

## Bracebridge Water Summary Report 2017



**Drinking Water Works Permit: 143-206**  
**Municipal Drinking Water Licence: 143-106**

**Ministry of Environment and Climate Change Waterworks #: 220007276**

## **INTRODUCTION**

The Kirby's Beach Water Treatment Plant (WTP) or Bracebridge WTP was constructed in 1995 and is owned and operated by the District Municipality of Muskoka. The Bracebridge WTP has a rated capacity of 10,000 cubic metres per day (m<sup>3</sup>/day). The water system currently serves a population of approximately 9,000 people.

The plant operated under the Ministry of Environment and Climate Change (MOECC) Permit To Take Water #93-P-3017 dated May 21, 2003 and #8183-7EMQZL issued May 16, 2008, which permits the operation of up to 10,000 m<sup>3</sup>/day. In addition, the plant operates under licence 143-106 and permit 143-206 under the Municipal Drinking Water Licensing Program. The raw water intake structure is located in Lake Muskoka, two meters above the lakebed at a depth of 18 metres and about 500 metres from shore.

The treatment system features pre-treatment consisting of chemically assisted coagulation-flocculation, sedimentation and filtration using dual media filters with a combination of sand and anthracite coal. Disinfection in a post treatment chlorine contact chamber is followed by fluoridation and final pH adjustment before the treated water is pumped to customers.

The water distribution system was also upgraded and expanded in 1995. A new 2,634 cubic metre above ground reservoir was constructed opposite the Hamblin subdivision. Extensive improvements were made to the trunk watermain network including a new main from the water treatment plant to the existing underground reservoir on Ecclestone Drive. This reservoir has a storage capacity of 4,086 cubic metres.

## **Legislation Requirements**

### Safe Drinking Water Act

In the Part Two Report in the Walkerton Inquiry, Commissioner Dennis O'Connor recommended that the Ontario Government enact a Safe Drinking Water Act to deal with matters related to treatment and distribution of drinking water. The Safe Drinking Water Act (SDWA) received royal assent in December 2002.

The purpose of the Act is to gather in one place all legislation and regulations relating to the treatment and distribution of drinking water. The Act serves to protect human health through the control and regulation of drinking water systems and drinking water testing.

The foundation provisions of the Safe Drinking Water Act include:

- Purpose of the Act
- Definitions
- Minister's Powers and Duties
- Inspections
- Compliance and Enforcement
- Appeals and Offences

### Ontario Regulations

The Ontario Government has enacted several supporting regulations under the SDWA (2002). These regulations combine previous requirements under the Ontario Water Resources Act and the new requirements under the SDWA. Key components of the regulations include:

- System Categories
- Groundwater Under Direct Influence Of Surface Water (GUDI)
- Exemptions
- Approval of Systems
- Treatment
- Testing and Operational Checks (General Rules)
- Operational Checks
- Microbiological Testing
- Chemical Testing
- Adverse Conditions
- Corrective Action
- Engineer's and Summary Reports

### Municipal Drinking Water Licences / Certificates of Approval

The Municipal Drinking Water Licensing Program has replaced the Certificate of Approval program for municipal residential drinking water systems. The Ontario Government has implemented the Municipal Drinking Water Licensing Program (MDWLP) as recommended by Justice O'Connor in the Part II Report of the Walkerton Inquiry. Justice O'Connor recommended a new approvals framework for municipal drinking water systems, which would require owners to obtain a licence to operate their systems as well as incorporate the concept of quality management into their operations.

A municipal drinking water license is an approval that is issued by the MOECC to owners under the Safe Drinking Water Act, 2002 for the operation of municipal residential drinking

water systems. The District of Muskoka operated under various Certificates of Approval until October 2010 when the operating licences were issued.

Previous Certificates of Approval were required for the establishment, replacement or alteration of all municipal drinking water systems. The Ministry of Environment and Climate Change (MOECC) issued Certificates of Approval to ensure that all undertakings comply with the legislation (i.e. Acts and Regulations) and the Ministry's Environmental Guidelines and Procedures developed to provide consistency of approach to various aspects of environmental protection throughout the province.

Municipal Drinking Water Licences and Permits similar to previous Certificates of Approval provide specific details about the drinking water system including:

- Drinking Water System Description
- Definitions and Information
- General Information – Compliance, Other Legal Requirements, Adverse Effects, Inspections
- Performance – Rated Capacity, Management of Residue
- Monitoring and Recording – Flow Measuring Devices, Sampling
- Operations and Maintenance

### **Comparison to Rated Capacity and Flow Rates**

In 2017, the total daily average flow for the year was 3,427 m<sup>3</sup>/day. The maximum daily flow for the year was 4,244 m<sup>3</sup>/day, however, the 3 year maximum daily average is 4830 m<sup>3</sup>/day which represents 48.3% of the plant design capacity. (No problems have been associated with this flow). Monthly flows are shown in the attached table.

The Permit To Take Water (PTTW #8183-7EMQZL) permits 10,000 cubic metres per day; therefore there were no exceedances of this permit.

