Windsor Utilities Commission

2023 ANNUAL REPORT

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Success by the NUMBERS

Windsor's water system has been a source of safe and reliable potable water for over 160 years.

2023 Fast Facts

76,435
Customers

$29.44 M
Invested in Infrastructure

1,419
New Water Meters Installed

35,845 ML*
Water Delivered

11.8 km
New Watermains Installed

*ML = Volume in megalitres (ML)

1 ML = 1,000,000 L

Windsor Utilities COMMISSIONERS

Kieran McKenzie

(Chair)
Councillor,
City of Windsor, Ward 9
BA

Egidio Sovran

(Vice-Chair)
Owner, E L Sovran Professional Corp.
Associate Grant Thornton
MBA, CPA, CA

Onorio Colucci

Retired CAO,
City of Windsor
CPA
(appointed April 2023)

Gary Kaschak

Councillor,
City of Windsor, Ward 8

J. Douglas Lawson

Counsel,
Willis Business Law
O.Ont. KC, LLD

Jim Morrison

Councillor,
City of Windsor, Ward 10
PFP

Ed Sleiman

Councillor,
City of Windsor, Ward 5

Mario Sonego

Retired City Engineer,
City of Windsor
President, Sonego Management Inc.
P.Eng

ENWIN Utilities Ltd.*
SENIOR MANAGEMENT

Garry Rossi

President and CEO
P.Eng

Robert Spagnuolo

VP Water Operations
MBA, P.Eng, BASc

Michelle Bonnici

Director,
People, Safety and Culture
(Chief People Officer,
appointed January, 2024)
LLM, BA

Jim Brown

VP Hydro Operations
P.Eng

Matt Carlini

VP Corporate Services and
Chief Financial Officer
CPA, CA, MBA

Paul Gleason

VP Customer Care and
Corporate Operations
LLM, BA, CSCMP

Kris Taylor

VP Business Development
MBA, CEM

*Windsor Utilities Commission maintains a contract of service with ENWIN Utilities Ltd. to operate and maintain the WUC owned water system that serves customers in Windsor, Tecumseh, and LaSalle.

Commissioner ATTENDANCE

Windsor Utilities Commission

	Commissioners	Attend	Held	%
	Kieran McKenzie	5	5	100%
	Egidio Sovran	4	5	80%
	Onorio Colucci	2	3	67%
	Gary Kaschak	5	5	100%
	Doug Lawson	5	5	100%
	Jim Morrison	5	5	100%
	Ed Sleiman	5	5	100%
	Mario Sonego	4	5	80%

Message from the

CHAIR OF THE BOARD AND VICE PRESIDENT OF WATER OPERATIONS

On behalf of the Windsor Utilities Commission (WUC), we are pleased to present our 2023 annual report to our customers, colleagues, and any parties interested in our operations.

We commenced 2023 by thanking ENWIN President and CEO Garry Rossi and WCU Chair Mayor Drew Dilkens for their years of service as Vice-President Water Operations and WUC Chair, respectively. Their dedication and mentorship were instrumental in providing our community with safe, clean, and reliable drinking water for many years. We are privileged to carry forward their legacy as the new leadership of WUC, and we express our heartfelt gratitude for the solid foundation they have laid.

The water operations team is committed to providing and maintaining the highest quality and professionalism in its products and services to our customers. It does this partly by ensuring continued compliance with the Ontario Ministry of the Environment, Conservation and Parks (MECP) Drinking Water Licensing program. We are proud to announce that as a result of the team's continued dedication, WUC has achieved a remarkable 100% inspection rating from the annual MECP audit for the 12th consecutive year.

As part of our commitment to maintaining a resilient water system, we made a number of advancements in our contingency planning efforts. This included our continued collaboration with the Union Water Supply System in designing a joint reservoir and backup connection which helped reduce the risk of water supply shortages in the event of a source water or water treatment plant emergency. This particular advancement was critical in strengthening both significant water systems in Windsor-Essex County.

We continue to invest in our water production assets to maintain reliability and optimize operational efficiency. We are proud to announce the completion of our eighth and final filter rehabilitation and upgrade at our Albert H. Weeks Water Treatment Plant (WTP) in 2023. This multi-year project will allow WUC to continue producing exceptional-quality water, optimizing treatment processes, and reducing energy costs.

In 2023, we developed our new five-year Master Plan and six-year Financial Plan, which defined our solution for meeting future demand in the City. In addition, 2023 saw the preparation for WUC's water licence renewal in 2024.

With the anticipation of Windsor's economic expansion at nearly twice the national rate, we are excited for the future of our community. As we see significant projects like the NextStar Energy facility and the Gordie Howe International Bridge nearing completion, we are confident that WUC will meet our area's growing demands. As part of our planning process, WUC initiated the design of the Central Corridor Feeder Main project in 2023, which was a key component of our Master Plan that involved the installation of a 1,200 mm diameter feedermain. This infrastructure is crucial to meet the future water demands of southern Windsor, Tecumseh, and LaSalle. With construction set to begin in 2024 and completion expected in 2027, we are confident in our ability to ensure a reliable water supply for our growing community.

Another significant accomplishment in 2023 was the announcement of the new Corporate Strategic Plan. Outlining WUC's new Mission, Vision and Values, the Strategic Plan sets the goals and initiatives for WUC as it prepares for our community's future.

A prominent component of the Strategic Plan is focused on enhancing WUC's value to its customers and partners. In 2024, our efforts are to support this goal through a Customer Education Campaign that will communicate WUC's message of value, reliability, and growth as WUC evolves to meet our customers' clean water needs.

As we look toward the future, we are confident in WUC's ability to continue its commitment to excellence, providing our customers with reliable and cost-effective water solutions that are essential to life.

Kieran McKenzie,
Chair
Windsor Utilities Commission

Robert Spagnuolo,
VP Water Operations
ENWIN Utilities Ltd.

Mission, Vision & VALUES

Strategic Goals and Initiatives

Continue to partner with a people driven learning organization.
Encourage our ENWIN service provider to drive organizational excellence and learning through attracting, retaining, developing, and engaging passionate and diverse people.

Drive a safe, secure, and resilient water supply.
Ensure a safe, secure, and resilient water supply for customers through sound physical and cyber infrastructure management and regional partnerships and investments in source water protection.

Grow WUC's value to customers and partners.
Demonstrate exceptional value to our customers and partners through a relentless focus on operational excellence and fostering a platform for clean water solutions and talent development.

Mission

We deliver to our customers the reliable and cost-effective water solutions that are essential to life.

Vision

Connecting communities through safe and sustainable water solutions.

Our Values

Agility
We are agile in responding to, and anticipating, our customers' and communities' water solutions needs.

Stewardship
We are responsible stewards of the sustainability and affordability of the vital resources that our customers and communities rely on for their quality of life.

Trust
We build trusted, long-term relationships with each other, our customers, and our communities through collaboration, engagement and volunteerism.

Excellence
We encourage and challenge ourselves to model and deliver excellence in our operations and every experience we share with each other, our customers, and our communities.

Purposeful
We are purpose-driven in our pursuit of innovation, growth, and exceptional results by seeking out and integrating diverse perspectives, experiences, and backgrounds.

WUC OPERATIONS

In 2023, WUC produced 35,845 million litres of potable water for residential, industrial, commercial and institutional customers within the City of Windsor, Town of LaSalle, and the Town of Tecumseh.

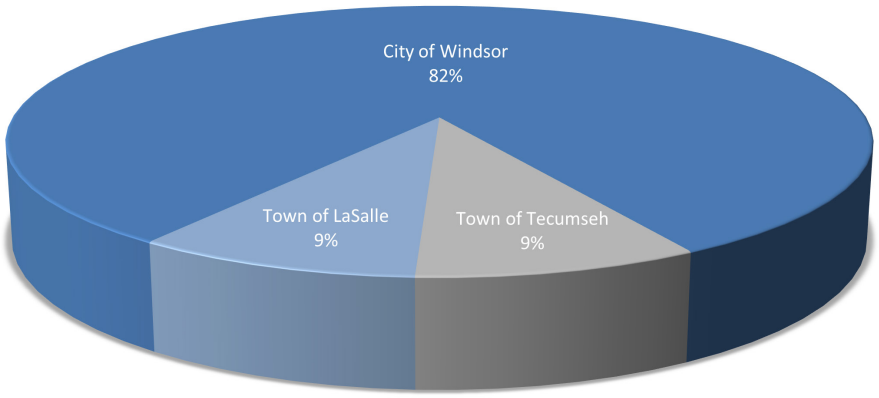
The summary contained in Table 5 – Treated Water Volume (page 25) provides a detailed breakdown of the monthly production rates. The volume of water transferred to the Town of LaSalle and the Town of Tecumseh is also provided.

Under the Municipal Drinking Water Licence (MDWL) and Ontario Regulation 170/03 (O. Reg. 170/03), there are a number of Schedules that outline the requirements for compliance with the Safe Drinking Water Act (SDWA). This report highlights O. Reg. 170/03 Schedule requirements and applicable statements of compliance or non-compliance.

Table 1: Volume in Megalitres (ML)

Town of LaSalle	3,258	9.09%
Town of Tecumseh	3,280	9.15%
City of Windsor	29,307	81.76%

Chart 1: 2023 Total Treated Water Delivered by Municipality



Treatment EQUIPMENT

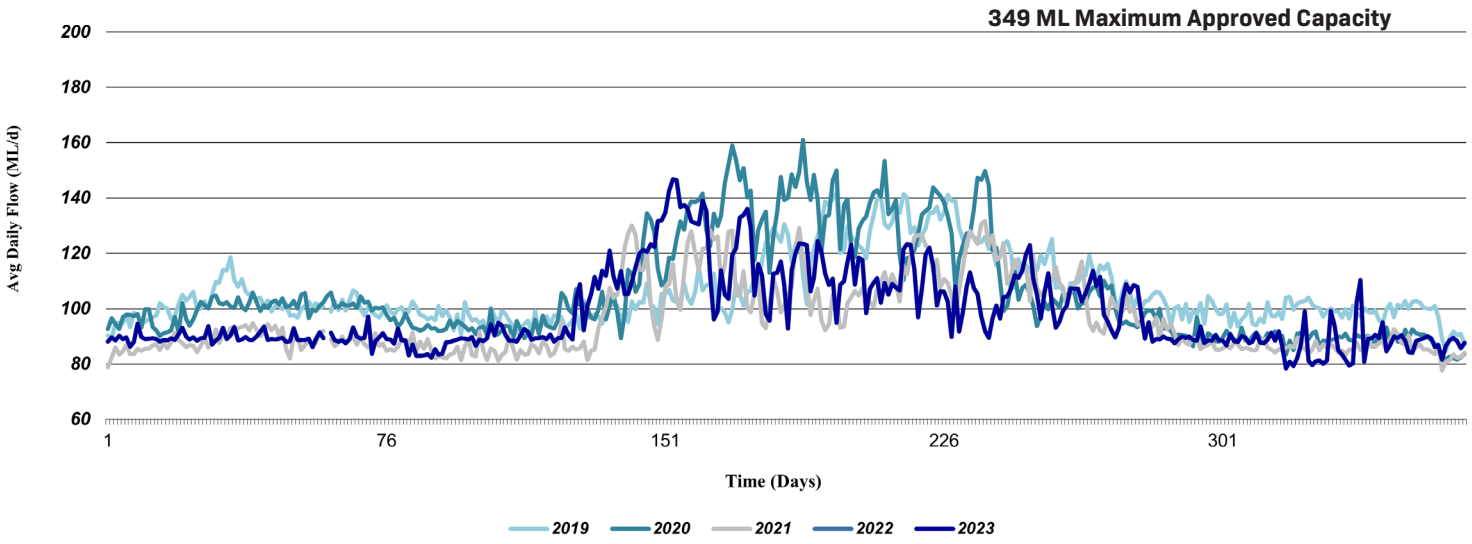
O. Reg. 170/03, Schedule 1 dictates that the owner of a drinking water system shall ensure that approved water treatment equipment, as specified in the Drinking Water Works Permit (DWWP), is provided and it is in operation whenever water is being supplied for potable use.

Further, the regulation requires that the equipment be operated in a manner that achieves its design capabilities and that only certified operators carry out operation of the system.

