

The Regional Municipality of Durham

Oshawa Drinking Water System 2018 Annual Report

Drinking Water System Number: 220000772

Municipal Drinking Water Licence Number: 003-111

Drinking Water System Owner: The Regional Municipality of Durham

Drinking Water System Category: Large Municipal Residential

This Annual Report for the calendar year 2018 is designed to inform you about your drinking water system. This report has been prepared to satisfy Section 11 of Ontario Regulation (O. Reg.) 170/03. O. Reg. 170/03 sets requirements for drinking water systems with regard to sampling and testing, levels of treatment, certification of staff, and notification of authorities and the public about water quality. Hard copies of this report and the Schedule 22 Summary Report are available at the Regional Municipality of Durham Headquarters office that is located at 605 Rossland Road East, Whitby. The annual report is also available on the [Region of Durham's website](http://www.durham.ca) at www.durham.ca. Further information regarding the Drinking Water Regulations can be found on the [Ministry of the Environment, Conservation and Parks website](http://www.ontario.ca/ministry-environment-conservation-parks) at www.ontario.ca/ministry-environment-conservation-parks.

Drinking Water System Process Description

General

The Oshawa Drinking Water System provides potable water to consumers in the City of Oshawa, Municipality of Clarington (Courtice urban area), Town of Whitby, Town of Ajax, and City of Pickering. The water supply plant is a Class Four Water Treatment Plant with an approved capacity of 134,000 cubic metres per day (m³/d). The Oshawa Water Supply Plant feeds a Class Two Distribution System and Class Three Trunk Distribution System. The treatment and distribution systems are owned and operated by the Regional Municipality of Durham. Oshawa Water Supply Plant No. 1 was offline for rehabilitation during the reporting period.

The source water for the treatment process is drawn from Lake Ontario. The water supply system includes the following processes:

- Zebra mussel control (chlorine),
- Screening,
- Low lift pumping,
- Coagulation (aluminum sulphate),
- Flocculation,
- Filtration,
- Residual management
- Disinfection (chlorine),

- Fluoridation (hydrofluosilicic acid),
- High lift pumping,
- Water storage and distribution.

Raw Water Supply

Raw water is drawn from Lake Ontario through two intake pipes. The first is a 750 millimetre (mm) diameter intake pipe extending 831 metres (m) into the lake at a depth of approximately 7.6 m, and the second is a 900 mm intake pipe extending 924 m into the lake at a depth of approximately 10.7 m. Chlorine is added at the raw water intake for zebra mussel control and to provide initial disinfection. There is also a line for raw water sampling at the east intake crib. The pre-chlorine residual and turbidity are continuously measured as the raw water enters the water supply plant.

Coagulation/Flocculation/Sedimentation

The water from the east intake flows through a traveling screen, while the west intake utilizes a manual screen to remove large solids and continues towards the low lift pumps. Aluminum sulphate (alum) is added into a mechanical mixer upstream of the flocculation tanks. Gentle mixing of the alum occurs as the water passes through the flocculation tanks. Plant #1 has three sets of three stage, four cell hydraulic spiral upflow flocculation tanks with three trains of horizontal cross flow settling tanks. Plant #2 has three sets of two stage, three cell hydraulic spiral upflow flocculation tanks with three trains of horizontal cross flow settling tanks.

Filtration

Most of the particulate matter that was present in the raw water is deposited in the sedimentation tanks. The water supply plant has a total of ten filters to remove flocculated particles. All ten filters are dual media filters, composed of anthracite and sand. Filter effluent turbidity and head loss are continually monitored to indicate filter effectiveness.

Residual Management

The filter backwash treatment includes isolation of the filter cell, reversal of flow through the media, air scouring or surface water agitation. The backwash water is treated in two plate settling tanks before being dechlorinated. The settled solids are pumped to the sanitary sewer and the dechlorinated clear supernatant is discharged back to Lake Ontario.

Disinfection and Fluoridation

Filtered water passes through the filter under-drain into the treated water clearwell and reservoir, and eventually to the high lift pump suction well. The high lift pumps deliver treated water to the distribution system. Disinfection is achieved by the addition of chlorine at multiple application points throughout the plant. Consistent disinfection is

ensured by continuous online monitoring of the free chlorine residual throughout the water supply plant. Fluoride (hydrofluosilicic acid) is added to the treated water for the prevention of tooth decay within the service area.

Distribution System

The Oshawa/Whitby/Ajax distribution system delivers treated water through approximately 2,072 kilometres of watermains in multiple pressure zones and includes 12 booster stations and 10 water storage facilities (nine inground reservoirs and one elevated tank).

The Oshawa distribution system is interconnected with the distribution systems of Whitby and Ajax, therefore the entire system is licensed by the Ministry of the Environment and Climate Change as one distribution system. For the purposes of clarity in this report, distribution information will be recorded under its corresponding system.

Major Monetary expenses(above \$10,000)

Under Section 11 of O. Reg. 170/03, a description of any major expenses incurred during this reporting period to install, repair or replace required equipment must be included in the annual report. The details of the major expenses for this drinking water system are as follows:

Cathodic protection of watermains - \$472,420

Replacement of polybutylene service connections - \$2,665,497

Rehabilitation of watermains (structural cement lining) - \$1,910,186

Repaired pump at Hortop Pumping Station - \$26,554

Replacement of flowmeter components at the water supply plant - \$10,820

Supervisory Control and Data Acquisition upgrades at Taunton Road Zone 3 and Zone 4 Reservoir and Pumping Station - \$23,870

Watermain replacement costs (multiple locations) - \$13,441,298

Tables

For a description of terms and abbreviations in all tables, refer to the glossary at the end of the report.

Oshawa Drinking Water System (DWS) Table 1

Summary of all Adverse Water Quality Incidents (AWQI) in 2018 Reported to Spills Action Centre in Accordance with Schedule 16-3 and 16-4 of O. Reg. 170/03.

Incident Date	Parameter	Result	Corrective Action	Corrective Action Date
May 23	Total Coliforms and Escherichia coli (Distribution)	Presence	Flushed, resampled. Results met Ontario Drinking Water Quality Standards (ODWQS).	May 23
June 24	Total Coliforms (Distribution)	1 Colony Forming Units (CFU) per 100 Millilitres	Flushed, resampled. Results met ODWQS.	June 24
July 30	Chlorine (Distribution)	0.04 mg/L	Residual restored, flushed, resampled. Results met ODWQS.	July 30
August 28	Total Coliforms (Distribution)	Presence	Flushed, resampled. Results met ODWQS.	August 28
September 18	Total Coliforms (Distribution)	Presence	Flushed, resampled. Results met ODWQS.	September 18
October 16	Total Coliforms (Distribution)	Presence	Flushed, resampled. Results met ODWQS.	October 16
October 17	Total Coliforms (Distribution)	4 CFU/100 ml	Flushed, resampled. Results met ODWQS.	October 17
October 19	Total Coliforms (Distribution)	24 CFU/100 ml	Flushed, resampled. Results met ODWQS.	October 19
November 21	Total Coliforms (Distribution)	9 CFU/100 ml	Flushed, resampled. Results met ODWQS. Laboratory withdrew adverse notification due to laboratory error.	November 21

Oshawa DWS Table 1 continued

Incident Date	Parameter	Result	Corrective Action	Corrective Action Date
November 21	Total Coliforms (Distribution)	100 CFU/100 ml	Flushed, resampled. Results met ODWQS. Laboratory withdrew adverse notification due to laboratory error.	November 21
November 25	Total Coliforms (Distribution)	1 CFU/100 ml	Flushed, resampled. Results met ODWQS.	November 25
December 23	Low pressure (Distribution)	Not applicable	Flushed, resampled. Results met ODWQS.	December 23

Oshawa DWS Table 2

Microbiological Membrane Filtration (MF) Testing Under Schedule 10 of O. Reg. 170/03.

Type of Sample	Number of Samples	Range of Escherichia Coli MF Colony Forming Units per 100 Millilitres	Range of Total Coliforms MF Colony Forming Units per 100 Millilitres
Raw	197	Non-Detect (ND) - 38	ND - 120
Treated	6	ND	ND
Distribution	196	ND	ND - 100(6)*

*Number in parenthesis represents number of exceedance(s).

Oshawa DWS Table 3

Microbiological Presence Absence (P/A) Testing Under Schedule 10 of O. Reg. 170/03.

Type of Sample	Number of Samples	Escherichia Coli P/A per 100 Millilitres	Total Coliforms P/A per 100 Millilitres
Treated	197	Absence (A)	A
Distribution	820	A - Presence (1)*	A - Presence (4)*

*Number in parenthesis represents number of exceedance(s).

Oshawa DWS Table 4

Microbiological Heterotrophic Plate Count (HPC) Testing Under Schedule 10 of O. Reg. 170/03.

Type of Sample	Number of Samples	Range of HPC Samples Colony Forming Units per Millilitre
Treated	203	Non-Detect (ND) - 5
Distribution	615	ND - 5,900

Oshawa DWS Table 5

Operational Testing Done Under Schedule 7 of O. Reg. 170/03.

Test	Number of Samples	Range of Results	Unit of Measure	Parameter Description
Turbidity - Filter Effluent	Continuous	0.001 - 0.645*	Nephelometric Turbidity Units (NTU)	Turbidity is a measure of particles in water.
Fluoride - Plant	Continuous	0.046 - 0.83*	Milligram per Litre (mg/L)	Fluoride is added to water to prevent tooth decay.
Free Chlorine - Plant	Continuous	0.57 - 3.18*	mg/L	Must be sufficient to ensure disinfection has been achieved.
Free Chlorine - Distribution	Continuous	0.04 - 2.6*	mg/L	Recommended level of at least 0.20 mg/L in the distribution system to maintain secondary disinfection, 0.05 mg/L is the minimum required.

*Results include all analyzers and grab samples.

Oshawa DWS Table 6

Summary of Additional Testing and Sampling Carried Out in Accordance With the Requirement of an Approval, Order or Other Legal Instrument.

Type of Sample	Parameter	Date Sampled	Result	MAC	Unit of Measure
Raw Water	Gross Beta	January - December	0.09 - 0.17	Not Applicable (N/A)	Becquerels per Litre (Bq/L)
Raw Water	Tritium	January - December	0.8 - 21.1	N/A	Bq/L
Treated Water	Tritium	January - September	ND - 19.0	7,000	Bq/L
Environmental Discharge (Backwash Supernatant)	Suspended Solids	January - December	5.6	25	Milligram per Litre (mg/L)
Raw Water	Microcystin (Total)	June - October	ND	1.5	Microgram per Litre (ug/L)
Treated Water*	Microcystin (Total)	August - October	ND	1.5	ug/L
Distribution*	Microcystin (Total)	June - August	ND	1.5	ug/L

*On August 10, the Region changed the total microcystin sampling location from the distribution to the point of entry to comply with the MECP Director's letter dated May 4, 2018. Prior to this date the Region collected samples from the THM sample locations in the distribution system as per previous direction from the MECP (2017) Director's letters.

Oshawa DWS Table 7

Summary of Treated Water Chemical Parameters Tested Under Schedule 13 and 23 of O. Reg. 170/03.

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources ¹
Antimony	14	Non-Detect (ND) - 0.001	0.006	Milligram per Litre (mg/L)	No	Fire retardants, ceramics, electronics, solder.
Arsenic	14	ND - 0.0007	0.01	mg/L	No	Mining.
Barium	2	0.0208 - 0.0221	1.0	mg/L	No	Metal refineries, oil drilling.
Boron	2	0.0264 - 0.0303	5.0	mg/L	No	Industrial.
Cadmium	14	ND	0.005	mg/L	No	Industrial.
Chromium	14	ND	0.05	mg/L	No	Industrial.
Haloacetic acids - Distribution (annual average)	12	14.0	80	Microgram per Litre (ug/L)	No	By-product of chlorination of drinking water.
Mercury	2	ND	0.001	mg/L	No	Industrial.
Selenium	14	ND	0.05	mg/L	No	Refineries, mines, chemical manufacturing.
Sodium	12	14.0 - 22.4	Not Applicable ²	mg/L	Yes (1) ³	Storm water runoff including road salt.
Trihalomethane - Distribution (annual average)	12	36.6	100	ug/L	No	By-product of chlorination of drinking water.
Uranium	2	ND	0.02	mg/L	No	Power generation.
Nitrite	12	ND	1.0	mg/L	No	Agriculture runoff, landfill leachate and animal waste.
Nitrate	12	ND - 0.53	10.0	mg/L	No	Fertilizer.

1 Parameters may occur naturally in the environment.

2 Sodium does not have a Maximum Acceptable Concentration (MAC); only an aesthetic objective of 200 mg/L. Sodium results exceeding 20 mg/L are to be reported to the Medical Officer of Health as per Schedule 16-3 (8) of O. Reg. 170/03.

3 Number in parenthesis represents number of exceedance(s). For Sodium, regulations require reporting when results exceed 20 mg/L if it has not been reported in the preceding 57 months.

Oshawa DWS Table 8

Summary of Lead Testing Under Schedule 15.1 of O. Reg. 170/03.

Location Type	Number of Samples	Range of Lead Results Milligram per Litre	MAC	Number of Exceedances	pH	Alkalinity Milligram per Litre
Plumbing	72	Non-Detect (ND) - 0.0074	0.01	0	7.37 - 7.97	Not Applicable
Distribution	6	ND - 0.0034	0.01	0	7.53 - 7.83	81.5 - 93.8

Oshawa DWS Table 9

Summary of Treated Water Organic Parameters Tested Under Schedule 24 of O. Reg. 170/03.

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Alachlor	2	Non-Detect (ND)	5	Microgram per Litre (ug/L)	No	Agricultural herbicide.
Atrazine + N-dealkylated metabolites	2	ND	5	ug/L	No	Agricultural herbicide.
Azinphos-methyl	2	ND	20	ug/L	No	Insecticide.
Benzene	2	ND	1	ug/L	No	Plastics manufacturing, leaking fuel tanks.
Benzo(a)pyrene	2	ND	0.01	ug/L	No	Formed from the incomplete burning of organic matter.
Bromoxynil	2	ND	5	ug/L	No	Agricultural herbicide.
Carbaryl	2	ND	90	ug/L	No	Agricultural, forestry, household insecticide.

Oshawa DWS Table 9 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Carbofuran	2	Non-Detect (ND)	90	Microgram per Litre (ug/L)	No	Agricultural insecticide.
Carbon Tetrachloride	2	ND	2	ug/L	No	Chemical and industrial activities.
Chlorpyrifos	2	ND	90	ug/L	No	Agricultural, household insecticide.
Diazinon	2	ND	20	ug/L	No	Agricultural, livestock, operation, residential insecticide.
Dicamba	2	ND	120	ug/L	No	Agricultural herbicide
1,2-Dichlorobenzene	2	ND	200	ug/L	No	Chemical and industrial factories.
1,4-Dichlorobenzene	2	ND	5	ug/L	No	Chemical and industrial factories.
1,2-Dichloroethane	2	ND	5	ug/L	No	Industrial chemical factories.
1,1-Dichloroethylene (vinylidene chloride)	2	ND	14	ug/L	No	Industrial chemical factories.
Dichloromethane	2	ND	50	ug/L	No	Pharmaceutical and chemical factories.
2,4-dichlorophenol	2	ND	900	ug/L	No	Industrial contamination, reaction with chlorine.
2,4-Dichlorophenoxy acetic acid (2,4-D)	2	ND	100	ug/L	No	Agricultural, residential herbicide.

Oshawa DWS Table 9 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Diclofop-methyl	2	Non-Detect (ND)	9	Microgram per Litre (ug/L)	No	Agricultural herbicide.
Dimethoate	2	ND	20	ug/L	No	Agricultural, livestock, operation, residential insecticide.
Diquat	2	ND	70	ug/L	No	Agricultural, aquatic herbicide.
Diuron	2	ND	150	ug/L	No	Agricultural, industrial herbicide.
Glyphosate	2	ND	280	ug/L	No	Agricultural, forestry, household herbicide.
Malathion	2	ND	190	ug/L	No	Pest control insecticide.
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	2	ND	100	ug/L	No	Agricultural herbicide.
Metolachlor	2	ND	50	ug/L	No	Agricultural herbicide.
Metribuzin	2	ND	80	ug/L	No	Agricultural herbicide.
Monochlorobenzene	2	ND	80	ug/L	No	Industrial and agricultural chemical factories and dry cleaning facilities.
Paraquat	2	ND	10	ug/L	No	Agricultural, aquatic herbicide.

Oshawa DWS Table 9 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Pentachlorophenol	2	Non-Detect (ND)	60	Microgram per Litre (ug/L)	No	Pesticide, wood preservative residue.
Phorate	2	ND	2	ug/L	No	Agricultural insecticide.
Picloram	2	ND	190	ug/L	No	Industrial herbicide.
Polychlorinated Biphenyls(PCB)	2	ND	3	ug/L	No	Residue from various industrial uses.
Prometryne	2	ND	1	ug/L	No	Agricultural herbicide.
Simazine	2	ND	10	ug/L	No	Agricultural herbicide.
Terbufos	2	ND	1	ug/L	No	Agricultural insecticide.
Tetrachloroethylene (perchloroethylene)	2	ND	10	ug/L	No	Leaching from PVC pipes; discharge from factories; dry cleaners and auto shops (metal degreaser).
2,3,4,6 - Tetrachlorophenol	2	ND	100	ug/L	No	Wood preservative.
Triallate	2	ND	230	ug/L	No	Agricultural herbicide.
Trichloroethylene	2	ND	5	ug/L	No	Metal degreasing sites and other factories.

Oshawa DWS Table 9 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
2,4,6-Trichlorophenol	2	Non-Detect (ND)	5	Microgram per Litre (ug/L)	No	Pesticide manufacturing.
Trifluralin	2	ND	45	ug/L	No	Agricultural herbicide.
Vinyl Chloride	2	ND	1	ug/L	No	Leaching from PVC pipes; discharge from plastics factories.

Oshawa DWS Table 10

Inorganic or Organic Parameter(s) that Exceed Half the Standard Prescribed in Schedule 2 of the Ontario Drinking Water Quality Standards.

No inorganic or organic parameters exceeded half the maximum allowable concentration in 2018.

Parameter	Result	Unit of Measure	Date of Sample
Not Applicable (N/A)	N/A	N/A	N/A

The Regional Municipality of Durham

Whitby Drinking Water System 2018 Annual Report

Drinking Water System Number: 220000754

Municipal Drinking Water Licence Number: 003-111

Drinking Water System Owner: The Regional Municipality of Durham

Drinking Water System Category: Large Municipal Residential

This Annual Report for the calendar year 2018 is designed to inform you about your drinking water system. This report has been prepared to satisfy Section 11 of Ontario Regulation (O. Reg.) 170/03. O. Reg. 170/03 sets requirements for drinking water systems with regard to sampling and testing, levels of treatment, certification of staff, and notification of authorities and the public about water quality. Hard copies of this report and the Schedule 22 Summary Report are available at the Regional Municipality of Durham Headquarters office that is located at 605 Rossland Road East, Whitby. The annual report is also available on the [Region of Durham's website](http://www.durham.ca) at www.durham.ca. Further information regarding the Drinking Water Regulations can be found on the [Ministry of the Environment, Conservation and Parks website](http://www.ontario.ca/ministry-environment-conservation-parks) at www.ontario.ca/ministry-environment-conservation-parks.

Drinking Water System Process Description

General

The Whitby Drinking Water System provides potable water to consumers in the Town of Whitby, Brooklin urban area, City of Oshawa, Town of Ajax, City of Pickering and Municipality of Clarington (Courtice urban area). The water supply plant is a Class Three Water Treatment Plant with an approved capacity of 118,000 cubic metres per day (m³/d). The Whitby Water Supply Plant feeds a Class Two Distribution System and Class Three Trunk Distribution System. The treatment and distribution systems are owned and operated by the Regional Municipality of Durham.

