

Municipality of



Brighton

WASTEWATER POLLUTION CONTROL PLANT

ANNUAL REPORT

2007

MINISTRY OF ENVIRONMENT - CERTIFICATE OF APPROVAL NUMBER 3-0521-00-006
SEWAGE WORKS NUMBER 110000953

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1.0 INTRODUCTION

The Municipality of Brighton is pleased to present its Annual Performance Report for wastewater treatment for the operating period of January 1 to December 31, 2007.

Brighton's Water Pollution Control Plant services a population of approximately 6,070 consisting of 2,510 residential and 170 commercial accounts. The Ontario Environmental Training Consortium Certification Office (OETC) classifies the Water Pollution Control Plant as Wastewater Treatment Class 1 facility and Wastewater Collection Class 2 collection system.

The Brighton Wastewater Pollution Control Plant operates under Certificate of Approval number 3-0521-99-006 issued by the Ministry of Environment.

CONTROL DOCUMENT INFORMATION

Type of Control Document	Number	Issue Date	Effluent Monitoring Requirements (Yes/No)	Effluent Reporting Requirements (Yes/No)
C of A Sewage Works	3-0521-99-006	7/09/99	YES	YES
C of A Sludge Drying Beds	3-0381-96-006	8/01/96	N/A	N/A
C of A Composting Site	A710120	2/05/97	N/A	N/A

There were no biosolids pumped to the drying beds during this reporting period and no material was utilized or removed from the composting site.

2.0 CONTACT INFORMATION

For information or questions regarding this report please contact:

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3.0 WASTEWATER TREATMENT PLANT DESCRIPTION & TREATMENT PROCESS

The sewage works in Brighton consists of:

- a 0.7 hectare aerated lagoon (lagoon #1) with two mechanical surface aerators. The effluent from the aeration lagoon passes through a chemical mixing chamber where alum is added before entering the waste stabilization pond;
- a 5.44 hectare waste stabilization pond (lagoon #2) is a facultative lagoon where wastewater stabilization is carried out by a combination of aerobic, anaerobic and facultative bacteria.
- a constructed wetland having a surface area of 6.2 hectare, located south of the existing waste stabilization pond consisting of Wetland Cell #1 (north cell) and Wetland Cell #2 (south cell) with alternating deep zones and vegetative terraces. The effluent from the constructed wetlands is continuous and discharges to a natural wetland that borders Presqu'ile Bay located off the northeast shore of Lake Ontario;
- a 2-cell drying bed to service the existing sewage treatment lagoons; sludge that accumulates in the lagoons may be periodically pumped to drying beds.

The hydraulic capacity of the sewage works was re-rated to 4,600 m³/day when the constructed wetland was incorporated to the treatment system in the summer of 2000. Approximately 35% of the sanitary sewage from the Brighton collection system flows by gravity to the aerated lagoon; the remainder of the flow (65%) was collected at the Harbour Street Sewage Pumping Station where it is pumped through a forcemain to the WPCP. The pumping station is equipped with three dry well centrifugal pumps that pump wastewater through a forcemain to the aerated lagoon. A standby diesel generator is on-site (replaced in September of 2005) at the pumping station to provide electricity to the pumps during power outage events.

Brighton's wastewater treatment system is a simple low-tech approach based on purifying the wastewater through biological activity in a lagoon-based system. Raw wastewater enters the aerated lagoon (lagoon #1) where it is mixed and oxygenated. The added oxygen from aeration allows aerobic microorganisms to reduce organic matter and nutrients, and reduces odour potential in the wastewater. The effluent from the aerated lagoon then passes through a mixing chamber where Alum (Aluminum Sulfate) is added. Alum is a flocculent used in wastewater ponds to precipitate soluble phosphorus and aids in the settling of many other substances. The effluent then flows to the waste stabilization pond (lagoon #2) where the bound solids settle to the bottom and the organic portions are decomposed through microbial action. Dissolved materials such as nitrogen and phosphorus are used by green algae in the pond for cell growth. The effluent from the waste stabilization pond then enters the constructed wetland for final polishing where the water is further filtered and cleansed. The natural processes occurring in the lagoons and wetland system produce a good quality effluent that is monitored regularly by licensed operators. Treatment performance from lagoon-based systems is susceptible to low temperature conditions and associated negative effects on biological treatment performance. Ammonia removal rates and microbial growth typically decrease with lower temperatures. The Certificate of Approval provides changes in concentration limits for Ammonia in the waste stabilization pond and constructed wetlands from October to April to provide allowances for cold temperatures that result in lower nitrification rates.

Analyses are taken in both the influent (raw sewage) and the effluent at the lagoon and wetlands to determine the amount of treatment achieved. The results must comply with MOE guidelines and Certificate of Approval effluent concentration limits and objectives.

