SIMULATION OF NITROGEN IN RECHARGE (SONIR)

NELSON, POPE & VOORHIS, LLC MICROCOMPUTER MODEL

NAME OF PROJECT

Hampton Bays Downtown Overlay District - Existing Conditions
Hampton Bays, NY

DATA INPUT FIELD

A	Site Recharge Parameters	Value	Units
1	Area of Site	54.85	acres
2	Precipitation Rate	50.10	inches
3	Acreage of Fertilized Landscaping	7.31	acres
4	Fraction of Land in above	0.133	fraction
5	Evapotranspiration from above	21.20	inches
6	Runoff from above	0.50	inches
7	Acreage of Unfertilized Landscaping	0.00	acres
8	Fraction of above	0.000	fraction
9	Evapotranspiration from above	21.20	inches
10	Runoff from above	0.50	inches
11	Acreage of Unvegetated/Dirt Roads	0.56	acres
12	Fraction of above	0.010	fraction
13	Evapotranspiration from above	21.20	inches
14	Runoff from above	0.00	inches
15	Acreage of Water/Ponds	0.00	acres
16	Fraction of Site in above	0.000	fraction
17	Evaporation from above	30.00	inches
18	Makeup Water (if applicable)	0.00	inches
19	Acreage of Natural	17.48	acres
20	Fraction of above	0.319	fraction
21	Evapotranspiration from above	21.20	inches
22	Runoff from above	0.50	inches
23	Acreage of Impervious/Paved/Bldgs	29.50	acres
24	Fraction of Land in above	0.538	fraction
25	Evapotrans. from above	5.01	inches
26	Runoff from Impervious	0.00	inches
23	Acreage of Other	0.00	acres
24	Fraction of Land in above	0.000	fraction
25	Evapotrans. from above	21.20	inches
26	Runoff from above	0.00	inches
27	Acreage of Land Irrigated	7.31	acres
28	Fraction of Land Irrigated	0.133	fraction
29	Irrigation Rate	24.00	inches
30	Number of Dwellings	54	units
31	Water Use per Dwelling	225	gal/day
32	Wastewater Design Flow (units)	45,460	gal/day

B	Nitrogen Budget Parameters	Value	Units
1	Persons per Dwelling	2.53	persons
2	Nitrogen per Person per Year	10.0	lbs
3	a. Sanitary Nitrogen Leaching Rate	84%	percent
3	b. Treated Sanitary Nitrogen Leaching Rate	100%	percent
4	Fertilized Landscaping	7.31	acres
5	Fertilizer Application Rate (for above)	3.00	lbs/1000 sq ft
6	Fertilizer Nitrogen Leaching Rate (for above)	30%	percent
7	Fertilized Land (other, if applicable)	0.00	acres
8	Fertilizer Application Rate (for above)	0.00	lbs/1000 sq ft
9	Fertilizer Nitrogen Leaching Rate (for above)	0%	percent
10	Outdoor Cat Population	0.19	pets/dwelling
11	Cat Waste Nitrogen Load	3.22	lbs/pet/year
12	Outdoor Dog Population	0.35	pets/dwelling
13	Dog Waste Nitrogen Load	4.29	lbs/pet/year
14	Pet Waste Nitrogen Leaching Rate	25%	percent
15	Area of Land Irrigated	7.31	acres
16	Irrigation Rate	24.00	inches
17	Irrigation Nitrogen Leaching Rate	10%	percent
18	Atmospheric Nitrogen Application/Load	0.04	lbs/1000 sq ft
19	Atmos. N Leaching Rate (Natural/Wetlands)	25%	percent
20	Atmos. N Leaching Rate (Turf/Landscaped)	20%	percent
21	Atmos. N. Leaching Rate (Ag; Imperv; Other)	40%	percent
22	Nitrogen in Water Supply	2.00	mg/l
23	Nitrogen in Sanitary Flow	50.00	mg/l

C	Comments
1)	Please refer to user manual for data input instructions; updated per LINAP.