### **Summary of Analytical Results**

A total of 941 microbiological regulatory tests were performed in 2017 and all but 1 had acceptable results. Resample of the August 28, 2017 sample was acceptable.

There were 283 free chlorine residual tests performed in the distribution system. A summary of other analytical results is also shown in this report.

### **Summary of Treatment Chemicals**

The following chemicals are used for the treatment of drinking water at the Kirby's Beach Road Water Treatment Plant:

- Sodium Hypochlorite: Disinfectant
- Aluminum Sulphate (alum): Primary coagulant
- Hydrated Lime: Alkalinity adjustment
- Carbon Dioxide: pH adjustment
- Sodium Hydroxide: Final pH adjustment
- Hydrofluosilicic Acid: Fluoride to prevent dental decay.
- Powder Activated Carbon: Taste and Odour Control

A table summarizing the chemical use and average dosages is included in this report.

### **Documentation of System Repairs and Upgrades**

There were no major upgrades started at Kirby's Beach WTP in 2017.

### **External Audits**

#### **MOECC Inspection**

A MOECC inspection was completed on December 23, 2016 and was attached to the 2016 Annual Report. The overall compliance rating was 100%. An MOECC inspection took place in January 2018 and the report is still in draft stage, a finalized copy will be provided in next year's Annual Report for 2018.

#### **DWQMS Audit**

In 2017 all drinking water systems within the District had an external recertification audit performed. There were four (4) minor non-conformances reported. Overall, all drinking water systems are performing satisfactorily.

## **2017 Gravenhurst Water Distribution Summary**

### **New Services**

One new 19 mm water service was installed, another 49 customers connected to existing serviced properties in 2017.

### **Watermain Failures**

Two watermain breaks occurred in 2017, with an average repair cost of approximately \$7000.

### **Service Leaks**

Three service leaks were repaired in 2017 on the District side of services, at an average cost of approximately \$1675.

### **Frozen Services**

There were no frozen services observed on municipal side in 2017.

### **Replacement Watermains**

195 m of 200 mm unlined ductile iron pipe was replaced with 250 mm PVC on District Road 169 (H-238 to Readman St.) in 2017.

### **New Watermains**

No new watermains were installed in 2017.

### **Watermain Rehabilitation**

Phillip Street's 150 mm cast was relined (from Fourth St. to H-306).

### **Valve Failure**

Valve # 328 was replaced on Phillip Street at a cost of \$1003.70.

### **Valve maintenance**

All 149 critical valves, and 167 non-critical valves where operated.

### **Fire Hydrants**

There are 468 hydrants maintained by the District in the Town of Gravenhurst, they were inspected, operated, and/or flushed at least once during 2017. One fire hydrant was replaced and two others were repaired in 2017.

### **Meter Replacement/Installations**

244 Water meters were replaced as part of the aged meter change out program in 2017. The average age of meters in Gravenhurst is 10 years.

### **Air-vacuum Release Valves**

All sixteen (16) Air-Vacuum release valves, were removed, cleaned, and tested for the yearly maintenance inspection.

### **Locates**

750 Locates were performed by District staff in 2017.



**OPTIONAL ANNUAL REPORT TEMPLATE**

<b>Drinking-Water System Number:</b>	220007276
<b>Drinking-Water System Name:</b>	Kirby's Beach Water Treatment Plant
<b>Drinking-Water System Owner:</b>	District Municipality of Muskoka
<b>Drinking-Water System Category:</b>	Large Municipal Residential
<b>Period being reported:</b>	January 01 to December 31, 2017

<p><b><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></b></p> <p><b>Does your Drinking-Water System serve more than 10,000 people? Yes [ X ] No [ ]</b></p> <p><b>Is your annual report available to the public at no charge on a web site on the Internet? Yes [ X ] No [ ]</b></p> <p><b>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.</b></p> <div style="border: 1px solid black; padding: 5px;"> <p>District Municipality of Muskoka 70 Pine Street Bracebridge, Ontario P1L 1N3 (705) 645-6764 www.muskoka.on.ca</p> </div>	<p><b><u>Complete for all other Categories.</u></b></p> <p><b>Number of Designated Facilities served:</b></p> <div style="border: 1px solid black; padding: 2px; width: 100px; margin: 5px 0;">N.A.</div> <p><b>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [ ] No [ ]</b></p> <p><b>Number of Interested Authorities you report to:</b> <div style="border: 1px solid black; width: 100px; height: 20px; display: inline-block; margin-left: 10px;"></div></p> <p><b>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [ ] No [ ]</b></p>
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**Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report**

**List all Drinking-Water Systems (if any), which receive all of their drinking water from your system:**

Drinking Water System Name	Drinking Water System Number
N.A.	

**Did you provide a copy of your annual report to all Drinking-Water System owners that are connected to you and to whom you provide all of its drinking water? Yes [ ] No [ ]**



Indicate how you notified system users that your annual report is available, and is free of charge.

- Public access/notice via the web
- Public access/notice via Government Office
- Public access/notice via a newspaper
- Public access/notice via Public Request
- Public access/notice via a Public Library
- Public access/notice via other method \_\_\_\_\_

**Describe your Drinking-Water System**

The Water Treatment Plant serving the community of Bracebridge was constructed in 1995. The system features pre-treatment consisting of chemically assisted coagulation-flocculation, sedimentation and filtration using dual media filters with a combination of sand and anthracite coal. Disinfection in a post treatment chlorine contact chamber is followed by fluoridation and final pH adjustment before the treated water is pumped to our customers. The water system currently serves a population of approximately 9000. The rated water production capacity of the plant is 10,000 cubic meters per day. Our raw water source is Lake Muskoka where the intake is located two meters above the lakebed at a depth of 18 meters and about 500 meters from shore.

**List all water treatment chemicals used over this reporting period**

Carbon Dioxide, Aluminum Sulphate, Powdered Activated Carbon, Hydrated Lime, Sodium Hypochlorite, Hydrofluosilicic Acid, and Sodium Hydroxide.

**Were any significant expenses incurred to?**

- Install required equipment
- Repair required equipment
- Replace required equipment

**Please provide a brief description and a breakdown of monetary expenses incurred**

**Provide details on the notices submitted in accordance with subsection 18(1) of the Safe Drinking-Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre**

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
Aug 28 2017	Total Coliform	25	Cfu/1ml	Resampled / OK	Aug 30 2017



**Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.**

	Number of Samples	Range of E.Coli Or Fecal Results (min #)-(max #)	Range of Total Coliform Results (min #)-(max #)	Number of HPC Samples	Range of HPC Results (min #)-(max #)
Raw	52	0-15	1-32	0	n/a
Treated	52	0-0	0-0	52	0-2
Distribution	283	0-0	0-0	115	0-23

**Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report.**

	Number of Grab Samples	Range of Results (min #)-(max #)	Geomean
Turbidity	8760	0.02 – 0.16 NTU	0.09 NTU
Chlorine	8760	1.53 – 2.07 mg/L	1.80 mg/L
Fluoride (If the DWS provides fluoridation)	8760	0.48 – 0.71 mg/L	0.60 mg/L

*NOTE: For continuous monitors use 8760 as the number of samples.*

**Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.**

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure

**Summary of Inorganic parameters tested during this reporting period or the most recent sample results**

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	May 09/17	0.05	µg/L	No
Arsenic	May 09/17	0.2 <MDL	µg/L	No
Barium	May 09/17	11.3	µg/L	No
Boron	May 09/17	24	µg/L	No
Cadmium	May 09/17	0.011	µg/L	No
Chromium	May 09/17	0.6	µg/L	No
*Lead				
Mercury	May 09/17	.01 <MDL	µg/L	No
Selenium	May 09/17	.04 <MDL	µg/L	No
Sodium	May 09/17	.002 <MDL	mg/L	No
Uranium	May 09/17	.003 <MDL	µg/L	No



<b>Fluoride</b>	May 09/17	0.50	mg/L	No
<b>Nitrite</b>	Feb 14/17	0.003<MDL	mg/L	No
<b>Nitrate</b>	Feb 14/17	0.175	mg/L	No
<b>Nitrite</b>	May 09/17	0.003<MDL	mg/L	No
<b>Nitrate</b>	May 09/17	0.194	mg/L	No
<b>Nitrite</b>	Aug 08/17	0.003<MDL	mg/L	No
<b>Nitrate</b>	Aug/08/17	0.220	mg/L	No
<b>Nitrite</b>	Nov 07/17	0.003<MDL	mg/L	No
<b>Nitrate</b>	Nov 07/17	0.148	mg/L	No

\*only for drinking water systems testing under Schedule 15.2; this includes large municipal non-residential systems, small municipal non-residential systems, non-municipal seasonal residential systems, large non-municipal non-residential systems, and small non-municipal non-residential systems

**Summary of lead testing under Schedule 15.1 during this reporting period**

(applicable to the following drinking water systems; large municipal residential systems, small municipal residential systems, and non-municipal year-round residential systems)

<b>Location Type</b>	<b>Number of Samples</b>	<b>Range of Lead Results (min#) – (max #)</b>	<b>Unit of Measure</b>	<b>Number of Exceedances</b>
<b>Plumbing</b>				
<b>Distribution</b>	7	0.03-1.74	µg/L	0