4.0 COMPLIANCE WITH TERMS AND CONDITIONS OF CERTIFICATE OF APPROVAL

4.1 Performance

4.1.1 *Wastewater Flow to the WPCP*

Certificate of Approval 2.(a) The Owner shall ensure that the flow of sewage into the sewage treatment works does not exceed the average daily flow of 4,600 m³/day for a period of any twelve (12) consecutive calendar months.

The average daily flow for 2007 was 3,108 m³/day, which represents 67.6% of the average day design capacity of 4,600 m³/day. The maximum annual daily flow for 2007 occurred on April 17, 2007 where heavy precipitation contributed to a peak flow of 7,653 m³/day. Peak monthly flow of 148,787 m³ occurred in April due to precipitation that month. Annual flow of sewage to the WPCP was 1,135,399 in 2007 with approximately 56% of the wastewater entered via the pumping station and 44% flowing by gravity from the remainder of the sanitary collection system.

Table I – Monthly Sewage In-flow to Treatment Plant

Date	Total Flow m ³	Avg. Flow m ³ /Day	Max. Day Flow m ³	% (Avg.Day/Design Capacity)
JAN	140,264	4525	7166	98%
FEB	78,345	2798	3306	60%
MAR	120,276	3880	6381	84%
APR	148,787	4960	7653	108%
MAY	113,879	3674	6592	80%
JUN	84,874	2829	3370	62%
JUL	78,451	2531	3313	55%
AUG	72,287	2332	2650	51%
SEP	67,372	2246	2763	49%
OCT	70,893	2287	2650	50%
NOV	73,350	2445	2966	53%
DEC	86,621	2794	5682	61%
ANNUAL	1,135,399	3108	4541	68%

Volume of influent of wastewater to lagoon #2 measured 1,135,399 m³ See Table II.

Average per capita daily wastewater flow from Brighton WWTP was approximately 0.51 m³/capita in 2007, which includes domestic, industrial and commercial contributions as well as infiltration and inflow. (Based on a population of 6,070 and an average daily flow of 3,108 m³/day.)

The total flow of wastewater to the treatment plant in 2006 was 1,388,797 m³, flows in 2007 were approximately 8% less due to decreased precipitation throughout the year

Table II- Annual Flows to the WPCP

Date	2007	2006	2005	2004	2003
JAN	140,264	135,919	120,016	99,348	72,557
FEB	78,345	116,375	91,820	72,900	68,753
MAR	120,276	108,727	93,266	139,521	121,860
APR	148,787	123,600	137,108	137,429	120,487
MAY	113,879	107,899	90,800	107,407	125,924
JUN	84,874	92,457	70,223	91,458	100,143
JUL	78,451	96,755	68,654	99,697	74,838
AUG	72,287	78,674	60,800	113,708	71,274
SEP	67,372	85,449	76,665	110,785	68,544
OCT	70,893	145,412	89,040	80,535	81,242
NOV	73,350	143,914	102,228	90,949	109,618
DEC	86,621	153,616	103,019	149,474	123,796
ANNUAL	1,135,399	1,388,797	1,103,699	1,293,211	1,139,036

4.1.2 Waste Stabilization Pond Effluent Quality

Certificate of Approval 2.(b) The owner shall design, construct and/or operate the sewage treatment works such that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from the waste stabilization pond:

Table III – C of A Waste Stabilization Pond Effluent Parameters

Effluent Parameters	Concentration in Effluent	Loading in Effluent
CBOD ₅	30.0 mg/L	138.0 kg./day
Suspended Solids	40.0 mg/L	184.0 kg./day
Ammonia & Ammonium Nitrogen (May 1 to Oct. 30) ¹	14.0 mg/L¹	64.4 kg./day¹
(Nov. 1 to Apr. 30) ²	17.0 mg/L ²	78.2 kg./day ²
Total Phosphorus	1.0 mg/L	4.6 kg./day

Waste Stabilization Pond Effluent Summary:

