

# Annual Report

## Atikokan Drinking Water System



# 2020

Prepared by **Northern Waterworks Inc.**  
on behalf of the **Town of Atikokan**



# Contents

<b>1</b>	<b>Introduction .....</b>	<b>3</b>
1.1	Annual Reporting Requirements .....	3
1.2	Report Availability .....	3
<b>2</b>	<b>System Overview &amp; Expenses .....</b>	<b>4</b>
2.1	System Description .....	4
2.2	Water Treatment Chemicals .....	5
2.3	System Expenses .....	6
<b>3</b>	<b>Water Quality.....</b>	<b>7</b>
3.1	Overview .....	7
3.2	Microbiological Parameters .....	7
3.3	Operational Parameters .....	8
3.4	Conventional Filtration Performance.....	9
3.5	Nitrate & Nitrite .....	10
3.6	Trihalomethanes & Haloacetic Acids .....	10
3.7	Lead Sampling.....	11
3.8	Inorganic & Organic Parameters.....	12
3.9	Special Herbicide Monitoring .....	14
3.10	Environmental Discharge Sampling .....	15
<b>4</b>	<b>Water Production.....</b>	<b>16</b>
4.1	Overview .....	16
4.2	Flow Monitoring Results .....	16
4.3	Recent Historical Flows.....	18
<b>5</b>	<b>Compliance .....</b>	<b>19</b>
5.1	Overview .....	19
5.2	Adverse Water Quality Incidents .....	19
5.3	Regulatory Compliance .....	22

# 1 Introduction

## 1.1 Annual Reporting Requirements

This consolidated Annual Report (the Report) has been prepared in accordance with both section 11 (Annual Reports) and Schedule 22 (Summary Reports for Municipalities) of Ontario Regulation 170/03 (Drinking Water Systems Regulation). This Report is intended to inform both the public and Municipal Council about the operation of the system over the previous calendar year (January 1 to December 31, 2020).

Section 11 of O. Reg. 170/03 requires the development and distribution to the public of an annual report summarizing water quality monitoring results, adverse water quality incidents, system expenses and chemicals used in the water treatment process.

Schedule 22 of O. Reg. 170/03 requires the development and distribution to Council of an annual report summarizing incidents of regulatory non-compliance and associated corrective actions, in addition to providing flow monitoring results for the purpose of enabling the Owner to assess the capability of the system to meet existing and planned demand.

## 1.2 Report Availability

In accordance with section 11 of O. Reg. 170/03, this Report must be given, without charge, to every person who requests a copy. Effective steps must also be taken to advise users of water from the system that copies of the report are available, without charge, and of how a copy may be obtained. This Annual Report shall be made available for inspection by the public at the Atikokan Public Library, on the Town of Atikokan's website, and on NWI's website.

In accordance with Schedule 22 of O. Reg. 170/03, this Annual Report must be given to the members of Municipal Council. Section 19 (Standard of care, municipal drinking-water system) of Ontario's *Safe Drinking Water Act* also places certain responsibilities upon those municipal officials who oversee an accredited operating authority or exercise decision-making authority over a system. The examination of this Report is one of the methods by which municipal officials may fulfil the obligations required by section 19 of O. Reg. 170/03.

System users and members of Council are strongly encouraged to contact a representative of NWI for assistance in interpreting this Report. Questions and comments may be directed to the local NWI Operations Manager or by email to [compliance@nwi.ca](mailto:compliance@nwi.ca).

## 2 System Overview & Expenses

### 2.1 System Description

The Atikokan Drinking Water System must meet extensive treatment and testing requirements to ensure that human health is protected. The operation and maintenance of the system is governed by Ontario's *Safe Drinking Water Act* and the regulations therein, in addition to requirements within system-specific environmental approvals. Important system information is summarized in Table 1.

<b>Table 1: System information</b>	
Drinking-Water System (DWS) Name:	Atikokan Drinking Water System
DWS Number:	220000950
DWS Owner:	The Corporation of the Town of Atikokan
DWS Operating Authority:	Northern Waterworks Inc.
DWS Category:	Large Municipal Residential
DWS Components:	<ul style="list-style-type: none"><li>• Raw water pumping station</li><li>• Atikokan Water Treatment Plant</li><li>• Atikokan water distribution system</li></ul>
Treatment Processes:	<ul style="list-style-type: none"><li>• Coagulation, sand-ballasted flocculation, and clarification</li><li>• Dual media (rapid sand) filtration</li><li>• Free chlorine disinfection</li><li>• pH adjustment</li></ul>

Water production begins as pumps at the raw water pumping station transfer source water from the Atikokan River and through a transmission line to the two proprietary Actiflo treatment units located at the Atikokan Water Treatment Plant, each of which includes a coagulation basin, injection basin, maturation basin and settling zone. Polyaluminum chloride (coagulant) is injected into the raw water immediately upstream from the coagulation basin, and water and coagulant are rapidly mixed in the basin before flow is directed to the injection basin. In the injection basin, microsand and polymer solution (flocculant) are added to facilitate the formation of robust flocs. Floc formation continues in the maturation basin before water is directed to the settling zone, where its velocity is reduced to allow for the separation and settling of floc. Supernatant then overflows into a launder and is directed to the filter units.