**Summary of Organic parameters sampled during this reporting period or the most recent sample results**

<b>Parameter</b>	<b>Sample Date</b>	<b>Result Value</b>	<b>Unit of Measure</b>	<b>Exceedance</b>
<b>Alachlor</b>	May 09/17	0.02 <MDL	µg/L	No
<b>Atrazine + N-dealkylated metabolites</b>	May 09/17	0.01 <MDL	µg/L	No
<b>Azinphos-methyl</b>	May 09/17	0.05 <MDL	µg/L	No
<b>Benzene</b>	May 09/17	0.32<MDL	µg/L	No
<b>Benzo(a)pyrene</b>	May 09/17	0.004<MDL	µg/L	No
<b>Bromoxynil</b>	May 09/17	0.33<MDL	µg/L	No
<b>Carbaryl</b>	May 09/17	0.05<MDL	µg/L	No
<b>Carbofuran</b>	May 09/17	0.01<MDL	µg/L	No
<b>Carbon Tetrachloride</b>	May 09/17	0.16<MDL	µg/L	No
<b>Chlorpyrifos</b>	May 09/17	0.02<MDL	µg/L	No
<b>Diazinon</b>	May 09/17	0.02<MDL	µg/L	No
<b>Dicamba</b>	May 09/17	0.20<MDL	µg/L	No
<b>1,2-Dichlorobenzene</b>	May 09/17	0.41<MDL	µg/L	No
<b>1,4-Dichlorobenzene</b>	May 09/17	0.36<MDL	µg/L	No
<b>1,2-Dichloroethane</b>	May 09/17	0.35<MDL	µg/L	No
<b>1,1-Dichloroethylene (vinylidene chloride)</b>	May 09/17	0.33<MDL	µg/L	No
<b>Dichloromethane</b>	May 09/17	0.35<MDL	µg/L	No
<b>2-4 Dichlorophenol</b>	May 09/17	0.15<MDL	µg/L	No
<b>2,4-Dichlorophenoxy acetic acid (2,4-D)</b>	May 09/17	0.19<MDL	µg/L	No
<b>Diclofop-methyl</b>	May 09/17	0.40<MDL	µg/L	No
<b>Dimethoate</b>	May 09/17	0.03<MDL	µg/L	No
<b>Diquat</b>	May 09/17	1<MDL	µg/L	No



<b>Diuron</b>	May 09/17	0.03<MDL	µg/L	No
<b>Glyphosate</b>	May 09/17	1<MDL	µg/L	No
<b>Malathion</b>	May 09/17	0.02<MDL	µg/L	No
<b>MCPA</b>	May 09/17	0.00012<MDL	µg/L	No
<b>Metolachlor</b>	May 09/17	0.01<MDL	µg/L	No
<b>Metribuzin</b>	May 09/17	0.02<MDL	µg/L	No
<b>Monochlorobenzene</b>	May 09/17	0.30<MDL	µg/L	No
<b>Paraquat</b>	May 09/17	1<MDL	µg/L	No
<b>Pentachlorophenol</b>	May 09/17	0.15<MDL	µg/L	No
<b>Phorate</b>	May 09/17	0.01<MDL	µg/L	No
<b>Picloram</b>	May 09/17	1<MDL	µg/L	No
<b>Polychlorinated Biphenyls(PCB)</b>	May 09/17	0.04<MDL	µg/L	No
<b>Prometryne</b>	May 09/17	0.03<MDL	µg/L	No
<b>Simazine</b>	May 09/17	0.01<MDL	µg/L	No
<b>THM</b> (NOTE: annual average from Distribution – 4 samples)	Samples Taken: Feb.14/17 May 09/17 Aug.08/17 Nov 07/17	58.25	µg/L	No
<b>Terbufos</b>	May 04/17	0.01<MDL	µg/L	No
<b>Tetrachloroethylene</b>	May 04/17	0.35<MDL	µg/L	No
<b>2,3,4,6-Tetrachlorophenol</b>	May 04/17	0.20<MDL	µg/L	No
<b>Triallate</b>	May 04/17	0.01<MDL	µg/L	No
<b>Trichloroethylene</b>	May 04/17	0.44<MDL	µg/L	No
<b>2,4,6-Trichlorophenol</b>	May 04/17	0.25<MDL	µg/L	No
<b>Trifluralin</b>	May 04/17	0.02<MDL	µg/L	No
<b>Vinyl Chloride</b>	May 04/17	0.17<MDL	µg/L	No
<b>HAA5</b>	Samples Taken:		µg/L	No
	Feb 14-17	13.7	µg/L	No
	May 09/17	18.8	µg/L	No
	Aug 08/17	44.6	µg/L	No
	Nov 07/17	24.8	µg/L	No

**List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.**

<b>Parameter</b>	<b>Result Value</b>	<b>Unit of Measure</b>	<b>Date of Sample</b>

## District of Muskoka - Bracebridge (Kirby's Beach) WTP

### 9.0 Chemical Usage Summary - 2017

Month	Powdered Activated Carbon			CO2			Hydrated Lime			Coagulant (Alum)		
	Average Dosage mg/L	Total kg	Estimated Monthly Cost	Average Dosage mg/L	Total kg	Estimated Monthly Cost+ Rental	Average Dosage mg/L	Total kg	Estimated Monthly Cost	Average Dosage mg/L	Total Kg	Estimated Monthly Cost
January	0.0	0.0	\$0	0.0	0.0	\$659	32.7	3,407.6	\$630	32.3	3,355	\$735
February	0.0	0.0	\$0	28.7	2,649.8	\$2,464	25.5	2,353.0	\$435	29.6	2,732	\$598
March	0.0	0.0	\$0	25.7	2,743.2	\$2,527	24.7	2,634.8	\$487	32.4	3,453	\$756
April	0.0	0.0	\$0	28.0	2,920.2	\$2,648	24.7	2,480.6	\$459	30.6	3,178	\$696
May	0.0	0.0	\$0	28.4	3,025.9	\$2,720	24.7	2,636.6	\$488	32.1	3,426	\$750
June	0.0	0.0	\$0	26.4	2,856.9	\$2,605	24.9	2,698.1	\$499	34.6	3,751	\$821
July	0.0	0.0	\$0	27.2	3,110.7	\$2,778	25.0	2,857.0	\$529	33.4	3,807	\$834
August	0.0	0.0	\$0	27.2	3,025.8	\$2,720	25.0	2,779.0	\$514	34.8	3,867	\$847
September	0.0	0.0	\$0	26.5	2,722.3	\$2,513	25.1	2,578.1	\$477	32.8	3,366	\$737
October	0.0	0.0	\$0	31.6	3,180.4	\$2,825	27.1	2,729.7	\$505	31.4	3,165	\$693
November	0.0	0.0	\$0	34.1	3,295.8	\$2,904	27.1	2,626.8	\$486	35.5	3,434	\$752
December	0.0	0.0	\$0	33.0	3,388.1	\$2,967	27.1	2,780.7	\$514	33.3	3,409	\$746
Average Monthly	0.0	0.0	\$0	26.4	2743.3	\$2,527	26	2713.5	\$502	32.7	3412	\$747
Unit Cost	<i>per kg</i>			659/Month +			<i>per kg</i>			\$218.95 <i>per MT</i>		
Total Yearly		0	\$0		32,919	\$30,329		32,562	\$6,024		40,943	\$8,964

Month	Sodium Hydroxide			Fluoride			Chlorine (NaOCl)			Soda Ash		
	Average Dosage mg/L	Total Kg	Estimated Monthly Cost	Average Dosage mg/L	Total kg	Estimated Monthly Cost	Average Dosage mg/L	Total Kg	Estimated Monthly Cost	Average Dosage mg/L	Total Kg	Estimated Monthly Cost
January	13.9	1,449	\$507	0.48	50.5	\$18	2.96	307.6	\$449	0.00	0.0	\$0
February	13.2	1,229	\$430	0.50	46.1	\$16	2.94	272.2	\$397	0.00	0.0	\$0
March	11.0	1,174	\$411	0.43	46.2	\$16	3.07	327.0	\$477	0.00	0.0	\$0
April	10.5	1,085	\$380	0.43	44.5	\$16	3.15	315.8	\$461	0.00	0.0	\$0
May	11.9	1,266	\$443	0.45	47.6	\$17	2.86	305.9	\$447	0.00	0.0	\$0
June	12.7	1,374	\$481	0.43	46.4	\$16	2.67	289.8	\$423	0.00	0.0	\$0
July	13.0	1,486	\$520	0.40	45.3	\$16	3.08	351.9	\$514	0.00	0.0	\$0
August	13.2	1,461	\$511	0.41	45.8	\$16	3.10	344.6	\$503	0.00	0.0	\$0
September	13.4	1,379	\$483	0.36	37.5	\$13	3.13	321.0	\$469	0.00	0.0	\$0
October	12.4	1,248	\$437	0.44	44.1	\$15	3.39	341.7	\$499	0.00	0.0	\$0
November	14.7	1,426	\$499	0.42	41.0	\$14	3.04	293.6	\$429	0.00	0.0	\$0
December	15.0	1,538	\$538	0.45	46.2	\$16	2.86	294.1	\$429	0.00	0.0	\$0
Average Monthly	12.9	1343	\$470	0.43	45	\$16	3.03	318	\$464	0	0	\$0
Unit Cost	\$0.35 <i>per kg</i>			\$0.35 <i>per kg</i>			\$1.46 <i>per kg dry</i>			<i>per kg dry</i>		
Total Yearly		16,115	\$5,640		541	\$189		3,765	\$5,497		0	\$0

Month	Potassium Permanganate			Polymer		
	Average Dosage mg/L	Total Kg	Estimated Monthly Cost	Average Dosage mg/L	Total Kg	Estimated Monthly Cost
January	0.0	0	\$0	0.0	0	\$0
February	0.0	0	\$0	0.0	0	\$0
March	0.0	0	\$0	0.0	0	\$0
April	0.0	0	\$0	0.0	0	\$0
May	0.0	0	\$0	0.0	0	\$0
June	0.0	0	\$0	0.0	0	\$0
July	0.0	0	\$0	0.0	0	\$0
August	0.0	0	\$0	0.0	0	\$0
September	0.0	0	\$0	0.0	0	\$0
October	0.0	0	\$0	0.0	0	\$0
November	0.0	0	\$0	0.0	0	\$0
December	0.0	0	\$0	0.0	0	\$0
Average Monthly	0.0	0	\$0	0.0	0	\$0
Unit Cost	<i>per kg</i>			<i>per kg</i>		
Total Yearly		0	\$0		0	\$0

**Overall total yearly cost of chemicals = \$56,644**

## District of Muskoka - Bracebridge (Kirby's Beach) WTP

### 1.0 Water Flow Summary - 2017

Month	Total Monthly (m <sup>3</sup> )	Average Day Flow (m <sup>3</sup> /d)	Maximum Day Flow (m <sup>3</sup> /d)	Minimum Day Flow (m <sup>3</sup> /d)	Comments
January	106,890	3,448	3,585	3,234	
February	88,562	3,280	3,571	0	
March	109,686	3,538	3,702	3,321	
April	102,581	3,419	3,857	0	
May	108,868	3,512	3,926	3,200	
June	110,446	3,682	4,244	3,312	
July	116,412	3,755	4,145	3,379	
August	113,470	3,660	4,229	3,225	
September	105,085	3,503	3,696	3,236	
October	102,916	3,320	3,499	3,167	
November	99,069	3,302	3,855	2,936	
December	105,432	3,401	4,154	2,714	

Total

Average Day

Maximum Day

Minimum Day



# District of Muskoka - Bracebridge (Kirby's Beach) WTP

## 4.0 Treated Water Monthly Analysis Summary - 2017

Month	Alkalinity	Hardness	pH	Turbidity Average	High	Low	Colour	Iron	Manganese	Chlorine Free	High	Low	TDS	Langliers Saturation Index	Total Coliforms	E-coli	Total Number of Samples	HPC	Total Number of Samples
Parameter	mg/L	mg/L	pH	NTU	NTU	NTU	TCU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		CFU/100mL	CFU/100mL		CFU/1mL	
January	39.0	40	7.98	0.04	0.05	0.04	0			1.74	1.82	1.69			0	0	5	0.6	5
February	39.1	39	8.03	0.07	0.13	0.04	0			1.67	1.78	1.62			0	0	4	0.0	4
March	36.2	44	7.89	0.05	0.07	0.04	0			1.68	1.75	1.62			0	0	4	0.0	4
April	36.40	40.50	7.82	0.05	0.05	0.05	0			1.80	1.95	1.64			0	0	4	0.3	4
May	36.30	39.60	7.81	0.05	0.05	0.05	0			1.74	1.83	1.62			0	0	5	0.0	5
June	38.20	44.50	7.87	0.06	0.06	0.05	0			1.67	1.80	1.45			0	0	4	0.0	4
July	39.00	40.40	7.93	0.06	0.06	0.05	0			1.91	1.98	1.81			0	0	4	0.0	4
August	40.50	42.00	7.96	0.08	0.08	0.07	0			1.80	1.87	1.75			0	0	4	6.8	4
September	40.70	40.00	8.10	0.08	0.08	0.06	0			1.80	1.90	1.69			0	0	4	0.0	4
October	41.20	40.40	7.97	0.05	0.05	0.05	0			1.64	1.72	1.55			0	0	5	0.0	5
November	43.10	43.50	7.95	0.05	0.05	0.05	0			1.73	1.80	1.68			0	0	4	0.0	4
December	38.00	39.50	7.56	0.06	0.06	0.04	0			1.73	1.80	1.67			0	0	4	0.3	4
Average	39.0	41.1	7.9	0.1	0.1	0.0	0.0	0.0	0.0	1.7	1.8	1.6	0.0	0.0	0.0	0.0	4.3	0.7	4.3