- The Biological Oxygen Demand is the amount of oxygen used by micro-organisms as they decompose organic matter in the effluent sample for five days. High BOD in effluent means a large quantity of oxygen was needed to break down the organic matter and identifies a large amount of organic matter in the effluent indicating inadequate treatment. The CBOD₅ average concentration from the waste stabilization pond effluent in 2007 was 4.92mg/L; the C of A limit is 30.0 mg/L CBOD₅ based on the average concentration of all samples taken.
- Total Suspended Solids in effluent are composed of settleable solids and nonsettleable solids depending on the size, shape and weight of the solid particles; large sized particles tend to settle more rapidly and are largely removed in the waste stabilization pond. Suspended Solids concentration limit from the waste stabilization pond effluent is 40.0 mg/L. The annual average of Total Suspended Solids was 10.45 mg/L from the waste stabilization pond.
- Total Phosphorus (TP) refers to the amount of phosphorus in a sample. Excess TP stimulates algae and weed growth that may cause fluctuations in dissolved oxygen in the receiving waters. Total Phosphorus limits for the waste stabilization pond is based on the monthly average concentration of the parameter; the C of A limit is 1.0 mg/L TP. Monthly average concentration of Total Phosphorus in 2007 ranged from 0.07-0.58 mg/L.
- C of A limits for Ammonia change from May to October at 14.0 mg/L and Nov.-Apr. at 17.0 mg/L. Non-compliance with respect to concentrations of (Ammonia + Ammonium) Nitrogen in the effluent is deemed to have occurred when the '*monthly average*' concentration of the parameter listed in Table III is exceeded in any calendar month. Ammonia concentrations from May to October ranged from 6.63-12.88 mg/L; and from 7.13-17.83 mg/L in November to April.

A summary of the Lagoon Loading is provided in Table VII.

A summary of the overall performance of the wastewater system is provided in Table IX.

4.1.3 *Wetland Effluent Quality*

Certificate of Approval 5.(a) the Owner shall use best effort to operate the sewage treatment works with the objective that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from constructed wetland:

Table IV – C of A Constructed Wetland Effluent Objectives

Constructed Wetland Effluent Parameter	Concentration
CBOD ₅	15.0 mg/L
Suspended Solids	15.0 mg/L
Ammonia + Ammonium Nitrogen (May 1 to October 30) ¹ (November 1 to April 30) ²	10.0 mg/L ¹ 15.0 mg/L ²
Total Phosphorus	0.80 mg/L

Wetland Effluent Summary:

- The average concentration of CBOD₅ from the constructed wetland effluent in 2007 was 4.02 mg/L; the C of A objective is 15.0 mg/L CBOD₅ based on the average concentration of all samples taken.
- Suspended Solids concentration limit from the constructed wetland effluent is 15.0 mg/L. The annual average concentration of Total Suspended Solids was 7.41 mg/L from the constructed wetland based on the average concentration of all samples taken.
- Total Phosphorus limits for the constructed wetland is based on the monthly average concentration of the parameter; the C of A limit is 0.80 mg/L. Monthly average concentrations of Total Phosphorus in 2007 ranged from 0.08-0.70 mg/L.
- Limits for Ammonia change from May to October at 10.0 mg/L and Nov.-Apr. at 15.0 mg/L. Non-compliance with respect to concentrations of (Ammonia + Ammonium) Nitrogen in the effluent is deemed to have occurred when the '*monthly average*' concentration of the parameter listed in Table IV is exceeded in any calendar month. Ammonia concentrations from May to October ranged from 2.18 – 9.25 mg/L; and from 7.52 – 16.50 mg/L from November to April.
- There was one exceedance in December 2007 as defined in the Certificate of Approval. Ammonia, one of the parameters with respect to concentration from the constructed wetland effluent was noted and since they are only guidelines the level was documented.
- Lack of sunlight, plant production, decreased temperatures and ice cover in winter months directly affects treatment capability of a natural treatment process by limiting dissolved oxygen concentrations which may contribute to elevated food to microorganism ratio (F:M) conditions. Algae and plants consume nitrogen and phosphorus in the wastewater; lack of this activity in winter months limits the reduction of Ammonia and Phosphorus in the final effluent.

Certificate of Approval (5.)(b) states that the geometric mean density of E. Coli should not exceed 200 organisms per 100 ml. for any calendar month. E. coli are sampled once a month from the waste stabilization pond basis as per C of A. See **Tables V and VI representing the weekly lab results of the Waste Stabilization Pond and Wetland Effluent including monthly E. Coli** results. E. Coli levels were above 200 organisms per 100 ml on four occasions in the lagoon and four occasions in the wetland. See Tables V & VI

4.2 Monitoring and Recording

Certificate of Approval 4.(a) Annual calibration of flow measuring devices was performed on December 5, 2007.

Certificate of Approval 4.(b)(c)(d) – Table VIII demonstrates compliance with frequency of sampling of raw sewage, waste stabilization pond effluent and wetland effluent.

4.3 **Operation and Maintenance**

Table V

WASTE POND EFFLUENT-2007											
DATE	CBOD ₅	TSS	T.P.	T.P.	Ammonia	Ammonia	TKN	Nitrite (N)	Nitrate (N)	E. Coli	
C of A	30 mg/L	40 mg/L		1.0 mg/L	(May-Oct)14	Monthly	mg/L	mg/L	mg/L	200/100ml/mo	
CBOD results <2 recorded as 1.0				weekly	Monthly Avg.	(Nov-Apr) 17	Average				
2-Jan	2.00	2.00	0.16		8.90		11.00	0.10	1.00	100	
9-Jan	2.00	2.00	0.06		8.70		9.00	0.10	1.10		
16-Jan	3.00	2.00	0.07		6.50		8.00	0.10	1.30		
23-Jan	2.00	6.00	0.10		4.40		8.30	0.10	1.40		
30-Jan	2.00	12.00	1.20		9.40		11.0	0.10	1.1		
	2.20	4.80		0.32		7.13	9.5	0.10	1.18	100	
6-Feb	4.00	14.00	0.26		15.00		14.00	0.10	0.30	300	
13-Feb	9.00	2.00	0.10		15.70		16.00	0.10	0.30		
20-Feb	10.00	13.00	0.35		17.90		17.00	0.10	0.40		
27-Feb	2.00	20.00	0.80		17.30		19.00	0.10	0.20		
	6.25	12.25		0.38		16.48	16.50		0.30		
6-Mar	14.00	46.00	0.90		19.90		20.00	0.10	0.20	7300	
13-Mar	2.00	62.00	1.00		20.10		19.00	0.10	0.20		
20-Mar	9.00	32.00	0.20		13.20		12.00	0.10	1.00		
27-Mar	2.00	8.00	0.20		12.90		12.00	0.10	0.90		
	6.75	37.00		0.58		16.53	15.75		0.58		
3-Apr	5.00	12.00	0.20		12.00		13.00	0.10	0.70	20	
10-Apr	15.00	29.00	0.20		11.20		13.00	0.10	0.90		
17-Apr	8.00	22.00	0.60		7.20		10.00	0.10	1.00		
24-Apr	3.00	20.00	0.80		3.60		9.00	0.10	1.30		
	7.75	20.75		0.45		8.50	11.25		0.98		
1-May	15.00	14.00	0.40		4.90		10.00	0.10	0.90	100	
8-May	10.00	25.00	0.60		6.60	0.60	10.00	0.60	1.20		
15-May	7.00	13.00	0.20		7.80		11.00	0.10	0.60		
22-May	2.00	8.00	0.08		6.30		11.00	0.40	0.50		
29-May	4.00	14.00	0.50		7.50		12.00	0.20	0.20		
	7.60	14.80		0.32		6.40	10.80		0.68		
5-Jun	4.00	5.00	0.10		11.90		15.00	0.10	0.10	54	
12-Jun	9.00	7.00	0.33		14.30		16.00	0.10	0.10		
19-Jun	2.00	6.00	0.35		8.10		14.00	0.10	2.60		
26-Jun	4.00	4.00	0.22		8.70		11.00	0.50	0.10		
	4.75	5.50		0.25		10.75	14.00		0.73		
3-Jul	3.00	4.00	0.12		13.20		12.00	0.10	0.10	1000	
10-Jul	2.00	12.00	0.17		11.40		16.00	0.10	0.10		
17-Jul	2.00	2.00	0.38		13.80		14.00	0.20	0.10		
24-Jul	2.00	8.00	0.21		13.10		17.00	0.10	0.10		
31-Jul	5.00	14.00	0.20		13.40		14.00	0.20	0.10		
	2.80	8.00		0.22		12.88	14.60		0.10		
7-Aug	2.00	7.00	0.11		5.10		6.00	2.50	0.20	27	
14-Aug	6.00	11.00	0.08		7.00		9.00	0.20	0.10		
21-Aug	4.00	4.00	0.03		5.30		7.00	0.30	0.50		
28-Aug	11.00	2.00	0.08		9.10		12.00	0.60	0.40		
	5.75	6.00		0.08		6.63	8.50		0.30		
4-Sep	2.00	2.00	0.08		12.00		12.00	0.10	0.20	100	
11-Sep	7.00	2.00	0.07		12.20		13.00	0.10	0.40		
18-Sep	2.00	6.00	0.1		8.50		11.00	0.20	1.00		
25-Sep	6.00	7.00	0.02		7.50		8.00	0.10	1.10		
	4.25	4.25		0.07		10.05	11.00		0.68		
2-Oct	14.00	3.00	0.14		11.20		12.00	0.1	0.6	100	
9-Oct	2.00	3	0.10		8.90		10.00	0.10	0.70		
16-Oct	2.00	3.00	0.09		9.00		16.00	0.10	0.90		
23-Oct	8.00	2.00	0.11		14.00		15.00	0.20	1.20		
30-Oct	5	8.00	0.10		14.80		16.00	0.20	1.30		
	6.20	3.80		0.11		11.58	13.80		0.94		
6-Nov	2.00	5.00	0.16		15.90		18.00	0.20	0.90	100	
13-Nov	2.00	2.00	0.01		13.10		16	0.30	0.90		
20-Nov	3	2.00	0.21		17.50		18.00	0.57	1.33		
27-Nov	2.00	6.00	0.18		18.30		17.00	0.10	0.90		
	2.25	3.75		0.14		16.20	17.25		1.01		
4-Dec	2.00	5.00	0.16		15.60		19.00	0.10	1.00	100	
11-Dec	2	2.00	0.14		20.30		20	0.10	0.60		
18-Dec	3.00	2.00	0.19		21.50		20.00	0.10	0.20		

