



AQUA TREATMENT TECHNOLOGIES INC.

Treatment of Waterloo Biofilter System © effluent
Six Nations Bingo Hall, Oshweken, Ontario, Canada

Wastewater type: Sanitary
Design flow: 50,000 L/day
Pre-treatment: Waterloo Biofilter System ©
Discharge: Surface water

In the fall of 2008 Aqua Treatment Technologies Inc. was retained by R.J. Burnside & Associates Limited to design and install the 'AQUA Wetland System' (AWS) to provide tertiary treatment of water discharged from an existing Waterloo Bioliter System © treating sanitary sewage from a Bingo Hall. Enhanced treatment of Waterloo Bioliter System © discharge water was required by Health Canada officials because treated water is being discharged to a ditch that drains into the Grand River.

Project description

The AWS is designed to treat 50,000 L/day of Waterloo Bioliter System © effluent. The AWS consists of three cells that are operated in series. Each cell measures 13.6 m L X 13.6 m W and 1.2 m in depth. Sanitary sewage receives septic tank pre-treatment treatment via the Waterloo Bioliter System © and final treatment within the AQUA Wetland System. Treated water from the AWS overflows into a ditch and subsequently into the Grand River. No external sterilization eg. UV is used.

Performance

The combined treatment system performance was assessed by means of a 13 month sampling program conducted by staff from R.J. Burnside & Associates Limited. Monthly water samples were collected from the discharge of the Waterloo Biofilter System © (i.e. AQUA Wetland System influent) and the discharge from the AQUA Wetland System. The performance data presented in tables 1 & 2 show that the after a brief maturation period the AQUA Wetland System can provide significant treatment to Waterloo Biofilter System © effluent. AQUA Wetland System effluent CBOD, BOD, TSS and ammonia were often below detect.

Table 1	CBOD	BOD	pH	TSS	TP	TKN	NH3+ NH4	Nitrate	E.Coli
20-Mar-09	--	--	--	--	--	--	--	--	--
21-Apr-09	52	14	7.02	26	8.17	121	140	0.05	380,000
22-May-09	31	32	8.16	21	8.48	117	110	0.05	76,000
18-Jun-09	30	46	8.03	14	8.92	108	109	0.05	34,000
22-Jul-09	14	15	7.95	13	9.96	89.7	81.7	2.78	71,000
28-Aug-09	6	6	7.42	13	8.09	24.3	20.1	14.5	620
16-Sep-09	8	10	7.9	12	10.2	36.8	37	26.7	980
21-Oct-09	22	15	7.38	63	9.86	43.9	46.3	31.1	2,500
19-Nov-09	7	8	7.57	12	11.3	57.7	46.6	50.7	11,000
18-Dec-09	12	13	7.39	11	13.7	44.6	36.6	51.6	48,000
22-Jan-10	16	14	7.4	18	11.5	56.1	45.7	37.1	30,000
25-Feb-10	25	15	7.79	8	11.4	51.6	44.1	36.2	22,000
16-Mar-10	9	10	7.37	8	8.52	26.4	28.2	28.6	13,000
22-Apr-10	15	23		10	12.5	45.6	43	30.6	48,000
Average	17.64	15.79	6.53	16.36	9.47	58.76	56.31	22.15	52,650

Table 1. Discharge from the Waterloo Biofilter System © & into the AQUA Wetland System.

Table 2	CBOD	BOD	pH	TSS	TP	TKN	NH3+ NH4	Nitrate	E.Coli
20-Mar-09	2	2	7.9	2	0.03		13.2	0.26	2
21-Apr-09	4	4	7.28	2	0.03	46.7	46.1	0.45	32
22-May-09	2	6	7.68	2	0.03	27.2	24.6	89.1	2
18-Jun-09	4	2	7.6	2	0.05	1	1	111	4
22-Jul-09	2	4	7.86	2	0.03	2.1	0.1	83.2	6
28-Aug-09	2	2	7.83	2	0.05	1.9	0.1	41.2	2
16-Sep-09	4	4	7.88	2	0.07	0.5	0.1	39.6	2
21-Oct-09	2	2	7.88	2	0.25	0.5	0.1	52.1	2
19-Nov-09	4	4	7.93	2	0.54	0.5	0.1	71.1	2
18-Dec-09	4	4	7.91	2	1.23	0.5	0.1	66.6	2
22-Jan-10	4	4	7.62	2	1.86	0.6	0.1	77.1	8
25-Feb-10	4	2	7.85	2	2.61	0.5	0.1	72.6	2
16-Mar-10	2	2	7.72	2	3.73	3.7	0.3	47.7	14
22-Apr-10	2	4		2	3.49	0.7	0.1	46.8	2
Average	ND	ND	7.21	ND	1	6.17	6.15 *	57.06	6

Table 2. Discharge from the AQUA Wetland System into surface water. XX = below lab detection limits.

* data analysis first 3 months only

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