Impurities that were not captured and settled in the clarifier are removed by passing water through four dual media filters composed of anthracite and silica sand. The filters are periodically cleaned by reversing the flow of water through the filter using pumps. Chlorine gas (disinfectant), sodium carbonate solution (pH/alkalinity adjustment) and hydrofluorosilicic acid (fluoridation) are added to the filtrate as it is directed from the filters to the treated water storage reservoir.

Primary disinfection is achieved as disinfectant mixes with the filtrate in the reservoir. Treated water is then delivered from the reservoir to the water distribution system using pumps. Secondary disinfection requirements in the water distribution system are achieved by maintaining a free chlorine residual at all locations.

## 2.2 Water Treatment Chemicals

In accordance with section 11 of O. Reg. 170/03, this Report must include a list of all water treatment chemicals used by the system during the period covered by the report (summarized in Table 2). All chemicals used in the treatment process are NSF/ANSI 60 certified for use in potable water, as required by system approvals.

<b>Table 2:</b> Water treatment chemicals used in 2020	
Treatment Chemical	Application
polyaluminum chloride (SternPAC)	coagulant
silica dioxide (Actisand)	flocculant
polymer (Superfloc C-492)	flocculant
sodium carbonate (soda ash)	pH/alkalinity adjustment
hydrofluorosilicic acid	fluoridation
chlorine gas	disinfectant

## 2.3 System Expenses

In accordance with section 11 of O. Reg. 170/03, this Report must describe any major expenses incurred during the reporting period to install, repair or replace required equipment. This Report also summarizes those expenses related to strengthening equipment inventories and to maintenance activities undertaken by subcontracted service providers. Major expenses incurred in 2020 are summarized in Table 3.

**Table 3:** Major expenses incurred in 2020

Category	Description	Expense
Repair/Replace	Distribution header upgrade project <sup>1</sup>	\$77,579
Replace	Uninterruptible power supply for PLC	\$7,723
Replace	Autodialer for alarm transmission	\$5,504
Replace	Two (2) industrial radios <sup>2</sup>	\$3,710
Maintenance/Replace	Backflow prevention device inspection and replacement (1)	\$3,605
Maintenance/Repair	Lifting equipment inspection and repairs to overhead hoists	\$2,866
Maintenance	Flow meter calibration verifications	\$1,728
Remove	Removal of defunct electrical equipment <sup>3</sup>	\$1,593
Replace	Hour meters for various equipment	\$1,567
Inventory/Replace	Integrators for various equipment	\$1,543

1. This project involved upgrading and reconfiguring the distribution header piping at the Atikokan Water Treatment Plant to better protect against a catastrophic component failure and to better mitigate the impacts of such a failure should it occur. The work consisted of 1) the reconfiguration of the bypass piping sections, including the installation of new piping sections, 2) the installation of five (5) new isolation valves and the replacement of one (1) existing valve, 3) the replacement of the automatic water control valve associated with high lift pump no. 2, and 4) the removal of the obsolete trim chlorination injection point and associated injecting piping. This expense also includes costs associated with renting a flow measuring device during the work.
2. The emergency replacement of the industrial radios was required to restore communication between the raw water pumping station and the water treatment plant.
3. Defunct electrical panels, cables and associated equipment were removed as per a best practice recommendation from the Water Inspector.



## 3 Water Quality

### 3.1 Overview

Water quality monitoring is conducted to determine and confirm that drinking water delivered to the consumer is safe and aesthetically pleasing. Monitoring is also required to assess compliance with legislation and to control the treatment process. In accordance with section 11 of O. Reg. 170/03, this Report must summarize the results of water quality tests required by regulations, approvals, and orders. The following sections summarize the results of all required water quality tests and compare the results to applicable water quality standards.

### 3.2 Microbiological Parameters

Microbiological sampling and testing requirements are provided in Schedule 10 (Microbiological sampling and testing) of O. Reg. 170/03. In 2020, a total of 265 routine source, treated and distribution water samples were collected for microbiological analysis by an accredited laboratory. Samples were collected on a weekly basis and included tests for E. coli (EC), total coliforms (TC) and heterotrophic plate counts (HPC). Results from microbiological analyses are summarized in Table 4. All results were below the associated Ontario Drinking Water Quality Standards.

**Table 4:** Results summary for microbiological parameters

Sample Type	# of Samples	EC Results Range <sup>1</sup> (MPN/100mL)	TC Results Range <sup>1</sup> (MPN/100mL)	# of HPC Samples	HPC Results Range (CFU/mL)
Raw Water	53	0 to 61	50 to >2420	---	---
Treated Water	53	absent	absent	52	0 to 2
Treated Water (nonroutine)	7	absent	absent	---	---
Distribution	159	absent	absent	53	0 to >300
Distribution (nonroutine)	21	absent	absent	---	---

1. The Ontario Drinking Water Quality Standard for E. Coli and Total Coliforms in a treated or distribution sample is 'not detectable'. The presence of either parameter in a treated or distribution sample is considered an exceedance.

### 3.3 Operational Parameters

In accordance with Schedule 7 (Operational checks) of O. Reg. 170/03, regulated operational parameters that must be monitored include raw water turbidity, filtrate turbidity, treated water fluoride residual, and the free chlorine residuals associated with primary and secondary disinfection. Table 5 summarizes water quality results for regulated and selected unregulated operational parameters. In accordance with Schedule 6 (Operational checks, sampling and testing – general) of O. Reg. 170/03, certain operational parameters are continuously monitored. One (1) Adverse Water Quality Incident (AWQI) pertaining to filtrate turbidity occurred during the reporting period. Refer to the *Compliance* section of this report for more information.

**Table 5:** Results summary for operational parameters

Parameter (Sample Type)	Number of Samples	Units	Min. Result	Max. Result	Annual Avg.	Adverse Result
Turbidity (Raw Water)	251	NTU	0.63	5.13	1.04	n/a
Turbidity (Filter 1)	Continuous	NTU	0.047	>2.000	0.074	>1.0
Turbidity (Filter 2)	Continuous	NTU	0.037	1.830	0.069	>1.0
Turbidity (Filter 3)	Continuous	NTU	0.023	>2.000	0.045	>1.0
Turbidity (Filter 4)	Continuous	NTU	0.025	>2.000	0.055	>1.0
Turbidity (Treated)	366	NTU	0.12	0.69	0.22	n/a
pH (Treated)	324	---	7.0	7.7	7.4	n/a
Alkalinity (Treated)	251	mg/L	31	80	42	n/a
Aluminum Residual (Treated)	24	mg/L	0.019	0.466	0.065	n/a
Fluoride Residual (Treated)	Continuous	mg/L	0.24	1.27	0.69	>1.5
FCR <sup>1</sup> (Treated)	Continuous	mg/L	1.13	2.97	1.76	n/a
FCR <sup>1</sup> (Distribution) <sup>2</sup>	490+	mg/L	0.30	2.20	n/a	<0.05

1. FCR = free chlorine residual.
2. Free chlorine residuals are tested at various locations in the distribution system. The free chlorine residual varies with water age and distribution system location, and for this reason an annual average cannot be provided. The values in the table pertain to the minimum and maximum results collected across all locations in the calendar year.



### 3.4 Conventional Filtration Performance

In accordance with the system's *Municipal Drinking Water Licence*, conventional filtration facilities must meet certain performance criteria in order to claim removal credits for *Cryptosporidium* oocysts and *Giardia* cysts. In addition to continuously monitoring filtrate turbidity and other requirements, filtrate turbidity must be less than or equal to 0.3 NTU in at least 95% of the measurements each month. Table 6 summarizes filtrate turbidity compliance against the <0.3 NTU/95% performance criterion. Minimum and maximum values in the table correspond to the proportion of time that filtered water turbidity was less than or equal to 0.3 NTU in a calendar month in 2020. No AWQIs pertaining to conventional filtration performance occurred during the reporting period.

**Table 6:** Filtration performance summary

Filter	Minimum Result	Maximum Result	Adverse Result
Filter 1	99.67%	100%	<95%
Filter 2	99.77%	100%	<95%
Filter 3	99.81%	100%	<95%
Filter 4	99.70%	100%	<95%



### 3.5 Nitrate & Nitrite

Treated water is tested for nitrate and nitrite concentrations on a quarterly basis in accordance with Schedule 13 (Chemical sampling and testing) of O. Reg. 170/03. Nitrate and nitrite results are provided in Table 7. All results were below the Ontario Drinking Water Quality Standards.

<b>Table 7: Nitrate and nitrite results</b>				
Sample Date	Nitrate		Nitrite	
	Result (mg/L)	ODWQS (mg/L)	Result (mg/L)	ODWQS (mg/L)
18-Feb-2020	0.071	10	<0.010	1
19-May-2020	<0.020		<0.010	
17-Aug-2020	0.024		<0.010	
16-Nov-2020	0.057		<0.010	

### 3.6 Trihalomethanes & Haloacetic Acids

Trihalomethanes (THMs) and haloacetic acids (HAAs) are sampled on a quarterly basis from a distribution system location that is likely to have an elevated potential for their formation, in accordance with Schedule 13 (Chemical sampling and testing) of O. Reg. 170/03. Total THM and HAA results are provided in Table 8 and Table 9, respectively. Compliance with the provincial standards for trihalomethane and haloacetic acid concentrations is determined by calculating a running annual average (RAA). The 2020 running annual averages for THMs and HAAs were below the respective Ontario Drinking Water Quality Standards.

