

2017 Annual Report

Atikokan Drinking Water System

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Prepared by



for the Corporation
of the Town of Atikokan

Introduction

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 the Town Council on the operation of the system over the previous calendar year (January 1 to December 31, 2017).

Section 11 of O. Reg. 170/03 requires the development and adequate 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 Town 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.

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 following locations:

- (1) Atikokan Public Library
- (2) Town of Atikokan Website (www.atikokan.ca)
- (3) NWI Website (www.nwi.ca/publications)

In accordance with Schedule 22 of O. Reg. 170/03, this Annual Report must be given to the members of the Town 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 the Town Council are strongly encouraged to contact a representative of Northern Waterworks Incorporated (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.

System Overview

The Atikokan Drinking Water System (DWS No. 220000950) must meet extensive treatment and testing requirements in order 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 approvals.

System Description

The Atikokan Drinking Water System (DWS) is classified as a large municipal residential system and is composed of a raw water pumping station, the Atikokan Water Treatment Plant (WTP), and the Atikokan water distribution system. The system is owned by the Corporation of the Town of Atikokan and is operated, maintained, managed and administered by Northern Waterworks Incorporated. Potential pathogenic organisms are removed and inactivated by chemical coagulation, sand-ballasted flocculation, clarification, rapid sand filtration and free chlorine disinfection.

Pumps located 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 at the WTP, 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. Water and coagulant are rapidly mixed in the coagulation basin and flow is directed to the injection basin, where microsand and polyacrylamide (polymer – a flocculant) are added to enhance 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.

Any suspended particles that did not settle in the clarifier are removed by passing water through four dual media filters (each composed of anthracite and silica sand on a layer of support gravel). The filters are periodically cleaned by reversing the flow of water through the filter using pumps. Chlorine gas (disinfectant), sodium carbonate solution (pH adjustment), and hydrofluorosilicic acid (fluoridation) are added to the filtrate as it is directed from the filters to the treated water storage reservoir.

The reservoir at the Atikokan WTP uses a baffling system to allow the disinfectant to mix adequately with the water, and disinfected water is held in the reservoir for a sufficient amount of time to achieve primary disinfection. Treated water is then delivered from the reservoir to the distribution system using pumps located at the WTP. Secondary disinfection requirements in the distribution system are achieved by maintaining a free chlorine residual.

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 (**Table 1**). All chemicals used in the treatment process are NSF/ANSI 60 certified for use in potable water, as required by system approvals.

Table 1: Water treatment chemicals used in 2017.

Treatment Chemical	Application
polyaluminum chloride (SternPAC)	coagulant
silica dioxide (Actisand)	flocculant
polymer (Superfloc C-492)	flocculant
sodium carbonate (soda ash)	pH adjustment
hydrofluorosilicic acid	fluoridation
chlorine gas	disinfectant

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 2017 are summarized in **Table 2**.

Table 2: Major expenses incurred in 2017.

Category	Description	Expense
Replace	High lift pumps (pumps 1, 2 and 4) and high lift pump motors (pumps 2 and 4)	\$147,811
New Equipment/Repair	Automation troubleshooting and various planned upgrades	\$50,584
Repair/Replace	Hydrants and components	\$47,000
Repair/Inventory	Actiflo recirculation pump rebuild kits	\$45,032
Replace/Inventory	Automatic flow control valve (associated with high lift pumps) replacement (2) and repair kits	\$35,519
Repair/Replace	Water service components	\$25,000
Repair	Water main components	\$18,000
Replace	Pressure relief valve on the main distribution header	\$12,188
Replace/Maintenance	Backflow prevention device testing and replacement	\$8,367
Replace	Unit heaters	\$4,127
Maintenance	Flow meter calibration verifications	\$3,454
Replace	Outdoor lighting	\$3,037

Water Quality

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 use technical water quality terms, some of which the reader may not be familiar with. It is recommended that the reader refer to the *Technical Support Document for Ontario Drinking Water Standards, Objectives, and Guidelines* available at the following website: <http://www.ontla.on.ca/library/repository/mon/14000/263450.pdf>. Within this document the reader will find information on provincial water quality standards, objectives and guidelines, rationale for monitoring, and a brief description of water quality parameters.

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 3** 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.

Table 3: Results summary for operational parameters.

