2018 Annual Summary Report

Windsor Utilities Commission

CONTENTS

Cover Photo

The George Avenue Reservoir under construction as seen from above

.

Back Cover Photo

ENWIN staff, Commissioners and City Councillors tour the George Avenue Reservoir Construction Site, April 2018.

A MESSAGE FROM
WINDSOR UTILITIES COMMISSION

Ensuring Our Water Future

Windsor's water system has been a source of safe and reliable potable water for over 160 years. That's a history to be proud of. We honour that heritage by working to ensure our water future, so that we can meet our community's needs for centuries to come.

Windsor Utilities Commission delivers water to the residents and businesses of Windsor, Tecumseh and LaSalle through a network of underground watermains stretching more than 1,100 kilometers. If set in a line, our distribution pipes would stretch from Windsor to Quebec City.

Much of our infrastructure has been in service since the mid-1900s. A comprehensive maintenance and restoration program is currently underway. Capital renewal projects are critical to maintaining the integrity of our water system. To that end, we completed the construction of a new reservoir in 2018. This basin will provide our water system with increased capability, redundancy and security.

In 2018, we replaced more than 14 kilometers of watermain. That's roughly the width of the City of Windsor from east to west.

We continually monitor the integrity of our system through comprehensive testing after treatment, in distribution and at customer premises. We follow all regulatory requirements and exceed the required number of samples for our drinking water system.

In addition, hydrant flow testing ensures adequate water supply, if and when required for firefighting. During an industrial fire in September 2018, we worked side by side with firefighters to maximize water availability, while ensuring that the supply to neighbouring residents remained unaffected.

Through our partnerships with The Safety Village and Essex Region Conservation, we educated thousands of students about the importance of water conservation and the dangers of playing with water hydrants.

Windsor Utilities Commission is proud to deliver water that exceeds Ontario's water quality standards. We will continue to meet our mandate to deliver an abundance of clean, reliable and safe water that enhances the quality of life for our customers.

Sincerely,

Mayor Drew Dilkens, Board Chair
Windsor Utilities Commission

Garry Rossi, Vice President Water Operations
ENWIN Utilities Ltd.

OUR VISION, MISSION **AND VALUES**

Our Mission

To provide safe and reliable energy and water services in a cost effective manner.

Our Vision

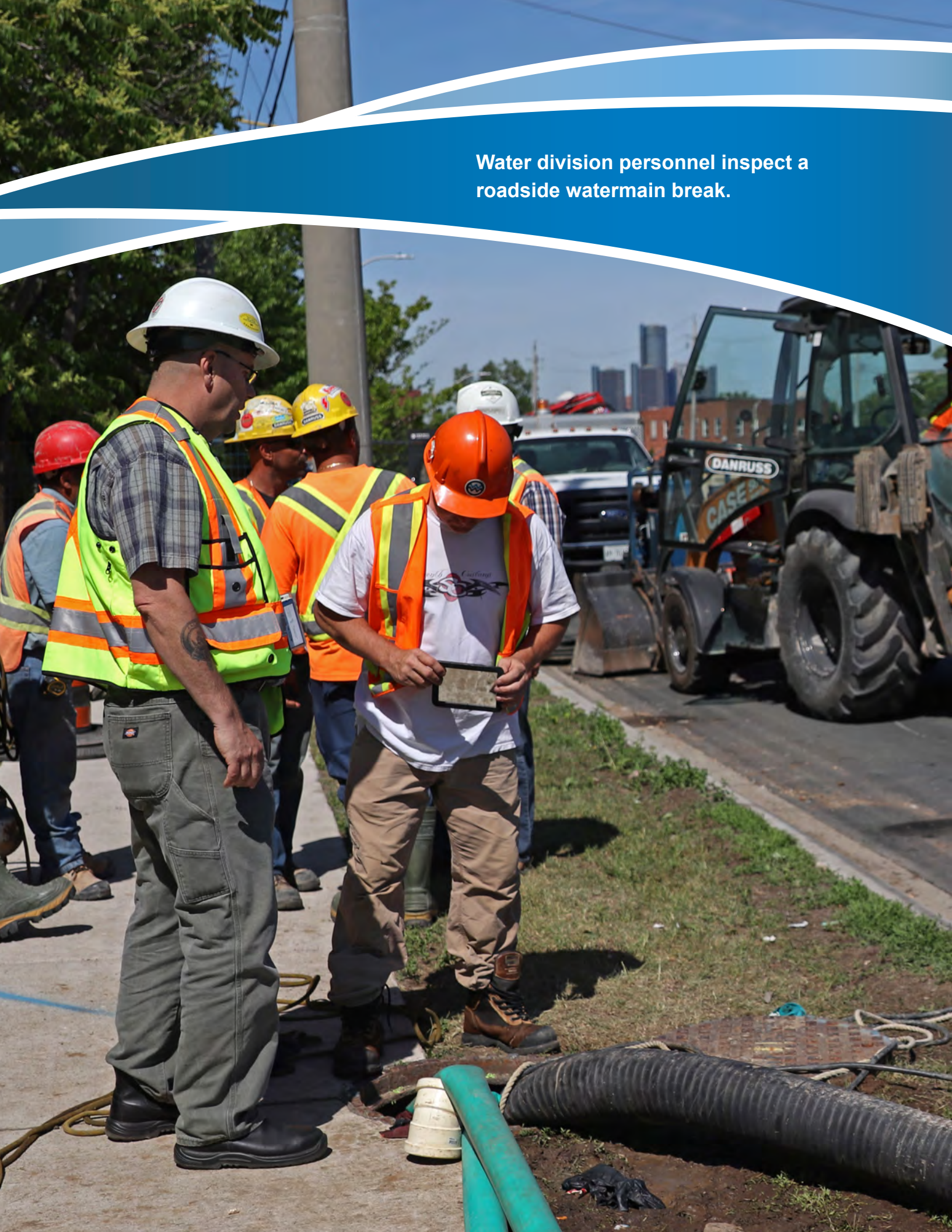
To be a trusted leader in providing exceptional value and services to our customers and stakeholders.

Our Values

LEADERSHIP

ACCOUNTABILITY

INTEGRITY



Water division personnel inspect a roadside watermain break.

Introduction

In 2018, **Windsor Utilities Commission (WUC)** produced 39,853.12 million litres of potable water for use by the citizens of the City of Windsor, the Town of LaSalle and the Town of Tecumseh.

The summary contained in Appendix A, Table 1, provides a detailed breakdown of the monthly production rates, including the average day, peak day and peak hour for each of the months. The volume of water transferred to the Town of LaSalle and the Town of Tecumseh is also provided.

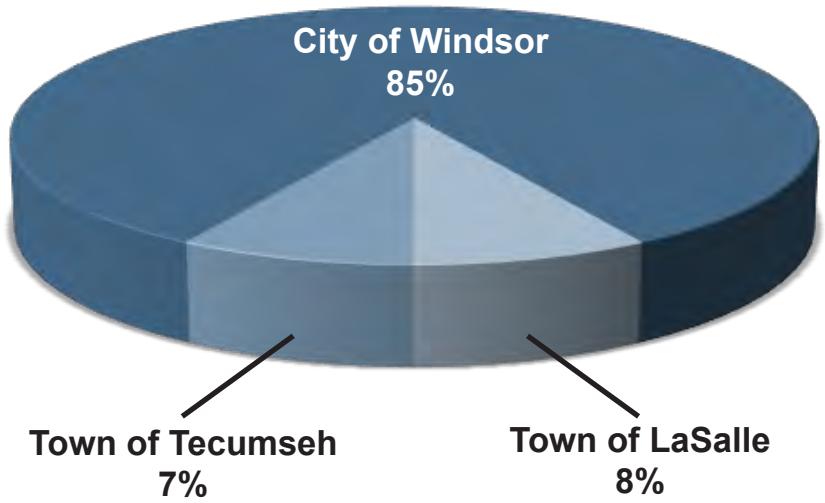
The chart below indicates the percentage of water delivered to each served Municipality.

Under Ontario 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 the requirements of the applicable section of the regulation, along with a statement of compliance or, if applicable, specific areas of non-compliance with the schedule requirements.

2018 Total Treated Water by Municipality

Volume in megalitres (ML)

Town of LaSalle	Town of Tecumseh	City of Windsor
3,343.9	3,315.6	33,193.6



Percentage of water delivered to each served Municipality.