Developed Area		37.37	68%
Natural/Unvegetated/Revegetated Area		17.48	32%
Total Acreage Check		54.85	100%

NELSON, POPE & VOORHIS, LLC MICROCOMPUTER MODEL

Hampton Bays Downtown Overlay District - Existing Conditions

SITE RECHARGE COMPUTATIONS

A	Fertilized Landscaping	Value	Units		B	Unfertilized Landscaping	Value	Units
1	A = Fraction of Land in Cover Type	0.133	fraction		1	A = Fraction of Land in Cover Type	0.000	fraction
2	P = Precipitation Rate	50.10	inches		2	P = Precipitation Rate	50.10	inches
3	E = Evapotranspiration Rate	21.20	inches		3	E = Evapotranspiration Rate	21.20	inches
4	Q = Runoff Rate	0.50	inches		4	Q = Runoff Rate	0.50	inches
5	R(a) = P - (E + Q)	28.40	inches		5	R(b) = P - (E + Q)	28.40	inches
6	R(A) = R(a) x A	3.78	inches		6	R(B) = R(b) x A	0.00	inches

C	Unvegetated/Dirt Roads	Value	Units		D	Water/Ponds	Value	Units
1	A = Fraction of Land in Cover Type	0.010	fraction		1	A = Fraction of Site in Water	0.000	fraction
2	P = Precipitation Rate	50.10	inches		2	P = Precipitation Rate	50.10	inches
3	E = Evapotranspiration Rate	21.20	inches		3	E = Evaporation Rate	30.00	inches
4	Q = Runoff Rate	0.00	inches		4	Q = Runoff Rate	0.00	inches
5	R(c) = P - (E + Q)	28.90	inches		5	M = Makeup Water	0.00	inches
6	R(C) = R(c) x A	0.30	inches		6	R(d) = { P - (E+Q)} - M	20.10	inches
					7	R(D) = R(d) x A	0.00	inches

E	Natural	Value	Units		F	Impervous/Paved/Roads	Value	Units
1	A = Fraction of Land in Cover Type	0.319	fraction		1	A = Fraction of Land in Cover Type	0.538	fraction
2	P = Precipitation Rate	50.10	inches		2	P = Precipitation Rate	50.10	inches
3	E = Evapotranspiration Rate	21.20	inches		3	E = Evapotranspiration Rate	5.01	inches
4	Q = Runoff Rate	0.50	inches		4	Q = Runoff Rate	0.00	inches
5	R(e) = P - (E + Q)	28.40	inches		5	R(f) = P - (E + Q)	45.09	inches
6	R(E) = R(e) x A	9.05	inches		6	R(F) = R(f) x A	24.25	inches

G	Other	Value	Units		H	Irrigation Recharge	Value	Units
1	A = Fraction of Land in Cover Type	0.000	fraction		1	A = Fraction of Land Irrigated	0.133	fraction
2	P = Precipitation Rate	50.10	inches		2	I = Irrigation Rate	24.00	inches
3	E = Evapotranspiration Rate	21.20	inches		3	E = Evaptranspiration Rate	21.40	inches
4	Q = Runoff Rate	0.00	inches		4	Q = Runoff Rate	0.00	inches
5	R(g) = P - (E + Q)	28.90	inches		5	R(h) = I - (E + Q)	2.60	inches
6	R(G) = R(g) x A	0.00	inches		6	R(H) = R(H) x A	0.35	inches

I	Wastewater Recharge				J	Runoff Recharge		
1	WDF = Wastewater Design Flow	45,460	gal/day		1	Q(A) = Runoff from Landscaped	0.067	inches
2	WDF = Wastewater Design Flow	2,218,471	cu ft/yr		2	Q(B) = Runoff from Unfertilized Landscaping	0.000	inches
3	A = Area of Site	2,389,266	sq ft		3	Q(C) = Runoff from Unvegetated	0.000	inches
4	R(j) = WDF/A	0.93	feet		4	Q(E) = Runoff from Natural	0.159	inches
5	R(I) = Wastewater Recharge	11.14	inches		5	Q(H) = Runoff from Other	0.000	inches
					6	Q(I) = Runoff from Irrigation	0.00	inches
					7	Q(tot) = Q(A)+Q(B)+Q(C)+Q(E)+Q(H)+Q(I)	0.23	inches

