



# Collingwood Public Utilities



## Devil's Glen Country Club Communal Water Treatment Plant 2007 Annual Compliance Report



**Operated By  
Collingwood Public Utilities**

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### Definitions

Collingwood Public Utilities	CPU
Ministry of the Environment	MOE
Flow	(m <sup>3</sup> /d) cubic metres per day
Weight	(kg) kilograms
Chlorine Residuals	(mg/l) milligrams/litre
Chlorine dosages	(mg/l) milligrams/litre
Temperature	(°C) degree Celsius
Turbidity	(NTU) nephelometric turbidity unit
Conditions	Visual checks
Bacteriological Sample	Sample count / Safe or adverse
Organic Sample	(mg/l) milligrams/litre (unless expressed otherwise)
Pesticides & PCB	(mg/l) milligrams/litre (unless expressed otherwise)
Inorganic	(mg/l) milligrams/litre (unless expressed otherwise)
Physical	(mg/l) milligrams/litre (unless expressed otherwise)
Maximum allowable concentration	MAC
American Water Works Association.	(AWWA)

## **Section 1 Drinking Water System General Information**

This report has been prepared in accordance with the reporting requirements of the Safe Drinking Water Act 2002 O. Reg. 170/03, s 11 (6,f) , (7) , (8) & 10.

Collingwood Public Utilities is pleased to provide Devil's Glen Country Club with this Communal Water Treatment Plant 2007 Annual Compliance Report. CPU's goal is to provide our clients with the cleanest, safest and most dependable supply of potable water possible. The following is general information pertaining to Devil's Glen Communal Water Treatment Plant:

<b>MOE PLANT CLASSIFICATION</b>	: Water Treatment System (Municipal Class III)
<b>DRINKING-WATER SYSTEM NUMBER</b>	: 260062972
<b>DRINKING-WATER SYSTEM CATEGORY</b>	: Non-Municipal Year-Round Residential
<b>OPERATING AUTHORITY</b>	: Collingwood Public Utilities
<b>PLANT LOCATION</b>	: RR#1, Glen Huron, Part of Lot 7, Concession 11, Clearview Township

### **Section 1.1 Description of the Drinking Water System**

Devil's Glen Communal Water Treatment Plant is an enhanced coagulation membrane filtration surface water treatment plant. Surface water is taken from the Mad River through a submerged 3mm screened inlet. Raw water flows by gravity into the raw water well in the Snowmaking Building. The raw water is then pumped by two (2) 25hp vertical turbine pumps (one duty one standby) through a 1.0 micron self cleaning strainer to remove large particulate matter. The raw water pumps generate a pressure of 1300kPa in order to discharge raw water at the treatment facility located at the top of the ski resort.

Raw water entering the treatment facility is dosed with pre-treatment chemicals, namely sulphuric acid for pH adjustment and Aluminum Chloride Hydroxide Sulphate (Sternpac) for coagulation. It should be noted that pH adjustment is necessary to optimize the coagulation process. Following the addition of the above noted chemicals the influent passes through a static mixer before discharging into a flocculation tank. The influent is then retained in the flocculation tank for approximately 15 minutes and mixed slowly to facilitate flocculation. This part of the process releases the dissolved organic matter that is in solution and changes it into a particulate which can be easily removed by the membrane filtration process.

The Zenon membrane filtration system consists eight (8) 500sq/ft modules, one (1) permeate pump, one (1) backpulse pump, one (1) backpulse tank and one (1) air blower. The membranes have a pour size of 0.035 micron and as such remove all particulate matter greater than this. The permeate pump creates a slight vacuum which sucks clean (permeate) water through the membrane leaving the particulate matter in the process tank.

The permeate water is then disinfected by the addition of sodium hypochlorite. The chlorinated permeate water then flows to the two (2) 140 m<sup>3</sup> combination chlorine contact chambers/reservoirs. The finished water then flows into two (2) separate distribution systems. One system is fed by gravity and flows to the bottom of the hill to service the lodge and the homes within the resort. The second system is fed by high lift distribution pumps and services the condo corporations at the top of the hill.

The fouling of the membranes is controlled by a regular cleaning cycle that consists of reversing the flow of clean water stored in the backpulse tank back through the membranes under positive pressure. This process concentrates the raw water which in turn is rejected to waste. It should be noted that this reject

water is discharged to a septic tank and weeping bed. Air is also used to prevent fouling of the membranes. This is achieved by injecting air at the bottom of the tank thus scouring the membranes with air bubbles as they rise to the surface. This air scouring process also assists in keeping the concentrated solids in suspension, prior to reject.

