

Hensall-Zurich Distribution System

Waterworks #260091650
System Category – Large Municipal Residential

Annual Drinking Water Report

Prepared For: Municipality of Bluewater

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.....	2
Adverse Water Quality Incidents.....	2
Non-Compliance	2
Non-Compliance Identified in a Ministry Inspection.....	2
Spills.....	3
Flows	3
Regulatory Sample Results Summary	4
Microbiological Testing.....	4
Operational Testing	4
Inorganic Parameters	5
Schedule 15.1 Sampling:	5
Organic Parameters.....	5
Additional Legislated Samples.....	5
Major Maintenance and Capital Summary.....	5
Revision History	6

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 14 Mill Ave, Zurich, Ontario, N0M 2T0.

System Process Description

The Hensall-Zurich Distribution System was deemed combined by the Ministry of the Environment, Conservation and Parks (MECP) in November, 2023. The system is a combination of the previous Hensall Distribution and Zurich Drinking Water Systems and serves a population of approximately 1990. The Hensall-Zurich Distribution System holds the previous Waterworks number from the Hensall Distribution System. A new Drinking Water Works Permit (DWWP), Municipal Drinking Water Licence (MDWL) and system classification certificate are in process.

Because the combination of these systems occurred during the period of this annual report, data for this report was taken from the Hensall Distribution System from January to October, 2023, and from the Hensall-Zurich Distribution System for the remainder of the year. Refer to the Zurich Drinking Water System annual report for that system's 2023 data.

Treated water is delivered to the Hensall-Zurich Distribution System by a trunk watermain from the Lake Huron Primary Water Supply System (LHPWSS). A 600 mm watermain runs east from Grand Bend along Huron Street West towards Exeter. A 400 mm watermain runs north along Airport Line where it terminates at a meter chamber (EH3) at County Road 84. This chamber is equipped with a flow meter, a pressure reducing valve, and an electronically controlled valve that controls the flow of water into the distribution system. This valve is operated by the LHPWSS and is based off the water level in the Hensall elevated tank. Another chamber, located on Blind Line, has two pressure reducing valves that assist in maintaining pressure in the system.

The Hensall elevated tank, located on Richmond Street North in Hensall, has a capacity of 455 m³. This tank helps maintain system pressure and provides reserve storage. Reserve storage is also provided by two reservoirs. Both the Hensall and Zurich reservoirs are equipped with chlorine analyzers to ensure secondary disinfection is met and have a capacity of 300 m³ and 1149 m³, respectively. Both reservoirs are also equipped with high lift pumps and water is cycled daily to maintain chlorine residuals. The Hensall reservoir has the ability to provide rechlorination, however, no rechlorination equipment is currently installed and no treatment chemicals are used within the Hensall-Zurich Distribution System. As well, the Zurich reservoir houses the distribution system's SCADA system.

The Hensall-Zurich Distribution System has a chlorine monitoring station equipped with an online chlorine analyzer. A provision has been made to install supplementary chlorination at this station. However, rechlorination equipment is not currently installed.

The distribution system is constructed of a combination of cast iron, ductile iron and PVC watermains ranging in

size from 100 to 400 mm. The distribution system includes various appurtenances such as valves, hydrants, and blow offs used to monitor and maintain the system. Typical system pressures range from 40 to 60 psi.

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 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
There were no AWQI's reported during this reporting period.					

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: Certification and Training, Logbooks, Operations Manuals, Reporting and Corrective Actions, Treatment Processes, and Water Quality Monitoring. This system received 0 out of 224 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.				

Spills

Spills of chemicals or chlorinated water can have a negative impact on the environment. As such, it is a federal and provincial regulatory requirement to report spills to the MECP through the Spills Action Centre (SAC) and take corrective action to mitigate potential harm.

On July 21, 2023, a communication error occurred whereby the valve at EH3 chamber remained in the open position thereby overflowing the Hensall elevated tank. Water flowed onto the lawn and parking lot surrounding the tank, however, no property damage occurred. The tower was isolated from the system preventing further spillage until valve communication was restored. Appropriate notifications were made. Refer to Table 4 below for additional information.

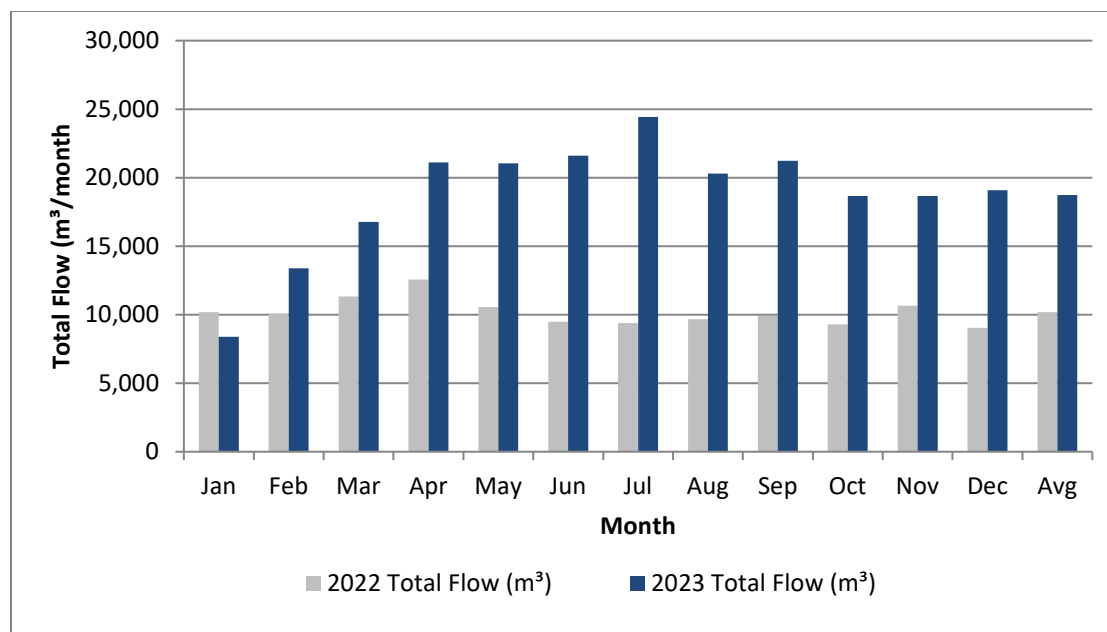
Table 4: Spill Events

Date	Legislation	Type of Spill	SAC Reference #	Cause	Corrective Action Taken
July 21, 2023	<i>Environmental Protection Act, Ontario Water Resources Act</i>	Chlorinated Water	1-3NPTLI	Valve Communication Issue	Isolated Water Tower

Flows

The total flow to the Hensall-Zurich Distribution System from LHPWSS was 224 695 m³. This is an 84% increase from the total flow in 2022 which was 122 132 m³. This increase is the result of the Zurich Drinking Water System switching from well supply to receiving water from the Hensall Distribution System via LHPWSS in February, 2023. See Figure 1 below for monthly average flows to the Hensall-Zurich Distribution System.

Figure 1: Monthly Flows to the Hensall-Zurich Distribution System



The Hensall-Zurich Distribution System is currently operating under the Hensall Distribution System MDWL (License Number: 045-101). This license does not identify a system rated capacity. The agreement between the Municipality of Bluewater and the LHPWSS Board of Management (Regional Water Supply) does not specify a maximum water taking volume.

The total flows and average daily flows per month in 2023 are listed in Table 5 below. The maximum total and average daily flow are also listed.

Table 5: Hensall-Zurich Distribution System Flows

Month	Total Flow (m ³)	Average Daily Flow (m ³)
January	8393	271
February	13 393	478
March	16 779	541
April	21 124	704
May	21 035	679
June	21 610	720
July	24 421	788
August	20 297	655
September	21 234	708
October	18 658	602
November	18 659	622
December	19 092	616
TOTAL	224 695	n/a
MAXIMUM	24 421	788
AVERAGE	18 724	615

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, HPC doesn't have a limit. Refer to Table 6 below for a summary of testing results.

Table 6: 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	164	0	0	0	0	52	10	100

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 7 below for free chlorine residual results.

Table 7: Free Chlorine Residuals

Parameter	No. of Samples Collected	Range of Results	
		Minimum	Maximum
Free Chlorine Residual, grab (mg/L)	364	0.3	1.23

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 Hensall-Zurich 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 8 below for Schedule 15.1 testing results.

Table 8: Schedule 15.1 Sample Results

Distribution System	Number of Samples	Range of Results		MAC (ug/L)	Number of Exceedances
		Minimum	Maximum		
Alkalinity (mg/L)	4	83	90	n/a	n/a
pH	4	7.54	7.83	n/a	n/a
Lead (ug/l)	2	0.02	0.09	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 9 below for organic parameter testing results.

Table 9: Organic Parameter Testing

Distribution Water	Annual Running Average	MAC	Number of Exceedances
Trihalomethane: Total (ug/L)	40	100	0
Halocetic Acids: Total (ug/L)	13	80	0

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

Additional Legislated Samples

There are no additional sampling requirements within the Hensall-Zurich Distribution System.

Major Maintenance and Capital Summary

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

Table 10: Major Maintenance in 2023

Item	Description
1	Watermain and Appurtenance Repairs
2	Construction of new Hensall Water Tower
3	Watermain Installation
4	Upgrade and relocation of SCADA equipment
5	Float repairs

Revision History

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