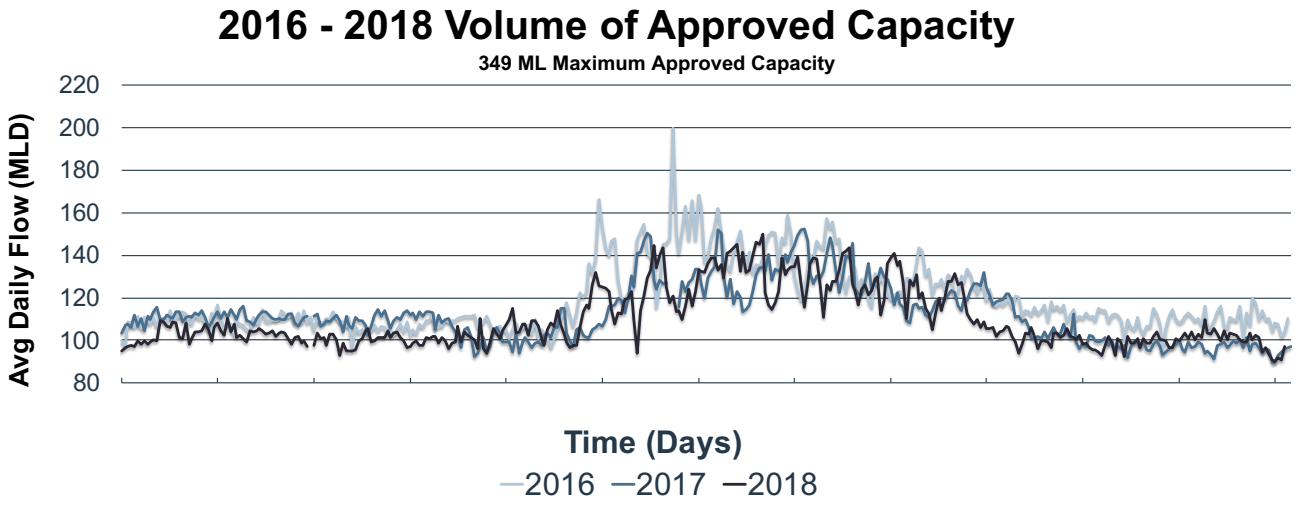
Schedule 1: Treatment Equipment

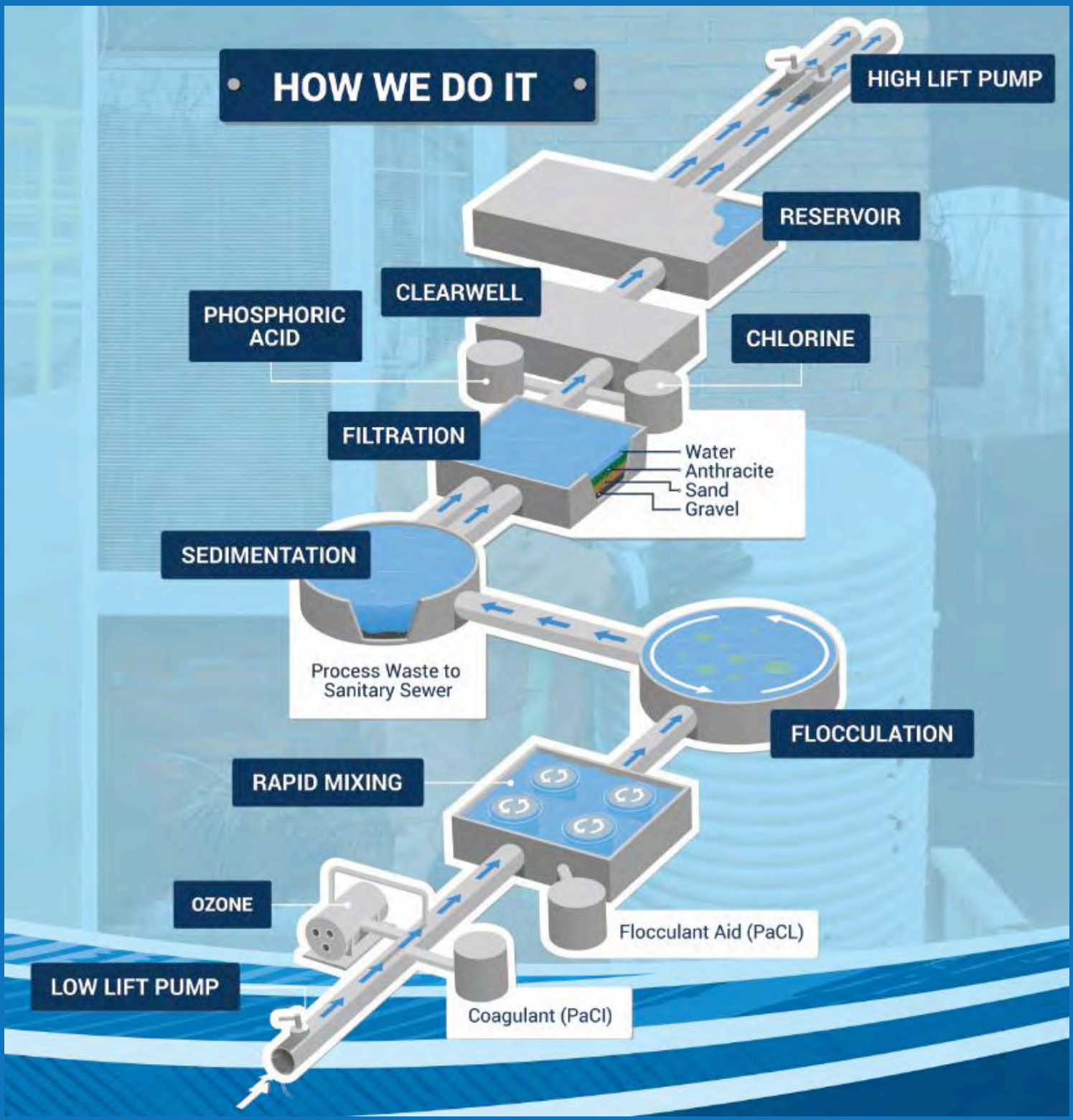
O.Reg 170/04, Schedule 1 dictates that the owner of a drinking water system shall ensure that approved water treatment equipment, as specified in the facility Licence or Certificate of Approval, is provided and is in operation whenever water is being supplied for potable use.

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

Page 7 features an image of the water treatment process.

In the calendar year 2018, this section of the regulations was fully complied with.




HOW WE DO IT
HIGH LIFT PUMP
RESERVOIR
CLEARWELL
PHOSPHORIC ACID
CHLORINE
FILTRATION
Water
Anthracite
Sand
Gravel
SEDIMENTATION
Process Waste to Sanitary Sewer
FLOCCULATION
RAPID MIXING
OZONE
Flocculant Aid (PaCL)
LOW LIFT PUMP
Coagulant (PaCl)

Schedule 6: Operational Checks, Sampling and Testing - General

O.Reg 170/04, Schedule 6 outlines:

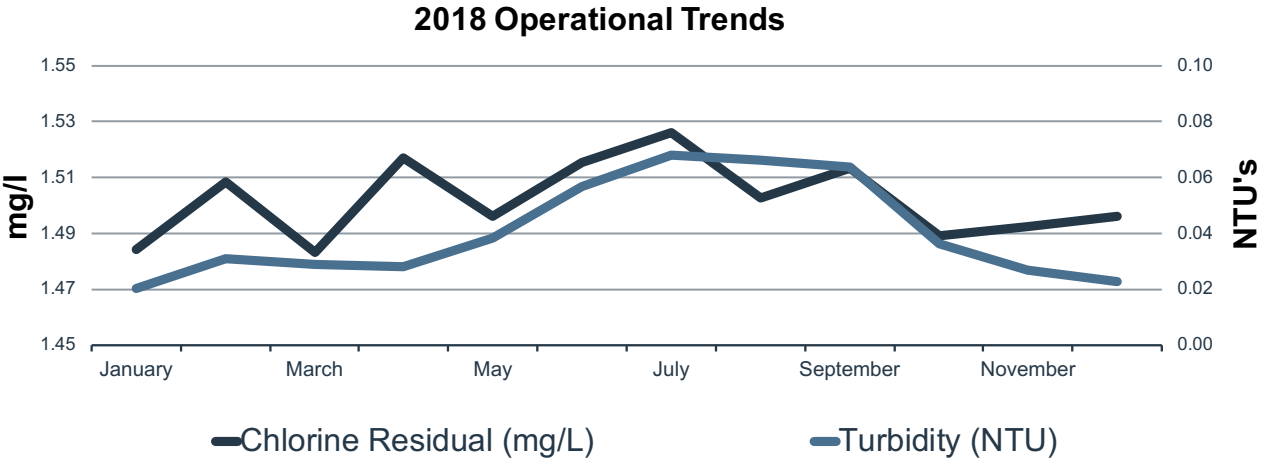
- The frequency of sampling and equipment checks;
- The requirement for chlorine residual testing to be carried out at the time microbiological samples are collected;
- The location at which samples are to be collected;
- The form of sampling to be undertaken and the requirements for continuous monitoring 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 2018, WUC complied fully with this section of the regulations.

Schedule 7: Operational Checks

O.Reg 170/04, Schedule 7 specifies the requirements for continuous monitoring of equipment for free chlorine residual, turbidity and fluoride, and the required location for this equipment. The regulation dictates the requirement for regular collection and analysis of samples by an appropriately certified individual. The chart below summarizes the results for the above mentioned parameters.

In the calendar year 2018, WUC complied fully with this section of the regulations.



Schedule 10: Microbiological Sampling and Testing

O.Reg 170/04, Schedule 10 provides the requirements for sampling and testing of microbiological parameters.