The source water for the treatment process is drawn from Lake Ontario. The water supply system includes the following processes:

- Zebra mussel control (chlorine),
- Screening,
- Low lift pumping,
- Dechlorination (sodium bisulphite),
- Coagulation (aluminum sulphate),
- Flocculation,
- Filtration,
- Disinfection (chlorine)
- Fluoridation (hydrofluosilicic acid),

- High lift pumping,
- Water storage and distribution.

Raw Water Supply

Raw water is drawn from Lake Ontario through a 1,350 millimetre diameter intake pipe extending 1,710 metres (m) into the lake. The intake structure is located at a depth of approximately 16 m. Chlorine is added at the raw water intake for zebra mussel control and to provide initial disinfection. There is also a line for raw water sampling at the intake crib. The pre-chlorine residual and turbidity are continuously measured as the raw water enters the water supply plant.

Coagulation/Flocculation

The water flows through traveling screens to remove large solids and continues towards the low lift pumps. Aluminum sulphate (alum) is added into a mechanical mixer upstream of the flocculation tanks. Gentle mixing of the alum with the water occurs as the water passes through the flocculation tanks. There are six sets of hydraulic spiral upflow flocculation tanks, each with three cells arranged for parallel flow.

Filtration

Particulate matter that is present in the raw water is captured by the coagulation/flocculation process and deposited on the top of the filters. The water supply plant has four filters to remove flocculated particles. All filters are dual media filters, composed of anthracite and sand. Filter effluent turbidity and head loss are continuously monitored to indicate filter effectiveness. The filters are cleaned using a backwash treatment. The backwash water is discharged to a two -cell sedimentation tank to allow for settling of the suspended solids. The settled solids are pumped to the sanitary sewer and the supernatant dechlorinated and discharged back to Lake Ontario.

Disinfection and Fluoridation

Treated water passes through the filters and the filter under-drain into the treated clearwell which feeds into the high lift suction well. The high lift pumps deliver treated water to the distribution system. Disinfection is achieved by the addition of chlorine at multiple application points throughout the plant. Sodium bisulfite, a dechlorination chemical, is used to manage chlorine residuals. Consistent disinfection is ensured by continuous online monitoring of the free chlorine residual throughout the water supply plant. Fluoride (hydrofluosilicic acid) is added to the treated water for the prevention of tooth decay within the service area.

Distribution System

The Oshawa/Whitby/Ajax distribution system delivers treated water through approximately 2,072 kilometres of watermains in multiple pressure zones and includes

12 booster stations and 10 water storage facilities (nine inground reservoirs and one elevated tank).

The Whitby distribution system is interconnected with the distribution systems of Oshawa and Ajax, therefore the entire system is licensed by the Ministry of the Environment and Climate Change as one distribution system. For the purposes of clarity in this report, distribution information will be recorded under its corresponding system.

Major Monetary expenses (above \$10,000)

Under Section 11 of O. Reg. 170/03, a description of any major expenses incurred during this reporting period to install, repair or replace required equipment must be included in the annual report. The details of the major expenses for this drinking water system are as follows:

Replacement of polybutylene service connections - \$2,298,485

Cathodic protection of watermains - \$38,740

Construction costs for the plant's wastewater dechlorination system - \$254,183

Pump repair at Westney Rd. Pumping Station - \$13,951

Remove and transport of diesel generator at Waverly Rd Pumping Station - \$14,760

Upgrading of safety gates at Garrard Rd Pumping Station - \$18,700

Watermain replacement costs (multiple locations) - \$653,460

Tables

For a description of terms and abbreviations in all tables, refer to the glossary at the end of the report.

Whitby Drinking Water System (DWS) Table 1

Summary of all Adverse Water Quality Incidents (AWQI) in 2018 Reported to Spills Action Centre in Accordance with Schedule 16-3 and 16-4 of O. Reg. 170/03.

Incident Date	Parameter	Result	Corrective Action	Corrective Action Date
January 10	Low pressure (Distribution)	Not applicable	Flushed, resampled. Results met Ontario Drinking Water Quality Standards (ODWQS).	January 10
January 16	Total Coliforms (Distribution)	4 Colony Forming Units (CFU) per 100 Millilitres	Flushed, resampled. Results met ODWQS.	January 16
March 28	Lead (Distribution)	12.2 Microgram per Litre (ug/L)	Flushed, resampled.	March 28 and April 3
April 3	Lead (Distribution)	10.2 ug/L	Hydrant rebuilt, flushed, resampled. Results met ODWQS.	April 3
September 28	Total Coliforms (Distribution)	16 CFU/100 ml	Flushed, resampled. Results met ODWQS.	September 28 and September 29
September 30	Total Coliforms (Distribution)	2 CFU/100 ml	Flushed, resampled. Results met ODWQS.	September 30 and October 2
October 11	Total Coliforms (Distribution)	54 CFU/100 ml	Flushed, resampled. Results met ODWQS.	October 11 and October 12

Whitby DWS Table 2

Microbiological Membrane Filtration (MF) Testing Under Schedule 10 of O. Reg. 170/03.

Type of Sample	Number of Samples	Range of Escherichia Coli MF Colony Forming Units per 100 Millilitres	Range of Total Coliforms MF Colony Forming Units per 100 Millilitres
Raw	197	Non-Detect (ND) - 1	ND - 230
Treated	2	ND	ND
Distribution	139	ND	ND - 54(4)*

* Number in parenthesis represents number of exceedance(s).

Whitby DWS Table 3

Microbiological Presence Absence (P/A) Testing Under Schedule 10 of O. Reg. 170/03.

Type of Sample	Number of Samples	Escherichia Coli P/A per 100 Millilitres	Total Coliforms P/A per 100 Millilitres
Treated	197	Absence (A)	A
Distribution	717	A	A

Whitby DWS Table 4

Microbiological Heterotrophic Plate Count (HPC) Testing Under Schedule 10 of O. Reg. 170/03.

Type of Sample	Number of Samples	Range of HPC Samples Colony Forming Units per Millilitre
Treated	199	Non-Detect (ND) - 5
Distribution	506	ND - 2900

Whitby DWS Table 5

Operational Testing Done Under Schedule 7 of O. Reg. 170/03.

Test	Number of Samples	Range of Results	Unit of Measure	Parameter Description
Turbidity - Filter Effluent	Continuous	0.001 - 0.184*	Nephelometric Turbidity Units (NTU)	Turbidity is a measure of particles in water.
Fluoride - Plant	Continuous	0.20 - 1.17*	Milligram per Litre (mg/L)	Fluoride is added to water to prevent tooth decay.
Free Chlorine - Plant	Continuous	0.81 - 2.09*	mg/L	Must be sufficient to ensure disinfection has been achieved.
Free Chlorine - Distribution	Continuous	0.21 - 3.00*	mg/L	Recommended level of at least 0.20 mg/L in the distribution system to maintain secondary disinfection, 0.05 mg/L is the minimum required.

