

North Middlesex Distribution System

Waterworks #260006529
System Category – Large Municipal Residential

Annual Drinking Water Report

Prepared For: Municipality of North Middlesex

Reporting Period of January 1st – December 31st, 2023

Issued: February 23, 2024

Revision: 0

Operating Authority:

OCWA



Table of Contents

Annual Drinking Water Report	1
Overview	1
Report Availability.....	1
System Process Description	1
Summary of Non-Compliance.....	1
Adverse Water Quality Incidents.....	1
Non-Compliance	2
Non-Compliance Identified in a Ministry Inspection:.....	2
Flows	3
Regulatory Sample Results Summary	4
Microbiological Testing.....	4
Operational Testing	4
Inorganic Parameters	4
Schedule 15.1 Sampling:	4
Organic Parameters	5
Additional Legislated Samples.....	5
Major Maintenance and Capital Summary.....	5
Revision History	5

Overview

This report fulfills requirements of Ontario Regulation 170/03 Section 11 and Schedule 22. The report must be made available to anyone that requests a copy of the report. By March 31st, 2024 the report must be provided to members of municipal council.

Report Availability

This system does not serve more than 10,000 residences and the annual reports will be available to residents at the Municipal Office as well as as on the municipal website. Notification will be at the Municipal Office and copies provided free of charge if requested. The Municipal Office is located at 229 Main Street, Parkhill, Ontario, N0M 2K0.

System Process Description

The North Middlesex Distribution System provides drinking water to consumers within the Municipality of North Middlesex. The North Middlesex Distribution System purchases potable water from the Lake Huron Primary Water Supply System (LHPWSS) ; water can enter the North Middlesex Distribution System from five points along the LHPWSS main transmission line. Primary and secondary disinfection is supplied from LHPWSS. There are no treatment chemicals used within the North Middlesex Distribution System.

The North Middlesex Distribution System is comprised of:

- one water tower;
- two underground water reservoirs;
- two booster pump stations;
- two booster pumps located in the LHPWSS McGillivray Booster Station; and,
- watermains and appurtenances such as hydrants, air release, pressure relief, isolation and sustaining valves.

The North Middlesex Distribution System is connected to the East Lambton Shores Distribution System (Thedford) and the Lucan Biddulph Distribution System (Lucan). The East Lambton Shores Distribution System connection can supply water to a section of the North Middlesex Distribution System if necessary or in an emergency situation. The East Lambton Shores Distribution System (Thedford) is located in the Municipality of Lambton Shores and is operated by Jacobs, OMI Canada. The Lucan Biddulph Distribution System (Lucan), operated by the Jacobs, OMI Canada, supplies water to the hamlet of Clandeboye located in the Municipality of North Middlesex.

Summary of Non-Compliance

Adverse Water Quality Incidents

Under the *Safe Drinking Water Act*, O.Reg 170/03, any adverse water quality incidents (AWQI) are required to be reported to the Ministry of the Environment, Conservation and Parks (MECP) and corrective action taken. Refer to Table 1 below for a summary of AWQI incidents in 2023.

Table 1: Adverse Water Quality Incidents

Date	AWQI #	Problem	Details	Legislation	Corrective Action Taken
November 7, 2023	163991	Total Coliform	1 Total Coliform on Lab Result	Safe Drinking Water Act: Reg 170/03	Two sets of resamples obtained (downstream, upstream and at location of AWQI). Results within regulatory requirement.

Non-Compliance

Under the *Safe Drinking Water Act*, O.Reg 170/03, any events where legislative requirements were not met are required to be reported to the MECP and corrective actions taken. Refer to Table 2 below for a summary of non-compliance incidents in 2023.

Table 2: Summary of Non-Compliance Incidents

Legislation	Requirement(s) system failed to meet	Duration of the failure (i.e. date(s))	Corrective Action	Status
There were no non-compliance issues reported during the reporting period.				

Non-Compliance Identified in a Ministry Inspection:

The routine MECP Inspections have an Inspection Rating Record. This record evaluates the system to provide information for the owner/operator on areas that need to be improved. The particular areas that were evaluated for the North Middlesex Distribution System were: Treatment Processes, Operations Manuals, Logbooks, Certification and Training, Water Quality Monitoring, and Reporting and Corrective Actions. This system received 0 out of 228 non-compliance ratings and as such received 100% for the Final Inspection Rating.

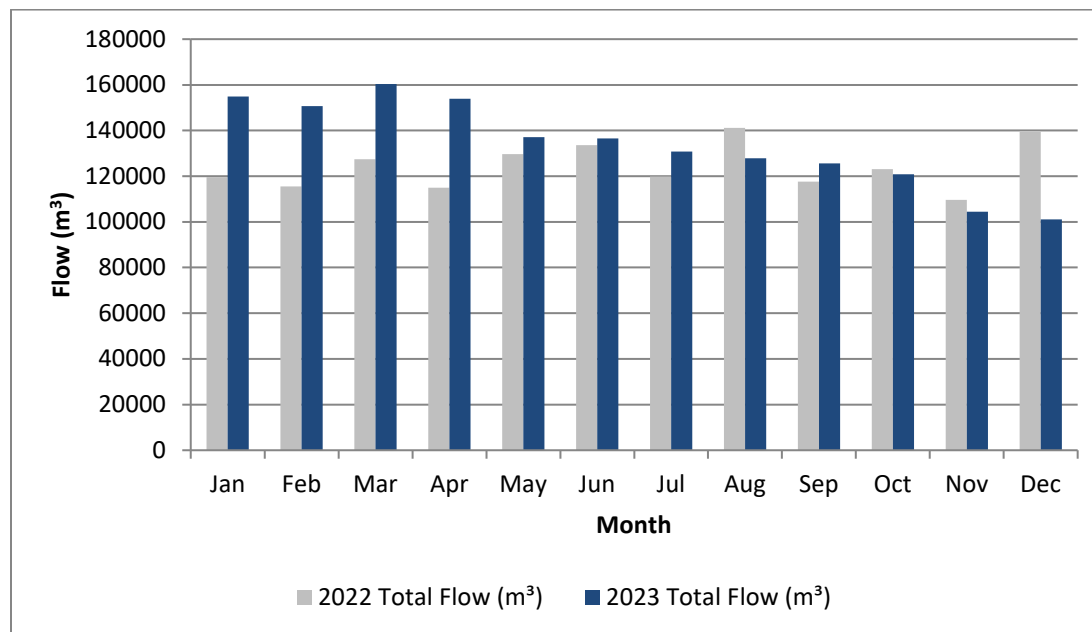
Table 3: Non-Compliances Identified in a Ministry Inspection