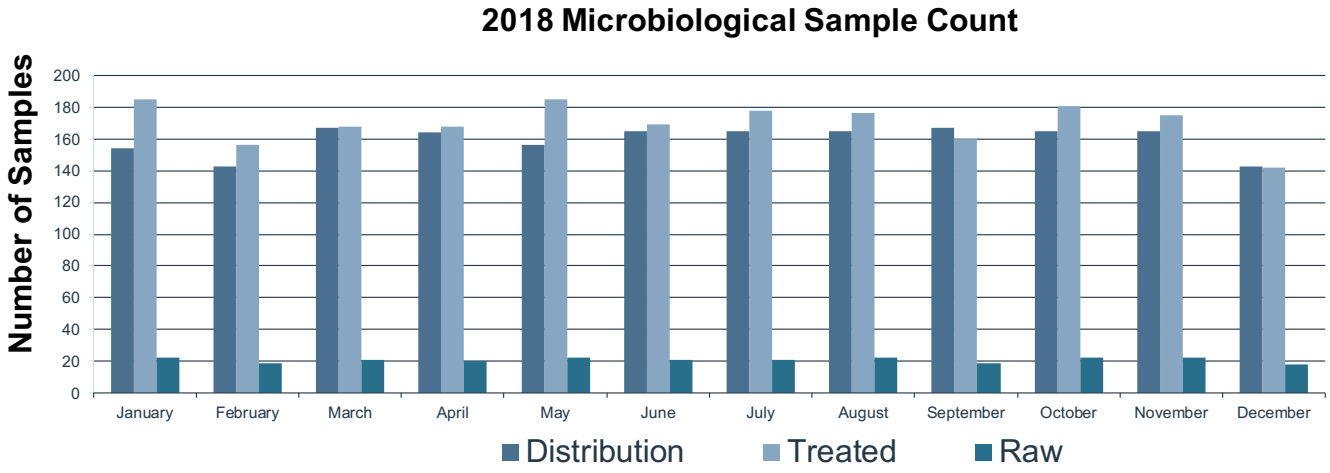
The schedule states that for Large Municipal Systems serving a population of more than 100,000 people, the required monthly frequency of sampling is 100 distribution samples, plus one additional sample for every 10,000 people served, with at least three samples being taken in each week.

Each of these samples are to be tested for *Escherichia coli* and total coliform, with a requirement that at least 25% 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 2018, 1,919 samples were collected and analyzed, an average of 160 samples per month. Approximately 59% 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*, total coliform and general bacteria population expressed as colony counts on a heterotrophic plate count. Windsor's treated water samples were generally collected on a daily basis and were tested by an accredited third-party laboratory.

The schedule further 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. The following chart indicates the number of samples taken on a monthly basis.



We constructed a new bulk water filling station on Matchette Road near the entrances to Malden and Mic Mac Parks.

Schedule 13: Chemical Sampling and Testing

O.Reg 170/04, Schedule 13 provides the requirements for sample collection and testing for a variety of chemical components in drinking water. Additionally, it lists the Maximum Acceptable Concentration (MAC) for each component. The requirements are outlined below along with the status of Windsor's sampling program.

Inorganics

One sample must be collected and tested every 12 months if the source is surface water and tested for every parameter set out in Schedule 23. (See page 12 for Table 13.1)

In 2018, ENWIN, on behalf of WUC collected and tested samples for every parameter set out in Schedule 23 on a quarterly basis.

Lead

One sample must be collected and tested every 12 months for Lead. (See page 12 for Table 13.1)

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 and the operating authority for the system shall ensure that at least one water sample is taken every three months and tested for nitrate and nitrite. (See page 12 for Table 13.1)

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

Sodium

Schedule 13 stipulates that at least one water sample is taken every 60 months and tested for sodium. (See page 12 for Table 13.1)

On behalf of WUC, ENWIN last collected and sampled for sodium on January 10, 2018.

Organics

One sample must be collected and tested every 12 months, if the source is surface water, and tested for every parameter set out in Schedule 24. (See pages 13-14 for Table 13.2)

During 2018, on behalf of WUC, ENWIN collected samples and tested for every parameter set out in Schedule 24 on a quarterly basis.

Trihalomethane (THM's)

For any system that provides chlorination, one distribution sample will be collected and tested for trihalomethanes every 3 months. (See pages 13-14 for Table 13.2)

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

Table 13.1 – Inorganics, Lead, Nitrates, Nitrites and Sodium Sample Results

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	October 3, 2018	0.00015	mg/L	No
Arsenic	October 3, 2018	0.0004	mg/L	No
Barium	October 3, 2018	0.0156	mg/L	No
Boron	October 3, 2018	0.014	mg/L	No
Cadmium	October 3, 2018	0.000003 <MDL	mg/L	No
Chromium	October 3, 2018	0.00017	mg/L	No
*Lead	October 3, 2018	0.00002 <MDL	mg/L	No
Mercury	October 3, 2018	0.00001 <MDL	mg/L	No
Selenium	October 3, 2018	0.00012	mg/L	No
Sodium	January 10, 2018	6.37	mg/L	No
Uranium	October 3, 2018	0.000009	mg/L	No
Fluoride	January 10, 2018	0.10	mg/L	No
Nitrite	October 3, 2018	0.003 <MDL	mg/L	No
Nitrate	October 3, 2018	0.26	mg/L	No

Table 13.2 – Organics and THM Sample Results

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	Oct. 3, 2018	0.00002 <MDL	mg/L	No
Atrazine + N-dealkylated metobolites	Oct. 3, 2018	0.00001 <MDL	mg/L	No
Azinphos-methyl	Oct. 3, 2018	0.00005 <MDL	mg/L	No
Benzene	Oct. 3, 2018	0.00032 <MDL	mg/L	No
Benzo(a)pyrene	Oct. 3, 2018	0.000004 <MDL	mg/L	No
Bromoxynil	Oct. 3, 2018	0.00033 <MDL	mg/L	No
Carbaryl	Oct. 3, 2018	0.00005 <MDL	mg/L	No
Carbofuran	Oct. 3, 2018	0.00001 <MDL	mg/L	No
Carbon Tetrachloride	Oct. 3, 2018	0.00016 <MDL	mg/L	No
Chlorpyrifos	Oct. 3, 2018	0.00002 <MDL	mg/L	No
Diazinon	Oct. 3, 2018	0.00002 <MDL	mg/L	No
Dicamba	Oct. 3, 2018	0.00020 <MDL	mg/L	No
1,2-Dichlorobenzene	Oct. 3, 2018	0.00041 <MDL	mg/L	No
1,4-Dichlorobenzene	Oct. 3, 2018	0.00036 <MDL	mg/L	No
1,2-Dichloroethane	Oct. 3, 2018	0.00035 <MDL	mg/L	No
1,1-Dichloroethylene (vinylidene chloride)	Oct. 3, 2018	0.00033 <MDL	mg/L	No
Dichloromethane	Oct. 3, 2018	0.00035 <MDL	mg/L	No
2,4-Dichlorophenol	Oct. 3, 2018	0.00015 <MDL	mg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	Oct. 3, 2018	0.00019 <MDL	mg/L	No
Diclofop-methyl	Oct. 3, 2018	0.0004 <MDL	mg/L	No
Dimethoate	Oct. 3, 2018	0.00003 <MDL	mg/L	No
Diquat	Oct. 3, 2018	0.001 <MDL	mg/L	No
Diuron	Oct. 3, 2018	0.00003 <MDL	mg/L	No
Glyphosate	Oct. 3, 2018	0.001 <MDL	mg/L	No
Haloacetic Acids (running Annual Average)	Avg.	0.0053	mg/L	No
Q1 2018 = 0.0053 mg/L	Jan. 10, 2018			No
Q2 2018 = 0.0053 mg/L	Apr. 4, 2018			No
Q3 2018 = 0.005575 mg/L	Jul. 9, 2018			No
Q4 2018 = 0.011 mg/L	Oct. 3, 2018			No

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Malathion	Oct. 3, 2018	0.00002 <MDL	mg/L	No
MCPA	Oct. 3, 2018	0.00012 <MDL	mg/L	No
Metolachlor	Oct. 3, 2018	0.00001 <MDL	mg/L	No
Metribuzin	Oct. 3, 2018	0.00002 <MDL	mg/L	No
Monochlorobenzene	Oct. 3, 2018	0.0003 <MDL	mg/L	No
Paraquat	Oct. 3, 2018	0.001 <MDL	mg/L	No
Pentachlorophenol	Oct. 3, 2018	0.00015 <MDL	mg/L	No
Phorate	Oct. 3, 2018	0.00001 <MDL	mg/L	No
Picloram	Oct. 3, 2018	0.001 <MDL	mg/L	No
Polychlorinated Biphenyls (PCB)	Oct. 3, 2018	0.00004 <MDL	mg/L	No
Prometryne	Oct. 3, 2018	0.00003 <MDL	mg/L	No
Simazine	Oct. 3, 2018	0.00001 <MDL	mg/L	No
THM (running Annual Average)	Oct. 3, 2018	0.0076	mg/L	No
Q1 2018 = 0.0045 mg/L	Jan. 10, 2018			No
Q2 2018 = 0.0044 mg/L	Apr. 4, 2018			No
Q3 2018 = 0.013 mg/L	Jul. 9, 2018			No
Q4 2018 = 0.0085 mg/L	Oct. 3, 2018			No
Terbofos	Oct. 3, 2018	0.00001 <MDL	mg/L	No
Tetrachlorethylene	Oct. 3, 2018	0.00035 <MDL	mg/L	No
2,3,4,6-Tetrachlorophenol	Oct. 3, 2018	0.00020 <MDL	mg/L	No
Triallate	Oct. 3, 2018	0.00001 <MDL	mg/L	No
Trichloroethylene	Oct. 3, 2018	0.00044 <MDL	mg/L	No
2,4,6-Trichlorophenol	Oct. 3, 2018	0.00025 <MDL	mg/L	No
Trifluralin	Oct. 3, 2018	0.00002 <MDL	mg/L	No
Vinyl Chloride	Oct. 3, 2018	0.00017 <MDL	mg/L	No

Table 13.3 Bromate Sample Results

Date of legal instrument issued	Parameter	Date Sampled	Result	Unit of Measure
MDWL 025-101	*Bromate - Treated	1-Jan-18 to 31-Dec-18	0.004	mg/L
MDWL 025-101	*Bromate - Distribution	1-Jan-18 to 31-Dec-18	0.004	mg/L

* Reported as running Annual Average

Schedule 15.1: Lead

O.Reg 170/04, Schedule 15.1 provides the requirements for sampling and testing of Lead.