*Results include all analyzers and grab samples.

Whitby DWS Table 6

Summary of Additional Testing and Sampling Carried Out in Accordance With the Requirement of an Approval, Order or Other Legal Instrument.

Type of Sample	Parameter	Date Sampled	Result	MAC	Unit of Measure
Raw Water	Gross Beta	January - December	0.10 - 0.14	Not Applicable (N/A)	Becquerels per Litre (Bq/L)
Raw Water	Tritium	January - December	0.8 - 16.1	N/A	Bq/L
Treated Water	Tritium	January - September	Non-Detect (ND) - 14.0	7,000	Bq/L
Environmental Discharge (Backwash Supernatant)	Suspended Solids	January - December	11.6	25	Milligram per Litre (mg/L)
Raw Water	Microcystin (Total)	June - October	ND	1.5	Microgram per Litre (ug/L)
Treated Water*	Microcystin (Total)	August - October	ND	1.5	ug/L
Distribution*	Microcystin (Total)	June - August	ND	1.5	ug/L

*On August 10, the Region changed the total microcystin sampling location from the distribution to the point of entry to comply with the MECP Director's letter dated May 4, 2018. Prior to this date the Region collected samples from the THM sample locations in the distribution system as per previous direction from the MECP (2017) Director's letters.

Whitby DWS Table 7

Summary of Treated Water Chemical Parameters Tested Under Schedule 13 and 23 of O. Reg. 170/03.

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources ¹
Antimony	14	Non-Detect (ND) - 0.001	0.006	Milligram per Litre (mg/L)	No	Fire retardants, ceramics, electronics, solder.
Arsenic	14	ND - 0.0007	0.01	mg/L	No	Mining.
Barium	2	0.0208 - 0.0229	1.0	mg/L	No	Metal refineries, oil drilling.
Boron	2	0.026 - 0.029	5.0	mg/L	No	Industrial.
Cadmium	14	ND	0.005	mg/L	No	Industrial.
Chromium	14	ND	0.05	mg/L	No	Industrial.
Haloacetic acids - Distribution (annual average)	12	16.2	80	Microgram per Litre (ug/L)	No	By-product of chlorination of drinking water.
Mercury	2	ND	0.001	mg/L	No	Industrial.
Selenium	14	ND - 0.0006	0.05	mg/L	No	Refineries, mines, chemical manufacturing.
Sodium	12	14.3 - 19.8	Not Applicable ²	mg/L	No	Storm water runoff including road salt.
Trihalomethane - Distribution (annual average)	12	38.3	100	ug/L	No	By-product of chlorination of drinking water.
Uranium	2	ND	0.02	mg/L	No	Power generation.
Nitrite	12	ND	1.0	mg/L	No	Agriculture runoff, landfill leachate and animal waste.
Nitrate	12	ND	10.0	mg/L	No	Fertilizer.

1 Parameters may occur naturally in the environment.

2 Sodium does not have a Maximum Acceptable Concentration (MAC); only an aesthetic objective of 200 mg/L. Sodium results exceeding 20 mg/L are to be reported to the Medical Officer of Health as per Schedule 16-3 (8) of O. Reg. 170/03.

Whitby DWS Table 8

Summary of Lead Testing Under Schedule 15.1 of O. Reg. 170/03.

Location Type	Number of Samples	Range of Lead Results Milligram per Litre	MAC	Number of Exceedances	pH	Alkalinity Milligram per Litre
Plumbing	68	Non-Detect (ND) - 0.0007	0.01	0	7.42 - 7.89	Not Applicable
Distribution	6	ND - 0.0122	0.01	1	7.52 - 7.75	84.6 - 89.9

Whitby DWS Table 9

Summary of Treated Water Organic Parameters Tested Under Schedule 24 of O. Reg. 170/03.

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Alachlor	2	Non-Detect (ND)	5	Microgram per Litre (ug/L)	No	Agricultural herbicide.
Atrazine + N-dealkylated metabolites	2	ND	5	ug/L	No	Agricultural herbicide.
Azinphos-methyl	2	ND	20	ug/L	No	Insecticide.
Benzene	2	ND	1	ug/L	No	Plastics manufacturing, leaking fuel tanks.
Benzo(a)pyrene	2	ND	0.01	ug/L	No	Formed from the incomplete burning of organic matter.
Bromoxynil	2	ND	5	ug/L	No	Agricultural herbicide.
Carbaryl	2	ND	90	ug/L	No	Agricultural, forestry, household insecticide.

Whitby DWS Table 9 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Carbofuran	2	Non-Detect (ND)	90	Microgram per Litre (ug/L)	No	Agricultural insecticide.
Carbon Tetrachloride	2	ND	2	ug/L	No	Chemical and industrial activities.
Chlorpyrifos	2	ND	90	ug/L	No	Agricultural, household insecticide.
Diazinon	2	ND	20	ug/L	No	Agricultural, livestock, operation, residential insecticide.
Dicamba	2	ND	120	ug/L	No	Agricultural herbicide
1,2-Dichlorobenzene	2	ND	200	ug/L	No	Chemical and industrial factories.
1,4-Dichlorobenzene	2	ND	5	ug/L	No	Chemical and industrial factories.
1,2-Dichloroethane	2	ND	5	ug/L	No	Industrial chemical factories.
1,1-Dichloroethylene (vinylidene chloride)	2	ND	14	ug/L	No	Industrial chemical factories.
Dichloromethane	2	ND	50	ug/L	No	Pharmaceutical and chemical factories.
2,4-dichlorophenol	2	ND	900	ug/L	No	Industrial contamination, reaction with chlorine.
2,4-Dichlorophenoxy acetic acid (2,4-D)	2	ND	100	ug/L	No	Agricultural, residential herbicide.

Whitby DWS Table 9 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Diclofop-methyl	2	Non-Detect (ND)	9	Microgram per Litre (ug/L)	No	Agricultural herbicide.
Dimethoate	2	ND	20	ug/L	No	Agricultural, livestock, operation, residential insecticide.
Diquat	2	ND	70	ug/L	No	Agricultural, aquatic herbicide.
Diuron	2	ND	150	ug/L	No	Agricultural, industrial herbicide.
Glyphosate	2	ND	280	ug/L	No	Agricultural, forestry, household herbicide.
Malathion	2	ND	190	ug/L	No	Pest control insecticide.
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	2	ND	100	ug/L	No	Agricultural herbicide.
Metolachlor	2	ND	50	ug/L	No	Agricultural herbicide.
Metribuzin	2	ND	80	ug/L	No	Agricultural herbicide.
Monochlorobenzene	2	ND	80	ug/L	No	Industrial and agricultural chemical factories and dry cleaning facilities.
Paraquat	2	ND	10	ug/L	No	Agricultural, aquatic herbicide.