Devil's Glen Communal Water Treatment Plant is continually monitored 24 hours a day 365 days a year. The treated water parameters monitored are Turbidity, Flow, Pressure, Chlorine Residual, Temperature and pH. This is achieved through the SCADA (Supervisory Control And Data Acquisition) system.

## **Section 2 Compliance Statements**

- Collingwood Public Utilities ensures compliance with the ODWS by establishing a sampling schedule based on O. Reg. 170/03. All sampling is performed in accordance with the Ministry of the Environment's "Guide to Collection and Submission of Samples for Laboratory Analysis". Compliance is also ensured by having all laboratory samples analyzed by a laboratory accredited by the Canadian Association for Environmental Analytical Laboratories (C.A.E.A.L.) of Canada.
- Collingwood Public Utilities ensures compliance is met with the requirements of the ODWS by operating the water treatment facility so that water intended for human consumption does not exceed the standards described in the ODWS. These standards are defined as Maximum Acceptable Concentration (MAC) standards, and Interim Maximum Acceptable Concentration (IMAC) standards. In the event that ODWS standards are exceeded, CPU will follow the requirements of O. Reg. 170/03 – in notifying the Medical Officer of Health, the MOE and the Owner, perform corrective actions as required, and if necessary, post a warning notice in a prominent location.
- Collingwood Public Utilities monitors the chemical parameters (non-health related) that may impair the taste, odour or colour of water or which may interfere with good water quality control practices which are reported as Aesthetic Objectives (AO).
- Collingwood Public Utilities ensures that the water leaving the treatment plant and entering the distribution system is disinfected to meet those requirements described in Ministry of the Environment (MOE) Procedure for Disinfecting Water in Ontario as amended from time to time.
- Collingwood Public Utilities ensures that all chemicals used in the treatment process and all materials contacting the water meet both the American Water Works Association (AWWA) quality criteria as set out in AWWA standards and the American National Standard Institute (ANSI) safety criteria as set out in ANSI standard NSF/60 or NSF/61.
- Collingwood Public Utilities ensures that the Overall Responsible Operator is an operator who holds a valid license that is applicable to Devil's Glen Treatment Facility and that this is the same or higher class than the class determined for the water treatment plant in accordance O Reg. 128/04 as amended from time to time.
- Collingwood Public Utilities exercises due diligence in ensuring that at all times, the works and related equipment and appurtenances used to achieve compliance are properly operated and maintained.

### **Section 3 Results of External Performance Audits**

The following section discusses performance audits conducted by external agencies.

No external audits were performed during this reporting period.

### **Section 4 Treatment Chemicals Used**

The following section discusses the chemicals used in the treatment process.

- Sodium Hypochlorite 12% solution
- Aluminum Chloride Hydroxide Sulphate
- Sulphuric Acid 93% solution

The following table shows total chlorine used per month, average post filtration chlorine dosage and average free chlorine residual after contact time. In addition average raw water temperature has been shown

<b>Month</b>	<b>Total Chlorine Used (l)</b>	<b>Ave.(Free) treatment Residual</b>	<b>Ave. Post Chlorine Dose (mg/l)</b>	<b>Ave. Water Temp. °C</b>
<b>January</b>	34	0.72	1.66	4.0
<b>February</b>	39	0.69	2.16	1.0
<b>March</b>	34	0.62	1.65	3.7
<b>April</b>	33	0.62	2.95	6.2
<b>May</b>	36	0.67	2.85	12.3
<b>June</b>	30	0.60	2.42	15.7
<b>July</b>	32	0.61	2.60	18.1
<b>August</b>	40	0.77	2.50	19.4
<b>September</b>	35	0.82	2.50	6.6
<b>October</b>	44	0.85	2.44	6.7
<b>November</b>	52	0.98	2.32	6.6
<b>December</b>	107	1.12	2.23	2.8
<b>Total/ Ave</b>	<b>516</b>	<b>0.8</b>	<b>2.4</b>	<b>8.6</b>
<b>Max</b>	<b>13.9</b>	<b>1.1</b>	<b>3.0</b>	<b>19.4</b>
<b>Min</b>	<b>2.8</b>	<b>0.6</b>	<b>1.7</b>	<b>1.0</b>

The following table shows total coagulant and sulphuric acid usage per month, average coagulant dosage, average raw water turbidity and average finished water turbidity.