<b>Table 8: Total THM results</b>	
Sample Date	Result (µg/L)
18-Feb-2020	52.0
19-May-2020	50.0
17-Aug-2020	97.4
16-Nov-2020	64.2
Regulatory Average (RAA)	65.9
ODWQS (RAA)	100

<b>Table 9: Total HAA results</b>	
Sample Date	Result (µg/L)
18-Feb-2020	62.6
19-May-2020	44.9
17-Aug-2020	66.1
16-Nov-2020	47.6
Regulatory Average (RAA)	55.3
ODWQS (RAA)	80

### 3.7 Lead Sampling

In accordance with Schedule 15.1 (Lead) of O. Reg. 170/03, the standard lead sampling schedule applied to the Atikokan Drinking Water System beginning with the Summer 2018 sample period (June 15, 2018 to October 15, 2018). Based upon favourable community lead sampling results following the Summer 2020 sample period (June 15, 2020 to October 15, 2020), the system has once again qualified for the reduced sampling schedule. Lead sampling under the reduced schedule will resume in the Summer 2022 sample period (June 15, 2022 to October 15, 2022). Table 10 summarizes the results of community lead sampling conducted during the reporting period. Distribution and plumbing samples were collected on October 1, 2020, and all results were below the Ontario Drinking Water Quality Standard for lead in drinking water.

**Table 10:** Lead sampling results summary

Sample Type	No. of Sample Points	No. of Samples	Min. Result (µg/L)	Max. Result (µg/L)	ODWQS (µg/L)	Number of Sample Point Exceedances	Number of Sample Exceedances
Distribution	4	4	<1.0	6.3	10	0	0
Plumbing <sup>1</sup>	22	44	<1.0	5.0		0	0
1. In accordance with the protocol outlined in Schedule 15.1 of O. Reg. 170/03, two samples are collected and analyzed for lead at each sample point for plumbing samples.							



### 3.8 Inorganic & Organic Parameters

Most inorganic parameters are sampled on an annual basis in treated water in accordance with Schedules 13 (Chemical sampling and testing) and 23 (Inorganic parameters) of O. Reg. 170/03. Sodium is sampled every five (5) years in treated water in accordance with Schedules 13 and 23 of O. Reg. 170/03. Although grab samples may be analyzed, regulatory testing for fluoride is achieved using continuous monitoring equipment in accordance with Schedule 6 of O. Reg. 170/03. The most recent inorganic parameter sampling results are provided in Table 11. All results were below the associated Ontario Drinking Water Quality Standards.

**Table 11:** Inorganic parameter sampling results

Parameter	Most Recent Sample Date	Units	Result	ODWQS
Antimony	17-Aug-2020	µg/L	<0.60	6
Arsenic	17-Aug-2020	µg/L	<1.0	10
Barium	17-Aug-2020	µg/L	<10	1000
Boron	17-Aug-2020	µg/L	<50	5000
Cadmium	17-Aug-2020	µg/L	<0.10	5
Chromium	17-Aug-2020	µg/L	<1.0	50
Fluoride	12-Aug-2019	mg/L	0.529	1.5
Mercury	17-Aug-2020	µg/L	<0.10	1
Selenium	17-Aug-2020	µg/L	<1.0	50
Sodium	12-Aug-2019	mg/L	16.3	20
Uranium	17-Aug-2020	µg/L	<2.0	20

Organic parameters are sampled on an annual basis in treated water in accordance with Schedules 13 (Chemical sampling and testing) and 24 (Organic parameters) of O. Reg. 170/03. These parameters include various organic acids, pesticides, herbicides, PCBs, volatile organics and other chemicals. Sampling for all organic parameters was conducted on August 17, 2020, and results are provided in Table 12. All results were below the associated Ontario Drinking Water Quality Standards.

**Table 12:** Organic parameter sampling results

Parameter	Result (µg/L)	ODWQS (µg/L)	Parameter	Result (µg/L)	ODWQS (µg/L)
Alachlor	<0.10	5	Diuron	<1.0	150
Atrazine & Metabolites	<0.20	5	Glyphosate	<5.0	280
Azinphos-methyl	<0.10	20	Malathion	<0.10	190
Benzene	<0.50	1	MCPA	<0.20	100
Benzo(a)pyrene	<0.005	0.01	Metolachlor	<0.10	50
Bromoxynil	<0.20	5	Metribuzin	<0.10	80
Carbaryl	<0.20	90	Monochlorobenzene	<0.50	80
Carbofuran	<0.20	90	Paraquat	<1.0	10
Carbon Tetrachloride	<0.20	2	Pentachlorophenol	<0.50	60
Chlorpyrifos	<0.10	90	Phorate	<0.10	2
Diazinon	<0.10	20	Picloram	<0.20	190
Dicamba	<0.20	120	Total PCBs	<0.035	3
1,2-Dichlorobenzene	<0.50	200	Prometryne	<0.10	1
1,4-Dichlorobenzene	<0.50	5	Simazine	<0.10	10
1,2-Dichloroethane	<0.50	5	Terbufos	<0.20	1
1,1-Dichloroethylene	<0.50	14	Tetrachloroethylene	<0.50	10
Dichloromethane	<5.0	50	2,3,4,6-Tetrachlorophenol	<0.50	100
2,4-Dichlorophenol	<0.30	900	Triallate	<0.10	230
2,4-D	<0.20	100	Trichloroethylene	<0.50	5
Diclofop-methyl	<0.20	9	2,4,6-Trichlorophenol	<0.50	5
Dimethoate	<0.10	20	Trifluralin	<0.10	45
Diquat	<1.0	70	Vinyl Chloride	<0.20	1

### 3.9 Special Herbicide Monitoring

Raw and treated water samples are collected and tested for common herbicides during the spring and summer months. This program is intended to monitor water quality before, during and after annual vegetation control activities are undertaken with respect to the railway right-of-way. The results from additional monitoring for herbicides are provided in Table 13. The table includes the results from samples collected on August 17, 2020, as part of the routine sampling program described in section 3.8 of this Report. No herbicides were detected in any of the samples and all results were below the associated Ontario Drinking Water Quality Standards.