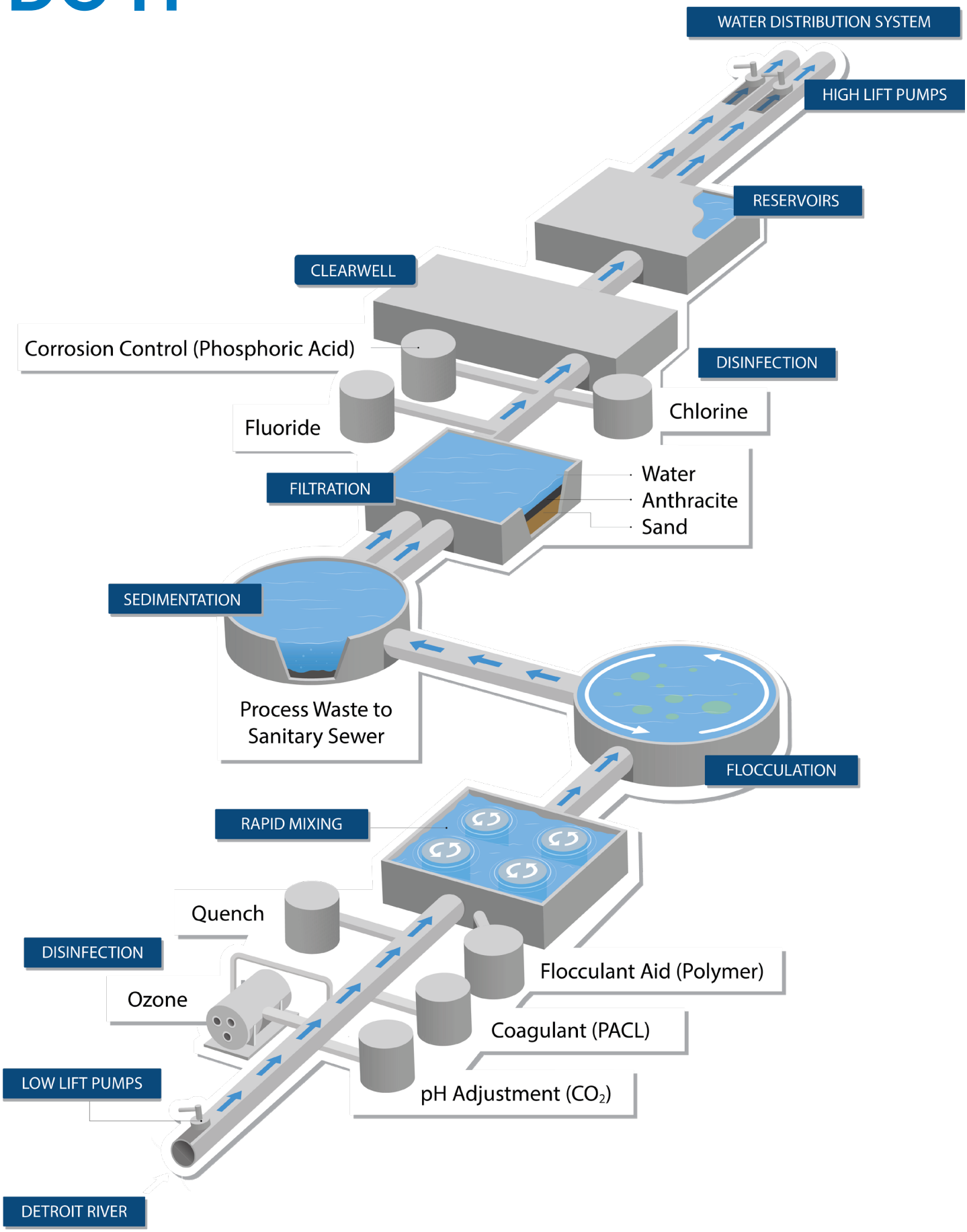
In the calendar year 2023, WUC complied fully with Schedule 1 of the regulation.

Chart 2: 2019 - 2023 Volume of Approved Capacity (below) depicts WUC's average daily water flow for the 2019 - 2023 calendar years. A daily maximum of 349 ML is the approved treatment capacity of WUC's treatment plants. As illustrated in the chart, WUC is operating well within the approved limits of the MDWL.

Chart 2: 2019 - 2023 Volume of Approved Capacity



How We DO IT


WATER DISTRIBUTION SYSTEM
HIGH LIFT PUMPS
RESERVOIRS
CLEARWELL
Corrosion Control (Phosphoric Acid)
DISINFECTION
Fluoride
Chlorine
FILTRATION
Water
Anthracite
Sand
SEDIMENTATION
Process Waste to Sanitary Sewer
FLOCCULATION
RAPID MIXING
Quench
DISINFECTION
Ozone
Flocculant Aid (Polymer)
Coagulant (PACL)
LOW LIFT PUMPS
pH Adjustment (CO_2)
DETROIT RIVER

Operational Checks, SAMPLING & TESTING

O. Reg. 170/03, Schedule 6 outlines:

- The frequency of sampling and testing requirements;
- The requirement for chlorine residual testing to be carried out at the time microbiological samples are collected;
- The location at which samples are to be collected;
- The form of sampling to be undertaken and the requirements for continuous monitoring equipment; and
- Clarification of how samples are to be handled and recorded, and the need for an appropriately accredited laboratory to carry out the sample analysis.

In the calendar year 2023, WUC complied fully with this section of the regulation.

OPERATIONAL CHECKS

O. Reg. 170/03, Schedule 7 specifies the requirements for continuous monitoring of equipment for free chlorine residual and turbidity, and the required location for this equipment. The regulation dictates the requirement for regular collection and analysis of samples by an appropriately certified individual. Chart 3: Operational Trends (below) summarizes the results for the parameters mentioned above.

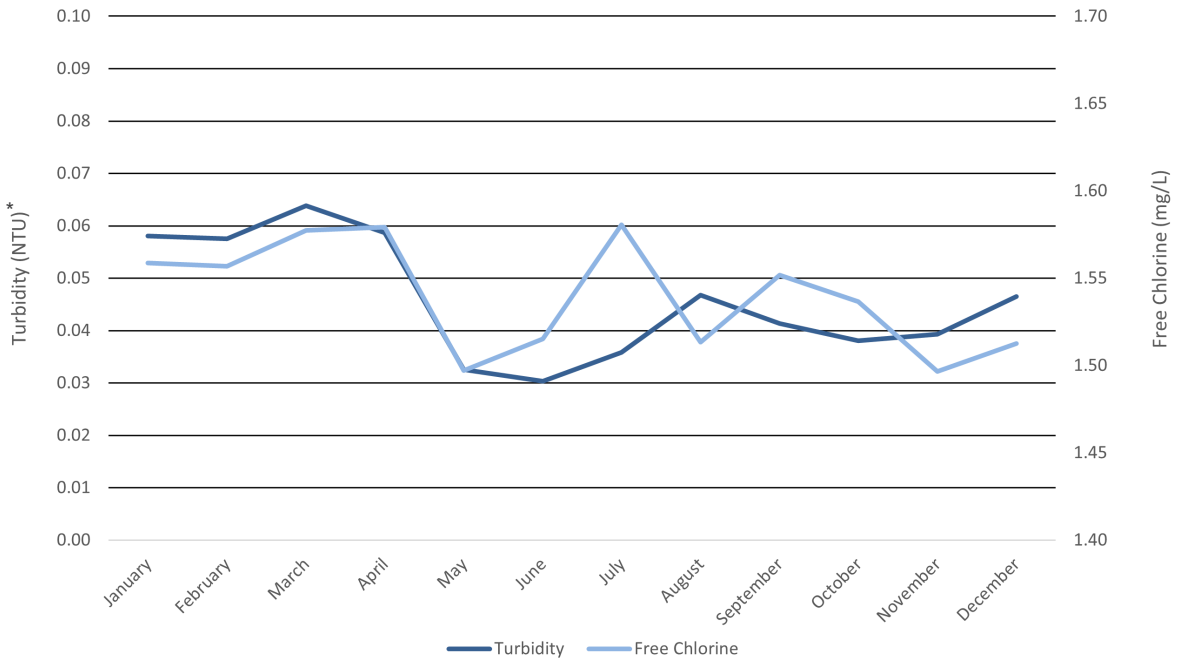
In the calendar year 2023, WUC complied fully with this section of the regulation.

MICROBIOLOGICAL SAMPLING AND TESTING

O. Reg. 170/03, Schedule 10 provides the requirements for sampling and testing of microbiological parameters.

Schedule 10 states that for large municipal systems serving a population of more than 100,000 people, the required monthly frequency of sampling is 100 distribution samples, plus one additional sample for every 10,000 people served, with at least three samples taken weekly.

Chart 3: Operational Trends



*NTU = Nephelometric Turbidity Unit

Each of these samples are to be tested for Escherichia Coli and Total Coliform, with a requirement that at least 25 per cent of the samples be tested for general bacteria population, expressed as colony counts on a heterotrophic plate count. Windsor's required sampling frequency is 130 samples monthly. In 2023, 1,883 samples were collected and analyzed - an average of 157 samples per month. Approximately 54 per cent of the distribution samples were also analyzed for heterotrophic plate count. In addition, each sample was tested for free chlorine residual at the time the sample was taken.

Schedule 10 states that a treated water sample must be taken at least once per week and tested for Escherichia Coli and Total Coliform. Windsor's treated water samples were generally collected and tested on average five days per week.

Furthermore, it states that a raw water sample must be taken at least once per week, before any treatment is applied to the water, and that the sample be tested for Escherichia Coli and Total Coliform. Samples were collected and tested on average five days per week.

Chart 4: 2023 Microbiological Sample Count (below) indicates the number of samples taken on a monthly basis.

CHEMICAL SAMPLING AND TESTING

O. Reg. 170/03, Schedule 13 provides the requirements for sample collection and testing for a variety of chemical parameters in drinking water. O. Reg 169/03 outlines the Maximum Acceptable Concentration (MAC) for each parameter required to be tested under O. Reg 170/03. The testing requirements are outlined in the following sections, along with the status of Windsor's sampling program.

INORGANICS

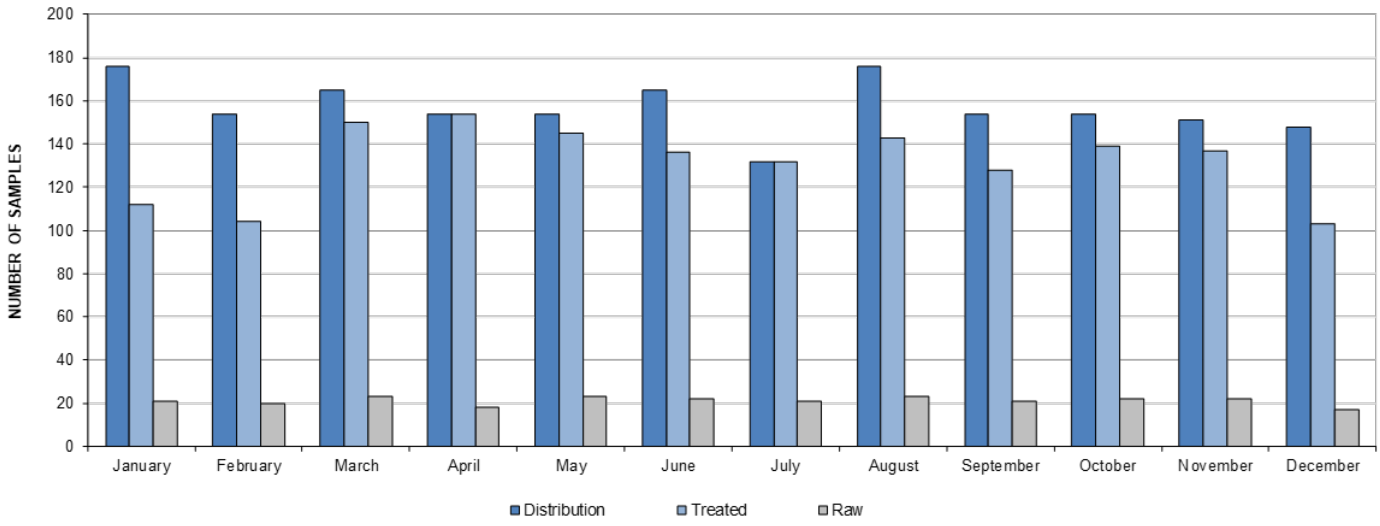
If the water source is surface water, one sample must be collected and tested every 12 months for every parameter set out in O. Reg. 170/03 Schedule 23 (see page 15 for Table 3 - Inorganics, Lead, Fluoride, Nitrates, and Sodium Sample Results).

In 2023, ENWIN, on behalf of WUC, collected and tested samples for every parameter set out in Schedule 23 on a quarterly basis.

ORGANICS

If the water source is surface water, one sample must be collected and tested every 12 months for every parameter set out in O. Reg. 170/03 Schedule 24 (see page 18 for Table 4 - Organics, THMs and HAAs Sample Results).

Chart 4: 2023 Microbiological Sample Count



In 2023, ENWIN, on behalf of WUC, collected samples and tested for every parameter set out in Schedule 24 on a quarterly basis.

TRIHALOMETHANES (THMs) AND HALOACETIC ACIDS (HAAs)

For any system that provides chlorination, one distribution sample must be collected and tested for trihalomethanes every three months (see page 18 for Table 4 - Organics, THMs and HAAs Sample Results).

In 2023, ENWIN, on behalf of WUC, collected samples and tested for trihalomethanes on a quarterly basis.

BROMATES

For any system that provides ozonation as a primary disinfection method, one treated water sample must be collected monthly from each Water Treatment Plant (see page 15 for Table 2 - Bromate Sample Results).

In 2023, ENWIN, on behalf of WUC collected samples and tested for Bromates on a monthly basis.

LEAD

One sample must be collected and tested every 12 months for Lead (see page 15 for Table 3 - Inorganics, Lead, Fluoride, Nitrates, and Sodium Sample Results).

In 2023, ENWIN, on behalf of WUC, collected samples and tested for lead in a treated water sample and a distribution sample on a quarterly basis.

NITRATES AND NITRITES

The owner of a drinking water system (WUC) and the operating authority for the system (ENWIN) must ensure that at least one water sample is taken every three months and tested for nitrates and nitrites (see page 15 for Table 3 - Inorganics, Lead, Fluoride, Nitrates, and Sodium Sample Results).

In 2023, ENWIN, on behalf of WUC, collected samples and tested for nitrates and nitrites on a quarterly basis.

SODIUM

O. Reg. 170/03, Schedule 13 stipulates that at least one water sample is taken every 60 months and tested for sodium (see page 15 for Table 3 - Inorganics, Lead, Fluoride, Nitrates, and Sodium Sample Results).

ENWIN, on behalf of WUC, collects and tests for sodium on an annual basis.

Table 2 - Bromate Sample Results

Date of legal instrument issued	Parameter	MAC or IMAC	Date Sampled	Running Annual Average Result	Unit of Measure
MDWL 025-101	Bromate - Treated	0.01	1-Jan-23 to 31-Dec-23	**0.004**	mg/L
MDWL 025-101	Bromate - Distribution	0.01	1-Jan-23 to 31-Dec-23	**0.004**	mg/L

Table 3 - Inorganics, Lead, Fluoride, Nitrates and Sodium Results

Parameter	MAC or IMAC	Sample Date	Result Value	Unit of Measure	In Compliance
Antimony	0.006	4-Oct-23	0.0001	mg/L	YES
Arsenic	0.01	4-Oct-23	0.0003	mg/L	YES
Barium	1	4-Oct-23	0.0163	mg/L	YES
Boron	5	4-Oct-23	0.016	mg/L	YES
Cadmium	0.005	4-Oct-23	0.000005 <MDL	mg/L	YES
Chromium	0.05	4-Oct-23	0.0005 <MDL	mg/L	YES
Lead	0.01	4-Oct-23	0.0005 <MDL	mg/L	YES
Mercury	0.001	4-Oct-23	0.0000001 <MDL	mg/L	YES
Selenium	0.05	4-Oct-23	0.0001	mg/L	YES
Sodium	20	4-Oct-23	6.71	mg/L	YES
Uranium	0.02	4-Oct-23	0.00004	mg/L	YES
Fluoride	1.5	4-Oct-23	0.57	mg/L	YES
Nitrite	1	4-Oct-23	0.010 <MDL	mg/L	YES
Nitrate	10	4-Oct-23	0.24	mg/L	YES

SAMPLING & TESTING: LEAD

The MDWL requires 60 samples annually to monitor corrosion control effectiveness. Sample locations include residential, non-residential and distribution systems. Each of these samples are to be tested for lead.

A total of 149 lead sample locations were collected and tested in 2023: 83 residential and non-residential samples and 66 samples in distribution. Of the 149 lead sample locations tested, one sample location exceeded the 10 micrograms per litre (µg/L).

Lead samples were collected from the kitchen tap as prescribed in O. Reg. 170/03. It remains optional to collect samples from an outside tap, as per our MDWL

In the calendar year 2023, WUC complied fully with the requirements of the MDWL.

REPORTING ADVERSE TEST RESULTS

O. Reg. 170/03 Schedule 16, outlines the adverse test result reporting requirements. If a sample collected and tested indicates an adverse test result, the owner of a drinking water system must report the result to the Medical Officer of Health (MOH) and the Spills Action Centre (SAC) of the Ministry of Environment, Conservation and Parks (MECP). If an observation other than an adverse test result indicates that a drinking water system is directing water that may not be adequately disinfected to users of the water system, the observation must be reported to the MOH and the SAC.

If a report is required under this section, a verbal report must be provided to the MOH by speaking directly to a person at the Windsor Essex County Health Unit (WECHU) or the designated on-call representative. In addition, a verbal report must be provided to the Ministry by contacting the SAC.

The verbal report of an adverse test result must be verified by written notice within 24 hours to the MOH and the SAC. This specifies the nature of the adverse test result, actions or observations taken and what corrective action is being taken.

Within seven days of the adverse test result resolution, a follow up written notice is to be provided.

In 2023, there were three adverse incidents requiring notification of the MOH and the SAC. Details are as follows:

- 1 NTU Filter effluent Turbidity for 18 minutes;
- Total Coliform result of 1 CFU/100mL – Treated Water
- Total Coliform result of 1 CFU/100mL at Sample Station at the Water Treatment Plant

CFU/100mL = colony forming units per 100 mililitres

Notifications were made to the MOH and the SAC.

Chart 5: Adverse Water Quality Incidents (see page 17) presents the number of adverse test results from 2012-2023.

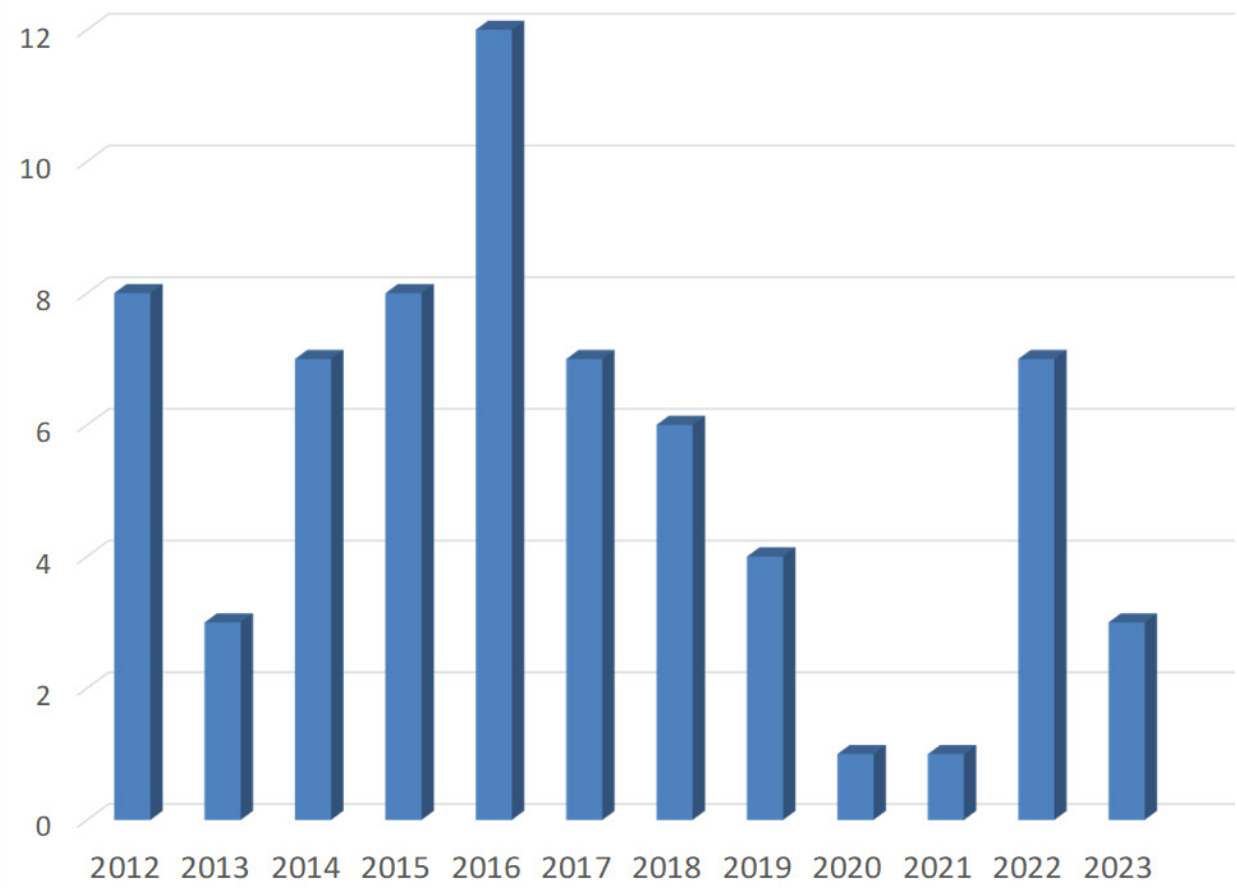
CORRECTIVE ACTION

O. Reg. 170/03, Schedule 17 outlines required corrective action to be followed with the determination of an adverse test result requiring notification. In all cases, the required corrective action was followed, as directed by the MOH.

SUMMARY REPORT FOR MUNICIPALITIES

O.Reg. 170/03 Schedule 22 requires that, no later than March 31st of each year, a summary report must be prepared for the preceding calendar year and submitted to members of municipal council and members of a municipal services board, if one exists. The submission of this report fulfills the Schedule 22 requirement of the regulation.

Chart 5: Adverse Water Quality Incidents



The following summarizing tables and charts are attached for review, included in Appendix A:

- Table 5 – 2023 Treated Water Volume (page 25)
- Table 6 – 2023 Volume as a Percentage of Approved Plant Capacity (pages 26-27)
- Chart 6 & 7 – 2023 Distribution Chlorine Residuals (page 28)
- Chart 8 & 9 – Operational Parameters (page 29)
- Chart 10 – 2023 Treated Water Aluminum (page 30)

A copy of O. Reg. 170/03 Schedule 23 (Inorganic Test Parameters) and O. Reg. 170/03 Schedule 24 (Organic Test Parameters) are attached for information (pages 30-31).

Table 4 - Organics, THMs and HAAs Sample Results

Parameter	MAC or IMAC	Sample Date	Result Value	Unit of Measure	In compliance
Alachlor	0.005	4-Oct-23	0.00050 <MDL	mg/L	YES
Atrazine + N-dealkylated metobolites	0.005	4-Oct-23	0.001 <MDL	mg/L	YES
Azinphos-methyl	0.02	4-Oct-23	0.0020 <MDL	mg/L	YES
Benzene	0.001	4-Oct-23	0.0001 <MDL	mg/L	YES
Benzo(a)pyrene	0.00001	4-Oct-23	0.0000050 <MDL	mg/L	YES
Bromoxynil	0.005	4-Oct-23	0.00050 <MDL	mg/L	YES
Carbaryl	0.09	4-Oct-23	0.005 <MDL	mg/L	YES
Carbofuran	0.09	4-Oct-23	0.005 <MDL	mg/L	YES
Carbon Tetrachloride	0.002	4-Oct-23	0.00010 <MDL	mg/L	YES
Chlorpyrifos	0.09	4-Oct-23	0.001 <MDL	mg/L	YES
Diazinon	0.02	4-Oct-23	0.001 <MDL	mg/L	YES
Dicamba	0.12	4-Oct-23	0.001 <MDL	mg/L	YES
1,2-Dichlorobenzene	0.2	4-Oct-23	0.00020 <MDL	mg/L	YES
1,4Dichlorobenzene	0.005	4-Oct-23	0.00020 <MDL	mg/L	YES
1,2-Dichloroethane	0.005	4-Oct-23	0.00020 <MDL	mg/L	YES
1,1-Dichloroethylene (vinylidene chloride)	0.014	4-Oct-23	0.00010 <MDL	mg/L	YES
Dichloromethane	0.05	4-Oct-23	0.00050 <MDL	mg/L	YES
2,4-Dichlorophenol	0.9	4-Oct-23	0.00025 <MDL	mg/L	YES
2,4-Dichlorophenoxy acetic acid (2,4-D)	0.1	4-Oct-23	0.001 <MDL	mg/L	YES
Diclofop-methyl	0.009	4-Oct-23	0.00090 <MDL	mg/L	YES

Parameter	MAC or IMAC	Sample Date	Result Value	Unit of Measure	Exceedence
Dimethoate	0.02	4-Oct-23	0.0025 <MDL	mg/L	YES
Diquat	0.07	4-Oct-23	0.007 <MDL	mg/L	YES
Diuron	0.15	4-Oct-23	0.010 <MDL	mg/L	YES
Glyphosate	0.28	4-Oct-23	0.010 <MDL	mg/L	YES
Haloacetic Acids (HAA5) (Note: show latest running annual average) Q1 2022 = <0.0053 mg/L Q2 2022 = <0.0050 mg/L Q3 2022 = <0.0050 mg/L Q4 2022 = <0.0050 mg/L	0.08	Running Annual average	0.0050 <MDL	mg/L	YES
Malathion	0.15	4-Oct-23	0.010 <MDL	mg/L	YES
MCPA	0.1	4-Oct-23	0.00050 <MDL	mg/L	YES
Metolachlor	0.05	4-Oct-23	0.0050 <MDL	mg/L	YES
Metribuzin	0.08	4-Oct-23	0.00010 <MDL	mg/L	YES
Monochlorobenzene	0.08	4-Oct-23	0.001 <MDL	mg/L	YES
Paraquat	0.01	4-Oct-23	0.00050 <MDL	mg/L	YES
Pentachlorophenol	0.06	4-Oct-23	0.00050 <MDL	mg/L	YES

Parameter	MAC or IMAC	Sample Date	Result Value	Unit of Measure	Exceedence
Phorate	0.002	4-Oct-23	0.00050 <MDL	mg/L	YES
Picloram	0.19	4-Oct-23	0.0050 <MDL	mg/L	YES
Polychlorinated Biphenyls (PCB)	0.003	4-Oct-23	0.00005 <MDL	mg/L	YES
Prometryne	0.001	4-Oct-23	0.00025 <MDL	mg/L	YES
Simazine	0.01	4-Oct-23	0.0010 <MDL	mg/L	YES
THM (Note: show latest running annual average) Q1 2022 = 0.0038 mg/L Q2 2022 = 0.00953 mg/L Q3 2022 = 0.0154 mg/L Q4 2022 = 0.00532 mg/L	0.10	Running Annual average	0.0095	mg/L	YES
Terbofos	0.001	4-Oct-23	0.00050 <MDL	mg/L	YES
Tetrachlorethylene	0.01	4-Oct-23	0.00010 <MDL	mg/L	YES
2,3,4,6-Tetrachlorophenol	0.1	4-Oct-23	0.00050 <MDL	mg/L	YES
Triallate	0.23	4-Oct-23	0.0010 <MDL	mg/L	YES
Trichloroethylene	0.05	4-Oct-23	0.00010 <MDL	mg/L	YES
2,4,6-Trichlorophenol	0.005	4-Oct-23	0.00050 <MDL	mg/L	YES
Trifluralin	0.045	4-Oct-23	0.0010 <MDL	mg/L	YES
Vinyl Chloride	0.001	4-Oct-23	0.00020 <MDL	mg/L	YES

Capital Renewal PROGRAM

Water Meter Replacement Program

WUC installed 1,419 new meters in 2023. A very small number of non-radio frequency (RF) meters remained in the field at year end. The remaining meters are either located in vacant properties or require additional attention prior to replacement due to the conditions on the customer sites. These replacements will be coordinated with customers on a case-by-case basis.

At year end, the average age of WUC's total meter population is four years. For industrial, commercial, and institutional premises only, the average age is 8.1 years.

All meter reading routes are now using the drive-by RF method to collect meter data. Aside from the exceptions noted, the Water Meter Replacement Program is now considered complete.

Watermain Replacement Program

The 2023 WUC capital renewal program involved the replacement of approximately 10.5 km of existing cast and ductile iron watermains, as well as water services, with new PVC pipelines and polyethylene/copper tubing, respectively. In addition, WUC installed 1.3 km of feedermain that will be connected to the future Central Corridor Feedermain.

Water services are typically replaced from the new watermain to the property line.

The projects included watermains that no longer provided adequate service and those deemed to have the highest risk to public health.

The MECP and Ontario Fire Codes (OFC) mandate minimum levels of performance required for hydrants throughout the water distribution system. In 2023, 85 water hydrants were installed.

WUC capital projects, such as renewal of cast iron watermain, are prioritized based on a scoring system algorithm. A point score is assigned to the seven criteria listed below to determine the priority of the project.

The higher the risk to public health and safety, the higher the score, and therefore the higher the priority status assigned.

The algorithm uses the following priority:

1. Anticipated percentage or total number of lead services
2. Deficient hydrant spacing
3. Low fire flow
4. Pipe diameter
5. Breaks per 100 m with an emphasis on recency
6. Disturbed water per 100 m
7. Age (life cycle of pipe type)

Filter Bed Rehabilitation (Phase 4): Filter #6 concrete surface waterproofing

Filter Bed Rehabilitation – Phase 4

In 2023, ENWIN completed rehabilitation of our eight dual media filters at the WTP. This included removal of the existing plastic underdrain system, waterproof coating of the filter beds and walls, installation of new stainless-steel underdrains and installation of new anthracite and sand filter media. The new underdrain system and media will increase the overall filter performance. Approximate capital expenditure for Phase 4 of the rehabilitations is $4.2M which included four filter rehabilitations from 2022 to 2023.

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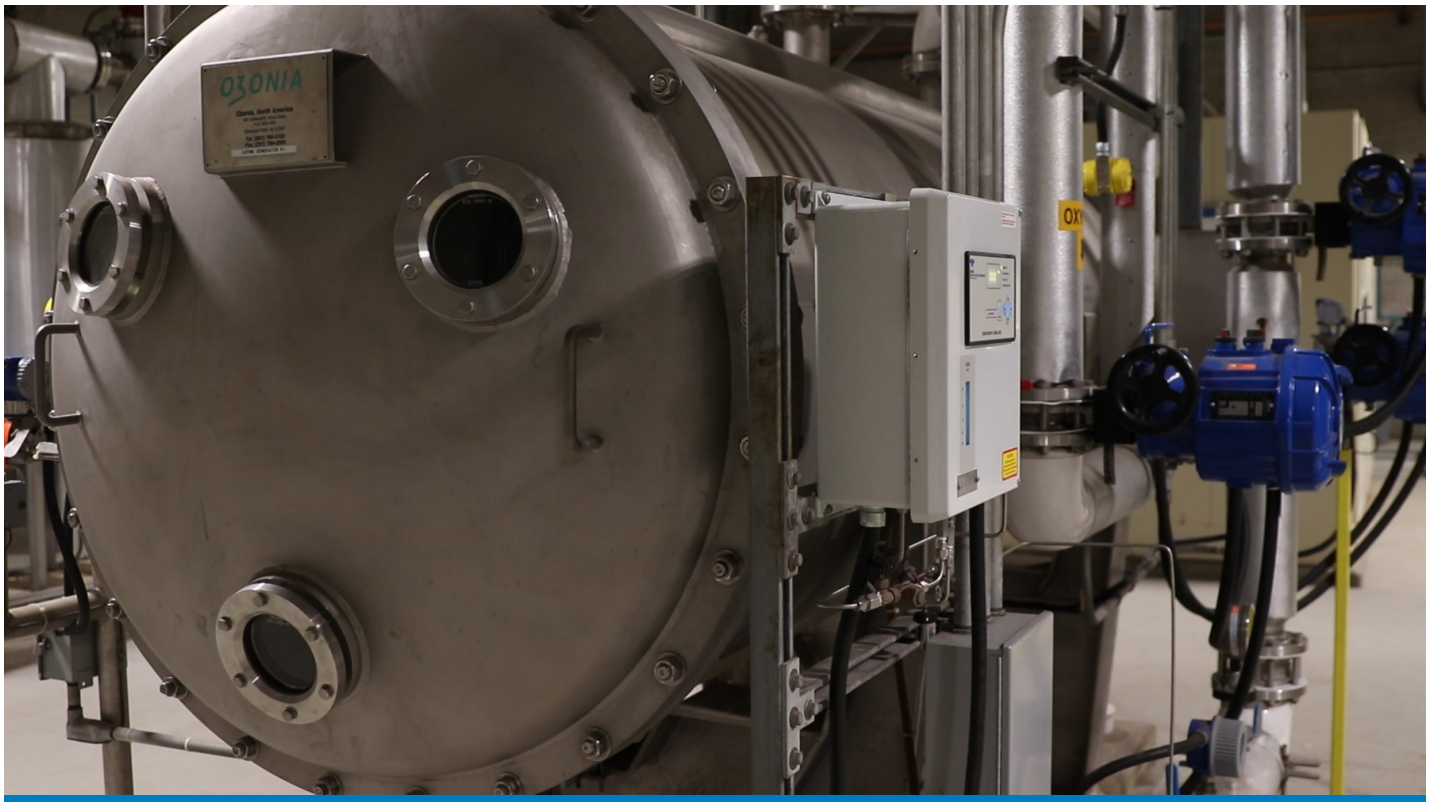
As part of the overall Fluoride Implementation project, ENWIN completed construction of the permanent fluoride dosing system, as well as upgrades to the phosphoric dosing system at the WTP. The new system includes dual chemical storage tanks, chemical dosing pump skid complete with three dosing pumps and chemical containment structure. It was completed in April 2023. Approximate cost for the overall project including studies, engineering and construction was $1.5M.



Ozone Generator at the A.H. Weeks Water Treatment Plant

Ozone Power Supply Unit (PSU) Upgrades

ENWIN procured the services of Suez Water Technologies to begin the refurbishment of two of the Ozone Generator Power Supply Units (PSU). The current PSU components for Ozone Generators #1 and #2 are at end of life and in need of replacement. ENWIN tendered the work for the PSU upgrades in summer 2022 and following receipt of the replacement equipment in October 2022 began work on the PSU upgrades. Due to some equipment issues, work on the project was completed June of 2023. Approximate capital expenditure for the project was $800k.

SCADA Network Upgrade

ENWIN engaged the service of Rockwell for the design and implementation of an upgraded Supervisory Control and Data Acquisition (SCADA) Network at the WTP. The project will update and improve the current SCADA network infrastructure, adding increased security measures in line with current industry best practices. Installation and commissioning of the new SCADA network was completed in late 2022. Testing and commissioning of the new network continued into early 2023. Approximate capital expenditure is $1.1M.

5.0 m hydrant being installed

Pipe with spacers ready to be placed in the caisson

Pipe being placed in the caisson

Water source to fill the 1050 mm feedermain using a 250 mm backflow preventer

Appendix A:
OPERATIONAL CHARTS

Table 5 - 2023 Treated Water Volume

MONTH	TOTAL PUMPED (ML) (Windsor / LaSalle / Tecumseh)	TOWN OF LASALLE (ML)	TOWN OF TECUMSEH (ML)	CITY OF WINDSOR (ML)
JANUARY	2,772	237	211	2,324
FEBRUARY	2,511	199	188	2,124
MARCH	2,718	226	199	2,293
APRIL	2,692	209	214	2,269
MAY	3,444	375	316	2,753
JUNE	3,644	418	374	2,852
JULY	3,458	329	355	2,774
AUGUST	3,277	318	326	2,633
SEPTEMBER	3,145	286	295	2,563
OCTOBER	2,850	260	305	2,286
NOVEMBER	2,582	209	259	2,114
DECEMBER	2,752	192	237	2,323
TOTAL	**35,845**	**3,258**	**3,280**	**29,307**
AVERAGE	**2,987**	**271**	**273**	**2,442**

Table 6 - Volume as Percentage of Approved Plant Capacity

Date	January		February		March		April		May		June	
	Average Daily Flow (ML/d)	Plant Capacity %	Average Daily Flow (ML/d)	Plant Capacity %	Average Daily Flow (ML/d)	Plant Capacity %	Average Daily Flow (ML/d)	Plant Capacity %	Average Daily Flow (ML/d)	Plant Capacity %	Average Daily Flow (ML/d)	Plant Capacity %
1	88.1	25%	93.1	27%	91.2	26%	87.7	25%	89.3	26%	146.8	42%
2	89.7	26%	89.0	26%	88.6	25%	88.0	25%	89.5	26%	146.4	42%
3	88.6	25%	90.4	26%	88.0	25%	88.5	25%	93.3	27%	136.7	39%
4	90.2	26%	93.3	27%	88.5	25%	88.9	25%	90.5	26%	137.5	39%
5	89.0	25%	88.6	25%	87.5	25%	89.3	26%	88.8	25%	136.3	39%
6	89.6	26%	88.9	25%	88.8	25%	89.2	26%	103.6	30%	131.6	38%
7	86.3	25%	89.8	26%	93.2	27%	88.9	25%	108.9	31%	131.0	38%
8	88.0	25%	88.7	25%	89.9	26%	89.8	26%	92.2	26%	130.5	37%
9	94.6	27%	88.8	25%	89.1	26%	86.7	25%	101.1	29%	139.1	40%
10	89.8	26%	89.9	26%	89.5	26%	88.9	25%	105.5	30%	135.4	39%
11	89.0	25%	91.5	26%	97.2	28%	88.2	25%	111.5	32%	112.0	32%
12	89.1	26%	93.5	27%	83.8	24%	89.3	26%	107.2	31%	96.2	28%
13	89.3	26%	88.8	25%	88.3	25%	94.3	27%	113.7	33%	99.1	28%
14	89.1	26%	89.0	26%	89.6	26%	90.3	26%	111.9	32%	113.9	33%
15	88.1	25%	88.9	25%	91.2	26%	94.9	27%	120.9	35%	105.0	30%
16	88.8	25%	89.2	26%	89.0	26%	94.1	27%	111.7	32%	103.5	30%
17	88.6	25%	89.4	26%	88.9	25%	90.6	26%	107.4	31%	119.5	34%
18	89.4	26%	88.0	25%	87.4	25%	88.3	25%	113.6	33%	121.8	35%
19	88.7	25%	88.3	25%	92.8	27%	88.4	25%	105.2	30%	133.0	38%
20	90.8	26%	93.0	27%	88.5	25%	88.2	25%	105.4	30%	133.9	38%
21	93.2	27%	88.7	25%	88.6	25%	90.3	26%	109.7	31%	136.1	39%
22	90.0	26%	88.7	25%	83.1	24%	92.6	27%	115.0	33%	129.4	37%
23	88.9	25%	88.7	25%	87.1	25%	91.6	26%	120.0	34%	104.8	30%
24	89.6	26%	89.1	26%	83.0	24%	88.8	25%	121.3	35%	116.2	33%
25	88.4	25%	86.2	25%	83.0	24%	89.3	26%	120.5	35%	112.1	32%
26	89.4	26%	89.0	25%	83.1	24%	89.3	26%	123.3	35%	98.1	28%
27	89.4	26%	91.5	26%	83.5	24%	89.7	26%	122.4	35%	95.7	27%
28	93.8	27%	89.3	26%	82.4	24%	89.1	26%	131.7	38%	112.6	32%
29	87.1	25%			85.4	24%	90.7	26%	131.9	38%	112.9	32%
30	88.5	25%			83.5	24%	88.1	25%	134.7	39%	117.0	34%
31	89.5	26%			83.8	24%			142.6	41%		
MAX	94.6	27%	93.5	27%	97.2	28%	94.9	27%	142.6	41%	146.8	42%

Note: White highlighted cells indicate peak consumption for the year.