Total Site Recharge		
R(T) =	R(A)+R(B)+R(C)+R(D)+R(E)+R(F)+R(G)+R(H)+R(I)+R(J)+Q(tot)	
R(T) =	**49.10**	**inches**

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NELSON, POPE & VOORHIS, LLC MICROCOMPUTER MODEL

Hampton Bays Downtown Overlay District - Existing Conditions

SITE NITROGEN BUDGET

A	Sanitary Nitrogen-Residential	Value	Units
1	Number of Dwellings	0	units
2	Persons per Dwelling	2.53	capita
3	P = Population	0.00	capita
4	N = Nitrogen per person	10	lbs
6	N = (total; pre loss/removal)	0	lbs
7	LR = Leaching Rate	84%	percent
8	N(S) = P x N x LR	0.00	lbs
9	N = loss/removed	0.00	lbs

C	Sanitary Nitrogen (Wastewater Design Flow)		
1	CF = Commercial/STP Flow	45,460	gal/day
2	CF = Commercial/STP Flow	62,804,127	liters/yr
5	N =Nitrogen	50.00	mg/l
6	N = Nitrogen	6924.15	lbs
7	LR = Leaching Rate	84%	percent
8	N(S) = CF x N x LR	2,637,773,313	milligrams
9	N(S) = Sanitary Nitrogen	5816.29	lbs
10	N = loss/removed	1107.86	lbs

E	Fertilized Land (Fertilized Landscaping)		
1	A = Area of Land Fertilized	318,424	sq ft
2	AR = Application Rate	3.00	lbs/1000 sf
3	N(T) = Nitrogen (total applied)	955.27	lbs
4	LR = Leaching Rate	30%	percent
5	N(F1) = A x AR x LR	286.58	lbs
6	N = loss/removed	668.69	lbs

G	Atmospheric Nitrogen (existing condition)		
1	Application Load	0.041	lbs/1000 sf
2	Area of Natural/Wetlands/1000 sf	761	1000 sf
3	Leaching Rate	25%	percent
4	Atmos. N Load-1 (natural/wetlands)	7.80	lbs/year
5	Area of turf/landscaped/1000 sf	318	1000 sf
6	Leaching Rate	20%	percent
7	Atmos. N Load-2 (golf/turf)	2.61	lbs/year
8	Area of Impervious/Agricult/1000 sf	1,285	1000 sf
9	Leaching Rate	40%	percent
10	Atmos. N Load-3 (ag; imperv; other)	21.07	lbs/year
11	N(at) = N Load 1 + 2 +3	31.49	lbs
12	N = loss/removed	65.47	lbs

B	Cat Waste Nitrogen	Value	Units
1	Number of Cats per Dwelling	0.19	cats/dwelling
2	Number of Cats (Cats/dwelling x dwellings)	10	cats
3	Cat Waste Nitrogen Load	3.22	lbs/cat/year
4	N(p) = AR x cats x Adjustment (if applicable)	32.17	lbs/year
5	LR = Leaching Rate	25%	percent
6	N(P) = N(p) x LR	8.04	lbs
7	N = (loss/removed)	24.13	lbs

B'	Dog Waste Nitrogen	Value	Units
1	Number of Dogs per Dwelling	0.35	dogs/dwelling
2	Number of Dogs (Dogs/dwelling x dwellings)	19	dogs
3	Dog Waste Nitrogen Load	4.29	lbs/dog/year
4	N(p) = AR x dogs x Adjustment (if applicable)	81.08	lbs/year
5	LR = Leaching Rate	25%	percent
6	N(P) = N(p) x LR	20.27	lbs
7	N = (loss/removed)	60.81	lbs