**Table 13:** Additional herbicide monitoring results

Parameter		AMPA	Bromoxynil	2,4-D	Dicamba	Dinoseb	Glyphosate	MCPA	Picloram	2,4,5-TP	Diuron
ODWQS (µg/L)		---	5	100	120	---	280	100	190	---	150
Sample Date & Type		Results (µg/L)									
19-May-2020	Raw	<0.50	<0.20	<0.20	<0.20	<0.20	<5.0	<0.20	<0.20	<0.20	<1.0
	Treated	<0.50	<0.20	<0.20	<0.20	<0.20	<5.0	<0.20	<0.20	<0.20	<1.0
4-Jun-2020	Raw	<0.50	<0.20	<0.20	<0.20	<0.20	<5.0	<0.20	<0.20	<0.20	<1.0
	Treated	<0.50	<0.20	<0.20	<0.20	<0.20	<5.0	<0.20	<0.20	<0.20	<1.0
15-Jun-2020	Raw	<0.50	<0.20	<0.20	<0.20	<0.20	<5.0	<0.20	<0.20	<0.20	<1.0
	Treated	<0.50	<0.20	<0.20	<0.20	<0.20	<5.0	<0.20	<0.20	<0.20	<1.0
29-Jun-2020	Raw	<0.50	<0.20	<0.20	<0.20	<0.20	<5.0	<0.20	<0.20	<0.20	<1.0
	Treated	<0.50	<0.20	<0.20	<0.20	<0.20	<5.0	<0.20	<0.20	<0.20	<1.0
13-Jul-2020	Raw	<0.50	<0.20	<0.20	<0.20	<0.20	<5.0	<0.20	<0.20	<0.20	<1.0
	Treated	<0.50	<0.20	<0.20	<0.20	<0.20	<5.0	<0.20	<0.20	<0.20	<1.0
17-Aug-2020	Raw	<0.50	<0.20	<0.20	<0.20	<0.20	<5.0	<0.20	<0.20	<0.20	<1.0
	Treated	<0.50	<0.20	<0.20	<0.20	<0.20	<5.0	<0.20	<0.20	<0.20	<1.0



### 3.10 Environmental Discharge Sampling

The *Municipal Drinking Water Licence* for the Atikokan Drinking Water System requires additional sampling associated with discharges to the natural environment. During normal water treatment plant operation, process wastewater is transferred directly to the wastewater collection (sanitary sewer) system. In the event that conditioned process wastewater is discharged to the natural environment, as may be the case during the management of a treatment process upset, composite samples must be collected and analyzed for total suspended solids (TSS). The *Licence* also requires that the effluent discharged to the natural environment has an annual average TSS concentration below 25 mg/L. In 2020, there was one (1) discharge event and the effluent discharged to the natural environment had a TSS concentration of 5.9 mg/L.