The schedule states that for Large Municipal Systems serving a population of more than 100,000 people, two sets of samples must be taken. One set of samples shall be taken from December 15, 2017 to April 15, 2018 and the second set from June 15, 2018 to October 15, 2018. The minimum number of samples to be collected for a population of 100,000 or more is 130 sample locations per round. These samples include private, non-private and distribution. Each of these samples are to be tested for Lead.

A total of 446 Lead sample locations have been collected and tested in 2018: 285 private and non-private samples and 161 samples in distribution. Of the sample locations tested, 7 sample locations exceeded the 10 ug/L reporting requirement.

In the calendar year 2018, WUC complied fully with the requirements of Schedule 15.1.

Hydrant flow testing operations measure water availability to ensure adequate supply for firefighting.

Schedule 16: Reporting Adverse Test Results and Other Problems

If a sample collected and tested indicates an adverse result, as outlined in the regulations, 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 and Climate Change (Ministry). If an observation, other than an adverse test results 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.

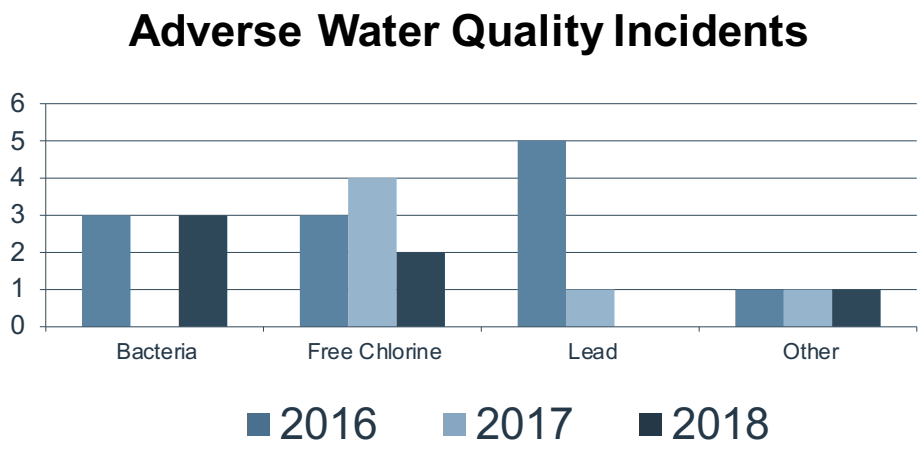
If a report is required under this section, a verbal report must be provided to the MOH by speaking directly to a person at the Windsor Essex County Health Unit (WECHU) or the designated on call representative. In addition, a verbal report must be provided to the Ministry by contacting the SAC.

These verbal reports of adverse water conditions must be verified by written notice within 24 hours to the MOH and the SAC specifying the nature of the adverse result, actions being taken or observation and what corrective action is being taken.

Within seven days of resolution of a problem, a follow up written notice is to be provided outlining the resolution that gave rise to the adverse result report.

In 2018, there were six adverse incidents requiring notification of the MOH and the SAC. Of these, two resulted from low chlorine being less than 0.05 mg/L within the distribution system, one resulted from a filter turbidity exceedance in the Water Treatment Plant, and three resulted from Coliform at the ‘a’ sample stations in the distribution.

In all situations where it was determined that there was an adverse result, notification was made to the MOH and the SAC.



Schedule 17: Corrective Action

This schedule outlines required corrective action to be followed with the determination of an adverse result requiring notification.

In all cases, the required corrective action was followed, as directed by the Medical Officer of Health.

Schedule 22: Corrective Action

Not later than March 31 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 requirement for this section of the regulations.

Summarizing tables are attached for review: (pages 23 - 32)

Table 1 - 2018 Treated Water Volume (page 23)

Table 2 - 2018 Volume as a Percentage of Approved Plant Capacity (pages 24-25)

Table 3 - 2018 Microbiological Sample Counts (page 26)

Table 4 - 2018 Distribution Chlorine Residuals (pages 27-28)

Table 5 - 2018 Operational Parameters (page 29)

A copy of Schedule 23 (Inorganic Test Parameters) and Schedule 24 (Organic Test Parameters) are attached for information, along with the 2017 Annual Report, as previously submitted and as required by the regulation. (pages 31-32)

The Hanna Water Tower has a maximum capacity of 5,680 cubic metres and regulates pressure across the water distribution system.

Capital Renewal Program

Water Meter Replacement Program

The goal of WUC's ongoing water meter replacement program is to replace all damaged, frozen, defective, aging and obsolete water meters, both in residential and industrial, commercial and institutional (ICI) settings. The program also incorporates the installation of new meters on both residential and newly constructed services in the City of Windsor, and ICI. Through this program, WUC installed 13,103 new meters in 2018. The average age of our total meter population is 6.4 years. For ICIs only, the average age is 6.8 years.

New meters provide benefits including:

- Increased accuracy in billing for our customers;
- Improved efficiency in meter reading, as reads can be obtained via radio frequency (RF); and
- Enhanced ability to identify the sources and manage the causes of non-revenue water, thereby limiting revenue loss for both WUC and the City of Windsor.

The program is ongoing with an anticipated completion at the end of 2019. Efforts will be focused on the completion of certain segments of the city, enabling entire meter routes to be read with a drive-by (RF) method. Approximately 85% of the meters are now RF-enabled.

We installed repurposed hydrants at The Safety Village to create a water hydrant safety feature.

Watermain Replacement Program

The WUC capital renewal program involved the replacement of approximately 14.84 km of existing cast and ductile iron watermains, as well as water services, with new PVC pipelines and polyethylene/copper tubing, respectively. Water services are typically replaced from the new main to the property line. This project included watermains which no longer provided adequate service, and which were deemed to have the highest risk to public health.

The Ministry and Ontario Fire Codes (OFC) mandate minimum levels of performance required throughout the water distribution system. 98 water hydrants were installed and 92 old public use hydrants were removed in 2018.

WUC 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, hence, the higher the priority status assigned.

1. Lead services in Right of Way (R.O.W.)
2. Low chlorine residual due to internal tuburculation (corrosion)
3. High frequency of water quality complaints (taste and odor, discoloured water)
4. High frequency of breaks, both mainline and services
5. Inadequate fire flow capacity
6. Low water pressure
7. Lifecycle replacement

We replaced 14.84 kilometers of watermains in 2018 as part of our capital renewal program.

We completed construction of the George Avenue Reservoir in 2018.

George Avenue Reservoir

Construction of the reservoir structure was completed in April. Backfilling, site restoration and drainage was generally completed in October.

Testing and commissioning continued through to the end of the year. Substantial completion is anticipated for the first quarter of 2019 due to ongoing deficiency repairs.

Filter Bed Rehabilitation at A.H. Weeks Plant

In 2017, a failure was found on one of the filter bed underdrain systems that required a new system to be installed to fix the problem. The old plastic system was removed, and the walls of the bed were coated to protect the concrete into the future.

Additionally, a new stainless steel underdrain was installed and new anthracite media was placed into the bed. The new bed, in service since early 2018, is performing 20% better than the old system.

Appendix A - Operational Charts

Windsor Utilities Commission

Table 1 - 2018 Treated Water Volume

MONTH	Total Pumped Volume ML	Daily Average Volume ML	Maximum Daily Volume		Minimum Daily Volume		Instantaneous Peak Volume		Town of Lasalle Volume ML	Town of Tecumseh Volume ML	City of Windsor Volume ML
			ML		ML		ML				
JANUARY	3,172.5	102.3	13	109.3	1	95.1	20	169.0	238.2	240.9	2693.4
FEBRUARY	2,875.2	102.7	3	110.0	28	97.3	15	158.0	189.5	217.1	2468.5
MARCH	3,098.8	100.0	18	105.4	9	92.9	4	151.0	226.0	224.1	2648.7
APRIL	3,022.1	100.7	22	110.4	24	94.2	30	204.4	181.4	235.1	2605.7
MAY	3,391.8	109.4	28	131.7	20	96.7	28	189.6	240.7	276.2	2874.8
JUNE	3,639.8	121.3	15	144.5	10	94.1	17	216.5	359.7	367.9	2912.2
JULY	4,166.6	134.4	19	149.9	22	114.3	9	219.2	501.8	366.2	3298.6
AUGUST	3,995.3	128.9	15	143.6	7	110.8	13	195.1	389.0	326.6	3279.7
SEPTEMBER	3,497.5	116.6	17	131.5	30	102.0	15	198.7	324.6	311.5	3497.5
OCTOBER	3,029.2	101.0	3	106.4	7	93.7	20	154.3	247.0	274.0	3029.2
NOVEMBER	2,974.6	99.2	19	104.0	9	92.2	24	151.9	234.0	241.0	2974.6
DECEMBER	2,989.9	99.7	4	109.8	26	89.9	4	237.2	212.0	235.0	2989.9
TOTAL	**39,853.1**								**3343.9**	**3315.6**	**33193.6**
AVERAGE	**3,321.1**								**278.7**	**276.3**	**2766.1**

Note: Volumes reported in megalitres (ML)

Table 2 - 2018 Volume as a Percentage of Approved Plant Capacity
(Part 1 - January to June)

