham Run where development potential is limited to a few areas or corridors, this study recommends the application of traditional stormwater management standards that would limit the release of post-development flows to pre-development levels.

Effects of Development on Runoff Quality

The change in annual pollutant loads resulting from hypothetical development in the Little Plum Run subwatershed was analyzed as a part of a graduate course in urban hydrology at the Pennsylvania State University (Laffey, 1988). The analysis was conducted assuming that impervious cover increased from 11 percent to 15 percent; residential land use increased from 9.7 to 17 percent; and wooded land decreased from 93.3 percent to 86.0 percent. These figures are hypothetical, and do not represent projected development figures presented elsewhere in this report. Although this analysis is not based on actual projected development for Little Plum Run, the results are important for this stormwater management plan because they provide a qualitative measure of the effects of development on watershed pollutants.

The aforementioned classroom analysis applied a pollutant regression method published by Driver and Tasker (1988) to the Little Plum Run subwatershed. The regression method estimates pollutant loads using hydrologic input data for the watershed that includes total annual rainfall; drainage area; impervious cover; and industrial, commercial, and residential land use. The classroom analysis reported existing and future annual pollutant load estimates for suspended solids, total phosphorous, and total nitrogen. Table 5-1 compares these existing and future annual pollutant load estimates for the Little Plum Run subwatershed.

Increases in pollutant loads resulting from development can be reduced through proper engineering design and prudent selection of stormwater management techniques. Stormwater management techniques selected to reduce pollutants from development must consider annual pollutant load estimates, and identify the specific pollutants that are to be removed.

Table 5-1

Comparison of Annual Pollutant Loads (lbs/yr) Discharged Under Existing and Future Conditions in Little Plum Run

	Suspended Solids	Total Phosphorous	Total Nitrogen
Existing	215,186	691	183
Future	220,461	694	226
Increase (%)	2.5	0.4	23.5