

2021 Year End Report: Baysville Potable Water Plant (PWP)



Drinking Water Works Permit: 143-208

Municipal Drinking Water License: 143-108

Ministry of Environment, Conservation and Parks Waterworks #: 260071435

Engineering and Public Works Department

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Introduction

The Baysville Potable Water Plant (PWP) services the community of Baysville and is owned and operated by the District Municipality of Muskoka.

It was commissioned in 2006 and has an initial design capacity of 1,100 m³/day. The water system currently serves a population of approximately 348 people.

The plant operates under license 143-108 and permit 143-208, issued in September 2020 under the Municipal Drinking Water Licensing Program. The plant also presently operates under MOECP permit to take water #7283-AUPPRM (expires February 06, 2028), which permits the operation of up to 1,100 m³/day.

The Raw Water intake structure is located in Lake of Bays, a fairly large and clear body of water. The intake is located in five (5) meters of water, about 385 meters from shore.

The plant treatment process consists of chemically assisted coagulation-flocculation, sedimentation, filtration, disinfection by chlorination as well as pH adjustment.

All treatment control systems use a Supervisory Control and Data Acquisition (SCADA) system for process control and monitoring.

Legislation Requirements

Safe Drinking Water Act

In the Part Two Report of 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 Licenses / 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 license 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 MECP 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 licenses were issued.

Previous Certificates of Approval were required for the establishment, replacement or alteration of all municipal drinking water systems. The MECP 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 Licenses 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

The Baysville Potable Water Plant has a rated capacity of 1,100 meters cubed per day. In 2021, the total monthly average flow for the year was 80.8 meters cubed per day. The maximum day flow for they ear was 288 meters cubed per day, however the 3-year average for maximum day flow is 275.7 meters cubed per day. This represents 25% 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 #7283-AUPPRM – expires Feb 06, 2028) permits 1,100 meters cubed per day; therefore there were no exceedances of this permit.

Summary of Analytical Results

A total of 634 microbiological regulatory tests were performed in 2021 and compliance with Provincial standards was achieved throughout the entire year. One exceedance was reported on May 25, 2021 due to a high (26) coliform count in a treated water sample. Once resampled, it was determined the water quality remained within Provincial standards.

There were 442 free chlorine residual tests performed in the distribution system and all results were satisfactory. Staff continue to routinely sample all areas of the system to ensure adequate free chlorine residuals are available throughout 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 Baysville PWP:

- Hydrated Lime: pH and Alkalinity Adjustment
- Carbon Dioxide: pH Adjustment
- Poly Aluminum Chloride: Primary Coagulant
- Sodium Hypochlorite: Disinfection
- Sodium Hydroxide: pH Adjustment

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

Documentation of System Repairs and Upgrades

No significant capital expenses were incurred to conduct system repairs or upgrades in 2021.

External Audits

M.E.C.P. Inspection

A Ministry of the Environment Conservation and Parks (M.E.C.P.) inspection was completed on July 15, 2021. The overall rating was 100%.

DWQMS Audit

In 2021, all drinking water systems within the District had an external reaccreditation audit performed. There were no minor non-conformances reported and all drinking water systems have been recertified. Overall, all drinking water systems are performing satisfactorily.

Baysville Water Distribution Summary 2021

New Services:

There were five (5) new water service installed in 2021.

Broken Watermains:

There were no broken water mains to report in 2021.

Service Leaks:

There were no service leaks to report in 2021.

Service Relocation:

There were no service relocations to report in 2021.

Frozen Services:

No municipal water services were frozen in 2021.

Replacement Watermains:

No watermain replacement occurred in 2021.

New Watermains:

There were no new watermains installed in 2021.

Valve Replacement:

No mainline valve replacement took place in 2021.

Fire Hydrants:

There are 57 municipally assumed hydrants maintained by the District in the Town of Baysville, 5 of which are privately owned. They were inspected, operated, and/or flushed at least once, pumped dry in the fall, and scoped during the winter months to ensure they are not susceptible to freezing. There were no new fire hydrants replaced or repaired in 2021.

Zero additional hydrants were added in 2021 as well as zero being repaired after being damaged.

Meter Installations:

A total of two (2) water meters were replaced in Baysville in 2021 as part of the aged meter change out program. The average meter age in Baysville is 14 years.

Service Box Maintenance:

District field staff excavated and repaired zero (0) curb stop boxes in 2021.

Air-Vacuum Release Valves:

All water air release valves were inspected and tested for proper operation in 2021. Each of the chambers was inspected and pumped out as required.

