

Nitrate Dilution Calculation Worksheet

(SWMP Area Excluded)

Nitrate Loading

Residential Septic Systems (assumes 1,000 L/day/lot)

Number of lots with untreated septic systems =	73 lots
Nitrate loading from untreated septic system =	40 grams/lot/day
Total annual nitrate loading from untreated systems =	1065800 grams/year

Total Annual Nitrate Loading from all Systems = 1065800 grams/year

Dilution Volumes

Infiltration Factors

Topography factor =	0.23
Soil factor =	0.40
Cover factor =	0.16
Combined infiltration factor =	0.79

Precipitation Infiltration

Annual water surplus =	0.380 metres/year
Annual infiltration (Water Surplus x Infiltration Factor) =	0.3002 metres/year

Infiltration Area and Infiltration Volumes

Area available for infiltration (Site Area) =	350,053.1 square metres
Area available for infiltration (Site Area - Hard Surface Area) =	301,953.1 square metres
<i>(assumes 7 metre wide x 1,700 m long interal roadways and 300m² for each lot house+driveway)</i>	
<i>(Minus 14,300m² for SWMP)</i>	

Total Annual Volume of Infiltration (Infiltration x Area) = 90,646 cubic metres/year

Annual Flow from Residential Lots (assuming 1000 L/day/lot) = 26,645 cubic metres/year

Total Annual Volume Available for Dilution = 117,291 cubic metres/year

Dilution Calculation

$$C_{\text{Nitrate}} = \frac{\text{Mass}}{\text{Volume}} = \frac{\text{Annual Nitrate Loading (grams/year)}}{\text{Annual Dilution Volume (cubic metres/year)}} = \frac{\text{grams}}{\text{cubic metre}} = \frac{\text{mg}}{\text{L}}$$

$$C_{\text{nitrate (73 lots)}} = \frac{1065800 \text{ grams/year}}{117291 \text{ cubic metres/year}} = 9.09 \text{ mg/L}$$

$$C_{\text{nitrate (81 lots)}} = \frac{1255600 \text{ grams/year}}{125752 \text{ cubic metres/year}} = 9.90 \text{ mg/L}$$

Nitrate Dilution Calculation Worksheet

(Conventional Method)

Nitrate Loading

Residential Septic Systems (assumes 1,000 L/day/lot)

Number of lots with untreated septic systems =	73 lots
Nitrate loading from untreated septic system =	40 grams/lot/day
Total annual nitrate loading from untreated systems =	1065800 grams/year

Total Annual Nitrate Loading from all Systems = 1065800 grams/year

Dilution Volumes

Infiltration Factors

Topography factor =	0.23
Soil factor =	0.40
Cover factor =	0.16
Combined infiltration factor =	0.79

Precipitation Infiltration

Annual water surplus =	0.380 metres/year
Annual infiltration (Water Surplus x Infiltration Factor) =	0.3002 metres/year

Infiltration Area and Infiltration Volumes

Area available for infiltration (Site Area) =	350,053.1 square metres
Area available for infiltration (Site Area - Hard Surface Area) =	316,253.1 square metres
<i>(assumes 7 metre wide x 1,700 m long interal roadways and 300m² for each lot house+driveway)</i>	
<i>(Minus 14,300m² for SWMP)</i>	

Total Annual Volume of Infiltration (Infiltration x Area) = 94,939 cubic metres/year

Annual Flow from Residential Lots (assuming 1000 L/day/lot) = 26,645 cubic metres/year

Total Annual Volume Available for Dilution = 121,584 cubic metres/year

Dilution Calculation

$$C_{\text{Nitrate}} = \frac{\text{Mass}}{\text{Volume}} = \frac{\text{Annual Nitrate Loading(grams/year)}}{\text{Annual Dilution Volume(cubic metres/year)}} = \frac{\text{grams}}{\text{cubic metre}} = \frac{\text{mg}}{\text{L}}$$

$$C_{\text{nitrate (73 lots)}} = \frac{1065800 \text{ grams/year}}{121584 \text{ cubic metres/year}} = 8.77 \text{ mg/L}$$

$$C_{\text{nitrate (85 lots)}} = \frac{1255600 \text{ grams/year}}{125752 \text{ cubic metres/year}} = 9.94 \text{ mg/L}$$