**District of Muskoka - Bracebridge (Kirby's Beach) WTP**

**5.0 Treated Water Quarterly Sampling Summary - 2017**

Parameter	I.D.						TW BBW2 Kirby's WTP-Treated	TW BBW2 Kirby's WTP-Treated	TW BBW2 Kirby's WTP-Treated	TW BBW2 Kirby's WTP-Treated			
Schedule 23 Inorganics		Units	MAC	Half MAC	AO/OG	RDL	LRL MDL				Average	Max	
Antimony	µg/L	6	3	-	-	0.2		0.05					
Arsenic	µg/L	25	12.5	-	-	2.5	0.2	0.2 <MDL					
Barium	µg/L	1000	500	-	-	100	0.05	11.3					
Boron	µg/L	5000	2500	-	-	500	1	24					
Cadmium	µg/L	5	2.5	-	-	1	0.06	0.011					
Chromium	µg/L	50	25	-	-	5	0.3	0.6					
Lead	µg/L	10	5	-	-	2	0.02						
Mercury	µg/L	1	0.5	-	-	0.1	0.02	.01 <MDL					
Selenium	µg/L	10	5	-	-	5	1	.04 <MDL					
Uranium	µg/L	20	10	-	-	10	0.02	.002 <MDL					
Nitrite	mg/L	1.0	0.5	-	-	0.1	0.005	0.003 <MDL	.003 <MDL	.003 <MDL	.003 <MDL		
Nitrate	mg/L	10	5	-	-	1	0.013	0.175	0.194	0.220	0.148		
Schedule 24 Organics		Units	MAC	Half MAC	AO/OG	RDL	LRL MDL	TW BBW2 Kirby's WTP-Treated	TW BBW2 Kirby's WTP-Treated	TW BBW2 Kirby's WTP-Treated	TW BBW2 Kirby's WTP-Treated	Average	Max
Alachlor	µg/L	5	2.5	-	-	0.5	0.11		.02 <MDL				
Aldicarb	µg/L	9	4.5	-	-	9	0.30						
Aldrin + Dieldrin	µg/L	0.7	0.35	-	-	0.07	0.067						
Atrazine+N-dealkylated Metabolite	µg/L	5	2.5	-	-	1	0.12		.01 <MDL				
Azinphos-methyl	µg/L	20	10	-	-	2	0.21		.05 <MDL				
Bendiocarb	µg/L	40	20	-	-	7.5	0.13						
Benzene	µg/L	5	2.5	-	-	0.5	0.37		.32 <MDL				
Benzo(a)pyrene	µg/L	0.01	0.005	-	-	0.01	0.004		.004 <MDL				
Bromoxynil	µg/L	5	2.5	-	-	0.5	0.33		.33 <MDL				
Carbaryl	µg/L	90	45	-	-	9	0.16		.05 <MDL				
Carbofuran	µg/L	90	45	-	-	12.5	0.37		.01 <MDL				
Carbon Tetrachloride	µg/L	5	2.5	-	-	0.5	0.41		.16 <MDL				
Chlordane ( Total )	µg/L	7	3.5	-	-	0.7	0.11						
Chorpyrifos	µg/L	90	45	-	-	9	0.18		0.02 <MDL				
Cyanazine	µg/L	10	5	-	-	1	0.18						
Diazinon	µg/L	20	10	-	-	2	0.081		0.02 <MDL				
Dicamba	µg/L	120	60	-	-	12	0.20		0.20 <MDL				
1,2 Dichlorobenzene	µg/L	200	100	3	20	0.50			0.41 <MDL				
1,4 Dichlorobenzene	µg/L	5	2.5	1	0.5	0.21			0.36 <MDL				
DDT+metabolites	µg/L	30	15	-	-	3	0.14						
1,2 Dichloroethane	µg/L	5	2.5	-	-	0.5	0.43		0.35 <MDL				
1,1 Dichloroethylene	µg/L	14	7	-	-	1.4	0.41		0.33 <MDL				
Dichloromethane	µg/L	50	25	-	-	5	0.34		0.35 <MDL				
2,4 Dichlorophenol	µg/L	900	450	0.3	90	0.15			0.15 <MDL				
2,4-D	µg/L	100	50	-	-	10	0.19		0.19 <MDL				
Diclofop-Methyl	µg/L	9	4.5	-	-	0.9	0.40		0.40 <MDL				
Dimethoate	µg/L	20	10	-	-	2.5	0.12		0.03 <MDL				
Dinoseb	µg/L	10	5	-	-	1	0.36						
Diquat	µg/L	70	35	-	-	7	1		1 <MDL				
Diuron	µg/L	150	75	-	-	1	0.087		0.03 <MDL				
Glyphosate	µg/L	280	140	-	-	28	6		1 <MDL				
Heptachlor+Heptachlor Epoxide	µg/L	3	1.5	-	-	0.3	0.11						
Lindane	µg/L	4	2	-	-	0.4	0.056						
Malathion	µg/L	190	95	-	-	19	0.091		0.02 <MDL				
MCPA	mg/L	-	-	-	-	-	0.00012		0.00012 <MDL				
Metolachlor	µg/L	50	25	-	-	5	0.092		0.01 <MDL				
Metribuzin	µg/L	80	40	-	-	8	0.12		0.02 <MDL				
Monochlorobenzene	µg/L	80	40	30	8	0.58			0.30 <MDL				
Paraquat	µg/L	10	5	-	-	1	1		1 <MDL				
Parathion	µg/L	50	25	-	-	5	0.18						
Pentachlorophenol	µg/L	60	30	30	6	0.15			0.15 <MDL				
Phorate	µg/L	2	1	-	-	0.5	0.11		0.01 <MDL				
Picloram	µg/L	190	95	-	-	19	0.25		1 <MDL				
PCB	µg/L	3	1.5	-	-	0.3	0.04		0.04 <MDL				
Prometryne	µg/L	1	0.5	-	-	0.25	0.23		0.03 <MDL				
Simazine	µg/L	10	5	-	-	1	0.15		0.01 <MDL				
Trihalomethanes Total	µg/L	100	50	-	-	10	0.48	25	33	34	37		
Temephos	µg/L	280	140	-	-	28	0.31						
Terbufos	µg/L	1	0.5	-	-	1	0.12		0.01 <MDL				
Tetrachloroethylene	µg/L	30	15	-	-	3	0.45		0.35 <MDL				
2,3,4,6 - Tetrachlorophenol	µg/L	100	50	1	10	0.14			0.20 <MDL				
Triallate	µg/L	230	115	-	-	23	0.10		0.01 <MDL				
Trichloroethylene	µg/L	50	25	-	-	5	0.38		0.44 <MDL				
2,4,6,- Trichlorophenol	µg/L	5	2.5	2	0.5	0.25			0.25 <MDL				
2,4,5,- T	µg/L	280	140	20	28	0.22							
Trifluralin	µg/L	45	22.5	-	-	4.5	0.12		0.02 <MDL				
Vinyl Chloride	µg/L	2	1	-	-	0.2	0.17		0.17 <MDL				
Additional Parameters	Units	MAC	Half MAC	AO/OG	RDL	LRL MDL	TW BBW2 Kirby's WTP-Treated	TW BBW2 Kirby's WTP-Treated			Average	Max	
Fluoride	mg/L	1.5	0.75	-	-	0.15	0.06		0.5				
Sodium	mg/L	*20	-	200	2	0.01		13.9					
HAA5	µg/L	-	-	-	-	-	5.3	13.7	18.8	44.6	24.8		
TOC	mg/L	-	-	-	-	-	1	4	2	2	3		
MAC - Maximum Acceptable Concentration							Half MAC - Half of the Maximum Acceptable Concentration						
OG - Operational Guideline							AO - Aesthetic Objective						
RDL - MOE Required Reporting Detection Limit							LRL MDL - SGS Lakefield Research Limited Method Detection Limit.						