Locates:

Field staff addressed 41 written locate requests in 2021

Table 1 Water Flow Summary - 2021

Month	Total Monthly (m³)	Average Day Flow (m³/d)	Maximum Day Flow (m³/d)	Minimum Day Flow (m³/d)
January	2,018	65	115	43
February	2,113	75	128	44
March	1,903	61	135	47
April	1,676	56	76	41
May	2,887	93	288	44
June	2,837	95	128	66
July	3,281	106	158	70
August	3,739	121	168	78
September	2,637	88	121	53
October	2,530	82	241	57
November	1,975	66	85	48
December	1,906	61	91	44

Total Flow: 29,502 m³
 Average Day: 80.8 m³
 Maximum Day: 288 m³
 Minimum Day: 40.8 m³

Table 2 Raw Water Monthly Analysis Summary 2021 Part 1

Month	Alkalinity (mg/L)	Hardness (mg/L)	pH	Turbidity (ntu)	True Colour (tcu)	Temperature (Celsius)
January	8	9	6.80	0.29	7	7.0
February	11	12	6.90	0.21	15	5.0
March	10	11	6.82	0.22	17	7.3
April	12	12	7.23	0.31	14	11.2
May	10	11	7.00	0.25	10	11.9
June	10	10	6.94	0.40	18	15.4
July	13	9	7.08	0.29	18	19.7
August	11	13	6.80	0.46	17	20.5
September	13	9	6.87	0.37	17	19.0
October	12	11	6.98	0.34	13	16.5
November	12	12	6.52	0.28	13	11.9
December	12	12	6.82	0.27	16	6.9
Average	11	11	6.90	0.31	15	12.7

Table 3 Raw Water Monthly Analysis Summary 2021 Part 2

Month	Microcystin (ug/L)	TDS (mg/L)	Langliers Saturation Index	Total Coliforms (CFU/100mL)	E. Coli (CFU/100mL)	Total Number of Samples
January	Not Sampled		-3.3	7	0	4
February	Not Sampled		-3.1	3	0	4
March	Not Sampled		-2.6	5	0	5
April	Not Sampled		-2.9	13.5	0	4
May	<0.10MDL		-2.9	9.6	0.4	5
June	<0.10MDL		-3.0	19	0.3	4
July	<0.10MDL		-2.8	10.3	1	4
August	<0.10MDL		-2.6	4	1.4	5
September	<0.10MDL		-2.6	9.3	1.3	4
October	Not Sampled		-2.6	11.3	1.3	4
November	Not Sampled		-2.6	12	0.4	5
December	Not Sampled		-2.6	16.5	0.3	4
Average	<0.10MDL		-2.6	10.1	0.6	4

Table 4 Chemical Usage Summary: CO2

Month	Average Dosage mg/L	Total kg
January	55.2	124.9
February	30.8	72.0
March	28.4	79.0
April	31.2	81.9
May	30.9	102.3
June	25.6	79.5
July	24.2	84.9
August	20.1	83.4
September	71.1	120.4
October	70.2	104.0
November	37.0	98.6
December	41.5	101.2
Average	38.8	94.3

Total Yearly Kilograms: 1,132kg

Table 5 Chemical Usage Summary: Hydrated Lime

Month	Average Dosage mg/L	Total kg
January	17.9	47.2
February	19.3	50.0
March	16.8	42.4
April	14.5	32.5
May	10.0	35.4
June	11.1	39.0
July	16.5	67.1
August	19.1	87.7
September	20.6	67.6
October	20.6	65.1
November	21.3	53.7
December	22.3	53.4
Average	17.0	53.4

Total Yearly Kilograms: 641kg

Table 6 Chemical Usage Summary: Coagulant

Month	Average Dosage mg/L	Total kg
January	27.0	71.7
February	28.6	73.3
March	30.2	76.3
April	30.2	68.2
May	30.2	106.9
June	30.2	106.9
July	30.1	122.4
August	30.0	137.2
September	24.9	81.6
October	26.0	81.8
November	26.4	66.8
December	26.7	63.8
Average	28.4	88.0

Total Yearly Kilograms: 1,057kg

Table 7 Chemical Usage Summary: Sodium Hydroxide

Month	Average Dosage mg/L	Total kg
January	3.5	32
February	3.6	31
March	2.4	20
April	1.8	14
May	1.8	22
June	1.6	19
July	1.4	18
August	0.9	13
September	0.6	7
October	0.6	6
November	0.6	5
December	0.6	5
Average	1.6	16