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Table VI

WETLAND FINAL EFFLUENT										
DATE	CBOD ₅	TSS	TP	TP Month	Ammonia(N)	NH ₃ Month	TKN	Nitrite	Nitrate	E. Coli
BOD <2mg/L recorded as 1.0			weekly	Average		Average		(N)	(N)	
2-Jan	2.00	3.00	0.12		7.70		9.00	0.10	1.40	100
9-Jan	2.00	3.00	1.16		7.00		7.00	0.10	1.40	
16-Jan	3.00	2.00	0.08		5.90		7.00	0.10	1.10	
23-Jan	2.00	3.00	0.08		6.60		9.00	0.10	1.40	
30-Jan	2.00	11.00	1.40		10.40		9.40	0.10	0.60	
2	2.20	4.40		0.57		7.52	8.28	0.10	1.18	
6-Feb	2.00	13.00	0.17		13.30		13.00	0.10	0.10	100
13-Feb	4.00	5.00	0.10		13.60		15.00	0.10	0.10	
20-Feb	6.00	11.00	0.21		12.90		17.00	0.10	0.20	
27-Feb	2.00	10.00	0.30		13.20		14.00	0.10	0.20	
3	3.50	9.75		0.20		13.25	14.75		0.15	
6-Mar	8.00	16.00	0.50		18.00		18.00	0.10	0.30	1100
13-Mar	2.00	10.00	1.90		18.50		18.00	0.10	0.40	
20-Mar	10.00	38.00	0.30		13.60		13.00	0.10	0.10	
27-Mar	2.00	2.00	0.10		10.10		12.00	0.10	0.90	
4	5.50	16.50		0.70		15.05	15.25			
3-Apr	2.00	8.00	0.10		7.60		8.00	0.10	1.30	40
10-Apr	6.00	3.00	0.10		8.20		13.00	0.10	1.90	
17-Apr	4.00	9.00	0.50		5.30		8.00	0.10	1.40	
24-Apr	2.00	10.00	0.40		3.30		6.00	0.10	0.60	
5	3.50	7.50		0.28		6.10	8.75			
1-May	9.00	69.00	0.40		2.00		4.00	0.10	1.20	13
8-May	4.00	5.00	0.30		0.50		2.00	0.10	0.60	
15-May	5.00	6.00	0.10		0.70		4.00	0.10	0.20	
22-May	2.00	7.00	0.02		2.50		4.00	0.20	0.30	
29-May	2.00	4.00	0.10		5.20		7.00	0.10	0.10	
6	4.40	18.20	0.18	0.18		2.18	4.20			
5-Jun	5.00	5.00	0.17		8.10		10.00	0.10	0.10	45
12-Jun	9.00	3.00	0.15		11.30		12.00	0.10	0.10	
19-Jun	2.00	2.00	0.29		8.00		14.00	0.10	0.10	
26-Jun	3.00	3.00	0.32		6.30		10.00	0.10	0.10	
7	4.75	3.25	0.23	0.23		8.43	11.50			
3-Jul	2.00	8.00	0.29		8.00		8.00	0.10	0.10	1000
10-Jul	2.00	7.00	0.15		6.60		10.00	0.10	0.10	
17-Jul	2.00	2.00	0.50		9.90		11.00	0.10	0.10	
24-Jul	2.00	7.00	0.36		10.90		13.00	0.10	0.10	
31-Jul	6.00	14.00	0.41		11.00		13.00	0.10	0.10	
8	2.80	7.60	0.34	0.33		8.85	11.00			
7-Aug	2.00	2.00	0.43		9.50		10.00	0.10	0.10	
14-Aug	6.00	11.00	0.32		4.20		8.00	0.10	0.10	
21-Aug	2.00	7.00	0.19		6		7.00	0.10	0.10	
28-Aug	11.00	2.00	0.63		6.40		10.00	0.10	0.10	
9	5.25	5.50	0.39	0.39		6.40	8.75			
4-Sep	2.00	5.00	0.21		8.20		9.00	0.10	0.10	100
11-Sep	13.00	2.00	0.26		9.50		11.00	0.10	0.10	
18-Sep	4.00	5.00	0.16		8.70		11.00	0.10	0.10	
25-Sep	6.00	6.00	0.60		10.60		11.00	0.10	0.10	
10	6.25	4.50	0.31	0.31		9.25	10.50			
2-Oct	14.00	8.00	0.27		9.40		10.00	0.10	0.10	
9-Oct	0.20	5.00	0.07		6.60		7.00	0.10	0.10	
16-Oct	2.00	2.00	0.02		4.50		11.00	0.21	0.10	
23-Oct	8.00	2.00	0.17		10.80		12.00	0.10	0.10	
30-Oct	4.00	6.00	0.1		13.6		13.00	0.10	0.10	
9	5.64	4.60	0.13	0.13		7.83	10.60			
6-Nov	4.00	4.00	0.09		13.00		14.00	0.10	0.20	100
13-Nov	2.00	2.00	0.04		14.20		14.00	0.20	0.40	
20-Nov	2.00	2.00	0.11		14.70		16.00	0.03	1.30	
27-Nov	2.00	2.00	0.07		16.50		17.00	0.10	0.10	
10	2.50	2.50	0.08	0.08		14.60	15.25			
4-Dec	2.00	5.00	0.11		15.10		17.00	0.10	0.90	
11-Dec	2.00	2.00	0.10		20.00		19.00	0.10	0.50	
18-Dec	2.00	2.00	0.10		17.50		20.00	0.10	0.20	
12/??/2005	2.00	9.00	0.10		13.40		17.00	0.10	0.40	