Month	Aluminum Chloride Hydroxide Sulphate (litres)	Coagulant dosage mg/l	Ave. Raw Water Turbidity	Ave. Finished Water Turbidity	Sulphuric Acid 93% (litres)
January	514	78.6	3.5	0.05	195
February	628	82.6	3.7	0.05	230
March	674	78.2	3.1	0.07	211
April	420	72.4	2.7	0.05	125
May	329	82.7	13.4	0.06	75
June	310	87.2	3.0	0.08	85
July	424	86.8	2.4	0.09	125
August	515	85.6	2.3	0.04	142
September	545	87.7	3.5	0.04	220
October	897	86.1	6.8	0.04	170
November	837	76.4	5.0	0.05	80
December	1677	75.5	1.9	0.07	142
<b>Total/ Ave</b>	<b>7770</b>	<b>81.6</b>	<b>4.3</b>	<b>0.06</b>	<b>1800</b>
<b>Max</b>	<b>1133</b>	<b>87.7</b>	<b>13.4</b>	<b>0.09</b>	<b>230</b>
<b>Min</b>	<b>109</b>	<b>72.4</b>	<b>2.3</b>	<b>0.04</b>	<b>75</b>

## **Section 5 Required Reports to the Ministry of the Environment**

In general the number of samples collected for analysis exceeded the minimum quantities set out by O. Reg. 170/03 of the Safe Drinking Water Act. The following is a summary of reports made to the MOE under subsection 18 (1) of the Act or 16-4 of Schedule 16 for the period covered by this report.

### **Samples collected from the distribution system and reported by CPU**

<b>Incident Date</b>	<b>Parameter</b>	<b>Result</b>	<b>Unit of Measurement</b>	<b>Corrective action</b>	<b>Corrective action date</b>
March 16 2007	Total Trihalomethanes	0.10275 running average	mg/l	Refer to section 5.1	March 16 <sup>th</sup> 2007 AWQI # 70526

**Note: Incident date is represented by the sample date**

**: Corrective action date is represented by the date the incident was resolved by confirmation of laboratory results**

**: The running average noted above was issued by the accredited Laboratory and was based on additional analysis that was not required to be shown in 2006 compliance report**

### **Samples collected from the distribution system and reported by Devils Glen Staff**

Explanation of incident & corrective action not commented on in this report

<b>Incident Date</b>	<b>Parameter</b>	<b>Result</b>	<b>Unit of Measurement</b>	<b>Corrective action</b>	<b>Corrective action date</b>
Nov 18 2007	Chlorine residual	<0.05	mg/L	Disinfection increased Flushed mains & Pipes Bacti samples	AWQI # 76757 Nov 20 <sup>th</sup> 2007

**Note: Incident date is represented by the sample date**

**: Corrective action date is represented by the date the incident was resolved by confirmation of laboratory results**

## **Section 5.1 Explanation of Treatment Reports**

There was one (1) exceedance to report in 2007, this was for total trihalomethanes (THMs) running average in the distribution system. The Regulation states that the results for total trihalomethanes based on a running four quarter average must remain under 0.100mg/l.

The adverse condition occurred as a carry over from 2006 running average for the first quarter sampling period; although the actual result of 0.019mg/l which is below the 0.100mg/l level the four quarter running average of 0.10275mg/l was still in exceedance. On notification from the laboratory on March 16 2007 all necessary Notices of Adverse Test Result forms were submitted to the Ministry of Environment and Medical Officer of Health within the regulated time frame.

## Section 5.2 Treatment Corrective Actions

CPU continues to optimize chemical addition to achieve the best possible organic removal in the prevention of trihalomethane formation. The distribution total trihalomethane running average at the end of 2007 was 0.0395mg/l which is less than 50% of the ODWS and EPA allowable averages of 0.100 mg/l and 0.080 mg/l respectively.

## Section 6 Summary of Results of the Required Tests

**Microbiological Testing carried out under Schedule 10, 11 or 12 of Regulation 170/03 during the period covered by this annual report for 2007**

	Number Of Samples	Range of E. Coli or Fecal Result (min #)-(max#)	Range of Total Coliform Results (min #)-(max#)	Range Of Background Counts (min #)-(max#)	Range of HPC Results (min #)-(max#)
Raw	52	25 (min) – >80(max)	3 (min) - >60(max)		
Treated	52	0 (max)	0 (max)	0 (max)	<10 (max)
Distribution	156	0 (max)	0 (max)	0 min- >10max	<10 (min) 280 (max)

Distribution system microbiological samples are collected by Devil's Glen staff and results of analysis are also reported by Devil's Glen staff

**Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this annual report for 2007**

	Number of Samples	Range of Results
Turbidity	Continuous analyzers	0.03 min 0.091max
Chlorine	Continuous analyzers	0.41 min. 1.68 max

