# Land Application Loading Equations

1. **Hydraulic Loading**

Where Lw = wastewater hydraulic loading rate, (in/mo)

Pr = design precipitation, (in/mo)

ET = evapotranspiration, (in/mo)

Wp = percolating water, (in/mo) [must = 0 for overland flow systems]

R = net runoff, (in/mo) [must = 0 for slow rate system]

1. **Nitrogen Loading**

where Ln = 2.7CnLw = wastewater nitgrogen loading (lb/acre-yr)

Cn = applied nitrogen concentration from the pretreatment facility (mg/l).

Lw = wastewater hydraulic loading, (ft/yr)

2.7 = conversion factor.

K = All other nitrogen sources, (lb/acre-yr)

U = Crop nitrogen uptake, (lb/acre-yr)

D = Denitrification, (lb/acre-yr)

Wp = Percolating water, (ft/yr)

Cp = Percolate nitrogen concentration, (mg/l)

1. **Nitrogen Loading**

Total Effluent Nitrogen concentration = mg/L

Total Wastewater volume to be land applied from storage cell = MG

Total Effluent Nitrogen mass with 20% loss (Conc. Mg/L X volume MG x 8.34) = lb

Available Land application area = Acres

Effluent Nitrogen Loading Rate (Mass lb/Area Acres) = lb/Acre

1. **Phosphorous Loading**

Total Effluent Phosphorous concentration = mg/L

Total Wastewater volume to be land applied from storage cell = MG

Total Effluent Phosphorous mass (Conc. Mg/L X volume MG x 8.34) = lb

Available Land application area = Acres

Effluent Phosphorous Loading Rate (Mass lb/Area Acres) = lb/Acre