Table 6 - Volume as Percentage of Approved Plant Capacity

Date	July		August		September		October		November		December	
	Average Daily Flow (ML/d)	Plant Capacity %	Average Daily Flow (ML/d)	Plant Capacity %	Average Daily Flow (ML/d)	Plant Capacity %	Average Daily Flow (ML/d)	Plant Capacity %	Average Daily Flow (ML/d)	Plant Capacity %	Average Daily Flow (ML/d)	Plant Capacity %
1	108.7	31%	106.6	31%	112.2	32%	108.9	31%	90.1	26%	80.3	23%
2	92.7	27%	121.5	35%	111.1	32%	106.0	30%	89.7	26%	102.4	29%
3	114.1	33%	123.3	35%	113.8	33%	108.6	31%	87.5	25%	110.4	32%
4	120.1	34%	123.1	35%	119.7	34%	108.0	31%	88.1	25%	80.8	23%
5	123.6	35%	114.3	33%	122.9	35%	98.1	28%	91.1	26%	89.1	26%
6	123.4	35%	96.8	28%	111.0	32%	89.2	26%	87.8	25%	89.3	26%
7	123.0	35%	107.1	31%	105.1	30%	95.1	27%	87.5	25%	90.5	26%
8	106.3	30%	119.6	34%	96.4	28%	88.1	25%	88.8	25%	89.5	26%
9	111.1	32%	122.0	35%	105.9	30%	89.0	25%	91.3	26%	95.0	27%
10	124.5	36%	115.7	33%	112.9	32%	88.9	25%	88.4	25%	84.6	24%
11	120.6	35%	101.2	29%	101.3	29%	90.0	26%	91.8	26%	86.9	25%
12	112.6	32%	106.3	30%	93.1	27%	89.2	26%	86.4	25%	90.0	26%
13	108.6	31%	106.1	30%	95.4	27%	89.0	25%	78.4	22%	89.5	26%
14	110.9	32%	102.4	29%	99.2	28%	87.4	25%	80.9	23%	90.4	26%
15	95.0	27%	89.8	26%	100.9	29%	89.1	26%	79.4	23%	88.4	25%
16	108.8	31%	108.1	31%	107.4	31%	89.9	26%	82.3	24%	84.3	24%
17	109.9	31%	91.8	26%	107.2	31%	89.5	26%	87.1	25%	84.1	24%
18	116.7	33%	98.9	28%	107.2	31%	89.9	26%	99.0	28%	88.3	25%
19	123.2	35%	108.0	31%	102.7	29%	88.7	25%	81.1	23%	88.8	25%
20	108.8	31%	113.1	32%	105.5	30%	88.5	25%	79.6	23%	89.3	26%
21	118.4	34%	107.5	31%	109.1	31%	93.6	27%	81.1	23%	90.2	26%
22	117.6	34%	105.4	30%	113.6	33%	87.7	25%	81.3	23%	89.4	26%
23	98.5	28%	97.2	28%	108.3	31%	88.6	25%	80.2	23%	86.2	25%
24	107.2	31%	91.9	26%	111.4	32%	88.4	25%	81.2	23%	87.0	25%
25	109.4	31%	89.4	26%	97.8	28%	90.5	26%	99.2	28%	81.7	23%
26	110.9	32%	96.6	28%	95.3	27%	88.5	25%	94.0	27%	86.7	25%
27	102.1	29%	101.1	29%	92.2	26%	88.4	25%	84.9	24%	88.5	25%
28	109.4	31%	96.5	28%	89.7	26%	86.7	25%	83.4	24%	89.5	26%
29	105.1	30%	104.2	30%	93.2	27%	90.8	26%	81.6	23%	88.3	25%
30	109.1	31%	104.4	30%	103.7	30%	88.3	25%	79.4	23%	85.7	25%
31	107.6	31%	107.2	31%			87.9	25%			87.7	25%
MAX	124.5	36%	123.3	35%	122.9	35%	108.9	31%	99.2	28%	110.4	32%

2023 Distribution Chlorine Residuals

Chart 6: Free Chlorine Concentration

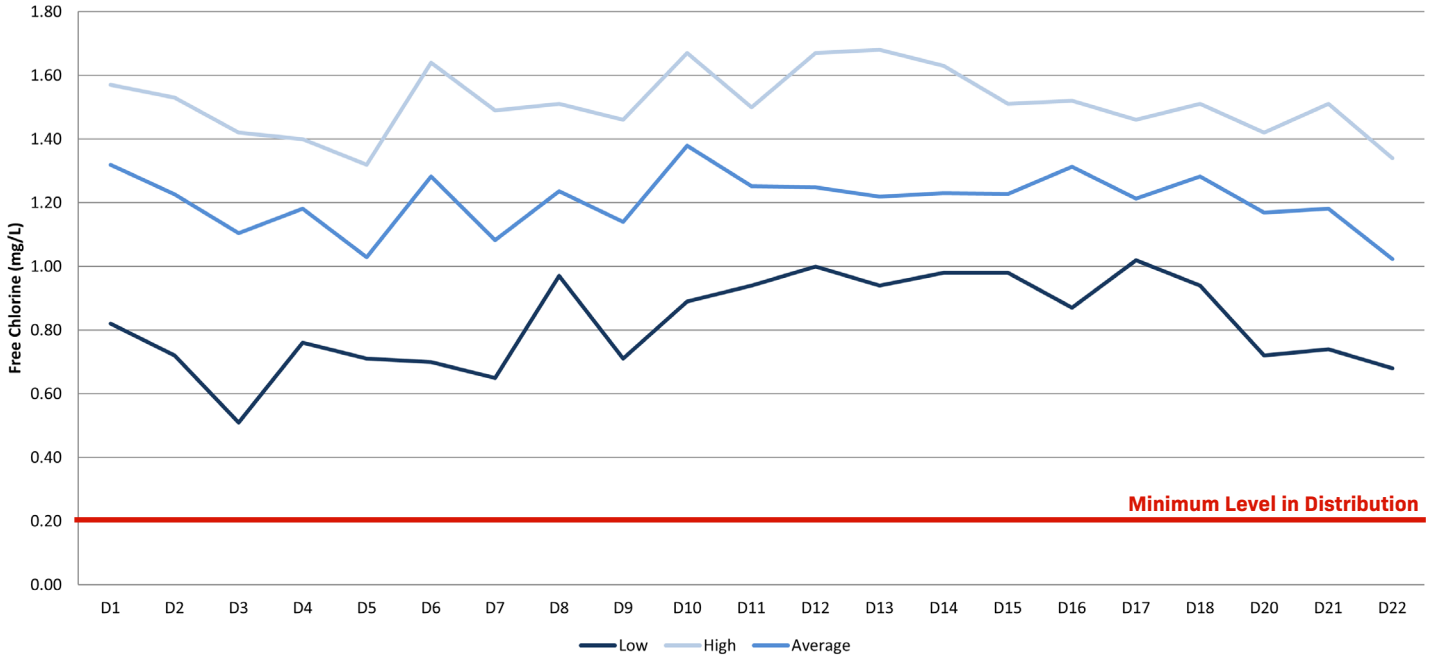


Chart 7: Average Free Chlorine Concentration per Quarter per Station

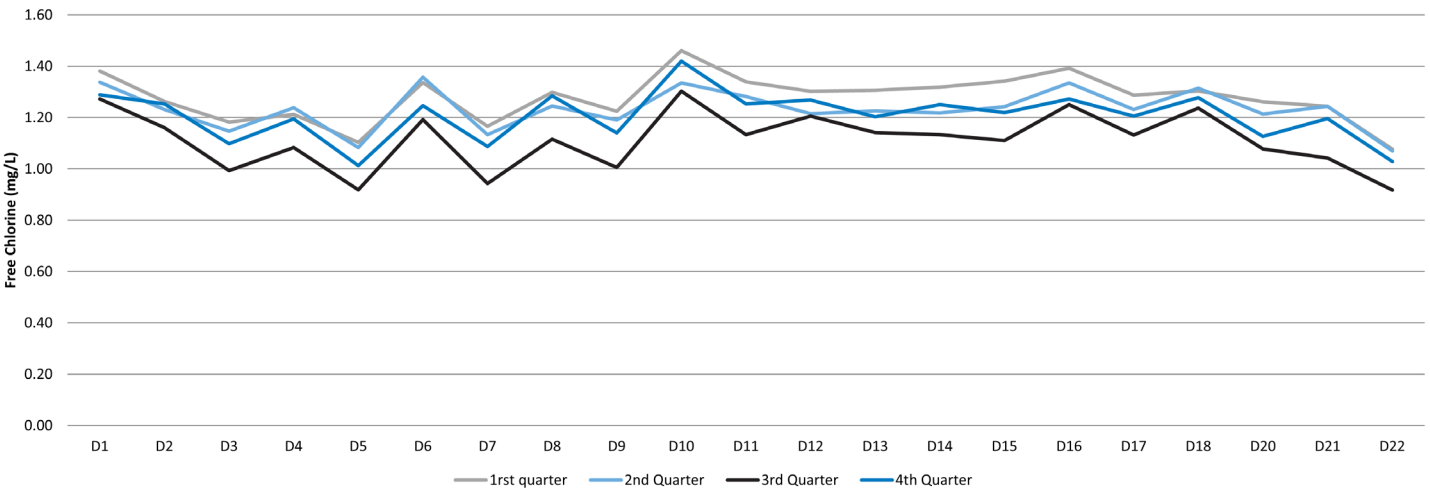
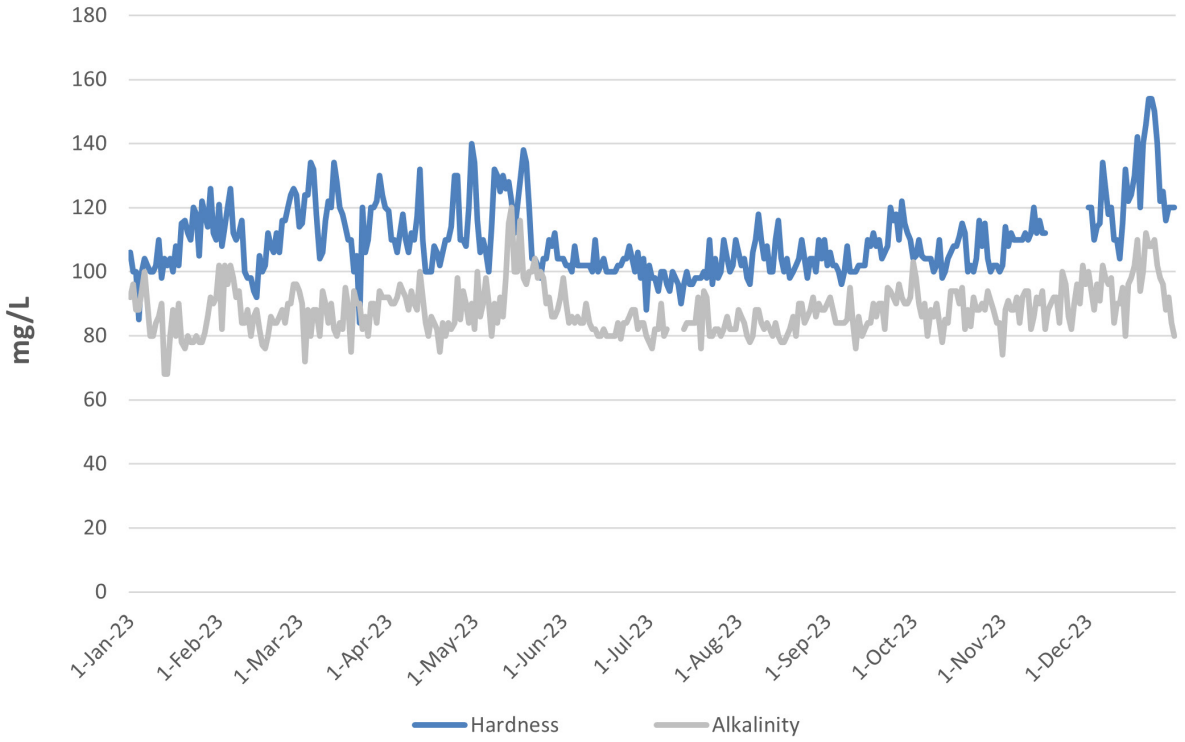


Chart 8: 2023 Operational Parameters - Treated Water Hardness and Alkalinity



Note: Gaps in the data are due to testing reagents supply shortage.

