NITROGEN LOADING CALCULATIONS
EXISTING AND PROPOSED DEVELOPMENT

Description: This calculation addresses estimated nitrogen-loading associated with the proposed communications compound and associated access roadway to be developed on Long Pond Road (Route 37) for TowerNorth, Inc.

These calculations are based on the Town of Brewster, MA Nitrogen Loading Calculations and MEP Nitrogen Threshold Loads

Conversions: 1 year = 365 days, d; 1 C.F. = 28.31685 liters, L; 1lbs = 0.454 kilograms, kg; 1 gallon = 3.7854 liters; 1 kg = 1,000,000 mg

Total lot area =	96,267 sq. ft.
Gravel Driveway =	4,100 sq. ft
Compound Area=	3,000 sq. ft

1. **Existing Wastewater Flow (WNC):**   250 gpd (From Septic plan provided by BOH)
   - 250 gpd =   946.35 L/d

(946.35L/day) * (35 mg/L) = 33,122 mg/day

2. **Impervious Surface**

Recharge rate, Ri (for impervious) =	40 in/yr
Pad nitrogen concentration (SNC) =	1.5 mg/liter
Non-Roadway nitrogen concentration (SNC)	0.75 mg/liter

Surface Type	Area (sft)	Ri (in/yr)	(in/ft)	(L/CFT)	(day/yr)	(L/day)	SNC Rate (mg/L)	SNC (mg/day)
Gravel Driveway	4,100	40	0.08	28.32	0.00274	1,060.4	1.5	1,590.6
Compound	3,000	40	0.08	28.32	0.00274	744.9	1.5	1,117.3
Existing Parking Lot	21,305	40	0.08	28.32	0.00274	5,510.1	1.5	8,265.2
Existing Roof	4,655	40	0.08	28.32	0.00274	1,155.8	0.75	866.8
						8,471.1		11,839.9
Natural	101,955	17	0.08	28.32	0.00274	10,758.40		
						RR		NC
						19,229.52		11,839.9

Surface Recharge Rate, SRR (L/d) = SA x Recharge Rate

Surface Nitrogen Content, SNC = SRR x Nitrogen Concentration x (1-Reduction Credit)

3. **Natural Surface**

Recharge Rate, Rn (natural Areas – Brewster) = 17 in/yr

4. **Summary of Estimated Nitrogen Contant & Loading**
   - Combined Recharge Rate, RR = WRR+∑SRR =   19,229.52
   - Total Nitrogen Content, NC = WNC+∑ SRR+FNC =   11,839.9 + 33,122 = 44,962

   Final nitrogen Loading, NL = NC/RR =   2.3 mg/L (ppm)

   **   < 5 ppm then OK**