## 4 Water Production

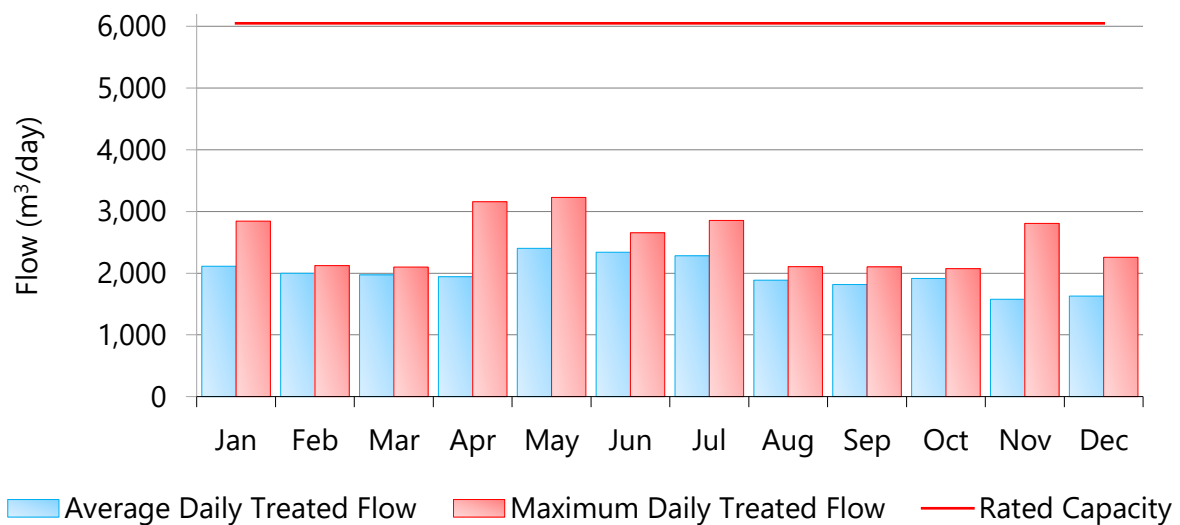
### 4.1 Overview

In accordance with Schedule 22 (Summary Reports for Municipalities) of O. Reg. 170/03, this Annual Report must include certain information for the purpose of enabling the Owner to assess the capability of the system to meet existing and planned uses. Specifically, this Report must include a summary of the quantities and flow rates of the water supplied during the reporting period, including monthly average and maximum daily flows. The Report must also include a comparison of flow monitoring results to the rated capacity and flow rates approved in the system's *Municipal Drinking Water Licence*.

### 4.2 Flow Monitoring Results

Throughout the reporting period the Atikokan DWS operated within its rated capacity and supplied a total of 728,241 m<sup>3</sup> of treated water. On an average day in 2020, 1,990 m<sup>3</sup> of treated water was supplied to the community, which represents 33% of the rated capacity of the Atikokan Water Treatment Plant (6,048 m<sup>3</sup>/day). The maximum daily flow in 2020 was 3,227 m<sup>3</sup>/day, which represents 53% of the rated capacity of the treatment facility. Flow monitoring results are summarized in Figure 1 and Table 14. The capacity assessments provided in the table compare the average and maximum daily treated water flows to the rated capacity of the facility.

**Figure 1:** 2020 average and maximum daily treated water flows



**Table 14:** 2020 water production summary

Month	Total Volumes (m <sup>3</sup> )		Daily Flows (m <sup>3</sup> /day)		Capacity Assessments	
	Raw Water	Treated Water	Average - Treated	Maximum - Treated	Average - Treated	Maximum - Treated
Jan	74,220	65,474	2,112	2,843	35%	47%
Feb	65,370	57,937	1,998	2,122	33%	35%
Mar	70,130	61,129	1,972	2,099	33%	35%
Apr	65,160	58,262	1,942	3,157	32%	52%
May	88,640	74,467	2,402	3,227	40%	53%
Jun	86,680	70,173	2,339	2,654	39%	44%
Jul	82,700	70,723	2,281	2,854	38%	47%
Aug	66,960	58,474	1,886	2,105	31%	35%
Sep	66,050	54,471	1,816	2,102	30%	35%
Oct	71,000	59,332	1,914	2,073	32%	34%
Nov	57,340	47,308	1,577	2,806	26%	46%
Dec	60,380	50,491	1,629	2,257	27%	37%
Total	854,630	728,241	---	---	---	---
Average	71,219	60,687	1,990	---	33%	---



### 4.3 Recent Historical Flows

Table 15 summarizes recent historical flow monitoring results for the Atikokan Drinking Water System. There were modest increases in the volumes of source water withdrawn and treated water supplied in 2020 when compared to 2019. In addition to population factors, annual variations in average daily flows may be in part attributable to the frequency and severity of distribution system leaks and to the quantities of water used to prevent water lines from freezing. Total annual volumes of treated water supplied in the near future may be expected to be between 625,000 m<sup>3</sup> and 825,000 m<sup>3</sup>, which represents approximately 28% to 37% of the rated capacity of the Atikokan Water Treatment Plant.

<b>Table 15:</b> Recent historical water production summary						
Year	Total Volumes (m <sup>3</sup> )		Daily Flows (m <sup>3</sup> /day)		Annual % Change	
	Raw Water	Treated Water	Average – Treated	Maximum – Treated	Raw Water	Treated Water
2011	762,600	615,934	1,687	3,889	-4.4%	-0.6%
2012	747,243	642,622	1,756	3,082	-2.0%	+4.3%
2013	798,360	639,019	1,751	5,530	+6.8%	-0.6%
2014	943,794	789,592	2,163	3,770	+18.2%	+23.6%
2015	1,029,030	825,522	2,262	4,124	+9.0%	+4.6%
2016	771,350	656,030	1,792	3,389	-25.0%	-20.5%
2017	768,291	639,453	1,752	2,813	-0.4%	-2.5%
2018	927,760	785,846	2,153	3,464	+20.8%	+22.9%
2019	789,460	673,698	1,846	3,834	-14.9%	-14.3%
2020	854,630	728,241	1,990	3,227	+8.3%	+8.1%

## 5 Compliance

### 5.1 Overview

Northern Waterworks Inc. and the Town of Atikokan employ an operational strategy that is committed to achieving the following goals:

- Providing a safe and reliable supply of drinking water to the community of Atikokan;
- Meeting or exceeding all applicable legislative and regulatory requirements; and,
- Maintaining and continually improving the operation and maintenance of the system.

The following sections will summarize incidents of adverse water quality and regulatory noncompliance that occurred during the reporting period. NWI is committed to employing timely and effective corrective actions to prevent the recurrence of identified incidents of adverse water quality and noncompliance.