Date	January		February		March		April		May		June	
	Average Daily Flow (MLD)	Plant Capacity %	Average Daily Flow (MLD)	Plant Capacity %	Average Daily Flow (MLD)	Plant Capacity %	Average Daily Flow (MLD)	Plant Capacity %	Average Daily Flow (MLD)	Plant Capacity %	Average Daily Flow (MLD)	Plant Capacity %
1	95.1	27%	104.3	30%	97.6	28%	98.5	28%	109.9	32%	123.1	35%
2	96.5	28%	102.3	29%	103.3	30%	99.5	29%	115.2	33%	114.5	33%
3	97.1	28%	110.0	32%	100.8	29%	97.7	28%	103.7	30%	107.8	31%
4	97.5	28%	103.8	30%	101.3	29%	97.4	28%	103.9	30%	112.8	32%
5	96.9	28%	107.5	31%	97.7	28%	101.4	29%	107.5	31%	112.1	32%
6	99.7	29%	101.5	29%	102.7	29%	100.9	29%	107.6	31%	119.5	34%
7	97.9	28%	102.2	29%	102.8	29%	101.6	29%	102.5	29%	119.5	34%
8	99.5	29%	101.0	29%	100.2	29%	101.6	29%	109.0	31%	123.2	35%
9	97.9	28%	99.3	28%	92.9	27%	98.8	28%	109.2	31%	109.5	31%
10	98.9	28%	104.7	30%	98.4	28%	101.2	29%	106.5	31%	94.1	27%
11	100.0	29%	103.7	30%	95.0	27%	99.6	29%	100.7	29%	114.1	33%
12	99.6	29%	104.3	30%	95.0	27%	96.1	28%	97.4	28%	120.7	35%
13	109.3	31%	105.5	30%	94.9	27%	98.6	28%	105.2	30%	129.3	37%
14	108.6	31%	104.4	30%	95.6	27%	99.1	28%	108.1	31%	132.9	38%
15	106.8	31%	103.0	30%	99.9	29%	106.3	30%	106.5	31%	144.5	41%
16	106.3	30%	103.4	30%	100.6	29%	99.3	28%	113.9	33%	133.9	38%
17	108.8	31%	104.6	30%	104.7	30%	103.8	30%	107.1	31%	139.8	40%
18	108.0	31%	102.1	29%	105.4	30%	102.5	29%	103.1	30%	143.7	41%
19	101.4	29%	103.3	30%	99.4	28%	101.1	29%	99.1	28%	124.8	36%
20	101.0	29%	104.1	30%	99.6	29%	100.3	29%	96.7	28%	117.8	34%
21	108.1	31%	103.2	30%	101.2	29%	96.1	28%	97.8	28%	120.6	35%
22	97.9	28%	100.7	29%	101.1	29%	110.4	32%	97.8	28%	113.6	33%
23	100.9	29%	97.9	28%	101.1	29%	96.2	28%	106.2	30%	114.0	33%
24	104.1	30%	101.5	29%	104.6	30%	94.2	27%	113.6	33%	109.9	31%
25	103.8	30%	101.7	29%	101.5	29%	99.1	28%	116.5	33%	116.3	33%
26	104.6	30%	98.5	28%	103.5	30%	105.3	30%	115.0	33%	123.8	35%
27	107.4	31%	99.6	29%	103.8	30%	103.1	30%	126.3	36%	115.9	33%
28	105.1	30%	97.3	28%	101.1	29%	100.5	29%	131.7	38%	123.0	35%
29	99.6	29%			99.7	29%	104.6	30%	125.4	36%	132.9	38%
30	105.9	30%			96.4	28%	107.3	31%	124.9	36%	132.2	38%
31	108.1	31%			97.0	28%			124.3	36%		

Table 2 - 2018 Volume as a Percentage of Approved Plant Capacity
(Part 2 - July to December)

Date	July		August		September		October		November		December	
	Average Daily Flow (MLD)	Plant Capacity %	Average Daily Flow (MLD)	Plant Capacity %	Average Daily Flow (MLD)	Plant Capacity %	Average Daily Flow (MLD)	Plant Capacity %	Average Daily Flow (MLD)	Plant Capacity %	Average Daily Flow (MLD)	Plant Capacity %
1	132.0	38%	115.6	33%	127.2	36%	103.8	30%	94.3	27%	100.3	29%
2	136.3	39%	126.8	36%	110.1	32%	104.4	30%	92.9	27%	103.1	30%
3	138.9	40%	136.2	39%	128.1	37%	106.4	30%	97.8	28%	101.3	29%
4	138.5	40%	138.9	40%	125.6	36%	106.2	30%	101.8	29%	109.8	31%
5	133.1	38%	138.2	40%	131.0	38%	102.1	29%	98.9	28%	103.4	30%
6	135.4	39%	126.0	36%	119.6	34%	99.1	28%	92.9	27%	103.0	30%
7	129.2	37%	110.8	32%	122.3	35%	93.7	27%	100.7	29%	105.8	30%
8	141.1	40%	126.1	36%	114.9	33%	98.3	28%	99.4	28%	103.1	30%
9	141.9	41%	123.5	35%	112.5	32%	103.3	30%	92.2	26%	99.6	29%
10	143.5	41%	127.5	37%	105.2	30%	103.1	30%	101.8	29%	104.4	30%
11	144.8	42%	127.5	37%	113.0	32%	106.1	30%	98.6	28%	100.4	29%
12	132.4	38%	133.1	38%	119.8	34%	101.9	29%	98.5	28%	103.4	30%
13	141.4	41%	140.8	40%	113.9	33%	95.9	27%	100.5	29%	102.9	29%
14	132.0	38%	141.8	41%	119.9	34%	99.5	29%	96.8	28%	102.5	29%
15	133.2	38%	143.6	41%	127.5	37%	100.0	29%	100.6	29%	100.2	29%
16	139.8	40%	126.2	36%	127.8	37%	99.0	28%	98.4	28%	99.0	28%
17	146.3	42%	123.7	35%	131.5	38%	96.7	28%	98.8	28%	98.9	28%
18	145.2	42%	116.5	33%	126.1	36%	103.4	30%	101.9	29%	103.3	30%
19	**149.9**	**43%**	123.8	35%	127.2	36%	103.4	30%	104.0	30%	100.2	29%
20	122.6	35%	126.3	36%	121.4	35%	101.5	29%	100.2	29%	102.1	29%
21	116.7	33%	121.4	35%	112.3	32%	102.4	29%	100.5	29%	101.3	29%
22	114.3	33%	123.5	35%	109.7	31%	105.4	30%	99.8	29%	94.7	27%
23	117.5	34%	128.5	37%	107.4	31%	101.8	29%	96.3	28%	96.4	28%
24	122.9	35%	129.8	37%	109.8	31%	101.1	29%	96.5	28%	93.4	27%
25	138.8	40%	112.1	32%	106.1	30%	100.3	29%	100.5	29%	90.8	26%
26	131.0	38%	118.7	34%	108.7	31%	102.4	29%	99.9	29%	89.9	26%
27	132.7	38%	136.1	39%	105.6	30%	97.9	28%	101.7	29%	92.0	26%
28	134.6	39%	138.7	40%	105.3	30%	98.4	28%	103.7	30%	90.7	26%
29	134.4	39%	141.1	40%	106.3	30%	96.4	28%	100.9	29%	97.1	28%
30	139.4	40%	135.3	39%	102.0	29%	95.4	27%	104.0	30%	97.0	28%
31	126.8	36%	137.3	39%			95.7	27%	104.0	30%	94.0	27%

Table 3 - 2018 Microbiological Sample Count

Month	January	February	March	April	May	June	July	August	September	October	November	December
DISTRIBUTION	154	143	167	164	156	165	165	165	167	165	165	143
TREATED	185	156	168	168	185	169	178	176	160	181	175	142
RAW	22	19	21	20	22	21	21	22	19	22	22	18
TOTAL	361	318	356	352	363	355	364	363	346	368	362	303

Table 4 - 2018 Distribution Chlorine Residuals

JANUARY TO MARCH 2018

		D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18	D20	D21	D22
Jan	LOW	1.10	1.11	0.42	1.06	0.75	1.06	0.56	1.00	0.82	1.37	0.94	0.97	0.81	0.79	1.03	0.96	1.10	1.19	1.01	0.69	0.88
	HIGH	1.28	1.37	1.21	1.25	1.28	1.41	1.10	1.34	1.25	1.62	1.36	1.32	1.21	1.26	1.38	1.34	1.28	1.36	1.14	1.17	1.06
	AVG	1.20	1.26	1.00	1.15	0.98	1.28	0.91	1.19	1.04	1.48	1.19	1.22	0.95	1.08	1.23	1.22	1.20	1.27	1.06	1.06	0.98
Feb	LOW	1.17	1.19	0.77	0.83	0.67	0.95	0.38	1.04	0.91	1.42	1.10	1.11	0.75	0.91	1.07	1.16	1.12	0.95	0.94	0.62	0.75
	HIGH	1.30	1.32	1.08	1.19	1.09	1.30	0.77	1.32	1.11	1.56	1.31	1.25	1.00	1.20	1.25	1.34	1.30	1.31	1.14	1.18	1.06
	AVG	1.23	1.25	0.93	1.01	0.90	1.11	0.62	1.17	1.02	1.48	1.19	1.16	0.88	1.06	1.16	1.25	1.22	1.20	1.06	0.97	0.93
Mar	LOW	0.91	1.04	0.76	0.85	0.87	1.03	0.28	1.02	0.97	1.27	0.99	0.79	0.78	0.98	1.01	1.20	1.04	0.94	0.88	0.83	0.64
	HIGH	1.37	1.34	1.15	1.33	1.16	1.34	0.79	1.40	1.26	1.57	1.19	1.22	1.07	1.23	1.24	1.54	1.35	1.48	1.33	1.24	1.01
	AVG	1.23	1.22	0.93	1.09	1.00	1.21	0.50	1.23	1.10	1.44	1.13	1.03	0.95	1.14	1.14	1.34	1.19	1.12	1.12	1.02	0.89
Quarterly Avg		1.22	1.25	0.95	1.08	0.96	1.20	0.68	1.20	1.05	1.47	1.17	1.14	0.93	1.09	1.18	1.27	1.20	1.19	1.08	1.02	0.93