Legislation	requirement(s) system failed to meet	duration of the failure (i.e. date(s))	Corrective Action	Status
There were no non-compliances identified in the Inspection Report.				

Flows

The total flow to the North Middlesex Distribution System from LHPWSS was 1 603 938 m³. This is a 7.5% increase from 2022. This increase was due to a watermain leak that was repaired upon detection. See Figure 1 below for monthly flows to the North Middlesex Distribution System.

Figure 1: Monthly Flows to the North Middlesex Distribution System



The North Middlesex Distribution System Municipal Drinking Water License (License Number: 002-101) does not identify a system rated capacity. The agreement between the Municipality of North Middlesex and the LHPWSS Board of Management (Regional Water Supply) does not specify a maximum water taking volume.

The total flow and average daily flows by month for 2023 and the maximum total and daily flows are listed in Table 4 below.

Table 4: North Middlesex Distribution System Flows

Month	Total Flow (m ³)	Average Daily Flow (m ³)
January	154 855	4995.3
February	150 666	5380.9
March	160 309	5171.3
April	153 868	5128.9
May	137 113	4423.0
June	136 602	4553.4
July	130 719	4216.7
August	127 851	4124.2
September	125 574	4185.8
October	120 818	3897.4
November	104 502	3483.4
December	101 061	3260.0
TOTAL	1 603 938	-
MAXIMUM	160 309	5380.9
AVERAGE	133 661.5	4401.7

Regulatory Sample Results Summary

Microbiological Testing

To meet regulatory requirements, the distribution system is sampled on a weekly basis at various locations for E. coli, Total Coliforms and heterotrophic plate count (HPC). The regulatory limit for Total Coliform and E. coli is zero, heterotrophic plate count (HPC) doesn't have a limit. Refer to Table 5 below.

Table 5: Microbiological Testing Summary

	No. of Samples Collected	Range of E.Coli Results (cfu/100mL)		Range of Total Coliform Results (cfu/100mL)		No. of HPC Samples Collected	Range of HPC Results (cfu/mL)	
		Min	Max	Min	Max		Min	Max
Distribution Water	220	0	0	0	1	59	10	2000

Operational Testing

Free chlorine residuals are monitored throughout the distribution system to meet regulatory requirements and ensure adequate secondary disinfection is provided. The regulatory requirement for free chlorine residual is a minimum of 0.05 mg/L with an objective of 0.20 mg/L in the distribution system. Refer to Table 6 below.

Table 6: Free Chlorine Residuals

Parameter	No. of Samples Collected	Range of Results	
		Minimum	Maximum
Free Chlorine Residual, grab (mg/L)	779	0.55	1.49

Inorganic Parameters

Schedule 15.1 Sampling:

The Schedule 15.1 Sampling is required under O.Reg 170/03. This includes sampling for lead, alkalinity and pH. The North Middlesex Distribution system is under reduced sampling. As such, no residential plumbing samples were required to be collected. Monitoring the pH and alkalinity in the distribution system is essential to ensure adequate buffering for corrosion control and to minimize exposure to metals such as lead. Refer to Table 7 below.

Table 7: Schedule 15.1 Sample Results

Distribution System	Number of Samples	Range of Results		MAC (ug/L)	Number of Exceedances
		Minimum	Maximum		
Alkalinity (mg/L)	6	80	90	n/a	n/a
pH	6	7.88	8.21	n/a	n/a
Lead (ug/l)	6	0.03	5.07	10	0

Organic Parameters

Organic parameters are tested quarterly as a requirement under O.Reg 170/03. This includes testing for chlorine byproducts including Trihalomethane and Halocetic Acid. Refer to Table 8 below.

Table 8: Organic Parameter Testing

	Annual Running Average	MAC	Number of Exceedances
Distribution Water			
Trihalomethane: Total (ug/L) Annual Average	28.3	100	0
Halocetic Acids: Total (ug/L) Annual Average	12.4	80	0

MAC = Maximum Allowable Concentration as per O.Reg 169/03

Additional Legislated Samples

There are no additional sampling requirements within the North Middlesex Distribution System.

Major Maintenance and Capital Summary

The North Middlesex Distribution System completed a number of repairs, installations, replacements and projects as listed below. These represent the major expenses incurred in 2023.

Table 9: Major Maintenance in 2023

Item	Description
1	Watermain Repairs, Appurtenance Repairs
2	Parkhill Main Street Watermain Replacement
3	Fire Flow Testing
4	Replaced four isolation valves in the McGillivray West System
5	Generator Repairs
6	Ausable Bluffs Watermain Commissioning
7	Lake Huron Primary Water Supply System Shutdown – Requiring Tanker Supply and Monitoring

Revision History

Date	Revision #	Revision Notes
February 23, 2024	0	Issued Report