### 5.2 Adverse Water Quality Incidents

In accordance with section 11 (Annual Reports) of O. Reg. 170/03, this Report must summarize any reports made to the Ministry under subsection 18(1) (Duty to report adverse test results) of *the Act* or section 16-4 (Duty to report other observations) of Schedule 16 of O. Reg. 170/03. Additionally, this Report must describe any corrective actions taken under Schedule 17 of O. Reg. 170/03 during the period covered by the report.

The seven (7) adverse water quality incidents that occurred during the reporting period are summarized below.

- **AWQI No. 149391 (January 7, 2020)**

As per Ontario's *Watermain Disinfection Procedure*, an emergency water distribution system repair on Gorrie Street was classified as a Category 2 repair. Corrective actions included completing the repair, restoring pressure, issuing a localized and precautionary Boil Water Advisory and collecting samples for microbiological testing. All samples tested absent for E. coli and total coliform parameters and the Boil Water Advisory was rescinded on January 16, 2020.

- **AWQI No. 149817 (April 3, 2020)**

As per Ontario's *Watermain Disinfection Procedure*, an emergency water distribution system repair on Pine Crescent was classified as a Category 2 repair. Corrective actions included completing the repair, restoring pressure, issuing a localized and precautionary Boil Water Advisory and collecting samples for microbiological testing. All samples tested absent for E. coli and total coliform parameters and the Boil Water Advisory was rescinded on April 9, 2020.

- **AWQI No. 149948 (May 4, 2020)**

As per Ontario's *Watermain Disinfection Procedure*, an emergency water distribution system repair on Grenville Avenue was classified as a Category 2 repair. Corrective actions included completing the repair, restoring pressure, issuing a localized and precautionary Boil Water Advisory and collecting samples for microbiological testing. All samples tested absent for E. coli and total coliform parameters and the Boil Water Advisory was rescinded on May 8, 2020.

- **AWQI No. 150365 (June 24, 2020)**

There was a temporary reduction in water distribution system pressure originating at the Atikokan Water Treatment Plant and lasting for approximately 90 seconds. The event was reported as an observation of improper disinfection caused by uninterruptible power supply and programmable logic controller failures.

Corrective actions were performed in accordance with Schedule 17 of O. Reg. 170/03 and including promptly restoring system pressure and replacing deficient equipment. A Boil Water Advisory was not indicated for this event.

- **AWQI No. 150598 (July 10, 2020)**

As per Ontario's *Watermain Disinfection Procedure*, an emergency water distribution system repair on O'Brien Street was classified as a Category 2 repair. Corrective actions included completing the repair, restoring pressure, issuing a localized and precautionary Boil Water Advisory and collecting samples for microbiological testing. All samples tested absent for E. coli and total coliform parameters and the Boil Water Advisory was rescinded on July 23, 2020.



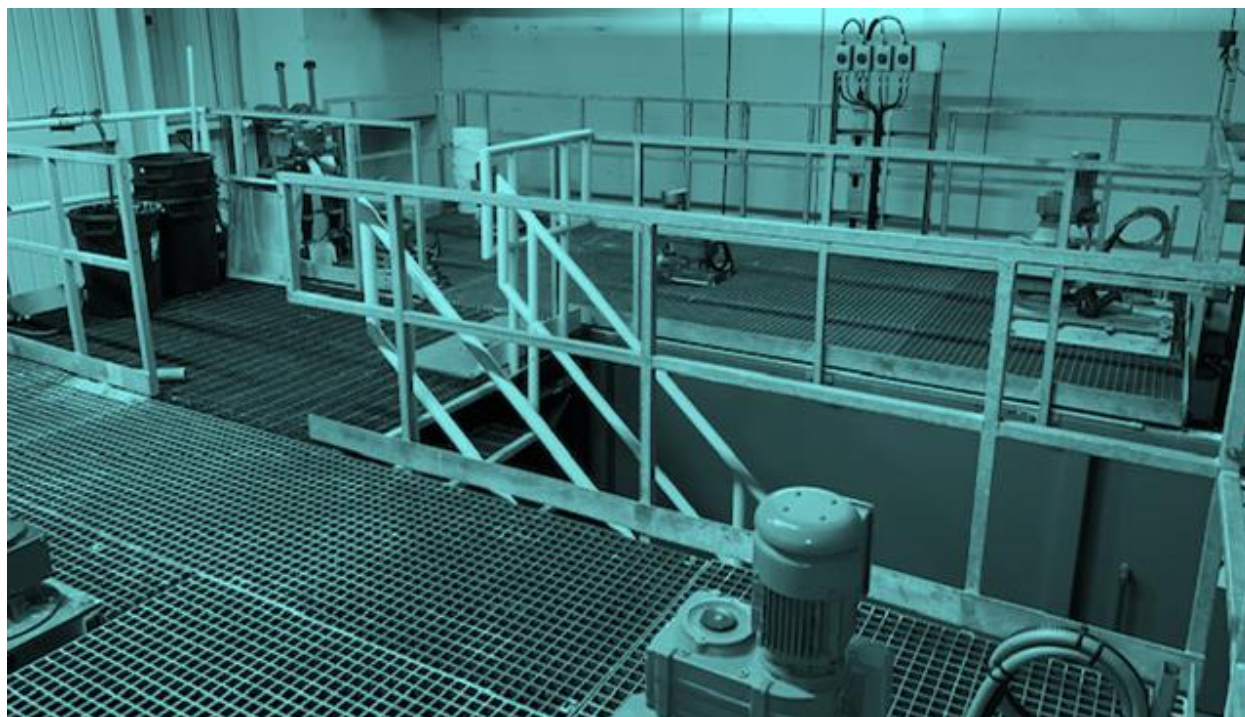
- **AWQI No. 152620 (October 20, 2020)**

An operational indicator of adverse water quality occurred at the Atikokan Water Treatment Plant as filtrate with turbidity exceeding 1.0 NTU was directed to the next stage of the treatment process for a period of time greater than 15 minutes.