D	Water Supply Nitrogen (other than wastewater, if applicable)		
1	WDF = Wastewater Design Flow	0	gal/day
2	WDF = Wastewater Design Flow	0	liters/yr
3	N = Nitrogen in Water Supply	50.00	mg/l
4	N(WW) = WDF x N	0	milligrams
5	N(WW) = Wastewater Nitrogen	0.00	lbs

F	Fertilized Land (Unfertilized Landscaping)		
1	A = Area of Land Fertilized 2	0	sq ft
2	AR = Application Rate	0.00	lbs/1000 sf
3	N(T) = Nitrogen (total applied)	0.00	lbs
4	LR = Leaching Rate	0%	percent
5	N(F2) = A x AR x LR	0.00	lbs
6	N = loss/removed	0.00	lbs

H	Irrigation Nitrogen		
1	R = Irrigation Recharge (inches)	0.35	inches
2	R = Irrigation Rate (feet)	0.0289	feet
3	A = Area of Land Irrigated	1,045,440	sq ft
4	R(I) = R(irr) x A	30,188	cu ft
5	R(I) = Site Irrigation (liters)	854,919	liters
6	N = Nitrogen in Water Supply	2.00	mg/l
7	N(T) = Nitrogen (total applied)	3.77	lbs
8	LR = Leaching Rate	10%	percent
9	N(irr) = R(I) x N x LR	170,984	milligrams
10	N(irr) = Irrigation Nitrogen	0.38	lbs
11	N = loss/removed	3.39	lbs

Total Site Nitrogen		
N=	N(S) + N(P) + N(WW) + N(F1) + N(F2) + N(ppt) + N(irr)	
N=	**6,163.05**	lbs

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NAME OF PROJECT

Hampton Bays Downtown Overlay District - Existing Conditions	
Hampton Bays, NY	

FINAL COMPUTATIONS

A	Nitrogen in Recharge (concentr.)	Value	Units
1	N = Total Nitrogen (lbs)	6,163.05	lbs
2	N = Total Nitrogen (milligrams)	2,798,025,000	milligrams
3	R(T) = Total Recharge (inches)	49.10	inches
4	R(T) = Total Recharge (feet)	4.09	feet
5	A = Area of Site	2,389,266	sq ft
6	R = R(T) x A	9,775,318	cu ft
7	R = Site Recharge Volume	276,836,995	liters
9	NR = N/R	10.11	mg/l

CONCENTRATION OF
NITROGEN IN RECHARGE

10.11

A	Nitrogen in Recharge	Value	Units
1	N = Total Nitrogen (lbs)	6,163.05	lbs
2	N = Total Nitrogen (milligrams)	2,798,025,000	milligrams
3	R(T) = Total Recharge (inches)	49.10	inches
4	R(T) = Total Recharge (feet)	4.09	feet
5	A = Area of Site	2,389,266	sq ft
6	R = R(T) x A	9,775,318	cu ft
7	R = Site Recharge Volume	276,836,995	liters
9	NR = N/R	10.11	mg/l

B	Site Recharge Summary	Value	Units
1	R(T) = Total Site Recharge	49.10	inches/yr
2	R = Site Recharge Volume	9,775,318	cu ft/yr
3	R = Site Recharge Volume	73,124,459	gal/yr
4	R = Site Recharge Volume	73.12	MG/yr

Conversions used in SONIR

Acres x 43,560 = Square Feet	Gallons x 0.1337 = Cubic Feet
Cubic Feet x 7.48052 = Gallons	Gallons x 3.785 = Liters
Cubic Feet x 28.32 = Liters	Grams / 1,000 = Milligrams
Days x 365 = Years	Grams x 0.002205 = Pounds
Feet x 12 = Inches	Milligrams / 1,000 = Grams

Nitrogen Load Summary - On-Site	Load	Percent
Sanitary Nitrogen (On-Site Wastewater)	5,816.29	94.37%
Fertilized Landscaping	286.58	4.65%
Dog Waste Nitrogen	20.27	0.33%
Cat Waste Nitrogen	8.04	0.13%
Atmospheric Nitrogen	31.49	0.51%
Irrigation Nitrogen	0.38	0.01%
Total Pounds Nitrogen	6,163.05	100.00%