Total Yearly Kilograms: 192kg

Table 8 Chemical Usage Summary: Fluoride

Month	Average Dosage mg/L	Total kg
January	0.0	0.0
February	0.0	0.0
March	0.0	0.0
April	0.0	0.0
May	0.0	0.0
June	0.0	0.0
July	0.0	0.0
August	0.0	0.0
September	0.0	0.0
October	0.0	0.0
November	0.0	0.0
December	0.0	0.0
Average	0.0	0.0

Total Yearly Kilograms: 0.0 kg (System not in use)

Table 9 Chemical Usage Summary: Chlorine

Month	Average Dosage mg/L	Total Liters
January	2.93	59.2
February	3.23	64.7
March	3.17	62.1
April	2.90	50.0
May	4.18	115.6
June	5.37	148.0
July	3.50	107.2
August	4.08	143.0
September	4.40	111.0
October	4.30	105.2
November	3.84	74.7
December	3.21	59.3
Average	3.98	102

Total Yearly Kilograms: 1,100 Liters

Baysville Certification of Reports

I certify that the information in this document and all attachments are correct, accurate, and complete to the best of my knowledge

Michael Spicer
Director, Water and Wastewater Services

Michael Currie
Manager of Water and Wastewater Operations

Disclaimer: The following pages are not in an accessible format.



OPTIONAL ANNUAL REPORT TEMPLATE

Drinking-Water System Number:	260071435
Drinking-Water System Name:	Birch Glen Potable Water Plant
Drinking-Water System Owner:	District Municipality of Muskoka
Drinking-Water System Category:	Large Municipal Residential
Period being reported:	January 01 to December 31, 2021

<p><u>Complete if your Category is Large Municipal Residential or Small Municipal Residential</u></p> <p>Does your Drinking-Water System serve more than 10,000 people? Yes [] No [X]</p> <p>Is your annual report available to the public at no charge on a web site on the Internet? Yes [X] No []</p> <p>Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.</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><u>Complete for all other Categories.</u></p> <p>Number of Designated Facilities served: <div style="border: 1px solid black; padding: 2px; width: 100px; text-align: center;">N.A.</div> </p> <p>Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [] No []</p> <p>Number of Interested Authorities you report to: <div style="border: 1px solid black; padding: 2px; width: 100px; text-align: center;">0</div> </p> <p>Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [] No [x]</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 servicing the village of Baysville was commissioned July 2006. The treatment process consists of chemically assisted coagulation-flocculation, sedimentation, filtration, and disinfection by chlorination and pH adjustment. The capacity of the plant is 1,00 cubic meters per day. The water source is Lake of Bays. The intake is located about 385 meters offshore.

List all water treatment chemicals used over this reporting period

Hydrated Lime, Sodium Hypochlorite, Carbon Dioxide, Sodium Hydroxide and Polyaluminum Chloride. Fluoride discontinued in January 2014.

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

N/A

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
May 25, 2021	Total Coliform Exceedance Finished Water	26*	CFU/100 mL	Confirm chlorine residuals and resampled.	May 27, 2021

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 - 5	0 - 27	0	~
Treated	53	0 - 0	0 - 26 *adverse resampled and found to be 0	53	0 - 47
Distribution	158	0 - 0	0 - 0	54	0 - 4

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	0.01-0.18	0.10 NTU
Chlorine	8760	0.98 - 1.99mg/L	1.30 mg/L
Fluoride (If the DWS provides fluoridation)	Not in Use		

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 03, 2021	0.9<MDL	µg/L	No
Arsenic	May 03, 2021	0.2<MDL	µg/L	No
Barium	May 03, 2021	9.59	µg/L	No
Boron	May 03, 2021	3	µg/L	No
Cadmium	May 03, 2021	0.007	µg/L	No
Chromium	May 03, 2021	0.20	µg/L	No
*Lead				
Mercury	May 03, 2021	0.01<MDL	µg/L	No
Selenium	May 03, 2021	0.04<MDL	µg/L	No
Sodium	May 03, 2021	6.55	mg/L	No
Uranium	May 03, 2021	0.003	µg/L	No
Fluoride	May 03, 2021	0.06<MDL	mg/L	No
Nitrite	Feb 08, 2021	0.003<MDL	mg/L	No
Nitrate	Feb 08, 2021	0.144	mg/L	No
Nitrite	May 03, 2021	0.003<MDL	mg/L	No
Nitrate	May 03, 2021	0.154	mg/L	No
Nitrite	Aug 03, 2021	0.003<MDL	mg/L	No



Nitrate	Aug 03, 2021	0.046	mg/L	No
Nitrite	Nov 01, 2021	0.003<MDL	mg/L	No
Nitrate	Nov 01, 2021	0.065	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)

Location Type	Number of Samples	Range of Lead Results (min#) – (max #)	Unit of Measure	Number of Exceedances
Plumbing				
Distribution	2	0.11-0.22	µg/L	0

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

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	May 03, 2021	0.02<MDL	µg/L	No
Atrazine + N-dealkylated metabolites	May 03, 2021	0.01<MDL	µg/L	No
Azinphos-methyl	May 03, 2021	0.05<MDL	µg/L	No
Benzene	May 03, 2021	0.32<MDL	µg/L	No
Benzo(a)pyrene	May 03, 2021	0.004<MDL	µg/L	No
Bromoxynil	May 03, 2021	0.33<MDL	µg/L	No
Carbaryl	May 03, 2021	0.05<MDL	µg/L	No
Carbofuran	May 03, 2021	0.01<MDL	µg/L	No
Carbon Tetrachloride	May 03, 2021	0.17<MDL	µg/L	No
Chlorpyrifos	May 03, 2021	0.02<MDL	µg/L	No
Diazinon	May 03, 2021	0.02<MDL	µg/L	No
Dicamba	May 03, 2021	0.20<MDL	µg/L	No
1,2-Dichlorobenzene	May 03, 2021	0.41<MDL	µg/L	No
1,4-Dichlorobenzene	May 03, 2021	0.36<MDL	µg/L	No
1,2-Dichloroethane	May 03, 2021	0.35<MDL	µg/L	No
1,1-Dichloroethylene (vinylidene chloride)	May 03, 2021	0.33<MDL	µg/L	No
Dichloromethane	May 03, 2021	0.35<MDL	µg/L	No
2-4 Dichlorophenol	May 03, 2021	0.15<MDL	µg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	May 03, 2021	0.19<MDL	µg/L	No
Diclofop-methyl	May 03, 2021	0.40<MDL	µg/L	No
Dimethoate	May 03, 2021	0.06<MDL	µg/L	No
Diquat	May 03, 2021	1<MDL	µg/L	No
Diuron	May 03, 2021	0.03<MDL	µg/L	No
Glyphosate	May 03, 2021	1<MDL	µg/L	No
Malathion	May 03, 2021	0.02<MDL	µg/L	No
MCPA	May 03, 2021	0.00012<MDL	µg/L	No



Metolachlor	May 03, 2021	0.01<MDL	µg/L	No
Metribuzin	May 03, 2021	0.02<MDL	µg/L	No
Monochlorobenzene	May 03, 2021	0.30<MDL	µg/L	No
Paraquat	May 03, 2021	1<MDL	µg/L	No
Pentachlorophenol	May 03, 2021	0.15<MDL	µg/L	No
Phorate	May 03, 2021	0.01<MDL	µg/L	No
Picloram	May 03, 2021	1<MDL	µg/L	No
Polychlorinated Biphenyls(PCB)	May 03, 2021	0.04<MDL	µg/L	No
Prometryne	May 03, 2021	0.03<MDL	µg/L	No
Simazine	May 03, 2021	0.01<MDL	µg/L	No
THM (NOTE: annual average from Distribution – 8 samples)	Samples Taken: Feb 08, 2021 May 03, 2021 Aug 03, 2021 Nov 01, 2021	50.9	µg/L	No
Terbufos	May 03, 2021	0.01<MDL	µg/L	No
Tetrachloroethylene	May 03, 2021	0.35<MDL	µg/L	No
2,3,4,6-Tetrachlorophenol	May 03, 2021	0.20<MDL	µg/L	No
Triallate	May 03, 2021	0.01<MDL	µg/L	No
Trichloroethylene	May 03, 2021	0.44<MDL	µg/L	No
2,4,6-Trichlorophenol	May 03, 2021	0.25<MDL	µg/L	No
Trifluralin	May 03, 2021	0.02<MDL	µg/L	No
Vinyl Chloride	May 03, 2021	0.17<MDL	µg/L	No
HAA5	Samples Taken:			
	Feb. 08/21	36.7	µg/L	No
	May 03/ 21	40.6	µg/L	No
	Aug. 03/21	58.5	µg/L	No
	Nov. 01/21	57.5	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.

Parameter	Result Value	Unit of Measure	Date of Sample
Distribution THM	56	µg/L	RAA of quarterly results