Parameter (Sample Type) ¹	Sample Method (Minimum Frequency)	Units	Min. Result	Max. Result	Annual Average	Adverse Result ²
Turbidity (Raw Water)	Grab (4x weekly)	NTU	0.61	3.73	1.14	n/a
Turbidity (Filter 1)	Continuous	NTU	0.038	>2.0	0.071	>1.0
Turbidity (Filter 2)	Continuous	NTU	0.046	>2.0	0.081	>1.0
Turbidity (Filter 3)	Continuous	NTU	0.029	>2.0	0.059	>1.0
Turbidity (Filter 4)	Continuous	NTU	0.028	>2.0	0.057	>1.0
Turbidity (Treated)	Continuous	NTU	0.057	0.348	0.123	n/a
pH (Treated)	Grab (4x weekly)	---	6.38	7.30	6.77	n/a
FR (Treated)	Continuous	mg/L	0.34	0.98	0.68	1.5
FCR (Treated)	Continuous	mg/L	0.56	3.36	2.48	n/a
FCR (Distribution)	Grab (Daily)	mg/L	0.06	2.20	1.37	<0.05

1. FR = fluoride residual; FCR = free chlorine residual.

2. Adverse results are prescribed within Schedule 16 of O. Reg. 170/03. There are additional factors not included in the table that are necessary to determine whether a result is adverse, such as the duration of the result and whether water is being directed to the next stage of the treatment process.

Conventional Filtration Performance

In accordance with the *Procedure for Disinfection of Drinking Water in Ontario*, conventional filtration facilities must meet certain performance criteria in order to claim removal credits for *Cryptosporidium* oocysts, *Giardia* cysts and viruses. 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 4 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 2017.

Table 4: Filter performance.

Filter	Monthly Min.	Monthly Max.	Adverse Result
Filter 1	98.9%	100%	<95%
Filter 2	98.3%	100%	<95%
Filter 3	98.6%	100%	<95%
Filter 4	98.5%	100%	<95%

Microbiological Parameters

Microbiological analyses are performed on source, treated, and distribution system water. 260 routine water samples were collected for microbiological analysis by an accredited laboratory in 2017, as required by Schedule 10 (Microbiological sampling and testing) of O. Reg. 170/03. These water 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 provided in **Table 5**. All results were below the associated Ontario Drinking Water Quality Standards.

Table 5: Microbiological sampling results.

Sample Type	# of Samples	EC Results Range ¹ (MPN/100mL)	TC Results Range ¹ (MPN/100mL)	# of HPC Samples	HPC Results Range (CFU/mL)
Raw Water	52	<1 to 138	40 to >2420	---	---
Treated	52	absent	absent	52	0 to 2
Distribution	156	absent	absent	52	0 to 6
Distribution (Non-routine)	1	absent	absent	1	0

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.

Nitrate and 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 6**. All results were below the Ontario Drinking Water Quality Standards.

Table 6: Nitrate and nitrite results.

Sample Date	Nitrate Result (mg/L)	Nitrite Result (mg/L)
13-Feb-2017	0.055	<0.010
23-May-2017	<0.020	<0.010
14-Aug-2017	<0.020	<0.010
14-Nov-2017	<0.020	<0.010
ODWQS	10	1

Trihalomethanes & Haloacetic Acids

Trihalomethanes (THMs) and haloacetic acids (HAAs) are required to be 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 summarized in **Table 7** and **Table 8**, respectively.

Compliance with the provincial standard for trihalomethane concentrations is determined by calculating a running annual average (with a Maximum Acceptable Concentration of 0.100 mg/L or 100 µg/L). In 2017, the running annual average for THMs was 73.7 µg/L. A new provincial standard for haloacetic acids, also expressed as a running annual average with a Maximum Acceptable Concentration of 0.080 mg/L or 80 µg/L, will come into effect on January 1, 2020.

Table 7: Total THM results.

Sample Date	Result (µg/L)
13-Feb-2017	56.5
23-May-2017	76.0
14-Aug-2017	88.5
14-Nov-2017	73.9
Average	73.7
ODWQS (RAA)	100

Table 8: Total HAA results.

Sample Date	Result (µg/L)
13-Feb-2017	58.8
23-May-2017	75.3
14-Aug-2017	86.4
14-Nov-2017	68.9
Average	72.4
Future ODWQS (RAA)	80

Lead Sampling

Based on favourable results of community lead sampling conducted in 2014 and 2015, the Atikokan DWS qualified for reduced lead sampling in accordance with Schedule 15.1 (Lead) of O.Reg. 170/03. Reduced sampling for lead will resume in the Winter 2017 sample period (i.e. December 15, 2017 to April 15, 2018).

Environmental Discharge Sampling

The Municipal Drinking Water Licence for the Atikokan DWS requires additional sampling associated with environmental discharges. During normal operation, process wastewater is transferred directly to the wastewater collection system. If conditioned process wastewater is discharged to the natural environment, 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 2017, effluent discharged to the natural environment had an annual average TSS concentration of 14.8 mg/L.