Chart 9: 2023 Operational Parameters - Treated Water Temperature and pH

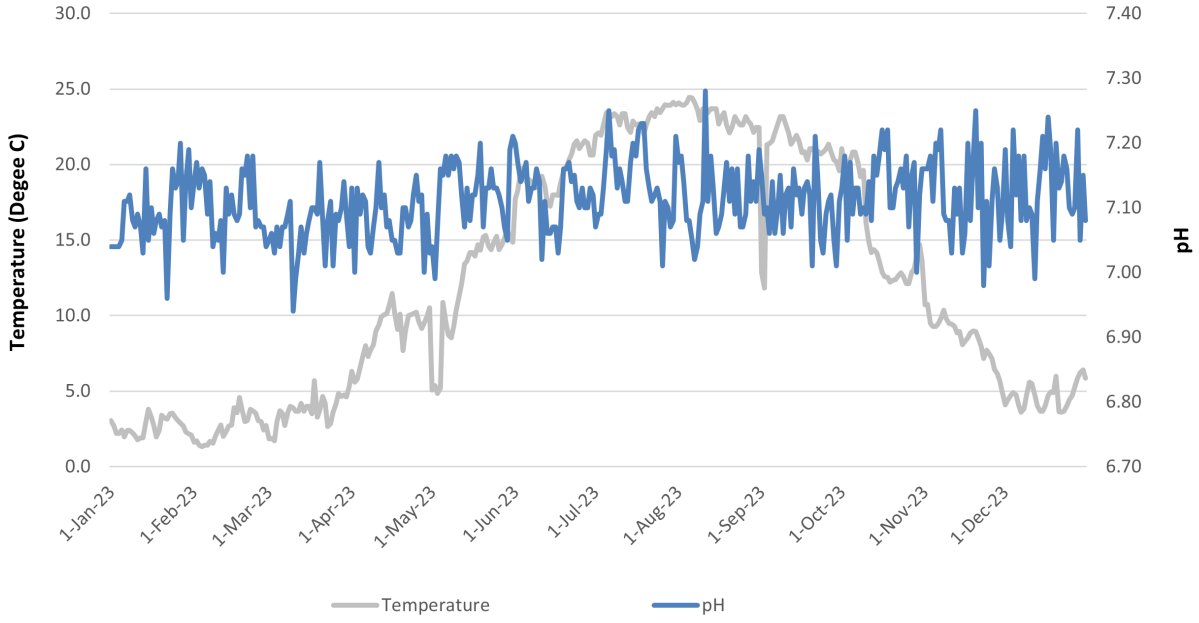
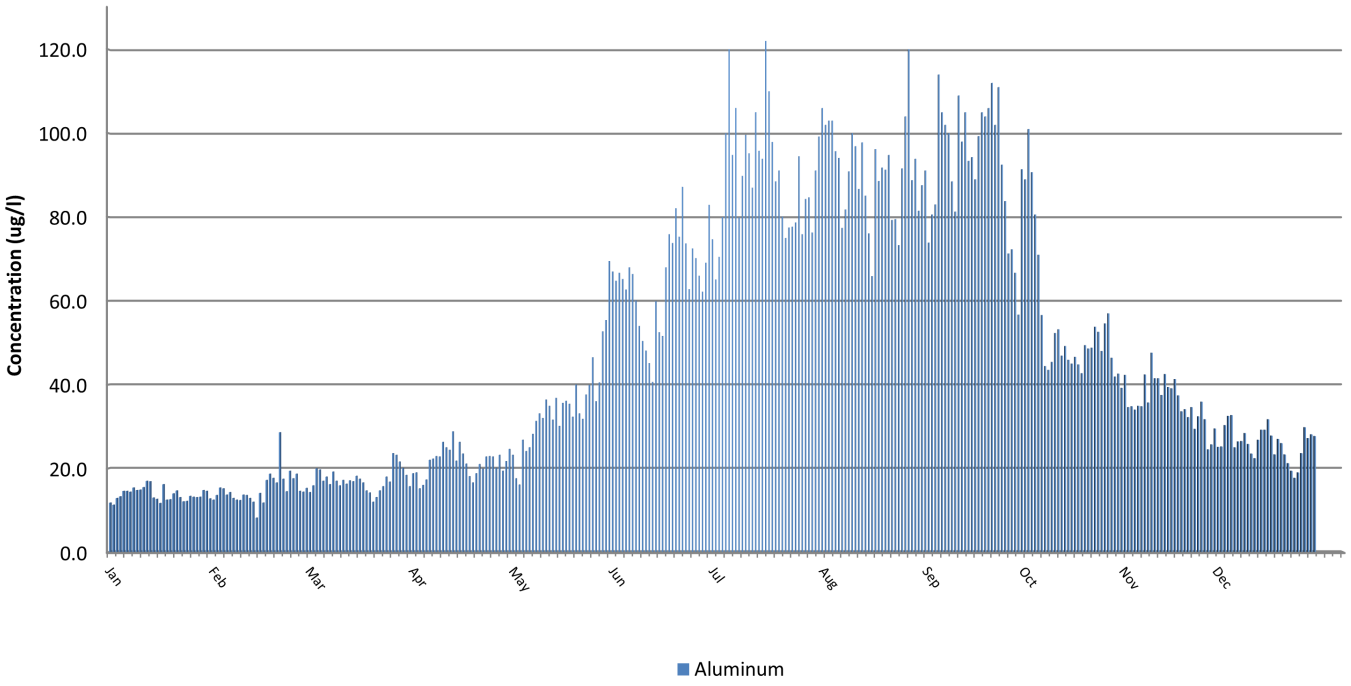


Chart 10: 2023 Treated Water Aluminum



O. Reg. 170/03 - Schedule 23 - Inorganic Parameters List

Item	Parameter
1	Antimony
2	Arsenic
3	Barium
4	Boron
5	Cadmium
6	Chromium
7	Mercury
8	Selenium
9	Uranium

O. Reg. 170/03 - Schedule 24 - Organic Parameters List

Item	Parameter
1	Alachlor
2	Atrazine + N-dealkylated metabolites
3	Azinphos-methyl
4	Benzene
5	Benzo(a)pyrene
6	Bromoxynil
7	Carbaryl
8	Carbofuran
9	Carbon Tetrachloride
10	Chlorpyrifos
11	Diazinon
12	Dicamba
13	1,2-Dichlorobenzene
14	1,4-Dichlorobenzene
15	1,2-dichloroethane
16	1,1-Dichloroethylene (vinylidene chloride)
17	Dichloromethane
18	2,4-Dichlorophenol
19	2,4-Dichlorophenoxy acetic acid (2,4-D)
20	Diclofop-methyl
21	Dimethoate
22	Diquat
Item	**Parameter**
23	Diuron
24	Glyphosate
25	Malathion
26	2-Methyl-4-chlorophenoxyacetic acid
27	Metolachlor
28	Metribuzin
29	Monochlorobenzene
30	Paraquat
31	Pentachlorophenol
32	Phorate
33	Picloram
34	Polychlorinated Biphenyls (PCB)
35	Prometryne
36	Simazine
37	Terbufos
38	Tetrachloroethylene (perchloroethylene)
39	2,3,4,6-Tetrachlorophenol
40	Triallate
41	Trichloroethylene
42	2,4,6-Trichlorophenol
43	Trifluralin
44	Vinyl Chloride

Appendix B:
O. REG. 170/03 ANNUAL WATER QUALITY REPORT

Ontario

Drinking Water Systems Regulation O. Reg. 170/03

OPTIONAL ANNUAL REPORT TEMPLATE

Drinking Water System Number:	**220003421**
Drinking Water System Name:	**City of Windsor Drinking Water System**
Drinking Water System Owner:	**The Windsor Utilities Commission**
Drinking Water System Category:	**Large Municipal Residential**
Period being reported:	**Calendar Year 2023**

Complete if your Category is Large Municipal Residential or Small Municipal Residential	***Complete for all other Categories***
Does your Drinking Water System serve more than 10,000 people? Yes [X] No [ ] **Is your annual report available to the public at no charge on a web site on the Internet? Yes [X] No [ ]** **Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.** The Windsor Utilities Commission 4545 Rhodes Dr. Windsor ON N8W 5T1	**Number of Designated Facilities served:** **Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [ ] No [ ]** **Number of Interested Authorities you report to:** **Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [ ] No [ ]**

List all Drinking Water Systems (if any), which receive all their drinking water from your system:

Drinking Water System Name	Drinking Water System Number
Town of Lasalle, ON	220004402
Town of Tecumseh, ON	260004969

Did you provide a copy of your annual report to all Drinking Water System owners that are connected to you and to whom you provide all drinking water? Yes [X] No [ ]

Indicate how you notified system users that your annual report is available and is free of charge.

[X] Public access/notice via the web
[X] Public access/notice via Government Office
[ ] Public access/notice via a newspaper
[X] Public access/notice via Public Request
[ ] Public access/notice via a Public Library
[ ] Public access/notice via other method_____

Description of the Drinking Water System

The City of Windsor Drinking Water System is owned by The Windsor Utilities Commission (WUC). It is maintained and operated by ENWIN Utilities Ltd. (ENWIN) as Operating Authority.

The City of Windsor Drinking Water System consists of the A.H. Weeks Water Treatment Plant (WTP), which is a Class IV water treatment subsystem and a Class III distribution system under Ontario Regulation 128/04 of the Safe Drinking Water Act, 2002. In addition, WUC has the Old Water Treatment Plant (OTP), also a Class IV water treatment subsystem currently in Stand By mode, A.J. Brian Pumping Station, George Avenue Pumping Station, J.F. Cooke Reservoir, Pumping and Re-chlorination Station and one (1) water tower.

To treat the raw water, which is sourced from the Detroit River, the WTP employs screening, pre-chlorination (on an as needed basis), pH adjustment (utilizing CO2), disinfection (utilizing ozone), coagulation, flocculation, sedimentation, dual-media filtration with post chlorination, fluoridation (utilizing fluorosilicic acid) and corrosion control adjustment (utilizing phosphoric acid). The WTP pumps sedimentation sludge and backwash water to the sanitary sewer.

Treated water from the WTP is routed to an on-site reservoir and another reservoir located near the WTP. The treated water is then pumped into the distribution system from two (2) pumping stations, which are located near the WTP. Water from the pumping stations satisfies demand for the greater Windsor area including the Towns of Tecumseh and LaSalle. A reservoir, pumping and re-chlorination station located further from the WTP provides system pressure and flow to the southwest portion of the system, while a centrally located water tower provides pressure and flow control to the downtown core.

The drinking water system is monitored continuously at various locations, both at the WTP and pumping stations as well as throughout the distribution system via a Supervisory Control and Data Acquisition (SCADA) system.

List all water treatment chemicals used over this reporting period

Chlorine gas, Sodium Hypochlorite, Carbon Dioxide (CO2), Ozone (generated on-site using liquid oxygen), Calcium Thiosulfate (ozone quench agent), Polyaluminum Chloride (PaCl), Filter Aid Cationic Polymer, Phosphoric Acid (corrosion control agent) and Fluorosilisic Acid.

Were any significant expenses incurred to?

[X] Install required equipment
[X] Repair required equipment
[X] Replace required equipment

Please provide a brief description and a breakdown of monetary expenses incurred:

Capital Projects in the Distribution System,

WUC, with a capital expenditure of approximately $17,500M, has:

- Installed 10.53 KM of Watermain (<400 mm)
- Installed 1.34KM of Feedermain (>400 mm)
- Installed 967 New Water Services in the public Right the Way (ROW)
- Installed 250 New Valves in the public ROW
- Installed 85 New Fire Hydrants in the public ROW
- Removed 76 Old Fire Hydrants in the public ROW
- Removed 592 Old Lead Water Services in the public ROW

Capital Projects in the Treatment System encompasses:

Filter Bed Rehabilitation – Phase 4

ENWIN completed rehabilitation of our eight (8) dual media filters at the WTP in 2023 which included removal of the existing plastic underdrain system, waterproof coating of the filter beds and walls, installation of new stainless-steel underdrains and installation of new anthracite and sand filter media. The new underdrain system and media will increase the overall filter performance. Approximate capital expenditure for phase 4 of the rehabilitations is $4.2M which included four (4) filter rehabilitations from 2022 to 2023.

Fluoride Implementation

As part of the overall fluoride implementation project, ENWIN completed construction of the permanent fluoride dosing system, as well as upgrades to the phosphoric dosing system at the WTP. The new system includes dual chemical storage tanks, chemical dosing pump skid complete with three (3) dosing pumps and chemical containment structure, and it was completed April 2023. Approximate cost for the overall project including studies, engineering and construction was $1.5M.

SCADA Network Upgrade

ENWIN engaged the service of Rockwell for the design and implementation of an upgraded SCADA Network at the WTP. The project will update and improve the current SCADA network infrastructure, adding increased security measures in line with current industry best practice. Installation and commissioning of the new SCADA network was completed in late 2022. Testing and commissioning of the new network continued into early 2023. Approximate capital expenditure is $1.1M.

Ozone Power Supply Unit (PSU) Upgrades

ENWIN procured the services of Suez Water Technologies to begin the refurbishment of two of the Ozone Generator Power Supply Units (PSU). The current PSU components for Ozone Gen. #1 and #2 are at end of life and in need of replacement. ENWIN tendered the work for the PSU upgrades in summer 2022 and following receipt of the replacement equipment in October 2022 began work on the PSU upgrades. Due to some equipment issues, work on the project was completed June of 2023. Approximate capital expenditure for the project was $800k.