Lagoon Loading
Table VII

	Total Flow (m ³)	Average Flow m ³ /day	Average CBOD mg/L	Loading BOD kg/day	Average S.S. mg/L	Loading S.S. kg/day	Average NH ₃ mg/L	Loading NH ₃ kg/day	Average TKN mg/L	Loading TKN kg/day	Average T. Phos mg/L	Loading T. Phos kg/day
JAN	140,264	4,525	2.20	9.95	4.80	21.72	7.13	32.24	9.46	42.80	0.32	1.44
FEB	78,345	2,798	6.25	17.49	12.25	34.28	16.48	46.10	16.50	46.17	0.38	1.06
MAR	120,276	3,880	6.75	26.19	37.00	143.56	16.53	64.11	15.75	61.11	0.58	2.23
APR	148,787	4,960	7.75	38.44	20.75	102.92	8.50	42.16	11.25	55.80	0.45	2.23
MAY	113,879	3,674	7.60	27.92	14.80	54.37	6.40	23.51	10.80	39.67	0.32	1.18
JUN	84,874	2,829	4.75	13.44	5.50	15.56	10.75	30.41	14.00	39.61	0.25	0.71
JUL	78,451	2,531	2.80	7.09	8.00	20.25	12.88	32.58	14.60	36.95	0.22	0.55
AUG	72,287	2,332	5.75	13.41	6.00	13.99	6.63	15.45	8.50	19.82	0.08	0.17
SEP	67,372	2,246	4.25	9.54	4.25	9.54	10.05	22.57	11.00	24.70	0.07	0.15
OCT	70,893	2,287	6.20	14.18	3.80	8.69	11.58	26.48	13.80	31.56	0.11	0.25
NOV	73,350	2,445	2.25	5.50	3.75	9.17	16.20	39.61	17.25	42.18	0.14	0.34
DEC	86,621	2,794	2.50	6.99	4.50	12.57	17.83	49.81	19.00	53.09	0.17	0.48
Total Annual	1,135,399											
Avg. Annual	94,617	3,108	4.92	15.84	10.45	37.22	9.71	25.17	13.49	41.12	0.26	0.90
Min	67,372						13.78	45.67				
Max	148,787											
CofA Limit		4,600	30.00	138.00	40.00	184.00	May-Oct. 14.0 ¹ Nov.-Apr. 17.0 ²	May-Oct. 64.4 ¹ Nov.-Apr. 76.2 ²			1.00	4.60