Inorganic & Organic Parameters

Inorganic and organic parameters are sampled on an annual basis in treated water in accordance with Schedules 13 (Chemical sampling and testing), 23 (Inorganic parameters) and 24 (Organic parameters) of O. Reg. 170/03. Sodium is sampled every five (5) years in treated water in accordance with Schedule 13 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 9**. All results were below the associated Ontario Drinking Water Quality Standards.

Table 9: Inorganic sampling results.

Parameter	Sample Date	Units	Result	ODWQS
Antimony	14-Nov-2017	µg/L	<0.60	6
Arsenic	14-Nov-2017	µg/L	<1.0	10
Barium	14-Nov-2017	µg/L	<10	1000
Boron	14-Nov-2017	µg/L	<50	5000
Cadmium	14-Nov-2017	µg/L	<0.10	5
Chromium	14-Nov-2017	µg/L	<1.0	50
Fluoride	14-Nov-2017	mg/L	0.543	1.5
Mercury	14-Nov-2017	µg/L	<0.10	1
Selenium	14-Nov-2017	µg/L	<1.0	50
Sodium	14-Nov-2017	mg/L	13.2	20
Uranium	14-Nov-2017	µg/L	<2.0	20

Organic parameters include various acids, pesticides, herbicides, PCBs, volatile organics, and other organic chemicals. Organic parameter sampling results are provided in **Table 10**. Sampling for all organic parameters was conducted on November 14, 2017. All results were below the associated Ontario Drinking Water Quality Standards.

Table 10: 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 + N-dealkylated metabolites	<0.20	5	Glyphosate	<5.0	280
Azinphos-methyl	<0.10	20	Malathion	<0.10	190
Benzene	<0.50	1	2-Methyl-4-Chlorophenoxy-acetic acid (MCPA)	<0.20	100
Benzo(a)pyrene	<0.010	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 Polychlorinated Biphenyls (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-Dichlorophenoxy acetic acid	<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

Flow Monitoring

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.

Throughout the reporting period, the Atikokan DWS operated within its rated capacity and supplied a total of 639,453 m³ of treated water. On an average day in 2017, 1,752 m³ of treated water was supplied to the community of Atikokan, which represents 29% of the rated capacity of the Atikokan WTP (6,048 m³/day). The maximum daily flow in 2017 was 2,813 m³/day, which represents 47% of the rated capacity of the facility. 2017 flow monitoring results are summarized in **Table 11** and **Figure 1**.

Table 11: 2017 total volumes, daily flows, and capacity assessments.

Month	Total Volumes (m ³)		Daily Flows (m ³ /day)		Capacity Assessments ¹	
	Raw Water	Treated Water	Average - Treated Water	Maximum - Treated Water	Average - Treated Water	Maximum - Treated Water
Jan	64,340	55,327	1,785	1,892	30%	31%
Feb	65,950	54,248	1,937	2,592	32%	43%
Mar	71,640	60,745	1,960	2,813	32%	47%
Apr	60,421	50,193	1,673	1,765	28%	29%
May	68,740	60,100	1,939	2,649	32%	44%
Jun	71,300	55,430	1,848	1,972	31%	33%
Jul	72,460	58,111	1,875	1,963	31%	32%
Aug	64,030	53,199	1,716	2,111	28%	35%
Sep	56,080	45,383	1,513	1,779	25%	29%
Oct	55,260	45,285	1,461	1,596	24%	26%
Nov	57,450	49,243	1,641	2,775	27%	46%
Dec	60,620	52,189	1,684	2,303	28%	38%
Total	768,291	639,453	---	---	---	---
Avg.	64,024	53,288	1,752	---	29%	---

1. Capacity assessments compare average and maximum daily treated water flows to the rated capacity of the treatment facility (6,048 m³/day), as provided within the Municipal Drinking Water Licence for the Atikokan DWS.

Figure 1: 2017 average and maximum daily treated water flows.