Whitby DWS Table 9 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Pentachlorophenol	2	Non-Detect (ND)	60	Microgram per Litre (ug/L)	No	Pesticide, wood preservative residue.
Phorate	2	ND	2	ug/L	No	Agricultural insecticide.
Picloram	2	ND	190	ug/L	No	Industrial herbicide.
Polychlorinated Biphenyls(PCB)	2	ND	3	ug/L	No	Residue from various industrial uses.
Prometryne	2	ND	1	ug/L	No	Agricultural herbicide.
Simazine	2	ND	10	ug/L	No	Agricultural herbicide.
Terbufos	2	ND	1	ug/L	No	Agricultural insecticide.
Tetrachloroethylene (perchloroethylene)	2	ND	10	ug/L	No	Leaching from PVC pipes; discharge from factories; dry cleaners and auto shops (metal degreaser).
2,3,4,6 - Tetrachlorophenol	2	ND	100	ug/L	No	Wood preservative.
Triallate	2	ND	230	ug/L	No	Agricultural herbicide.
Trichloroethylene	2	ND	5	ug/L	No	Metal degreasing sites and other factories.

Whitby DWS Table 9 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
2,4,6-Trichlorophenol	2	Non-Detect (ND)	5	Microgram per Litre (ug/L)	No	Pesticide manufacturing.
Trifluralin	2	ND	45	ug/L	No	Agricultural herbicide.
Vinyl Chloride	2	ND	1	ug/L	No	Leaching from PVC pipes; discharge from plastics factories.

Whitby DWS Table 10

Inorganic or Organic Parameter(s) that Exceed Half the Standard Prescribed in Schedule 2 of the Ontario Drinking Water Quality Standards.

No inorganic or organic parameters exceeded half the maximum allowable concentration in 2018.

Parameter	Result	Unit of Measure	Date of Sample
Not Applicable (N/A)	N/A	N/A	N/A

The Regional Municipality of Durham

Ajax Drinking Water System 2018 Annual Report

Drinking Water System Number: 220008890

Municipal Drinking Water Licence Number: 003-111

Drinking Water System Owner: The Regional Municipality of Durham

Drinking Water System Category: Large Municipal Residential

This Annual Report for the calendar year 2018 is designed to inform you about your drinking water system. This report has been prepared to satisfy Section 11 of Ontario Regulation (O. Reg.) 170/03. O. Reg. 170/03 sets requirements for drinking water systems with regard to sampling and testing, levels of treatment, certification of staff, and notification of authorities and the public about water quality. Hard copies of this report and the Schedule 22 Summary Report are available at the Regional Municipality of Durham Headquarters office that is located at 605 Rossland Road East, Whitby. The annual report is also available on the [Region of Durham's website](http://www.durham.ca) at www.durham.ca. Further information regarding the Drinking Water Regulations can be found on the [Ministry of the Environment, Conservation and Parks website](http://www.ontario.ca/ministry-environment-conservation-parks) at www.ontario.ca/ministry-environment-conservation-parks.

Drinking Water System Process Description

General

The Ajax Drinking Water System provides potable water to consumers in the Town of Ajax and City of Pickering. The plant also has the capability to supply a limited amount of water to the Town of Whitby, City of Oshawa, and Municipality of Clarington (Courtice). The water supply plant is a Class Four Water Treatment Plant with a rated capacity of 163,500 cubic metres per day (m³/d). Ajax Water Supply Plant supplies a Class Two Distribution System, and a Class Three Trunk Distribution System. The treatment and distribution systems are owned and operated by the Regional Municipality of Durham.

The source water for the treatment process is drawn from Lake Ontario. The water supply system includes the following processes:

- Zebra mussel control (sodium hypochlorite),
- Screening,
- Low lift pumping,
- pH adjustment (sulphuric acid),
- Coagulation (aluminum sulphate),
- Flocculation,
- Filtration,
- Disinfection (sodium hypochlorite),

- Dechlorination (sodium bisulphite),
- Fluoridation (hydrofluosilicic acid),
- High lift pumping,
- Water storage and distribution.

Raw Water Supply

Raw water is drawn from Lake Ontario through a 2,100 millimetre (mm) diameter intake pipe extending 2,506 metres (m) into the lake. The intake structure is located at a depth of approximately 18 m. Five 100 mm diameter lines are located outside the intake pipe. Three lines are used for raw water sampling and two lines are dedicated to the delivery of chlorine solution to a zebra mussel chlorine diffuser that is used for initial disinfection and control of zebra mussels. The chlorine residual and turbidity are continuously measured as the raw water enters the water supply plant. Sulphuric acid can be added for pH adjustment to enhance disinfection, coagulation and flocculation.

Coagulation/Flocculation

The water flows through traveling screens to remove large solids and continues towards the low lift pumps. Aluminum sulphate (alum) is added to a mechanical mixer upstream of the flocculation tanks. Gentle mixing of the alum with the water occurs as the water passes through the six sets of mechanical mixing and hydraulic spiral up-flow flocculation tanks. Each tank contains three flocculation cells.

Filtration

Particulate matter that is present in the raw water is captured by the coagulation/flocculation process and deposited on the top of the filters. The water supply plant has six dual media filters to remove flocculated particles. Four of the filters use granulated activated carbon (GAC) and two use anthracite. GAC is used to assist in taste and odour control. Filter effluent turbidity and head loss are continuously monitored to indicate filter effectiveness. Three vertical centrifugal pumps are available for backwashing the filters. The backwashed water is discharged to two holding tanks and two sedimentation tanks to allow for settling of the suspended solids. The settled solids are pumped to the sanitary sewer and the dechlorinated clear supernatant is discharged back to Lake Ontario.

Disinfection, Fluoridation and High Lift Pumping

Filtered water passes through the filter under-drain into the reservoir. The water in the reservoir then enters the clear well and eventually the high lift pump suction well. The high lift pumps deliver treated water to the distribution system. Disinfection is achieved by the addition of chlorine at multiple application points throughout the plant. Sodium bisulphite, a dechlorination chemical, is used to manage chlorine residuals. Consistent disinfection is ensured by continuous online monitoring of the free chlorine residual

throughout the water supply plant. Fluoride (hydrofluosilicic acid) is added to the treated water for the prevention of tooth decay within the service area.

Distribution System

The Oshawa/Whitby/Ajax distribution system delivers treated water through approximately 2,072 kilometres of watermains in multiple pressure zones and includes 12 booster stations and 10 water storage facilities (nine inground reservoirs and one elevated tank).

The Ajax distribution system is interconnected with the distribution systems of Whitby and Oshawa, therefore the entire system is licensed by the Ministry of the Environment and Climate Change as one distribution system. For the purposes of clarity in this report, distribution information will be recorded under its corresponding system.

