WORKSHOP ASSIGNMENT ON NITROGEN AND PHOSPHORUS MODULE

The following examples assume the following common parameters:

Climate Data:

      Climate Zone = Zone 2
      Average Annual Rainfall = 50 inches (Orlando)

Predevelopment:

      Runoff producing area = 100 acres
      Non-DCIA Curve Number = 75
      DCIA = 0%
      Land Use = Undeveloped / Rangeland / Forest

Postdevelopment:

      Runoff producing area = 90 acres
      Assumed area of pond = 10 acres
      Non-DCIA Curve Number = 75
      DCIA = 40%
      Land Use = Single Family Development

Example 1

For a dry pond, calculate the retention depth required to achieve no net increase in the pre vs postdevelopment nutrient loading for this site.

Example 2

Recalculate the required dry pond retention depth (from Example 1) to achieve an 85% reduction in postdevelopment nutrient discharge.

Example 3

Analyze the pond requirements for a wet pond / treatment train system which will provide no net increase in nitrogen and phosphorous loading for pre vs postdevelopment discharge. Assume a wet pond residence time of 100 days. Determine the required permanent pool volume and anoxic depth for the wet pond, and the required pretreatment retention depth of the dry pond.

Example 4

Analyze the same wet pond /treatment train (as Example 3) but analyze for an 85% reduction in postdevelopment phosphorous only.

        Residence Time = 100 days

Example 5

Determine the residence time for the wet pond which will provide 85% removal of postdevelopment phosphorous with no need for pretreatment.

        Residence Time = ?

Example 6

Analyze the same wet pond / treatment train (as Example 3) for a postdevelopment nutrient reduction of:

    65% nitrogen reduction in postdevelopment discharge
    85% phosphorous reduction in postdevelopment discharge

    Residence Time = 100 days

Example 7

Analyze for a stormwater reuse pond to achieve an 85% reduction in postdevelopment nutrient discharge (with no dry pretreatment required). Assume:

    Irrigated Area = 30 acres
    Application Rate = 1.1 in/wk (plus or minus)