Corrective actions were performed in accordance with Schedule 17 of O. Reg. 170/03 and including checking the filters and turbidity monitoring equipment. The high filtrate turbidity was caused by an upstream treatment process upset, and water production was promptly stopped as the process was corrected. Filter units were also cleaned prior to restoring water production.

- **AWQI No. 153311 (December 22, 2020)**

As per Ontario's *Watermain Disinfection Procedure*, an emergency water distribution system repair on Marks Street was classified as a Category 2 repair. Corrective actions included completing the repair, restoring pressure, issuing a localized and precautionary Boil Water Advisory and collecting samples for microbiological testing. All samples tested absent for E. coli and total coliform parameters and the Boil Water Advisory was rescinded on January 8, 2021.



### 5.3 Regulatory Compliance

In accordance with Schedule 22 (Summary Reports for Municipalities) of O. Reg. 170/03, this Report must list any requirements of the *Act*, the regulations, the system's approval, drinking water works permit, municipal drinking water licence, and any orders applicable to the system that were not met at any time during the period covered by the report. Additionally, this Report must specify the duration of the failure and the measures that were taken to correct the failure.

The most recent inspection by Ontario's Ministry of the Environment, Conservation and Parks was initiated on December 3, 2020. The final inspection rating was 91.70% and three (3) incidents of regulatory noncompliance were identified. Information concerning the duration of failures and the measures taken to address those failures is provided below.

- **Noncompliance item no. 1**

Continuous monitoring equipment utilized for sampling and testing was not equipped with alarms that satisfied the standards described in Schedule 6 of O. Reg. 170/03. For an unknown period of time during the inspection period, the high filtrate turbidity alarm was programmed with a two-minute delay and would not alarm immediately, as required by Schedule 6. Additionally, on July 6, 2020, the chlorine residual dropped to 1.13 mg/L, which was below the minimum regulatory alarm standard. However, an alarm was not activated during this event due to an autodialer malfunction.

Concerning the regulatory alarm for high filtrate turbidity, the automation service provider was notified and the transmission delay was removed from the alarm condition. Concerning the regulatory alarm for low chlorine and the alarm transmission failure, the autodialer was replaced on October 15, 2020. No additional low chlorine events occurred prior to the replacement of the autodialer.

- **Noncompliance item no. 2**

Schedule 6 of O. Reg. 170/03 requires that chlorine residuals be recorded at least once every 5 minutes. The intent of recording this information is to demonstrate that primary disinfection is being achieved as water is directed to users. Although the SCADA system recorded this parameter at the required frequency during the inspection period, water pH fluctuations resulted in inaccurate treated water chlorine residual readings on October 17, 2019 at approximately 18:00 until October 19, 2019 at approximately 02:00.

As an interim solution, a contingency plan was developed to manage inaccurate chlorine measurement events caused by pH fluctuations. As a long-term solution, an investigation determined that pH fluctuations would be minimized by a) defining a clear and restricted operational target for finished water pH and b) utilizing the pH compensation feature of the chlorine signal on the treated water analyzer. All solutions were implemented in January 2021.

- **Noncompliance item no. 3A**

As per section 27.(5) of O. Reg. 128/04, an Operator-In-Charge (OIC) or a person authorized by an OIC is required to record any unusual or abnormal conditions that are observed in the subsystem during the shift, and any action that was taken and any conclusions drawn from the observations. On March 10, 2020 at approximately 11:44, filtrate turbidity on filter unit no. 1 spiked to 2.0 NTU. This event would have activated an alarm condition, but no record of the event could be identified.

Effective immediately upon the publication of the inspection report, the OIC or person authorized by the OIC shall record any usual or abnormal conditions that are observed in the subsystem during the shift, including any action that was taken and any conclusions drawn from the observations. Compliance will be reassessed during the next annual inspection.

- **Noncompliance item no. 3B**

As per section 26.(2) of O. Reg. 128/04, an Operator-In-Charge (OIC) must perform specific duties. On multiple days through the inspection review period, more than one OIC was signed into the logbook and at least one of the OICs that was signed in was not performing the functions of an OIC.

Effective immediately upon the publication of the inspection report, all operators who sign into the facility logbook as OIC must be performing the duties of an OIC and have log entries which describe those duties. Furthermore, two operators must not both be assigned as OIC for a single operational task. Compliance will be reassessed during the next annual inspection.