Major Monetary expenses (above \$10,000)

Under Section 11 of O. Reg. 170/03, a description of any major expenses incurred during this reporting period to install, repair or replace required equipment must be included in the annual report. The details of the major expenses for this drinking water system are as follows:

- Cathodic protection of watermains - \$195,236
- Replacement of polybutylene service connections - \$4,387,571
- Construction costs for the Brock Road Zone 1 Reservoir and Zone 3 and 4 (Seaton) Pumping Station (2018 costs) - \$2,605,150
- Installation magnetic flowmeter at Rosebank Pumping Station - \$14,650
- Replacement of isolation valve at Rosebank Pumping Station - \$24,530
- Replacement of isolation valve at the water supply plant - \$13,500
- Upgraded Supervisory Control and Data Acquisition (SCADA) components - \$16,598
- Repaired pumps and motor driveshafts at Harwood Pumping Station - \$32,564
- Upgraded pumps and equipment guards at the water plant - \$10,441
- Replacement of fluoride woodstave storage tank - \$18,500
- Upgraded Supervisory Control and Data Acquisition at Harwood Pumping Station - \$11,532
- Repaired sodium hypochlorite metering pump at the water supply plant - \$13,577
- Repaired pump at Harwood Pumping Station - \$11,474
- Replacement of two battery banks at the water supply plant - \$16,930
- Watermain replacement costs (multiple locations) - \$1,978,598

Tables

For a description of terms and abbreviations in all tables, refer to the glossary at the end of the report.

Ajax Drinking Water System (DWS) Table 1

Summary of all Adverse Water Quality Incidents (AWQI) in 2018 Reported to Spills Action Centre in Accordance with Schedule 16-3 and 16-4 of O. Reg. 170/03.

Incident Date	Parameter	Result	Corrective Action	Corrective Action Date
January 15	Low pressure (Distribution)	Not applicable	Flushed, resampled. Results met Ontario Drinking Water Quality Standards (ODWQS).	January 15
March 1	Total Coliforms (Distribution)	1 Colony Forming Units (CFU) per 100 millilitres.	Flushed, resampled. Results met ODWQS.	March 1
March 8	Sodium (Plant)	20.1 Milligram per Litre (mg/L)	Resampled.	March 8
April 15	Total Coliforms and E. coli (Distribution)	No data. Overgrown.	Flushed, resampled. Results met ODWQS.	April 15 and April 17
July 11	Total Coliforms (Distribution)	8 CFU/100 mL	Flushed, resampled. Results met ODWQS.	July 11
July 11	Schedule 1- 4 (Filtration and primary disinfection for surface water raw water supply)	Interruption of chemically assisted filtration.	Standby alum feed pump in service within 60 seconds, confirmed alum flow by drawdown flow test and in-line flow meter. All filter turbidities were maintained below 0.1 NTU.	July 11
July 15	Total Coliforms (Distribution)	24 CFU/100 mL	Flushed, resampled. Results met ODWQS.	July 15
July 17	Schedule 1- 4 (Filtration and primary disinfection for surface water raw water supply)	Interruption of chemically assisted filtration.	Standby alum feed pump in service within 60 seconds, confirmed alum flow by drawdown flow test and in-line flow meter. All filter turbidities were maintained below 0.1 NTU.	July 17

Ajax DWS Table 1 continued

Incident Date	Parameter	Result	Corrective Action	Corrective Action Date
July 20	Total Coliforms (Distribution)	54 CFU/100 mL	Flushed, resampled. Results met ODWQS.	July 20
August 23	Total Coliforms (Distribution)	Presence	Flushed, resampled. Results met ODWQS.	August 23
August 24	Total Coliforms (Distribution)	1 CFU/100 mL	Flushed, resampled. Results met ODWQS	August 24 and August 26
October 4	Total Coliforms (Distribution)	Presence	Flushed, resampled. Results met ODWQS.	October 4
November 21	Total Coliforms (Distribution)	18 CFU/100 mL	Flushed, resampled. Results met ODWQS. Adverse notification rescinded due to laboratory contamination.	November 21
November 30	Total Coliforms (Distribution)	2 CFU/100 mL	Flushed, resampled. Results met ODWQS.	November 30

Ajax DWS Table 2

Microbiological Membrane Filtration (MF) Testing Under Schedule 10 of O. Reg. 170/03.

Type of Sample	Number of Samples	Range of Escherichia Coli MF Colony Forming Units per 100 Millilitres	Range of Total Coliforms MF Colony Forming Units per 100 Millilitres
Raw	197	Non-Detect (ND) - 1	ND - 120
Treated	13	ND	ND
Distribution	330	ND - Over-grown (1)	ND - 54(8)*

* Number in parenthesis represents number of exceedance(s).

Ajax DWS Table 3

Microbiological Presence Absence (P/A) Testing Under Schedule 10 of O. Reg. 170/03.

Type of Sample	Number of Samples	Escherichia Coli P/A per 100 Millilitres	Total Coliforms P/A per 100 Millilitres
Treated	197	Absence (A)	A
Distribution	1074	A	A - Presence (2)*

* Number in parenthesis represents number of exceedance(s).

Ajax DWS Table 4

Microbiological Heterotrophic Plate Count (HPC) Testing Under Schedule 10 of O. Reg. 170/03.

Type of Sample	Number of Samples	Range of HPC Samples Colony Forming Units per Millilitre
Treated	210	Non-Detect (ND) - 4
Distribution	878	ND - 480

Ajax DWS Table 5

Operational Testing Done Under Schedule 7 of O. Reg. 170/03.

Test	Number of Samples	Range of Results	Unit of Measure	Parameter Description
Turbidity - Filter Effluent	Continuous	0.01 - 1.99	Nephelometric Turbidity Units (NTU)	Turbidity is a measure of particles in water.
Fluoride - Plant	Continuous	0.20 - 1.234*	Milligram per Litre (mg/L)	Fluoride is added to water to prevent tooth decay.
Free Chlorine - Plant	Continuous	0.55 - 2.01*	mg/L	Must be sufficient to ensure disinfection has been achieved.
Free Chlorine - Distribution	Continuous	0.10 - 5.12*	mg/L	Recommended level of at least 0.20 mg/L in the distribution system to maintain secondary disinfection, 0.05 mg/L is the minimum required.

*Results include all analyzers and grab samples.

Ajax DWS Table 6

Summary of Additional Testing and Sampling Carried Out in Accordance With the Requirement of an Approval, Order or Other Legal Instrument.