**Summary of Inorganic parameters tested during the period covered by this annual report.**

	Date Of Samples	MAC
	March 2007	mg/l
<b>Antimony</b>	<0.001	<b>0.006</b>
<b>Arsenic</b>	<0.0006	<b>0.025</b>
<b>Barium</b>	<0.01	<b>1.0</b>
<b>Boron</b>	<0.008	<b>5.0</b>
<b>Cadmium</b>	<0.0005	<b>0.005</b>

<b>Chromium</b>	<0.0006	<b>0.05</b>
<b>Fluoride</b>	<0.05	<b>1.5</b>
<b>Lead</b>	0.0005	<b>0.01</b>
<b>Mercury</b>	<0.0001	<b>0.001</b>
<b>Nitrate + Nitrite (as N)</b>	2.54	<b>10.0</b>
<b>Nitrite</b>	<0.05	<b>1.0</b>
<b>Nitrate</b>	2.54	<b>10.0</b>
<b>Selenium</b>	<0.0008	<b>0.01</b>
<b>Sodium</b>	8.01	greater than <b>20</b>
<b>Uranium</b>	0.0002	<b>0.02</b>

**Operational testing carried out under Schedule 24(Organics) of Regulation 170/03 during the period covered by this annual report for 2007.**

**Note:** non-municipal year round residential systems are only required to ensure at least one water sample is taken every 60 months and tested for every parameter set out in Schedule 24 listed in the table below.

		<b>MAC</b>
	<b>March 2007</b>	<b>mg/l</b>
<b>Alachlor</b>	<0.0005	<b>0.005</b>
<b>Aldicarb</b>	<0.00015	<b>0.009</b>
<b>Aldrin +Dieldrin</b>	<0.00007	<b>0.0007</b>
<b>Atrazine</b>	<0.0005	<b>0.005</b>
<b>Azinphos-methyl</b>	<0.002	<b>0.02</b>
<b>Bendiocarb</b>	<0.002	<b>0.04</b>
<b>Bromoxynil</b>	<0.0005	<b>0.005</b>
<b>Carbaryl</b>	<0.005	<b>0.09</b>
<b>Carbofuran</b>	<0.005	<b>0.09</b>
<b>Chlordane(Total)</b>	<0.0007	<b>0.007</b>
<b>Chlorpyrifos</b>	<0.001	<b>0.09</b>
<b>Cyanazine</b>	<0.001	<b>0.01</b>
<b>Diazinon</b>	<0.001	<b>0.02</b>
<b>Dicamba</b>	<0.001	<b>0.12</b>
<b>2,4-Dichlorophenol</b>	<0.0005	<b>0.9</b>
<b>DDT</b>	<0.003	<b>0.03</b>
<b>24-D</b>	<0.001	<b>0.1</b>
<b>Dicoflp-methyl</b>	<0.0009	<b>0.009</b>
<b>Dimethoate</b>	<0.0025	<b>0.02</b>
<b>Dinoseb</b>	0.001	<b>0.01</b>
<b>Diquat</b>	<0.005	<b>0.07</b>
<b>Diuron</b>	<0.01	<b>0.15</b>
<b>Glyphosate</b>	<0.01	<b>0.28</b>
<b>Heptachlor + heptachlor epoxide</b>	<0.0003	<b>0.003</b>
<b>Lindane (Total)</b>	<0.0004	<b>0.004</b>
<b>Malathion</b>	<0.005	<b>0.19</b>
<b>Methoxychlor</b>	<0.09	<b>0.9</b>
<b>Metolachlor</b>	<0.00011	<b>0.05</b>

<b>Metribuzin</b>	<0.00025	<b>0.08</b>
<b>Paraquat</b>	<0.001	<b>0.01</b>
<b>Parathion</b>	<0.001	<b>0.05</b>
<b>Pentachlorophenol</b>	<0.0005	<b>0.06</b>
<b>Phorate</b>	<0.0005	<b>0.002</b>
<b>Picloram</b>	<0.05	<b>0.19</b>
<b>PCB</b>	<0.0002	<b>0.003</b>
<b>Prometryne</b>	<0.00025	<b>0.001</b>
<b>Simazine</b>	<0.001	<b>0.01</b>
<b>Temephos</b>	<0.007	<b>0.28</b>
<b>Terbufos</b>	<0.0007	<b>0.001</b>
<b>2,3,4,6-Terachlorophenol</b>	<0.0005	<b>0.1</b>
<b>Triallate</b>	<0.001	<b>0.23</b>
<b>2,4,6,-Trichlorphenol</b>	<0.0005	<b>0.005</b>
<b>Trifluralin</b>	<0.001	<b>0.045</b>
<b>2,4,5-T</b>	<0.001	<b>0.28</b>
<b>Trichlorophenoxy acetic Acid</b>	<0.0002	<b>0.28</b>
<b>Benzo(a)pyrene</b>	<0.00001	<b>0.00001</b>