\* The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L.



**District of Muskoka - Bracebridge (Kirby's Beach) WTP**

**7.0 Distribution Water Quarterly Sampling Summary - 2017**

Parameter	I.D.						DDW BBW20 Hydrant #328 Tap	DDW BBW20 Hydrant #328 Tap	DDW BBW20 Hydrant #328 Tap	DDW BBW20 Hydrant #328 Tap		
DDW	Units	MAC	Half MAC	AO/OG	RDL	LRL MDL	Feb 14 17	May 9 17	Aug 8 17	Nov 7 17	Average	Max
Trihalomethanes Total	µg/L	100	50	-	10	0.48	42	56	66	69		
Lead	µg/L	10	5	-	2	0.02						
HAA5	µg/L					5.3	35.2					
MAC - Maximum Acceptable Concentration							Half MAC - Half of the Maximum Acceptable Concentration					
OG - Operational Guideline							AO - Aesthetic Objective					
RDL - MOE Required Reporting Detection Limit							LRL MDL - SGS Lakefield Research Limited Method Detection Limit.					

							DDW BBW5 Clearbrook SPS	DDW BBW5 Clearbrook SPS	DDW BBW5 Clearbrook SPS	DDW BBW5 Clearbrook SPS
HAA5	µg/L					5.3				
Lead	µg/L	10	5	-	2	0.02	0.53		1.74	
							DDW BBW15 Royal Muskoka SPS	DDW BBW15 Royal Muskoka SPS	DDW BBW15 Royal Muskoka SPS	DDW BBW15 Royal Muskoka SPS
HAA5	µg/L					5.3	0.38		0.54	
Lead	µg/L	10	5	-	2	0.02				
							DDW BBW17 River SPS	DDW BBW17 River SPS	DDW BBW17 River SPS	DDW BBW17 River SPS
HAA5	µg/L					5.3			0.12	
Lead	µg/L	10	5	-	2	0.02	0.06			
							DDW BBW10 S.M.M. Hospital	DDW BBW10 S.M.M. Hospital	DDW BBW10 S.M.M. Hospital	DDW BBW10 S.M.M. Hospital
HAA5	µg/L					5.3			30.6	
Lead	µg/L	10	5	-	2	0.02				

## District of Muskoka - Bracebridge (Kirby's Beach) WTP

### 10.0 Adverse Water Quality Summary - 2017

1	Sample		Lab ID #	Location	Parameter	Result	Mac / Imac	Comments
	Date	Time						
Adverse	Aug 29-17	10:57	CA18915	BBW2 WTP Treated	Total Coliform	25	0	Raw water sample mislabeled as treated water sample sent to lab. Treated water sent bottle labeled Raw water. Reported and resampled
1st R1-AL	Aug 30-17	14:40	CA15967	BBW2 WTP Treated	Total Coliform/E Coli	0/0	0	
1st R2-DS	Aug 30-17	15:20	CA15967	BBW6 MacArthur SPS	Total Coliform/E Coli	0/0	0	
1st R3-DS	Aug 30-17	15:30	CA15967	Ecclestone BPS	Total Coliform/E Coli	0/0	0	
2nd R1- AL								
2nd R2-US								
2nd R3-DS								

2	Sample		Lab ID #	Location	Parameter	Result	Mac / Imac	Comments
	Date	Time						
Adverse								
1st R1-AL								
1st R2-US								
1st R3-DS								
2nd R1- AL								
2nd R2-US								
2nd R3-DS								

3	Sample		Lab ID #	Location	Parameter	Result	Mac / Imac	Comments
	Date	Time						
Adverse								
1st R1-AL								
1st R2-US								
1st R3-DS								
2nd R1- AL								
2nd R2-US								
2nd R3-DS								

Legend: R# = Repeat Sample Number    AL = Adverse Location    US = Upstream Sample    DS = Downstream Sample