Provide details on the notices submitted in accordance with subsection 18 (1) of the Safe Drinking Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre.

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
2023/03/11	1 NTU Turbidity for 18 minutes	1	NTU	Additional monitoring and sampling. Refer to CPAR EWU-2023-04 details.	2023/03/20
2023/09/10	Total Coliform (TC) – Treated Water	TC = 1	CFU/100 mL	Due to our sampling schedule samples are collected every 12 hours, consecutively. Note: This is a point source (Most likely Laboratory error)	2023/09/15
2023/11/17	Total Coliform (TC) – S.S. D10	TC = 1	CFU/100 mL	Flush and Re-sample at location, upstream and downstream for 2 consecutive days. Results of the re-sampling are free of bacterial content.	2023/11/21

Please refer to the colour chart below when reviewing the data summarized herein:

Green	Indicates results are in compliance
Yellow	Indicates results are in compliance however above the half Maximum Acceptable Concentration (MAC) or IMAC level.
Red	Indicates results are not in compliance or not within the operational guideline

Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.

	Number of Samples	Range of E.Coli (min#)-(max#)	Range of Total Coliform (min#)-(max#)	Number of HPC Samples	Range of HPC (min#)-(max#)
Raw	253	**0 - 2600**	**0 - 8500**	253	**<10 - 1650[1]**
Treated	1583	**0 - 0**	**0 - 1**	968	**<10 - 440[2]**
Distribution	1883	**0 - 0**	**0 - 1**	1023	**<10 - 300[2]**

(1) No standard available – Results indicate the overall Raw Water Quality
(2) < 500 – Internal Target as Best Management Practice

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report.

	Number of Samples	Range of Results (min#)-(max#)	Unit of Measure
Turbidity	365	0.02 - 0.1	NTU
Chlorine	365	1.19 - 1.66	mg/L

Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.

Date of legal instrument issued	Parameter	Date Sampled	Running Annual Average Result	Unit of Measure	In compliance
MDWL 025-101	Bromate - Treated	1-Jan-23 to 31-Dec-23	0.004	mg/L	Yes
MDWL 025-101	Bromate - Distribution	1-Jan-23 to 31-Dec-23	0.004	mg/L	Yes

Date of legal instrument issued	Location Type	Number of Samples	Range of Lead Results (min#)-(max#)	Unit of Measure	Number of Exceedances
MDWL 025-101	Lead - Plumbing	83	<0.05 - 12.9	ug/L	1
MDWL 025-101	Lead - Distribution	66	<0.05 - 9.77	ug/L	0

Summary of Inorganic parameters tested during this reporting period or the most recent sample results.

Parameter	MAC OR IMAC	Sample Date	Result Value	Unit of Measure	In Compliance
Antimony	0.006	October 4, 2023	0.0001	mg/L	Yes
Arsenic	0.01	October 4, 2023	0.0003	mg/L	Yes
Barium	1	October 4, 2023	0.0163	mg/L	Yes
Boron	5	October 4, 2023	0.016	mg/L	Yes
Cadmium	0.005	October 4, 2023	0.000005 <MDL	mg/L	Yes
Chromium	0.05	October 4, 2023	0.00050 <MDL	mg/L	Yes
Lead(3)	0.01	October 4, 2023	0.0005 <MDL	mg/L	Yes
Mercury	0.001	October 4, 2023	0.00000010 <MDL	mg/L	Yes
Selenium	0.05	October 4, 2023	0.0001	mg/L	Yes
Sodium	20	October 4, 2023	6.71	mg/L	Yes
Uranium	0.02	October 4, 2023	0.00004	mg/L	Yes
Fluoride	1.5	October 4, 2023	0.57	mg/L	Yes
Nitrite(3)	1	October 4, 2023	0.010 <MDL	mg/L	Yes
Nitrate(3)	10	October 4, 2023	0.24	mg/L	Yes

(3) Lead, Nitrite, Nitrate results are from Maximum resolution in the Distribution system

Summary of Organic parameters sampled during this reporting period or the most recent sample results.

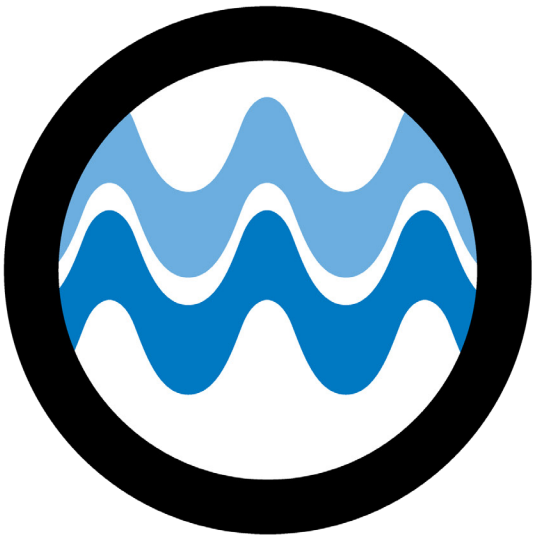
Parameter	MAC OR IMAC	Sample Date	Result Value	Unit of Measure	In Compliance
Alachlor	0.005	October 4, 2023	**0.00050 <MDL**	mg/L	Yes
Atrazine + N-dealkylated metobolites	0.005	October 4, 2023	**0.001 <MDL**	mg/L	Yes
Azinphos-methyl	0.02	October 4, 2023	**0.0020 <MDL**	mg/L	Yes
Benzene	0.001	October 4, 2023	**0.0001 <MDL**	mg/L	Yes
Benzo(a)pyrene	0.00001	October 4, 2023	**0.0000050 <MDL**	mg/L	Yes
Bromoxynil	0.005	October 4, 2023	**0.00050 <MDL**	mg/L	Yes
Carbaryl	0.09	October 4, 2023	**0.005 <MDL**	mg/L	Yes
Carbofuran	0.09	October 4, 2023	**0.005 <MDL**	mg/L	Yes
Carbon Tetrachloride	0.002	October 4, 2023	**0.00010 <MDL**	mg/L	Yes
Chlorpyrifos	0.09	October 4, 2023	**0.001 <MDL**	mg/L	Yes
Diazinon	0.02	October 4, 2023	**0.001 <MDL**	mg/L	Yes
Dicamba	0.12	October 4, 2023	**0.001 <MDL**	mg/L	Yes
1,2-Dichlorobenzene	0.2	October 4, 2023	**0.00020 <MDL**	mg/L	Yes
1,4Dichlorobenzene	0.005	October 4, 2023	**0.00020 <MDL**	mg/L	Yes
1,2-Dichloroethane	0.005	October 4, 2023	**0.00020 <MDL**	mg/L	Yes
1,1-Dichloroethylene (vinylidene chloride)	0.014	October 4, 2023	**0.00010 <MDL**	mg/L	Yes
Dichloromethane	0.05	October 4, 2023	**0.00050 <MDL**	mg/L	Yes
2,4-Dichlorophenol	0.9	October 4, 2023	**0.00025 <MDL**	mg/L	Yes
2,4-Dichlorophenoxy acetic acid (2,4-D)	0.1	October 4, 2023	**0.001 <MDL**	mg/L	Yes
Diclofop-methyl	0.009	October 4, 2023	**0.00090 <MDL**	mg/L	Yes
Dimethoate	0.02	October 4, 2023	**0.0025 <MDL**	mg/L	Yes
Diquat	0.07	October 4, 2023	**0.007 <MDL**	mg/L	Yes
Diuron	0.15	October 4, 2023	**0.010 <MDL**	mg/L	Yes
Glyphosate	0.28	October 4, 2023	**0.010 <MDL**	mg/L	Yes
Haloacetic Acids (HAA5)[4] (Note: show latest running annual average) Q1 2023 = <0.0050 mg/L Q2 2023 = <0.0050 mg/L Q3 2023 = <0.0050 mg/L Q4 2023 = <0.0050 mg/L	0.080	Running Annual Average =	**0.0050 <MDL**	mg/L	Yes
Malathion	0.19	October 4, 2023	**0.010 <MDL**	mg/L	Yes
MCPA	0.1	October 4, 2023	**0.00050 <MDL**	mg/L	Yes
Metolachlor	0.05	October 4, 2023	**0.0050 <MDL**	mg/L	Yes
Metribuzin	0.08	October 4, 2023	**0.00010 <MDL**	mg/L	Yes
Monochlorobenzene	0.08	October 4, 2023	**0.001 <MDL**	mg/L	Yes

Parameter	MAC OR IMAC	Sample Date	Result Value	Unit of Measure	In Compliance
Paraquat	0.01	October 4, 2023	**0.00050 <MDL**	mg/L	Yes
Pentachlorophenol	0.06	October 4, 2023	**0.00050 <MDL**	mg/L	Yes
Phorate	0.002	October 4, 2023	**0.0050 <MDL**	mg/L	Yes
Picloram	0.19	October 4, 2023	**0.00005 <MDL**	mg/L	Yes
Polychlorinated Biphenyls (PCB)	0.003	October 4, 2023	**0.00025 <MDL**	mg/L	Yes
Prometryne	0.001	October 4, 2023	**0.0010 <MDL**	mg/L	Yes
Simazine	0.01	October 4, 2023	**0.0010 <MDL**	mg/L	Yes
THM[(4)] (Note: show latest running annual average) Q1 2023 = 0.00349 mg/L Q2 2023 = 0.00615 mg/L Q3 2023 = 0.0144 mg/L Q4 2023 = 0.014 mg/L	0.100	Running Annual Average =	**0.0095**	mg/L	Yes
Terbofos	0.001	October 4, 2023	**0.00050 <MDL**	mg/L	Yes
Tetrachlorethylene	0.01	October 4, 2023	**0.00010 <MDL**	mg/L	Yes
2,3,4,6-Tetrachlorophenol	0.1	October 4, 2023	**0.00050 <MDL**	mg/L	Yes
Triallate	0.23	October 4, 2023	**0.0010 <MDL**	mg/L	Yes
Trichloroethylene	0.005	October 4, 2023	**0.00010 <MDL**	mg/L	Yes
2,4,6-Trichlorophenol	0.005	October 4, 2023	**0.00050 <MDL**	mg/L	Yes
Trifluralin	0.045	October 4, 2023	**0.0010 <MDL**	mg/L	Yes
Vinyl Chloride	0.001	October 4, 2023	**0.00020 <MDL**	mg/L	Yes

(4) – THM's and HAA5 results are from Max resolution in the Distribution system
Note – MDL – Method Detection Limit

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

No Inorganic or Organic parameter(s) exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.



WINDSOR UTILITIES COMMISSION

Ontario

Drinking Water Systems Regulation O. Reg. 170/03

OPTIONAL ANNUAL REPORT TEMPLATE

Drinking Water System Number:	**220003421**
Drinking Water System Name:	**City of Windsor Drinking Water System**
Drinking Water System Owner:	**The Windsor Utilities Commission**
Drinking Water System Category:	**Large Municipal Residential**
Period being reported:	**Calendar Year 2023**

Complete if your Category is Large Municipal Residential or Small Municipal Residential

Does your Drinking Water System serve more than 10,000 people? Yes [X] No [ ]

Is your annual report available to the public at no charge on a web site on the Internet? Yes [X] No [ ]

Location where Summary Report required under O. Reg. 170/03 Schedule 22 will be available for inspection.

The Windsor Utilities Commission
4545 Rhodes Dr.
Windsor ON N8W 5T1

Complete for all other Categories

Number of Designated Facilities served:

Did you provide a copy of your annual report to all Designated Facilities you serve? Yes [ ] No [ ]

Number of Interested Authorities you report to:

Did you provide a copy of your annual report to all Interested Authorities you report to for each Designated Facility? Yes [ ] No [ ]

List all Drinking Water Systems (if any), which receive all their drinking water from your system:

Drinking Water System Name	Drinking Water System Number
Town of Lasalle, ON	220004402
Town of Tecumseh, ON	260004969

Did you provide a copy of your annual report to all Drinking Water System owners that are connected to you and to whom you provide all drinking water? Yes [X] No [ ]

Indicate how you notified system users that your annual report is available and is free of charge.

- **[X] Public access/notice via the web**
- **[X] Public access/notice via Government Office**
- **[ ] Public access/notice via a newspaper**
- **[X] Public access/notice via Public Request**
- **[ ] Public access/notice via a Public Library**
- **[ ] Public access/notice via other method_____**

Description of the Drinking Water System

The City of Windsor Drinking Water System is owned by The Windsor Utilities Commission (WUC). It is maintained and operated by ENWIN Utilities Ltd. (ENWIN) as Operating Authority.

The City of Windsor Drinking Water System consists of the A.H. Weeks Water Treatment Plant (WTP), which is a Class IV water treatment subsystem and a Class III distribution system under Ontario Regulation 128/04 of the Safe Drinking Water Act, 2002. In addition, WUC has the Old Water Treatment Plant (OTP), also a Class IV water treatment subsystem currently in Stand By mode, A.J. Brian Pumping Station, George Avenue Pumping Station, J.F. Cooke Reservoir, Pumping and Re-chlorination Station and one (1) water tower.