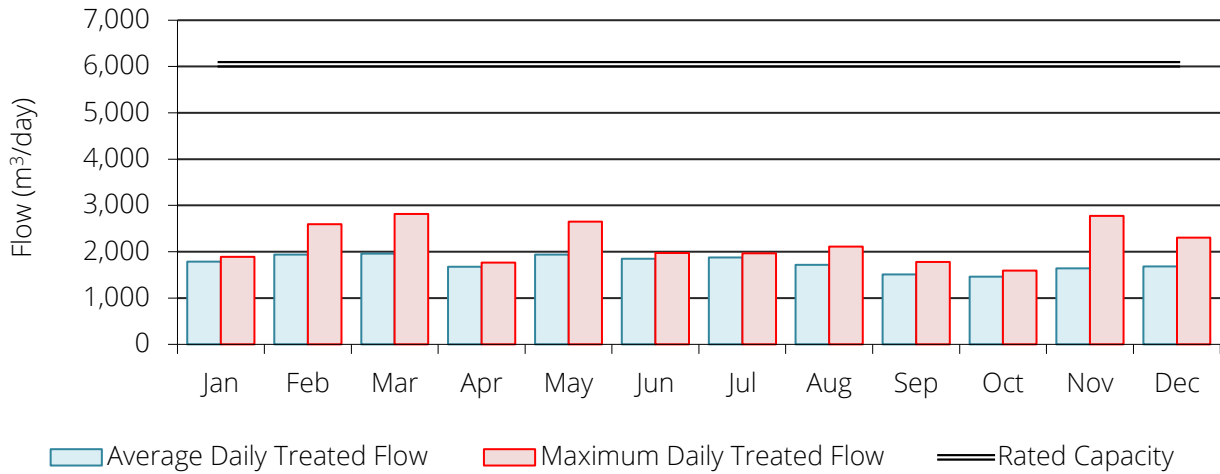


Table 12 summarizes annual flow monitoring results for the Atikokan DWS. There were slight reductions in the amounts of source water withdrawn and treated water supplied in 2017 when compared to 2016. Total annual volumes of treated water supplied in the near future may be expected to be between 600,000 m³ and 825,000 m³, which represents approximately 27% to 37% of the rated capacity of the Atikokan WTP.

Table 12: Recent historical flow monitoring results.

Year	Total Volumes (m ³)		Daily Flows (m ³ /day)		Annual % Change	
	Raw Water	Treated Water	Average – Treated Water	Maximum – Treated Water	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%

(Compliance)

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

- 1) Providing a safe and reliable supply of drinking water to the community of Atikokan;
- 2) Meeting or exceeding all applicable legislative and regulatory requirements;
- 3) Maintaining and continually improving the operation and maintenance of the system; and,
- 4) Maintaining and operating the Atikokan Drinking Water System in a responsible manner in accordance with documented quality management system policies and procedures.

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

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.

There were two (2) adverse water quality incidents during the reporting period for the Atikokan DWS:

- **AWQI No. 132658 (March 16, 2017)**

A localized loss of pressure occurred due to unplanned distribution system repairs affecting 109 to 148 Larson Street. The issue was reported to the MOECC Spills Action Centre and the Northwestern Health Unit.

Corrective action included completing repairs, restoring pressure, issuing a localized and precautionary Boil Water Advisory, flushing watermains, restoring disinfection and collecting microbiological samples. The Notice of Issue Resolution was provided on March 24, 2017.

- **AWQI No. 133225 (June 1, 2017)**

A localized loss of pressure occurred due to unplanned distribution system repairs affecting 202 to 220 Mercury Avenue East and 211 to 217 Mercury Avenue. The issue was reported to the MOECC Spills Action Centre and the Northwestern Health Unit.

Corrective action included completing repairs, restoring pressure, issuing a localized and precautionary Boil Water Advisory, flushing watermains, restoring disinfection and collecting microbiological samples. The Notice of Issue Resolution was provided on June 9, 2017.

Regulatory Noncompliance

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 (i.e. an incident of regulatory noncompliance). Additionally, this Report must specify the duration of the failure and the measures that were taken to correct the failure.

Four (4) incidents of regulatory noncompliance were identified during the most recent inspection initiated on February 1, 2017, by Ontario's Ministry of the Environment and Climate Change (MOECC). Information concerning the duration of failures and the measures taken to address those failures is provided for each item of non-compliance. The details of the noncompliance items and the actions required may utilize some or all of the original wording contained within the inspection report. Updates concerning the status of actions required have been provided where appropriate.

- **Records did not confirm that the water treatment equipment which provides chlorination for secondary disinfection purposes was operated so that at all times and all locations in the distribution system the chlorine residual was never less than 0.05 mg/L.**

Due to the condition of the distribution system, low chlorine residuals in sections of the distribution system, particularly unlined cast iron mains, have been a chronic problem. The old mains combined with low usage or dead-end areas result in low free chlorine residuals. Despite the actions that have been taken to date, free chlorine residuals less than 0.05 mg/L have been detected in the distribution system.

