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Surke Meadow Nitrogen Load Calculations
April 29, 2023

Total Perimeter Land Area = 17.28 acres

MVC WQMP Adjusted Nitrogen Load Limit (Edgartown Great Pond) = 1.40 kg/acre/yr

MVC WQMP maximum nitrogen load for 17.28 acres = 24.19 kg/yr

Nitrogen Load Estimates

N loads from wastewater/ wastewater facility contribution

Water use/wastewater generation per lot = 185.5 gal/day x 365 days =
67,700 gal/yr (per 5 bedrooms)

- Wastewater Department regulations allow 7 bedroom on these lots
7/5 x 67,700 gal/yr = 94,780 gal/yr
- $94,780 \times 0.9 \times 3.785 \times 3 \text{ mg/l N} / 1,000,000 = \mathbf{0.97 \text{ kg/year}}$

Travelled Way within Surke Meadow Way

- Dirt, rap, peastone or other semi-pervious surface
- 500 linear feet, 12 feet wide, 4 foot loamed and seeded shoulders (20 foot wide total), with turnouts for adequate passing of 2 vehicles
- $10,000 \text{ s.f.} \times 46.9 \text{ inches annual precip} / 12 \text{ inches per foot} \times 65\% \text{ leaching rate} \times 28.3 \text{ liters/cubic foot} \times 0.75 \text{ mg/liter N per policy} / 1,000,000 = \mathbf{0.54 \text{ kg/year}}$

Driveways

- $1,395 \text{ linear feet} \times 12 \text{ feet wide} = 16,620 \text{ s.f.}$
- $16,620 \text{ s.f.} \times 46.9 \text{ inches annual precip} / 12 \text{ inches per foot} \times 65\% \text{ leaching rate} \times 28.3 \text{ liters/cubic foot} \times 0.75 \text{ mg/liter N per policy} / 1,000,000 = \mathbf{0.90 \text{ kg/year}}$

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Roofs + Covered Decks & Porches + Patios (runoff to mulched/vegetated areas)

- 50,000 s.f. x 46.9 inches annual precip/12 inches per foot x 90% leaching rate x 28.3 liters/cubic foot x 0.38 mg/liter N per policy/1,000,000 = **1.88 kg/year**

Fertilized Lawns & Gardens (4,000 s.f. per lot max)

- 5 lots x 4,000 s.f. per lot = 20,000 s.f.
- 20,000 s.f. x 3 lbs N per 1,000 s.f. x 20% leaching rate/2.205 lbs per kg = **5.44 kg/year**

Pools

- 1 pool per lot potentially @ 1,000 s.f. per pool = **no nitrogen contribution**

Remaining DE Land (calculated the same as Fertilized Lawns and Gardens)

- 5 Development Envelopes, total DE land areas = 154,094 s.f.
- 154,094 s.f. minus 50,000 s.f. (roofs + covered decks & porches + patios) minus 20,000 s.f. (fertilized lawns & gardens) minus 5,000 s.f. (pools) = 79,094 s.f. remaining in DE's
- 79,094 s.f. x 67% (2/3) = 52,993 s.f. available as total "Remaining Land" to be split among the 5 lots (brush cut areas, un-irrigated un-treated grassy areas, play areas, etc.)
- 52,993 s.f. x 3 lbs N per 1,000 s.f. x 20% leaching rate/2.205 lbs per kg = **14.42 kg/year**

Totals = 0.97 + 0.54 + 0.90 + 1.88 + 5.44 + 14.42 = 24.15 kg N per year potentially generated by this project at maximum build-out

Per MVC Water Quality Management Policy, the maximum allowable nitrogen load for this property is 24.19 kg N per year