To treat the raw water, which is sourced from the Detroit River, the WTP employs screening, pre-chlorination (on an as needed basis), pH adjustment (utilizing CO2), disinfection (utilizing ozone), coagulation, flocculation, sedimentation, dual-media filtration with post chlorination, fluoridation (utilizing fluorosilicic acid) and corrosion control adjustment (utilizing phosphoric acid). The WTP pumps sedimentation sludge and backwash water to the sanitary sewer.

Treated water from the WTP is routed to an on-site reservoir and another reservoir located near the WTP. The treated water is then pumped into the distribution system from two (2) pumping stations, which are located near the WTP. Water from the pumping stations satisfies demand for the greater Windsor area including the Towns of Tecumseh and LaSalle. A reservoir, pumping and re-chlorination station located further from the WTP provides system pressure and flow to the southwest portion of the system, while a centrally located water tower provides pressure and flow control to the downtown core.

The drinking water system is monitored continuously at various locations, both at the WTP and pumping stations as well as throughout the distribution system via a Supervisory Control and Data Acquisition (SCADA) system.

List all water treatment chemicals used over this reporting period

Chlorine gas, Sodium Hypochlorite, Carbon Dioxide (CO2), Ozone (generated on-site using liquid oxygen), Calcium Thiosulfate (ozone quench agent), Polyaluminum Chloride (PaCl), Filter Aid Cationic Polymer, Phosphoric Acid (corrosion control agent) and Fluorosilisic Acid.

Were any significant expenses incurred to?

[X] Install required equipment
[X] Repair required equipment
[X] Replace required equipment

Please provide a brief description and a breakdown of monetary expenses incurred:

Capital Projects in the Distribution System,

WUC, with a capital expenditure of approximately $17,500M, has:

- Installed 10.53 KM of Watermain (<400 mm)
- Installed 1.34KM of Feedermain (>400 mm)
- Installed 967 New Water Services in the public Right the Way (ROW)
- Installed 250 New Valves in the public ROW
- Installed 85 New Fire Hydrants in the public ROW
- Removed 76 Old Fire Hydrants in the public ROW
- Removed 592 Old Lead Water Services in the public ROW

Capital Projects in the Treatment System encompasses:

Filter Bed Rehabilitation – Phase 4

ENWIN completed rehabilitation of our eight (8) dual media filters at the WTP in 2023 which included removal of the existing plastic underdrain system, waterproof coating of the filter beds and walls, installation of new stainless-steel underdrains and installation of new anthracite and sand filter media. The new underdrain system and media will increase the overall filter performance. Approximate capital expenditure for phase 4 of the rehabilitations is $4.2M which included four (4) filter rehabilitations from 2022 to 2023.

Fluoride Implementation

As part of the overall fluoride implementation project, ENWIN completed construction of the permanent fluoride dosing system, as well as upgrades to the phosphoric dosing system at the WTP. The new system includes dual chemical storage tanks, chemical dosing pump skid complete with three (3) dosing pumps and chemical containment structure, and it was completed April 2023. Approximate cost for the overall project including studies, engineering and construction was $1.5M.

SCADA Network Upgrade

ENWIN engaged the service of Rockwell for the design and implementation of an upgraded SCADA Network at the WTP. The project will update and improve the current SCADA network infrastructure, adding increased security measures in line with current industry best practice. Installation and commissioning of the new SCADA network was completed in late 2022. Testing and commissioning of the new network continued into early 2023. Approximate capital expenditure is $1.1M.

Ozone Power Supply Unit (PSU) Upgrades

ENWIN procured the services of Suez Water Technologies to begin the refurbishment of two of the Ozone Generator Power Supply Units (PSU). The current PSU components for Ozone Gen. #1 and #2 are at end of life and in need of replacement. ENWIN tendered the work for the PSU upgrades in summer 2022 and following receipt of the replacement equipment in October 2022 began work on the PSU upgrades. Due to some equipment issues, work on the project was completed June of 2023. Approximate capital expenditure for the project was $800k.

Provide details on the notices submitted in accordance with subsection 18 (1) of the Safe Drinking Water Act or section 16-4 of Schedule 16 of O.Reg.170/03 and reported to Spills Action Centre.

Incident Date	Parameter	Result	Unit of Measure	Corrective Action	Corrective Action Date
2023/03/11	1 NTU Turbidity for 18 minutes	1	NTU	Additional monitoring and sampling. Refer to CPAR EWU-2023-04 details.	2023/03/20
2023/09/10	Total Coliform (TC) – Treated Water	TC = 1	CFU/100 mL	Due to our sampling schedule samples are collected every 12 hours, consecutively. Note: This is a point source (Most likely Laboratory error)	2023/09/15
2023/11/17	Total Coliform (TC) – S.S. D10	TC = 1	CFU/100 mL	Flush and Re-sample at location, upstream and downstream for 2 consecutive days. Results of the re-sampling are free of bacterial content.	2023/11/21

Please refer to the colour chart below when reviewing the data summarized herein:

Green	Indicates results are in compliance
Yellow	Indicates results are in compliance however above the half Maximum Acceptable Concentration (MAC) or IMAC level.
Red	Indicates results are not in compliance or not within the operational guideline

Microbiological testing done under the Schedule 10, 11 or 12 of Regulation 170/03, during this reporting period.

	Number of Samples	Range of E.Coli (min#)-(max#)	Range of Total Coliform (min#)-(max#)	Number of HPC Samples	Range of HPC (min#)-(max#)
Raw	253	**0 - 2600**	**0 - 8500**	253	**<10 - 1650(1)**
Treated	1583	**0 - 0**	**0 - 1**	968	**<10 - 440(2)**
Distribution	1883	**0 - 0**	**0 - 1**	1023	**<10 - 300(2)**

(1) No standard available – Results indicate the overall Raw Water Quality
(2) < 500 – Internal Target as Best Management Practice

Operational testing done under Schedule 7, 8 or 9 of Regulation 170/03 during the period covered by this Annual Report.

	Number of Samples	Range of Results (min#)-(max#)	Unit of Measure
Turbidity	365	0.02 - 0.1	NTU
Chlorine	365	1.19 - 1.66	mg/L

Summary of additional testing and sampling carried out in accordance with the requirement of an approval, order or other legal instrument.

Date of legal instrument issued	Parameter	Date Sampled	Running Annual Average Result	Unit of Measure	In compliance
MDWL 025-101	Bromate - Treated	1-Jan-23 to 31-Dec-23	0.004	mg/L	Yes
MDWL 025-101	Bromate - Distribution	1-Jan-23 to 31-Dec-23	0.004	mg/L	Yes

Date of legal instrument issued	Location Type	Number of Samples	Range of Lead Results (min#)-(max#)	Unit of Measure	Number of Exceedances
MDWL 025-101	Lead - Plumbing	83	<0.05 - 12.9	ug/L	1
MDWL 025-101	Lead - Distribution	66	<0.05 - 9.77	ug/L	0

Summary of Inorganic parameters tested during this reporting period or the most recent sample results.

Parameter	MAC OR IMAC	Sample Date	Result Value	Unit of Measure	In Compliance
Antimony	0.006	October 4, 2023	0.0001	mg/L	Yes
Arsenic	0.01	October 4, 2023	0.0003	mg/L	Yes
Barium	1	October 4, 2023	0.0163	mg/L	Yes
Boron	5	October 4, 2023	0.016	mg/L	Yes
Cadmium	0.005	October 4, 2023	0.000005 <MDL	mg/L	Yes
Chromium	0.05	October 4, 2023	0.00050 <MDL	mg/L	Yes
Lead[(3)]	0.01	October 4, 2023	0.0005 <MDL	mg/L	Yes
Mercury	0.001	October 4, 2023	0.00000010 <MDL	mg/L	Yes
Selenium	0.05	October 4, 2023	0.0001	mg/L	Yes
Sodium	20	October 4, 2023	6.71	mg/L	Yes
Uranium	0.02	October 4, 2023	0.00004	mg/L	Yes
Fluoride	1.5	October 4, 2023	0.57	mg/L	Yes
Nitrite[(3)]	1	October 4, 2023	0.010 <MDL	mg/L	Yes
Nitrate[(3)]	10	October 4, 2023	0.24	mg/L	Yes

(3) Lead, Nitrite, Nitrate results are from Maximum resolution in the Distribution system

Summary of Organic parameters sampled during this reporting period or the most recent sample results.

Parameter	MAC OR IMAC	Sample Date	Result Value	Unit of Measure	In Compliance
Alachlor	0.005	October 4, 2023	**0.00050 <MDL**	mg/L	Yes
Atrazine + N-dealkylated metobolites	0.005	October 4, 2023	**0.001 <MDL**	mg/L	Yes
Azinphos-methyl	0.02	October 4, 2023	**0.0020 <MDL**	mg/L	Yes
Benzene	0.001	October 4, 2023	**0.0001 <MDL**	mg/L	Yes
Benzo(a)pyrene	0.00001	October 4, 2023	**0.0000050 <MDL**	mg/L	Yes
Bromoxynil	0.005	October 4, 2023	**0.00050 <MDL**	mg/L	Yes
Carbaryl	0.09	October 4, 2023	**0.005 <MDL**	mg/L	Yes
Carbofuran	0.09	October 4, 2023	**0.005 <MDL**	mg/L	Yes
Carbon Tetrachloride	0.002	October 4, 2023	**0.00010 <MDL**	mg/L	Yes
Chlorpyrifos	0.09	October 4, 2023	**0.001 <MDL**	mg/L	Yes
Diazinon	0.02	October 4, 2023	**0.001 <MDL**	mg/L	Yes
Dicamba	0.12	October 4, 2023	**0.001 <MDL**	mg/L	Yes
1,2-Dichlorobenzene	0.2	October 4, 2023	**0.00020 <MDL**	mg/L	Yes
1,4Dichlorobenzene	0.005	October 4, 2023	**0.00020 <MDL**	mg/L	Yes
1,2-Dichloroethane	0.005	October 4, 2023	**0.00020 <MDL**	mg/L	Yes
1,1-Dichloroethylene (vinylidene chloride)	0.014	October 4, 2023	**0.00010 <MDL**	mg/L	Yes
Dichloromethane	0.05	October 4, 2023	**0.00050 <MDL**	mg/L	Yes
2,4-Dichlorophenol	0.9	October 4, 2023	**0.00025 <MDL**	mg/L	Yes
2,4-Dichlorophenoxy acetic acid (2,4-D)	0.1	October 4, 2023	**0.001 <MDL**	mg/L	Yes
Diclofop-methyl	0.009	October 4, 2023	**0.00090 <MDL**	mg/L	Yes
Dimethoate	0.02	October 4, 2023	**0.0025 <MDL**	mg/L	Yes
Diquat	0.07	October 4, 2023	**0.007 <MDL**	mg/L	Yes
Diuron	0.15	October 4, 2023	**0.010 <MDL**	mg/L	Yes
Glyphosate	0.28	October 4, 2023	**0.010 <MDL**	mg/L	Yes
Haloacetic Acids (HAA5)[(4)] (Note: show latest running annual average) Q1 2023 = <0.0050 mg/L Q2 2023 = <0.0050 mg/L Q3 2023 = <0.0050 mg/L Q4 2023 = <0.0050 mg/L	0.080	Running Annual Average =	**0.0050 <MDL**	mg/L	Yes
Malathion	0.19	October 4, 2023	**0.010 <MDL**	mg/L	Yes
MCPA	0.1	October 4, 2023	**0.00050 <MDL**	mg/L	Yes
Metolachlor	0.05	October 4, 2023	**0.0050 <MDL**	mg/L	Yes
Metribuzin	0.08	October 4, 2023	**0.00010 <MDL**	mg/L	Yes
Monochlorobenzene	0.08	October 4, 2023	**0.001 <MDL**	mg/L	Yes

Parameter	MAC OR IMAC	Sample Date	Result Value	Unit of Measure	In Compliance
Paraquat	0.01	October 4, 2023	**0.00050 <MDL**	mg/L	Yes
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Simazine	0.01	October 4, 2023	**0.0010 <MDL**	mg/L	Yes
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Tetrachlorethylene	0.01	October 4, 2023	**0.00010 <MDL**	mg/L	Yes
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Triallate	0.23	October 4, 2023	**0.0010 <MDL**	mg/L	Yes
Trichloroethylene	0.005	October 4, 2023	**0.00010 <MDL**	mg/L	Yes
2,4,6-Trichlorophenol	0.005	October 4, 2023	**0.00050 <MDL**	mg/L	Yes
Trifluralin	0.045	October 4, 2023	**0.0010 <MDL**	mg/L	Yes
Vinyl Chloride	0.001	October 4, 2023	**0.00020 <MDL**	mg/L	Yes

(4) – THM's and HAA5 results are from Max resolution in the Distribution system
Note – MDL – Method Detection Limit

List any Inorganic or Organic parameter(s) that exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.

No Inorganic or Organic parameter(s) exceeded half the standard prescribed in Schedule 2 of Ontario Drinking Water Quality Standards.