NOTE: All values in mg/l unless otherwise stated

APRIL TO JUNE 2018

		D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18	D20	D21	D22
Apr	LOW	1.24	1.19	0.94	1.00	0.74	0.96	0.57	0.75	0.84	1.43	1.06	0.83	0.87	1.12	1.20	1.20	1.02	1.01	1.04	1.04	0.92
	HIGH	1.44	1.46	1.24	1.28	1.25	1.64	0.95	1.56	1.26	1.69	1.44	1.23	1.22	1.40	1.48	1.52	1.33	1.26	1.35	1.43	1.17
	AVG	1.33	1.32	1.10	1.17	1.07	1.29	0.72	1.29	1.16	1.53	1.25	1.09	1.03	1.28	1.31	1.33	1.24	1.10	1.19	1.21	1.02
May	LOW	1.22	1.24	0.97	0.91	0.92	1.24	0.84	0.95	0.88	1.38	1.11	1.05	0.96	1.09	1.20	1.02	1.15	1.07	1.11	0.85	0.97
	HIGH	1.47	1.49	1.35	1.40	1.25	1.54	1.21	1.40	1.45	1.57	1.38	1.37	1.24	1.41	1.35	1.40	1.39	1.22	1.34	1.46	1.25
	AVG	1.31	1.34	1.13	1.20	1.07	1.36	0.99	1.20	1.17	1.47	1.27	1.15	1.07	1.23	1.30	1.32	1.26	1.19	1.23	1.09	1.08
Jun	LOW	1.24	1.35	1.14	1.08	0.96	1.11	0.81	1.15	0.92	1.40	1.16	1.08	1.00	1.18	1.24	1.31	1.27	1.00	1.20	0.98	1.05
	HIGH	1.45	1.45	1.26	1.44	1.16	1.56	1.13	1.52	1.38	1.59	1.29	1.38	1.12	1.36	1.42	1.49	1.43	1.36	1.35	1.45	1.18
	AVG	1.33	1.41	1.19	1.27	1.08	1.36	0.99	1.27	1.17	1.51	1.23	1.20	1.06	1.29	1.31	1.42	1.34	1.22	1.27	1.22	1.10
Quarterly Avg		1.32	1.36	1.14	1.21	1.07	1.34	0.90	1.25	1.17	1.50	1.25	1.15	1.05	1.27	1.31	1.35	1.28	1.17	1.23	1.17	1.07

NOTE: All values in mg/l unless otherwise stated

Table 4 - 2018 Distribution Chlorine Residuals

JULY TO SEPTEMBER 2018

		D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18	D20	D21	D22
Jul	LOW	1.13	1.25	1.04	1.06	1.02	1.14	0.86	1.10	1.01	1.30	1.15	0.90	0.90	1.22	1.17	1.19	1.27	1.01	0.93	1.04	0.90
	HIGH	1.47	1.51	1.29	1.41	1.19	1.50	1.06	1.27	1.26	1.82	1.43	1.33	1.33	1.39	1.36	1.46	1.44	1.25	1.29	1.35	1.14
	AVG	1.32	1.37	1.16	1.25	1.12	1.33	0.96	1.17	1.14	1.52	1.25	1.12	1.09	1.31	1.26	1.35	1.33	1.14	1.19	1.19	1.06
Aug	LOW	1.23	1.22	1.07	0.96	0.87	1.17	0.79	0.89	1.06	1.29	1.11	1.11	0.76	0.93	1.22	1.22	1.19	0.97	1.07	1.00	0.96
	HIGH	1.52	1.47	1.33	1.29	1.25	1.47	0.98	1.22	1.25	1.73	1.37	1.32	1.05	1.34	1.34	1.45	1.41	1.24	1.28	1.20	1.32
	AVG	1.36	1.37	1.18	1.15	1.03	1.32	0.90	1.00	1.12	1.50	1.22	1.21	0.92	1.22	1.30	1.36	1.32	1.09	1.18	1.12	1.06
Sep	LOW	1.13	1.11	0.88	1.08	0.82	1.09	0.71	0.81	0.90	1.19	1.02	0.91	0.80	1.07	0.86	0.93	1.12	1.03	0.92	1.07	0.81
	HIGH	1.41	1.43	1.36	1.26	1.16	1.41	0.97	1.34	1.15	1.51	1.29	1.32	1.09	1.32	1.32	1.32	1.36	1.37	1.32	1.23	1.08
	AVG	1.28	1.33	1.15	1.19	0.97	1.27	0.84	1.10	1.08	1.40	1.19	1.16	0.96	1.19	1.14	1.21	1.23	1.19	1.14	1.14	0.96
Quarterly Avg		1.32	1.36	1.17	1.20	1.04	1.31	0.90	1.09	1.11	1.47	1.22	1.17	0.99	1.24	1.23	1.31	1.30	1.14	1.17	1.15	1.03

NOTE: All values in mg/l unless otherwise stated

OCTOBER TO DECEMBER 2018

		D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	D16	D17	D18	D20	D21	D22
Oct	LOW	1.10	1.16	0.92	0.97	0.76	0.99	0.56	0.95	0.80	1.44	1.05	0.98	0.77	1.09	1.09	1.04	1.12	0.92	0.85	0.97	0.83
	HIGH	1.48	1.38	1.22	1.39	1.01	1.34	0.76	1.27	1.28	1.55	1.32	1.27	0.94	1.29	1.29	1.24	1.32	1.23	1.22	1.18	1.02
	AVG	1.23	1.25	1.02	1.15	0.89	1.17	0.66	1.16	1.04	1.51	1.15	1.13	0.84	1.18	1.18	1.15	1.21	1.10	1.07	1.06	0.89
Nov	LOW	1.22	1.18	0.96	1.07	0.96	1.25	0.68	1.15	1.10	1.36	1.43	1.10	1.11	1.28	1.45	1.25	1.21	1.07	1.33	1.06	1.32
	HIGH	1.54	1.55	1.27	1.37	1.28	1.49	1.10	1.39	1.32	1.65	1.09	1.34	0.79	1.40	1.14	1.46	1.45	1.45	1.13	1.25	0.89
	AVG	1.35	1.35	1.17	1.25	1.08	1.38	0.91	1.31	1.23	1.50	1.43	1.27	1.11	1.35	1.45	1.36	1.32	1.27	1.41	1.19	1.32
Dec	LOW	1.20	1.26	1.14	0.91	1.00	1.18	0.18	1.18	1.02	1.35	1.24	1.00	0.81	1.18	1.25	1.32	1.11	0.99	1.16	0.73	0.97
	HIGH	1.46	1.44	1.32	1.31	1.28	1.41	0.86	1.37	1.28	1.63	1.37	1.34	1.19	1.40	1.39	1.48	1.40	1.45	1.34	1.32	1.24
	AVG	1.39	1.37	1.22	1.15	1.13	1.30	0.70	1.25	1.19	1.49	1.29	1.26	0.99	1.26	1.31	1.36	1.30	1.26	1.25	1.08	1.11
Quarterly Avg		1.32	1.32	1.13	1.18	1.04	1.28	0.76	1.24	1.16	1.50	1.29	1.22	0.98	1.26	1.32	1.29	1.28	1.21	1.24	1.11	1.11

NOTE: All values in mg/l unless otherwise stated

(0.05 mg/L - minimum standard per Ministry of Environment)
(0.20 mg/L - miminum WUC standard)

Table 5 - 2018 Operational Parameters

		JANUARY			FEBRUARY			MARCH			PLANT PARAMETERS HIGH LOW VALUES		MINISTRY MAC	
		HIGH	LOW	AVG.	HIGH	LOW	AVG.	HIGH	LOW	AVG.			HIGH(*1)	LOW
COLOUR (*2)	TCU	(---)	(---)	(---)	(---)	(---)	(---)	(---)	(---)	(---)	5.00	0.00	N/A	
ALUMINUM (*3)	µg/l	14	1	9	24	7	15	85	22	70	100.0	0.0	N/A	
pH (*2)		7.18	6.88	7.05	7.13	6.96	7.08	7.13	6.95	7.04	7.30	6.50	N/A	
TURBIDITY (*1)	NTU	0.03	0.02	0.02	0.04	0.02	0.03	0.08	0.02	0.03	1.00	0.00	1.00	0.00
HARDNESS (*2)	mg/L	122	100	110	130	97	112	154	100	122	100	80	N/A	
TEMPERATURE	℃	3.7	1.3	2.1	3.5	1.4	2.0	5.0	1.0	3.3			N/A	
ODOUR/TASTE		(---)	(---)	(---)	(---)	(---)	(---)	(---)	(---)	(---)	in-offensive		N/A	
ALKALINITY (*2 and *3)	mg/L	92	72	81	88	72	81	104	74	86	500	30	N/A	
CHLORINE RESIDUAL (*1)	mg/L	1.60	1.28	1.48	1.79	1.37	1.51	1.61	1.35	1.48	1.50	0.80	N/A	0.05