A routine sample collected on June 27, 2016, at a Grenville Avenue residence was found to contain 0.01 mg/L of free chlorine. Reporting and corrective actions were followed as required by the Drinking Water Systems Regulation. This has been an area of chronically low chlorine residuals. Previously on September 29, 2015, a bleeder was installed in this area of town to promote the maintenance of higher chlorine residuals.

Staff who work maintaining the distribution system recognize the need to replace sections of watermains. This would help to resolve low chlorine residuals in the distribution system. Unfortunately, replacement of watermains must compete with other municipal projects for capital to finance the projects. Spruce Road is an area of town that has experienced numerous breaks in the distribution system. The Town of Atikokan applied for funding to replace this section of watermain and successfully received OCIF funding. However, the Town of Atikokan decided not to accept the funding and did not proceed with the work because of the financial constraints of a project revitalizing the arena and swimming pool.

Actions required: The Town of Atikokan and Northern Waterworks Inc. have been working to address low chlorine residuals with both short term and long-term solutions. The Grenville Avenue location is one of many sampling locations in the distribution system. This location should be considered as a primary location for the weekly sample collection for bacteriological analysis and measurement of the chlorine residual in the distribution system. Sections of watermains require replacement and the Town of Atikokan needs to find ways of ensuring that funds are available to complete this work.

Update: The sampling program continues to include distribution system locations with previous or suspected low free chlorine residuals, including locations on Grenville Avenue. Notably, there were no adverse free chlorine residuals in 2017.

- **Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was not performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and/or was not recording data with the prescribed format.**

From the afternoon of August 21, 2016, to the morning of August 22, 2016, the free chlorine residual analyzer monitoring the treated water entering the distribution system was not working correctly. This was due to the pH of the water exceeding the operating range of the probe. For a period of time on August 21, from 16:02 to 20:30, a free chlorine residual was manually measured every 5 minutes. After this the manual grab samples were taken less frequently and did not meet the requirements of the regulation. The elevated pH was caused during a period of process upset when partially treated water was being directed to waste while the soda ash continued to be injected, elevating the pH of the water in the clearwell.

Actions Required: By March 31, 2017, the Town of Atikokan and Northern Waterworks shall provide a report to the undersigned inspector describing what measures have been taken to resolve the problem of soda ash being injected while partially treated water is being wasted after the Actiflo unit.

Update: After receiving an extension to the deadline, the requested report was provided to the inspector on April 28, 2017. The report identified three (3) strategies that had been or were in the process of being implemented to resolve the problem of soda ash being injected while effluent from the Actiflo units is directed to waste. No further actions are required.

- **The operations and maintenance manuals did not meet the requirements of the Drinking Water Works Permit and Municipal Drinking Water Licence issued under Part V of the SDWA.**

As part of the inspection the "Standard Operating Procedures Atikokan Distribution DWS Binder" was reviewed. Many the documents are quite dated. For example, the Atikokan Distribution DWS Emergency Contact List is dated June 13, 2013, and lists many people who are no longer working for the Town of Atikokan or Northern Waterworks Inc. Another document, "Atikokan Water Distribution System - Logbook - Signing Authority and Special Instructions Procedures" also contains the names of OROs and OICs who no longer work for the Town of Atikokan.

The manual contains the document "Disinfection of New Watermains", dated June 28, 2013. Schedule B of the Drinking Water Works Permit states that effective December 30, 2016, disinfection shall be in accordance with the ministry's Watermain Disinfection Procedure.

As discussed with the Director of Public Works, there have been many staffing changes and now is the time to review and update the operations and maintenance manuals.

Actions Required: By March 31, 2017, the Town of Atikokan shall provide a report to the undersigned inspector and include a list of the update documents.

Update: The report and updated documents were delivered to the inspector on March 29, 2017.

- **The following instance(s) of non-compliance were also noted during the inspection:**

Schedule C, Table 3, of the Municipal Drinking Water Licence limits the concentration of Suspended Solids in the effluent discharged to the natural environment from the treatment (wastewater) system. The annual average concentration shall not exceed 25 mg/L. Samples collected during five discharge events resulted in an annual average concentration of 42.6 mg/L.

Actions Required: By March 31, 2017, the Town of Atikokan and Northern Waterworks Inc. shall provide a report to the undersigned inspector discussing what actions have and will be taken to ensure the annual average concentration of TSS in the wastewater does not exceed 25 mg/L.

Update: After receiving an extension to the deadline, the requested report was provided to the inspector on April 28, 2017. The report identified four (4) strategies that had been or were in the process of being implemented to ensure the annual average concentration remains below 25 mg/L. The annual average TSS concentration in 2017 was 14.8 mg/L.