

# VORTECHS SYSTEM® ESTIMATED NET ANNUAL TSS REDUCTION



Spy Pond  
Arlington, MA  
MODEL NAME VORTECHS 11000  
SITE DESIGNATION VORTECHS

Design Ratio<sup>1</sup> = 
$$\frac{(27 \text{ acres}) \times (0.9) \times (449 \text{ gpm/cfs})}{(78.5 \text{ sf})} = 138.9$$

Estimated bypass occurs at an elevation of 3.7' (at approximately 73 gpm/sf) above inlet invert\*  
\*assuming a weir length of 6 ft

<u>Rainfall Intensity</u> "/hr	<u>Operating Rate</u> <sup>2</sup> gpm/sf	<u>Treated Flow</u> cfs	<u>% Total Rainfall</u> Volume <sup>3</sup>	<u>Rmvl. Effic</u> <sup>4</sup> (%)	<u>Rel. Effic</u> (%)
0.02	2.8	0.49	10.2%	100.0%	10.2%
0.04	5.6	0.97	9.6%	100.0%	9.6%
0.06	8.3	1.46	9.4%	100.0%	9.4%
0.08	11.1	1.94	7.7%	99.8%	7.7%
0.10	13.9	2.43	8.6%	99.8%	8.6%
0.12	16.7	2.92	6.3%	99.6%	6.3%
0.14	19.4	3.40	4.7%	99.4%	4.6%
0.16	22.2	3.89	4.6%	99.1%	4.6%
0.18	25.0	4.38	3.5%	99.8%	3.5%
0.20	27.8	4.86	4.3%	98.5%	4.3%
0.25	34.7	6.08	8.0%	96.3%	7.7%
0.30	41.7	7.29	5.6%	92.7%	5.2%
0.35	48.6	8.51	4.4%	88.8%	3.9%
0.40	55.6	9.72	2.5%	84.5%	2.1%
0.45	62.5	10.94	2.5%	79.9%	2.0%
0.50	69.5	12.15	1.4%	74.8%	1.0%
0.75	104.6	18.31	5.1%	0.0%	0.0%
1.00	139.5	24.41	1.0%	0.0%	0.0%
1.50	171.6	30.02	0.0%	0.0%	0.0%
2.00	183.2	32.06	0.0%	0.0%	0.0%
3.00	202.3	35.39	0.2%	0.0%	0.0%
					90.8%
% rain falling at >0"/hr or bypassing treatment =					0.2%
Assumed removal efficiency for bypassed flows =					0.0%
Estimated reduction in efficiency <sup>4</sup> =					6.5%
Predicted Net Annual Load Removal Efficiency =					84%

1 - Design Ratio = (Total Drainage Area) x (Runoff Coefficient) x (cfs to gpm conversion) / Grit Chamber Area  
 - The Total Drainage Area and Runoff Coefficient is specified by the site engineer.  
 - The conversion factor from cfs to gpm is 449.

2 - Operating Rate (gpm/sf) = intensity ("/hr) x Design Ratio.

3 - Based on 10 years of hourly precipitation data from NCDC Station 770, Boston WSFO AP, Suffolk County, MA

4- Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

Calculated by: CJA 5/8/15 Checked by: