

## 2021 Year End Report: Huntsville Potable Water Plant (PWP)



Drinking Water Works Permit: 143-203

Municipal Drinking Water License: 143-103

Ministry of Environment, Conservation and Parks Waterworks #: 220002093

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## Introduction

The Huntsville Potable Water Plant (PWP) services the community of Huntsville and is owned and operated by the District Municipality of Muskoka. It was commissioned in 1988 and has an initial design capacity of 9000 meters cubed per day. The drinking water system currently services an estimated population of 9125 persons. There are approximately 3742 total service connections, of which approximately 3279 are residential services; 388 are commercial services; 60 are institutional services, and approximately 15 are industrial service

The plant operates under license 143-103 and permit 143-203, issued in September 16<sup>th</sup>, 2021 under the Municipal Drinking Water Licensing Program. The plant also presently operates under Ministry of the Environment Conservation and Parks (MECP) permit to take water #3322-C34K6H (expires May 17, 2031), which permits the operation of up to 22,500 meters cubed per day

The water source is Fairy Lake, a fairly large and clear body of water. The intake is located 15 meters deep about 280 meters from shore

The treatment process consists of chemically assisted coagulation-flocculation, sedimentation, filtration, disinfection by chlorination and pH adjustment. There are reservoirs located at the water treatment plant, Dufferin Street, Skyline Drive and Hanes Road reservoirs

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 Huntsville Potable Water Plant has a rated capacity of 9000 meters cubed per day. In 2021, the total monthly average flow for the year was 3,498 meters cubed per day. The maximum day flow for the year was 5,086 meters cubed per day, however the 3-year average for maximum day flow is 5562meters cubed per day. This represents 62% 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 #3322-C34K6H) permits 22,500 meters cubed per day; therefore there were no exceedances of this permit

### Summary of Analytical Results

A total of 856 microbiological regulatory tests were performed in 2021 and compliance with Provincial standards was achieved throughout the entire year

There were 559 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 Huntsville PWP:

- Chlorine: Disinfection
- PolyAluminum Chloride (SternPac): Primary coagulant
- Soda Ash: Alkalinity and pH adjustment

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

### Documentation of System Repairs and Upgrades

In 2021, a number of significant capital expenses were incurred to conduct system upgrades and replacements. These include replacement of the watermains on Main Street from River to Centre Street including valve and service lateral replacements

Peak Construction Ltd. completed contract 20-431-253 "Fairview Potable Water Plant Phase 3 Upgrades" inside the water treatment plant including

- Modification of the chlorine contact chamber to become fixed water level chamber enhancing disinfection effectiveness
- Backwash effluent disposal system upgrades to significantly reduce plant backwash wastewater emission treatment costs
- Addition of a filter to waste system downstream of the filters to improve post backwash filter performance

- Installation of a booster pumping system fed by the backwash system to be used when the high lift pump chamber is off line and serpentine pipe system is in service for primary disinfection
- Removal of the chlorine gas system and conversion to sodium hypochlorite storage and dosing system that provides greater safety, controllability and stability of supply
- Replacement of the aged plant back-up diesel generator with a pad mounted unit outside of the plant
- Replacement of aged electrical switch gear and automatic electrical transfer switch
- Replacement of end of life programmable logic controllers which control automated treatment functions

## External Audits

### MECP Inspection

A MOE inspection was completed on August 11, 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

## Huntsville Water Distribution Summary 2021

### New Services:

A total of 69 customers connected to water services in 2021, 13 of which were installed in 2021

- Five 25 mm Poly water services installed by owner's contractor. These services are located at 47, 49, 51, 53 and 55 Yonge St S
- Two 25 mm Poly water services installed by owner's contractor. These services are located at 87 and 89 Hanes Rd
- One 25 mm Poly water service installed by owner's contractor. This service is located at 5 Rogers Rd
- One 25 mm Poly water service installed by owner's contractor. This service is located at 185 Hunters Bay Dr
- One 38 mm Poly water service installed by owner's contractor. This service is located at 72 Centre St S
- One 150 mm PVC water service installed by owner's contractor. This service is located at 210 Hwy 60
- One 150 mm PVC water service installed by owner's contractor. This service is located at 159 Howland Dr



- One 150 mm PVC water service installed by owner's contractor. This service is located at 161 Town line Rd W

#### Broken Watermains:

District staff repaired a total of seven (4) watermain breaks during 2021. The average cost to repair each water main break was \$13,471.43

#### Service Leaks:

District staff repaired a total of 14 water service leaks during 2021. The average cost to repair each water service leak was \$4326.44

#### Service Relocation:

As part of the Main Street "Diggin Downtown" project, water services to customers along Main Street East between River Street and Centre Street were removed, replaced and connected to the new watermain. This project will continue and is expected to be completed in 2022

#### Frozen Services:

No municipal water services were frozen in 2021

#### Replacement Watermains:

A total of 492 meters of aged watermain was replaced with 200mm PVC on Main Street East and River Street as part of the District of Muskoka "Diggin Downtown" project in 2021. This project will continue in 2022 with further watermain replacement along Main Street to Lorne Street.

#### New Watermains:

No new watermains were installed in 2021.

#### Valve Replacement:

- A total of thirteen watermain valves were replaced in 2021 as part of District of Muskoka capital works project on River St and Main St E
- Two new watermain live tap valves were installed in 2021 by owner's contractor. These valves are located at 210 Hwy 60 and 161 Townline Rd W
- Thirty seven watermain valve boxes were repaired in 2021 by District of Muskoka staff
- One watermain valve was replaced in 2021 by District of Muskoka staff due to mechanical failure. Valve #648 is located at Grandview.