#### Trihalomethanes quarterly sample results

	Date Of Samples				MAC
	March	May	August	Oct	mg/l
<b>Benzene</b>	<0.0002	<0.0002	<0.0002	<0.0002	<b>0.005</b>
<b>Carbon Tetrachloride</b>	<0.0001	<0.0001	<0.0001	<0.0001	<b>0.005</b>
<b>1,2-Dichlorobenzene</b>	<0.0001	<0.0001	<0.0001	<0.0001	<b>0.005</b>
<b>1,4-Dichlorobenzene</b>	<0.0002	<0.0002	<0.0002	<0.0002	<b>0.001</b>
<b>1,2-Dichloroethane</b>	<0.0002	<0.0002	<0.0002	<0.0002	<b>0.005</b>
<b>1,1-Dichloroethane</b>	<0.0002	<0.0002	<0.0002	<0.0002	<b>0</b>
<b>1,1-Dichloromethylene</b>	<0.0003	<0.0003	<0.0003	<0.0003	<b>0.014</b>
<b>Dichchloromethane</b>	<0.0001	<0.0001	<0.0001	<0.0001	<b>0.05</b>
<b>Monochlorobezene</b>	<0.0001	<0.0001	<0.0001	<0.0001	<b>0.08</b>
<b>Tetrachloroethlene</b>	<0.0002	<0.0002	<0.0002	<0.0002	<b>0.03</b>
<b>Total Trihalomethanes</b>					
<b>* Note:</b>	<b>0.019</b>	<b>0.057</b>	<b>0.041</b>	<b>0.041</b>	<b>0.100<sup>a</sup></b>
<b>Trichloroethylene</b>	<0.0002	<0.0002	<0.0002	<0.0002	<b>0.005</b>
<b>Vinyl chloride</b>	<0.00017	<0.00017	<0.00017	<0.00017	<b>0.002</b>
<b>Xylene</b>	<0.001	<0.001	<0.001	<0.001	<b>0.05</b>

<sup>a</sup> **Note:** The MAC for Total Trihalomethanes is based on a four ( 4) quarter running average. The current running average for the Devil's Glen system is 0.0395 mg/l

## **Section 7 Items of Significant Investment in the Water Treatment System in 2007**

The following is a brief description of items of significant expenses and system investment incurred during the period covered by this annual report.

<b>Description</b>	<b>Monetary Expenses Incurred Investment</b>
Raw Water online monitoring (flow, ph & turbidity)	\$10,000

This completes the Devil's Glen Communal Water Treatment Plant 2007 Annual Compliance Report. It gives CPU great pleasure to provide this report and to reaffirm CPU's commitment to provide the resort with the cleanest, safest, most dependable supply of portable water for this year and the years to follow. If you have any questions or comments about this report please do not hesitate to contact any of the following personnel.

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**Appendix 1 Summary of Plant Flows**

Month	Raw Water Taking				Month	Total Plant Finished Water Supplied			
	Monthly Total (m <sup>3</sup> )	Ave Day (m <sup>3</sup> )	Max Day (m <sup>3</sup> )	Min Day (m <sup>3</sup> )		Monthly Total (m <sup>3</sup> )	Ave Day (m <sup>3</sup> )	Max Day (m <sup>3</sup> )	Min Day (m <sup>3</sup> )
January	2,227	144	185	27	January	1,721	56	137	12
February	2,299	82	159	26	February	1,780	64	141	18
March	2,531	84	148	15	March	1,919	62	118	17
April	1,451	48	85	19	April	601	20	46	11
May	1270	41	64	12	May	527	17	53	9
June	1112	37	72	11	June	554	18	42	9
July	1290	43	114	4	July	594	19	56	8
August	1449	47	64	21	August	797	26	45	7
September	1772	59	165	2	September	1,014	34	137	12
October	2212	71	178	10	October	1,278	41	279	10
November	2209	74	148	33	November	1,646	55	96	42
December	6885	222	285	23	December	5,219	168	256	82
<b>Total/ Ave</b>	<b>26707</b>	<b>80</b>			<b>Total/ Ave</b>	<b>17,650</b>	<b>48</b>		
<b>Max</b>	<b>6,885</b>		<b>285</b>		<b>Max</b>	<b>5219</b>		<b>256</b>	
<b>Min</b>	<b>1,270</b>			<b>2</b>	<b>Min</b>	<b>554</b>			<b>8</b>