Table VIII

Certificate of Analysis 4.(b) Samples of raw sewage shall be collected at locations acceptable to the District Manager and analyzed for at least parameters 1 to 4 at the indicated minimum frequencies; parameters 5 to 8 are taken in order to analyze system performance.				
	Raw Sewage Parameter	Type of Sample	Minimum Frequency	Total # of Samples
1	CBOD ⁵	grab	monthly	12
2	Suspended Solids	grab	monthly	12
3	Total Phosphorus	grab	monthly	12
4	Total Kjeldahl Nitrogen	grab	monthly	12
5	Ammonia (N)	grab	monthly	12
6	Nitrite (N)	grab	monthly	12
7	Nitrate (N)	grab	monthly	12
Certificate of Analysis 4.(c) Samples of effluent from the waste stabilization pond shall be collected at locations acceptable to the District Manager and analysed for at least the following parameters(1-10) at the indicated minimum frequencies.				
	Waste Stabilization Pond Effluent Parameter	Type of Sample	Minimum Frequency	Total # of Samples
1	CBOD5	grab	weekly	52
2	Suspended Solids	grab	weekly	52
3	Total Phosphorus	grab	weekly	52
4	Total Kjeldahl Nitrogen	grab	weekly	52
5	Ammonia (N)	grab	weekly	52
6	Nitrite (N)	grab	weekly	52
7	Nitrate (N)	grab	weekly	52
8	pH	grab	weekly	52
9	Temperature	grab	weekly	52
10	E. Coli	grab	monthly	12
Certificate of Analysis 4.(d) Samples of effluent from the constructed wetland shall be collected at locations acceptable to the District Manager and analysed for at least the following parameters (1-9) at the indicated minimum frequencies. E. Coli is sampled to comply with C. of A. objective 5.(b).				
	Constructed Wetland Effluent Parameter	Type of Sample	Minimum Frequency	Total # of Samples
1	CBOD5	grab	weekly	52
2	Suspended Solids	grab	weekly	52
3	Total Phosphorus	grab	weekly	52
4	Total Kjeldahl Nitrogen	grab	weekly	52
5	Ammonia (N)	grab	weekly	52
6	Nitrite (N)	grab	weekly	52
7	Nitrate (N)	grab	weekly	52
8	pH	grab	weekly	52
9	Temperature	grab	weekly	52
10	E. Coli	grab	monthly	12

Certificate of Approval (5.)(c) stipulates that the Owner shall endeavour to operate the sewage treatment works such that the effluent will not contain any oil or other substance in amounts sufficient to create a visible film or sheen on the surface of the receiving waters and shall be essentially free of any floating material.

Occasional foaming was present where wastewater cascades over weirs or from outfalls; this appears to occur on a seasonal basis.

Certificate of Approval 6.(a) refers to proper maintenance of related equipment and appurtenances to operate sewage works, including funding for operator training.

In September of this year we replaced the stand-by Generator at the Harbour Street Pumping Station

An Operations and Maintenance Manual is in place at the Sewage Works. Continuing education for operators is promoted by the municipality for wastewater treatment and collection as well as health, safety, and technical related courses.

Certificate of Approval 7.(c) Flows through the Brighton Wastewater Treatment lagoons and wetlands are continuous.

Certificate of Approval 7.(d)(i) Summary of all monitoring data including an overview of the sewage treatment program.

Certificate of Approval 7.(d)(ii) Interpretation of all monitoring and analytical data and comparison to the final effluent quality and quantity.

Table IX Brighton WPCP Performance Summary details results and efficiency of the sewage treatment performance demonstrating pollutant removal rates from raw sewage concentrations through to final effluent for CBOD₅, Suspended Solids, Total Phosphorus, TKN and Ammonia.

Table IX also demonstrates the success of Brighton's WPCP natural treatment process, which includes:

- 92.9% CBOD₅ removal
- 93.1% removal of Suspended Solids
- 94.4% removal of Phosphorus
- 60.9% removal of Nitrogen
- 57.7% removal of Ammonia.

Certificate of Approval 7.(d)(iii) Summary of any final effluent quality assurance or control measures undertaken during the reporting period.