#### Fire Hydrants:

There are 650 fire hydrants in Huntsville, 66 of which are privately owned. Three new Municipal fire hydrant were installed in 2021. One on Main Street East and two on River Street. One privately owned hydrant was installed at 210 Highway 60.

- No fire hydrants were replaced in 2021 by the District of Muskoka.

All Fire Hydrants were flushed and thoroughly inspected at least once in 2021.

#### Meter Installations:

- 32 water meters were replaced by District of Muskoka staff in 2021 under our scheduled meter change out program or due to meter failure.

#### Service Box Maintenance:

- A total of 28 curb stop boxes were replaced, repaired or lowered in 2021

- Two curb stop valves were replaced in 2021.

**Air-Vacuum Release Valves:**

- All water air-vacuum release valves were inspected in 2021

**Locates:**

- 951 locate requests were completed in Huntsville in 2021.

*Table 1 Water Flow Summary - 2021*

<b>Month</b>	<b>Total Monthly (m<sup>3</sup>)</b>	<b>Average Day Flow (m<sup>3</sup>/d)</b>	<b>Maximum Day Flow (m<sup>3</sup>/d)</b>	<b>Minimum Day Flow (m<sup>3</sup>/d)</b>
<b>January</b>	102,141	3,295	4,304	2,324
<b>February</b>	100,400	3,586	4,825	2,217
<b>March</b>	101,626	3,278	3,993	2,500
<b>April</b>	90,535	3,018	3,695	1,375
<b>May</b>	109,425	3,530	4,598	2,408
<b>June</b>	125,496	4,183	5,086	3,470
<b>July</b>	117,898	3,803	4,650	2,999
<b>August</b>	130,333	4,204	5,045	2,339
<b>September</b>	108,763	3,625	4,538	3,117
<b>October</b>	102,531	3,307	3,726	2,564
<b>November</b>	92,798	3,093	3,622	2,546
<b>December</b>	94,737	3,056	3,576	2,382

Total Flow: 1,276,682  
Average Day: 3,502.0  
Maximum Day: 5,086.4  
Minimum Day: 1,375.2



*Table 2 Raw Water Monthly Analysis Summary 2021 Part 1*

<b>Month</b>	<b>Alkalinity (mg/L)</b>	<b>Hardness (mg/L)</b>	<b>pH</b>	<b>Turbidity (ntu)</b>	<b>True Colour (tcu)</b>	<b>Temperature (Celsius)</b>
<b>January</b>	15.0	13	6.7	0.7	37	11.4
<b>February</b>	16.5	16	6.7	0.7	31	4.3
<b>March</b>	13.6	16	6.4	0.6	48	1.8
<b>April</b>	15.0	15	6.4	0.8	62	4.4
<b>May</b>	10.6	12.0	6.3	0.6	51	7.7
<b>June</b>	14.0	11.0	6.2	0.5	46	6.4
<b>July</b>	12.0	11.5	6.2	0.7	48	6.8
<b>August</b>	11.2	11.2	6.1	0.6	47	7.5
<b>September</b>	12.0	11.0	6.1	0.5	44	7.6
<b>October</b>	13.5	15.5	6.4	0.5	26	9.7
<b>November</b>	14.5	13.5	6.4	0.6	54	8.1
<b>December</b>	14.0	18.0	6.4	0.8	50	6.2
<b>Average</b>	13.5	13.6	6.4	0.6	45	6.8

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		-3.2	24	1	4
February	Not Sampled		-2.9	11	1	4
March	Not Sampled		-3.0	94	4	5
April	Not Sampled		-3.2	52	5	4
May	<0.1MDL		-3.2	44	4	5
June	<0.1MDL		-3.5	28	3	4
July	<0.1MDL		-3.5	99	17	4
August	<0.1MDL		-3.7	219	7	5
September	<0.1MDL		-3.6	73	0	4
October	<0.1MDL		-3.2	40	5	4
November	Not Sampled		-3.2	77	2	5
December	Not Sampled		-3.1	93	9	4
Average	<0.1MDL		-3.3	71.2	4.8	4

*Table 4 Chemical Usage Summary: Coagulant*

Month	Average Dosage mg/L	Total kg
January	16.5	5,255
February	16.8	5,326
March	16.0	5,228
April	15.8	4,527
May	16.2	5,473
June	16.2	6,201
July	16.5	6,177
August	18.0	7,351
September	17.1	5,836
October	17.4	5,645
November	19.6	5,651
December	19.5	5,785
Average	17.1	5705

Total Yearly Kilograms: 68,455kg

*Table 5 Chemical Usage Summary: Chlorine*

Month	Average Dosage mg/L	Total kg
January	1.48	155.4
February	1.53	158.3
March	1.59	165.7
April	1.63	152.0
May	1.72	188.7
June	1.28	161.9
July	1.80	188.9
August	3.70	414.8
September	3.80	355.2
October	3.80	334.6
November	3.70	290.9
December	3.50	279.4
Average	2.46	237.2

Total Yearly Kilograms: 2,845.8 kg

*Table 6 Chemical Usage Summary: Soda Ash*

Month	Average Dosage mg/L	Total kg
January	22.38	2,309.7
February	23.06	2,359.3
March	24.30	2,552.8
April	26.16	2,419.8
May	24.10	2,658.0
June	27.24	3,413.0
July	24.22	2,942.7
August	21.50	2,877.3
September	26.16	2,907.1
October	27.81	2,940.7
November	20.00	1,883.6
December	20.45	1,961.7
Average	24	2,667

Total Yearly Kilograms: 31,226 kg