		APRIL			MAY			JUNE			PLANT PARAMETERS HIGH LOW VALUES		MINISTRY MAC	
		HIGH	LOW	AVG.	HIGH	LOW	AVG.	HIGH	LOW	AVG.			HIGH(*1)	LOW
COLOUR (*2)	TCU	(---)	(---)	(---)	(---)	(---)	(---)	(---)	(---)	(---)	5.00	0.00	N/A	
ALUMINUM (*3)	µg/l	26	8	14	29	16	21	67	24	44	100.0	0.0	N/A	
pH (*2)		7.16	7.00	7.08	7.11	6.88	7.04	7.20	6.81	7.04	7.30	6.50	N/A	
TURBIDITY (*1)	NTU	0.05	0.02	0.03	0.12	0.03	0.04	0.15	0.04	0.06	1.00	0.00	1.00	0.00
HARDNESS (*2)	mg/L	150	78	117	150	80	112	120	100	107	100	80	N/A	
TEMPERATURE	℃	10.1	3.8	6.6	17.9	10.7	14.1	21.5	16.5	19.6			N/A	
ODOUR/TASTE		(---)	(---)	(---)	(---)	(---)	(---)	(---)	(---)	(---)	in-offensive		N/A	
ALKALINITY (*2 and *3)	mg/L	100	74	84	114	76	82	82	72	78	500	30	N/A	
CHLORINE RESIDUAL (*1)	mg/L	1.66	1.37	1.52	1.62	1.42	1.50	1.70	1.40	1.52	1.50	0.80	N/A	0.05

Table 5 - 2018 Operational Parameters

		JULY			AUGUST			SEPTEMBER			PLANT PARAMETERS HIGH LOW VALUES		MINISTRY MAC	
		HIGH	LOW	AVG.	HIGH	LOW	AVG.	HIGH	LOW	AVG.			HIGH(*1)	LOW
COLOUR (*2)	TCU	(---)	(---)	(---)	(---)	(---)	(---)	(---)	(---)	(---)	5.00	0.00	N/A	
ALUMINUM (*3)	µg/l	109	40	69	120	38	61	84	19	44	100.0	0.0	N/A	
pH (*2)		7.19	6.90	7.08	7.16	6.96	7.04	7.18	6.89	7.03	7.30	6.50	N/A	
TURBIDITY (*1)	NTU	0.10	0.06	0.07	0.14	0.05	0.07	0.13	0.05	0.06	1.00	0.00	1.00	0.00
HARDNESS (*2)	mg/L	114	94	101	117	92	99	125	98	106	100	80	N/A	
TEMPERATURE	℃	24.8	21.2	23.4	25.7	22.8	24.4	25.3	18.4	21.7			N/A	
ODOUR/TASTE		(---)	(---)	(---)	(---)	(---)	(---)	(---)	(---)	(---)	in-offensive		N/A	
ALKALINITY (*2 and *3)	mg/L	81	70	76	80	66	75	82	70	78	500	30	N/A	
CHLORINE RESIDUAL (*1)	mg/L	1.67	1.42	1.53	1.63	1.32	1.50	1.68	1.32	1.51	1.50	0.80	N/A	0.05

		OCTOBER			NOVEMBER			DECEMBER			PLANT PARAMETERS HIGH LOW VALUES		MINISTRY MAC	
		HIGH	LOW	AVG.	HIGH	LOW	AVG.	HIGH	LOW	AVG.			HIGH(*1)	LOW
COLOUR (*2)	TCU	(---)	(---)	(---)	(---)	(---)	(---)	(---)	(---)	(---)	5.00	0.00	N/A	
ALUMINUM (*3)	µg/l	31	9	20	19	5	10	12	6	9	100.0	0.0	N/A	
pH (*2)		7.14	6.94	7.03	7.20	6.90	7.02	7.13	6.95		7.30	6.50	N/A	
TURBIDITY (*1)	NTU	0.05	0.03	0.04	0.03	0.02	0.03	0.03	0.02	0.02	1.00	0.00	1.00	0.00
HARDNESS (*2)	mg/L	130	98	111	148	100	118	148	104	123	100	80	N/A	
TEMPERATURE	℃	18.7	9.0	13.8	10.1	3.3	6.5	4.8	2.0	3.2			N/A	
ODOUR/TASTE		(---)	(---)	(---)	(---)	(---)	(---)	(---)	(---)	(---)	in-offensive		N/A	
ALKALINITY (*2 and *3)	mg/L	94	76	83	102	74	85	104	72	88	500	30	N/A	
CHLORINE RESIDUAL (*1)	mg/L	1.66	1.36	1.49	1.69	1.35	1.49	1.58	1.30	1.50	1.50	0.80	N/A	0.05

(*1) MAC - Maximum Allowable Concentration
(*2) Health Canada Operational Guidline (O.G.)
(*3) Recommended in coagulant treated drinking water

Schedule 23
Inorganic Parameters

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

Schedule 24
Organic Parameters

Item	Parameter
1.	Alachlor
2.	Aldicarb
3.	Aldrin + Dieldrin
4.	Atrazine + N-dealkylated metabolites
5.	Azinphos-methyl
6.	Bendiocarb
7.	Benzene
8.	Benzo(a)pyrene
9.	Bromoxynil
10.	Carbaryl
11.	Carbofuran
12.	Carbon Tetrachloride
13.	Chlordane (Total)
14.	Chlorpyrifos
15.	Cyanazine
16.	Diazinon
17.	Dicamba
18.	1,2-Dichlorobenzene
19.	1,4-Dichlorobenzene
20.	Dichlorodiphenyltrichloroethane (DDT) + metabolites
21.	1,2-dichloroethane
22.	1,1-Dichloroethylene (vinylidene chloride)
23.	Dichloromethane
24.	2,4-Dichlorophenol
25.	2,4-Dichlorophenoxy acetic acid (2,4-D)
26.	Diclofop-methyl
27.	Dimethoate

Item	Parameter
28.	Dinoseb
29.	Diquat
30.	Diuron
31.	Glyphosate
32.	Heptachlor + Heptachlor Epoxide
33.	Lindane (Total)
34.	Malathion
35.	Methoxychlor
36.	Metolachlor
37.	Metribuzin
38.	Monochlorobenzene
39.	Paraquat
40.	Parathion
41.	Pentachlorophenol
42.	Phorate
43.	Picloram
44.	Polychlorinated Biphenyls (PCB)
45.	Prometryne
46.	Simazine
47.	Temephos
48.	Terbufos
49.	Tetrachloroethylene (perchloroethylene)
50.	2,3,4,6-Tetrachlorophenol
51.	Triallate
52.	Trichloroethylene
53.	2,4,6-Trichlorophenol
54.	2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)
55.	Trifluralin
56.	Vinyl Chloride

Note: As of January 1, 2016, theh following tests have been eliminated by the MOECC.

Item	Parameter
1.	Aldicarb
2.	Aldrin+Dieldrin
3.	Aldrin
4.	Dieldrin
5.	Bendiocarb
6.	Chlordane (Total)
7.	a-chlordane
8.	g-chlordane
9.	Oxychlordane
10.	Cyanazine
11.	DDT+Metabolites
12.	op-DDT

Item	Parameter
13.	pp-DDD
14.	pp-DDE
15.	pp-DDT
16.	Dinoseb
17.	Heptachlor+HepEpox
18.	Heptachlor
19.	Heptachor Epoxide
20.	Lindane
21.	Methoxychlor
22.	Parathion
23.	Temephos
24.	2,4,5-T

Appendix B - 2018 O.Reg 170/03 Annual Report

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 2018**

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 N9A 5T7	**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 [ ]**

Note: For the following tables below, additional rows or columns may be added or an appendix may be attached to the report

List all Drinking-Water Systems (if any), which receive all of 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 of its 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 _____

Describe your Drinking-Water System

The Windsor Utilities Commission water treatment facility employs screening, pre-chlorination (on an as needed basis), pH adjustment (utilizing CO_2), primary disinfection (utilizing ozone), coagulation, flocculation, sedimentation, dual-media filtration with post chlorination and corrosion control adjustment (utilizing phosphoric acid) to treat raw water obtained from the Detroit River.

The water treatment plant pumps sedimentation sludge and backwash water to the sanitary sewer. Treated water from the plant is routed to an on-site reservoir and subsequently pumped into the distribution system from two pumping stations that are co-located nearby the water treatment facilities. Water from the pumping stations satisfies demand for the greater Windsor area including the communities of Tecumseh and LaSalle. A remote reservoir and pumping station provides a re-chlorination facility (using sodium hypochlorite) to provide system pressure and flow to the southwest portion of the city, while a centrally located water tower provides pressure and flow control to the downtown core.

The drinking water system is monitored at various locations, both at the water treatment and pumping stations as well as throughout the transmission 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 (CO_2), Ozone (generated on-site using liquid oxygen), Calcium Thiosulfate (ozone quench agent), Polyaluminum chloride (PaCl), Filter aid cationic polymer and phosphoric acid (corrosion control agent).

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

Installed 98 new public-use fire hydrants through capital projects.

Removed 92 existing public-use fire hydrants through capital projects.

Installed 13.26 km of watermain <400 mm and 1.35 km of watermain = 400 mm.

Decommissioned approximately 13.29 km of watermain <400 mm and decommissioned 0.5 km watermain >400 mm.

Ontario **Drinking-Water Systems Regulation O. Reg. 170/03**

Replaced underdrain and media in a filter bed at Water Treatment Plant - $345k in 2018.