Table IX

Month	Flows		Maximum Day m ³ /D	CBOD ₅			Suspended Solids			Total Phosphorous			TKN			Ammonia			Wetland Effluent Temp.				
	Total Flow m ³	Average Day m ³ /D		Raw Sewage (mg/L)	Lagoon #1 (mg/L)	Lagoon #2 (mg/L)	Wetland Effluent (mg/L)	Raw Sewage (mg/L)	Lagoon #1 (mg/L)	Lagoon #2 (mg/L)	Wetland Effluent (mg/L)	Raw Sewage (mg/L)	Lagoon #1 (mg/L)	Lagoon #2 (mg/L)	Raw Sewage (mg/L)	Lagoon #1 (mg/L)	Lagoon #2 (mg/L)						
Jan.	140,964	4,525	7,166	32.00	17.00	2.20	2.20	36.00	4.80	4.40	1.70	0.55	0.32	0.57	14.00	12.00	9.46	9.70	8.28	9.70	7.13	4.14	
Feb.	79,945	2,798	3,906	52.00	25.00	6.25	3.60	40.00	12.25	4.40	2.70	0.88	0.38	0.20	30.00	16.00	16.50	21.40	9.75	21.40	16.48	13.25	
Mar.	120,276	3,690	6,381	66.00	63.00	6.75	5.50	96.00	37.00	16.50	3.50	2.90	0.88	0.70	33.00	20.00	15.75	32.00	15.25	32.00	16.53	15.06	
Apr.	148,787	4,660	7,653	72.00	64.00	7.75	3.50	90.00	20.75	7.50	4.50	1.80	0.45	0.70	25.00	15.00	11.25	25.80	7.50	25.80	8.50	6.10	
May	113,679	3,674	6,592	63.00	33.00	7.60	4.40	78.00	14.80	18.20	3.00	1.80	0.52	0.18	30.00	17.00	10.80	30.00	4.20	13.10	10.70	6.40	
June	84,674	2,629	3,270	90.00	36.00	4.75	4.75	104.00	5.50	3.25	2.60	1.70	0.25	0.23	40.00	40.00	14.00	28.50	11.50	28.50	10.75	8.43	
July	78,451	2,531	3,213	30.00	30.00	2.80	2.90	272.00	8.00	7.60	2.40	3.20	0.22	0.33	30.00	20.00	14.60	23.90	10.00	23.90	19.70	12.88	
Aug.	72,927	2,322	2,550	18.00	12.00	5.75	6.25	168.00	6.00	5.50	2.00	0.88	0.20	0.38	21.00	20.00	8.50	18.40	10.00	18.40	8.90	6.63	
Sept.	67,272	2,246	2,763	102.00	16.00	4.25	6.25	132.00	4.25	4.50	1.80	3.30	0.87	0.31	71.00	20.00	11.00	48.00	10.50	48.00	8.80	9.25	
Oct.	70,893	2,297	2,650	156.00	84.00	6.20	5.64	174.00	3.80	4.60	5.00	4.70	0.11	0.13	50.00	30.00	13.80	50.00	10.60	50.00	23.70	11.58	
Nov.	73,550	2,445	2,666	84.00	42.00	2.25	2.50	140.00	108.00	3.75	23.00	3.40	0.14	0.08	40.00	30.00	17.25	38.00	15.25	38.00	21.60	14.60	
Dec.	86,621	2,794	5,682	66.00	18.00	2.50	2.00	460.00	84.00	4.50	2.50	3.30	0.17	0.10	30.00	20.00	19.00	24.70	18.25	24.70	17.10	17.83	
Total	1,135,399									7.93													
Average	94,617	3,108	4,541	69.25	33.50	4.92	4.02	150.68	112.67	10.45	4.57	2.84	0.26	0.33	34.50	21.83	13.49	27.79	10.76	27.79	16.71	11.74	9.86
C of A Limit						30.0	15.0		40.0	15.0		1.00		0.80								14.0 (S)	10.0 (S)
%					51.6%	92.9%	94.2%	25.2%	93.1%	95.1%		37.8%	94.4%	92.3%		36.7%	60.9%	88.8%		88.8%	39.9%	57.7%	65.2%
						Wetland																17.63	16.50 min
						Wetland																5.40	2.18 min

Certificate of Approval 7.(d)(iv) Summary of maintenance carried out on major structure, equipment, apparatus, mechanism forming part of the works.

- In January 2007 the wet well at the Harbour Street Pumping Station was cleaned by a contracted company.

Certificate of Approval 7.(d)(v) Summary of any environmental or operating problems encountered and mitigative measures taken.

- Although there are no combined sanitary and storm sewers in Brighton, the collection system is susceptible to higher flows with heavy precipitation events. Investigation of potential incorrect sump pump connections in the community was commenced in 2006 to ensure that the discharge from sump pumps are not connected to the sanitary sewer system.
- Muskrat damage to the constructed wetlands have reduced plant growth in the vegetated zones. Seasonal trapping is being conducted to control muskrat population. This will become a yearly on going situation due to the natural conditions for muskrats.

Certificate of Approval 7.(d)(vi) Summary of alterations, extensions or replacements in the process or operation of the works which are considered for implementation over the next reporting period.

Certificate of Approval 7.(d)(iv) Summary of calibration and maintenance procedures conducted on all monitoring equipment.

Milltronics performed annual calibration of flow meters at the Brighton WPCP on December 5th 2007.

4.4 **Reporting – Non-Compliance**

Certificate of Approval 7. (b) There was one non-compliance issues in this reporting period. December of 2007 we reported to the Ministry of the Environment an exceedance of Ammonia levels, our C of A stipulates that we do not exceed a level of 17 mg/L and we had a level of 17.83 mg/L .

5.0 CONCLUSION

The Brighton Water Pollution Control Plant has been successful in treating the wastewater utilizing the lagoons and wetlands through natural treatment processes. The final quality of the effluent may be influenced by a majority of environmental factors such as climate or wildlife. Enhanced performance is exhibited during warmer months when nutrients are absorbed from the growth of vegetation and bacteria are most active. Wastewater effluent from the wastewater pollution control plant (WPCP) is tested at Caduceon Environmental Labs, a certified lab, on a

weekly basis as per Certificate of Approval. The effluent quality from the lagoon and wetland site to Presqu'ile Bay has met and/or exceeded the contaminant limits and objectives set under the terms and conditions of the Certificate of Approval. Brighton is dedicated to achieving continuous improvement of its wastewater treatment system and being environmentally responsible to the quality of its receiving waters.