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
Feb. 8, 2018	**AWQI #138703** Free Chlorine residual of 0.04 mg/L	1	mg/L	After 15 minutes of flushing free chlorine residual restored. Reading of 0.46 mg/L.	Feb. 8, 2018
Mar. 16, 2018	**AWQI #13927** Count of 2 TC at the D18 sample station with free chlorine at 0.94 mg/L	1	mg/L	Testing. 2 sets taken 24 hours apart initial location, downstream and upstream	Mar. 19., 2018
May 8, 2018	**AWQI #139277** Count of 11 TC at the DO3 Sample Station. Free Chlorine residual 0.97 mg/L	11 0.97	TC mg/L	Resample initial location, downstream and upstream	May 8, 2018
May 23, 2019	**AWQI #139425** Filter #3 23:30 to 23:51 run above 1.00 NTU. Highest value 1.81 NTU. SCADA is set up to run filter to waste at 0.70 NTU. Due to a mechanical failure, Filter #3 e3ffluent valve did not shut down. Filter #3 was placed out of sercie at 23:56. Treate water turbidity has not been affected.	1.81	NTU	Replaced valve actuator and tested the Filter #3 effluent valve operation. Returned Filter #3 back in service May 23, 2018 at 17:23	May 23, 2018
Sept. 25, 2018	**AWQI #143263** Count of 1 TC at the D16 Sample Station. Free Chlorine residual 1.22 mg/L	1 1.22	TC mg/L	Resampled initial location, downstream and upstream.	Oct. 1, 2018
Dec. 17, 2018	**AWQI #144329** Sample Station D7. Free Chlorine residual reading of	1 1.22	TC mg/L	After 10 minutes of flushing, Free Chlorine residual reading of 0.12 mg/L	Dec. 17/18

	0.04 mg/L			at 8:55. Additional flushing performed 0.34 mg/L obtained at 10:20 p.m. and 0.85 mg/L at 10:35.	

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 Results (min #)-(max #)	Range of Total Coliform Results (min #)-(max #)	Number of HPC Samples	Range of HPC Results (min #)-(max #)
Raw	249	0 - 520	0 - 7500	249	20 - >2000
Treated	2043	0 - 0	0 - 0	1532	<10 - 140
Distribution	1919	0 - 0	0 - 11	890	<10 - 70

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

	Number of Grab Samples	Range of Results (min #)-(max #)	Unit of Measure
Turbidity	365	0.02 - 0.15	NTU
Chlorine	365	1.47 - 1.61	mg/L

***NOTE**: For continuous monitors use 8760 as the number of samples.*

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	Result	Unit of Measure
MDWL 025-101	*Bromate - Treated	1-Jan-18 to 31-Dec-18	0.004	mg/L
MDWL 025-101	*Bromate - Distribution	1-Jan-18 to 31-Dec-18	0.004	mg/L

* Reported as Running Annual Average

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

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Antimony	October 3, 2018	0.00015	mg/L	No
Arsenic	October 3, 2018	0.0003	mg/L	No
Barium	October 3, 2018	0.0156	mg/L	No
Boron	October 3, 2018	0.014	mg/L	No
Cadmium	October 3, 2018	0.000003 <MDL	mg/L	No
Chromium	October 3, 2018	0.00017	mg/L	No
Lead	October 3, 2018	0.00001 <MDL	mg/L	No

Ontario Drinking-Water Systems Regulation O. Reg. 170/03

Mercury	October 3, 2018	0.00001 <MDL	mg/L	No
Selenium	October 3, 2018	0.00012	mg/L	No
Sodium	January 10, 2018	6.37	mg/L	No
Uranium	October 3, 2018	0.000009	mg/L	No
Nitrite	October 3, 2018	0.003 <MDL	mg/L	No
Nitrate	October 3, 2018	0.26	mg/L	No

Summary of lead testing under Schedule 15.1 during this reporting period

(applicable to the following drinking water systems; large municipal residential systems, small municipal residential systems, and non-municipal year-round residential systems)

Location Type	Number of Samples	Range of Lead Results (min#) – (max #)	Unit of Measure	Number of Exceedances
Plumbing	571	0.01 <MDL - 21.8	ug/L	9
Distribution	80	0.01 <MDL - 3.06	ug/L	0

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

Parameter	Sample Date	Result Value	Unit of Measure	Exceedance
Alachlor	Oct. 3, 2018	0.00002 <MDL	mg/L	No
Atrazine + N-dealkylated metobolites	Oct. 3, 2018	0.00001 <MDL	mg/L	No
Azinphos-methyl	Oct. 3, 2018	0.00005 <MDL	mg/L	No
Benzene	Oct. 3, 2018	0.00032 <MDL	mg/L	No
Benzo(a)pyrene	Oct. 3, 2018	0.000004 <MDL	mg/L	No
Bromoxynil	Oct. 3, 2018	0.00033 <MDL	mg/L	No
Carbaryl	Oct. 3, 2018	0.00005 <MDL	mg/L	No
Carbofuran	Oct. 3, 2018	0.00001 <MDL	mg/L	No
Carbon Tetrachloride	Oct. 3, 2018	0.00016 <MDL	mg/L	No
Chlorpyrifos	Oct. 3, 2018	0.00002 <MDL	mg/L	No
Diazinon	Oct. 3, 2018	0.00002 <MDL	mg/L	No
Dicamba	Oct. 3, 2018	0.00020 <MDL	mg/L	No
1,2-Dichlorobenzene	Oct. 3, 2018	0.00041 <MDL	mg/L	No
1,4-Dichlorobenzene	Oct. 3, 2018	0.00036 <MDL	mg/L	No
1,2-Dichloroethane	Oct. 3, 2018	0.00035 <MDL	mg/L	No
1,1-Dichloroethylene (vinylidene chloride)	Oct. 3, 2018	0.00033 <MDL	mg/L	No
Dichloromethane	Oct. 3, 2018	0.00035 <MDL	mg/L	No
2,4-Dichlorophenol	Oct. 3, 2018	0.00015 <MDL	mg/L	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	Oct. 3, 2018	0.00019 <MDL	mg/L	No
Diclofop-methyl	Oct. 3, 2018	0.0004 <MDL	mg/L	No
Dimethoate	Oct. 3, 2018	0.00003 <MDL	mg/L	No
Diquat	Oct. 3, 2018	0.001 <MDL	mg/L	No
Diuron	Oct. 3, 2018	0.00003 <MDL	mg/L	No

Glyphosate	Oct. 3, 2018	0.001 <MDL	mg/L	No
Haloacetic Acids (HAA5) - Running Annual Average	Oct. 3, 2018	0.0053 <MDL	mg/L	No
Malathion	Oct. 3, 2018	0.00002 <MDL	mg/L	No
MCPA	Oct. 3, 2018	0.00012 <MDL	mg/L	No
Metolachlor	Oct. 3, 2018	0.00001 <MDL	mg/L	No
Metribuzin	Oct. 3, 2018	0.00002 <MDL	mg/L	No
Monochlorobenzene	Oct. 3, 2018	0.0003 <MDL	mg/L	No
Paraquat	Oct. 3, 2018	0.001 <MDL	mg/L	No
Pentachlorophenol	Oct. 3, 2018	0.00015 <MDL	mg/L	No
Phorate	Oct. 3, 2018	0.00001 <MDL	mg/L	No
Picloram	Oct. 3, 2018	0.001 <MDL	mg/L	No
Polychlorinated Biphenyls (PCB)	Oct. 3, 2018	0.00004 <MDL	mg/L	No
Prometryne	Oct. 3, 2018	0.00003 <MDL	mg/L	No
Simazine	Oct. 3, 2018	0.00001 <MDL	mg/L	No
THM – Running Annual Average	Oct. 3, 2018	0.0076	mg/L	No
Q1 2018 = 0.0045 mg/L	Jan.10, 2018			No
Q2 2018 = 0.0044 mg/L	Apr. 4, 2018			No
Q3 2018 = 0.013 mg/L	Jul. 9, 2018			No
Q4 2018 = 0.0085 mg/L	Oct. 3, 2018			No
Terbofos	Oct. 3, 2018	0.00001 <MDL	mg/L	No
Tetrachlorethylene	Oct. 3, 2018	0.00035 <MDL	mg/L	No
2,3,4,6-Tetrachlorophenol	Oct. 3, 2018	0.00020 <MDL	mg/L	No
Triallate	Oct. 3, 2018	0.00001 <MDL	mg/L	No
Trichloroethylene	Oct. 3, 2018	0.00044 <MDL	mg/L	No
2,4,6-Trichlorophenol	Oct. 3, 2018	0.00025 <MDL	mg/L	No
Trifluralin	Oct. 3, 2018	0.00002 <MDL	mg/L	No
Vinyl Chloride	Oct. 3, 2018	0.00017 <MDL	mg/L	No

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 Standard.

WINDSOR
UTILITIES
COMMISSION

ENWIN Utilities Ltd. is contracted to operate the water system through the Water System Operating Agreement (WSOA).

Senior Management, ENWIN Utilities Ltd.

Helga Reidel
President and CEO

Garry Rossi
Vice President
Water Operations

Jim Brown
Vice President
Hydro Operations

Byron Thompson
Vice President
Finance and CFO

John Wladarski
Vice President
Shared Services and COO

Board of Commissioners

Drew Dilkens (Chair)
Mayor, City of Windsor

Egidio Sovran
Owner, Sovran CPA, CA & Associates

Julian (Jules) Hawkins
Partner, Hawkins & Co. Accounting Professional Corp. Public Accountants

Irek Kusmierczyk
Councillor, City of Windsor, Ward 7

J. Douglas Lawson O. Ont. QC. LLD
Counsel, Willis Law

Kieran McKenzie
Councillor, City of Windsor, Ward 9

Jim Morrison
Councillor, City of Windsor, Ward 10

Mario Sonego
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