Type of Sample	Parameter	Date Sampled	Result	MAC	Unit of Measure
Raw Water	Gross Beta	January - December	0.09 - 0.15	Not Applicable (N/A)	Becquerels per Litre (Bq/L)
Raw Water	Tritium	January - December	0.3 - 11.8	N/A	Bq/L
Treated Water	Tritium	January - September	Non-Detect (ND) - 14.0	7,000	Bq/L
Environmental Discharge (Backwash Supernatant)	Suspended Solids	January - December	9.6	25	Milligram per Litre (mg/L)
Environmental Discharge (Backwash Supernatant)	Chlorine Residual	January - December	0.02	N/A	mg/L
Raw Water	Microcystin (Total)	June - October	ND	1.5	Microgram per Litre (ug/L)
Treated Water*	Microcystin (Total)	August - October	ND	1.5	ug/L
Distribution*	Microcystin (Total)	June - August	ND	1.5	ug/L

*On August 10, the Region changed the total microcystin sampling location from the distribution to the point of entry to comply with the MECP Director's letter dated May 4, 2018. Prior to this date the Region collected samples from the THM sample locations in the distribution system as per previous direction from the MECP (2017) Director's letters.

Ajax DWS Table 7

Summary of Treated Water Chemical Parameters Tested Under Schedule 13 and 23 of O. Reg. 170/03.

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources ¹
Antimony	14	0.0005 - 0.001	0.006	Milligram per Litre (mg/L)	No	Fire retardants, ceramics, electronics, solder.
Arsenic	14	Non-Detect (ND) - 0.0007	0.01	mg/L	No	Mining.
Barium	2	0.0186 - 0.0212	1.0	mg/L	No	Metal refineries, oil drilling.
Boron	2	0.0161 - 0.0301	5.0	mg/L	No	Industrial.
Cadmium	14	ND	0.005	mg/L	No	Industrial.
Chromium	14	ND	0.05	mg/L	No	Industrial.
Haloacetic acids - Distribution (annual average)	12	10.6	80	Microgram per Litre (ug/L)	No	By-product of chlorination of drinking water.
Mercury	2	ND	0.001	mg/L	No	Industrial.
Selenium	14	ND	0.05	mg/L	No	Refineries, mines, chemical manufacturing.
Sodium	12	16.2 - 20.8	Not Applicable ²	mg/L	Yes (2) ³	Storm water runoff including road salt.
Trihalomethane - Distribution (annual average)	12	31.8	100	ug/L	No	By-product of chlorination of drinking water.
Uranium	2	ND	0.02	mg/L	No	Power generation.
Nitrite	12	ND	1.0	mg/L	No	Agriculture runoff, landfill leachate and animal waste.
Nitrate	12	ND	10.0	mg/L	No	Fertilizer.

1 Parameters may occur naturally in the environment.

2 Sodium does not have a Maximum Acceptable Concentration (MAC); only an aesthetic objective of 200 mg/L. Sodium results exceeding 20 mg/L are to be reported to the Medical Officer of Health as per Schedule 16-3 (8) of O. Reg. 170/03.

3 Number in parenthesis represents number of exceedance(s). For Sodium, regulations require reporting when results exceed 20 mg/L if it has not been reported in the preceding 57 months.

Ajax DWS Table 8

Summary of Lead Testing Under Schedule 15.1 of O. Reg. 170/03.

Location Type	Number of Samples	Range of Lead Results Milligram per Litre	MAC	Number of Exceedances	pH	Alkalinity Milligram per Litre
Plumbing	84	Non-Detect (ND) - 0.001	0.01	0	7.38 - 8.29	Not Applicable
Distribution	8	ND - 0.0016	0.01	0	7.52 - 7.91	84.8 - 92.4

Ajax DWS Table 9

Summary of Treated Water Organic Parameters Tested Under Schedule 24 of O. Reg. 170/03.

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Alachlor	2	Non-Detect (ND)	5	Microgram per Litre (ug/L)	No	Agricultural herbicide.
Atrazine + N-dealkylated metabolites	2	ND	5	ug/L	No	Agricultural herbicide.
Azinphos-methyl	2	ND	20	ug/L	No	Insecticide.
Benzene	2	ND	1	ug/L	No	Plastics manufacturing, leaking fuel tanks.
Benzo(a)pyrene	2	ND	0.01	ug/L	No	Formed from the incomplete burning of organic matter.
Bromoxynil	2	ND	5	ug/L	No	Agricultural herbicide.
Carbaryl	2	ND	90	ug/L	No	Agricultural, forestry, household insecticide.

Ajax DWS Table 9 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Carbofuran	2	Non-Detect (ND)	90	Microgram per Litre (ug/L)	No	Agricultural insecticide.
Carbon Tetrachloride	2	ND	2	ug/L	No	Chemical and industrial activities.
Chlorpyrifos	2	ND	90	ug/L	No	Agricultural, household insecticide.
Diazinon	2	ND	20	ug/L	No	Agricultural, livestock, operation, residential insecticide.
Dicamba	2	ND	120	ug/L	No	Agricultural herbicide
1,2-Dichlorobenzene	2	ND	200	ug/L	No	Chemical and industrial factories.
1,4-Dichlorobenzene	2	ND	5	ug/L	No	Chemical and industrial factories.
1,2-Dichloroethane	2	ND	5	ug/L	No	Industrial chemical factories.
1,1-Dichloroethylene (vinylidene chloride)	2	ND	14	ug/L	No	Industrial chemical factories.
Dichloromethane	2	ND	50	ug/L	No	Pharmaceutical and chemical factories.
2,4-dichlorophenol	2	ND	900	ug/L	No	Industrial contamination, reaction with chlorine.
2,4-Dichlorophenoxy acetic acid (2,4-D)	2	ND	100	ug/L	No	Agricultural, residential herbicide.

Ajax DWS Table 9 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Diclofop-methyl	2	Non-Detect (ND)	9	Microgram per Litre (ug/L)	No	Agricultural herbicide.
Dimethoate	2	ND	20	ug/L	No	Agricultural, livestock, operation, residential insecticide.
Diquat	2	ND	70	ug/L	No	Agricultural, aquatic herbicide.
Diuron	2	ND	150	ug/L	No	Agricultural, industrial herbicide.
Glyphosate	2	ND	280	ug/L	No	Agricultural, forestry, household herbicide.
Malathion	2	ND	190	ug/L	No	Pest control insecticide.
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	2	ND	100	ug/L	No	Agricultural herbicide.
Metolachlor	2	ND	50	ug/L	No	Agricultural herbicide.
Metribuzin	2	ND	80	ug/L	No	Agricultural herbicide.
Monochlorobenzene	2	ND	80	ug/L	No	Industrial and agricultural chemical factories and dry cleaning facilities.
Paraquat	2	ND	10	ug/L	No	Agricultural, aquatic herbicide.

Ajax DWS Table 9 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
Pentachlorophenol	2	Non-Detect (ND)	60	Microgram per Litre (ug/L)	No	Pesticide, wood preservative residue.
Phorate	2	ND	2	ug/L	No	Agricultural insecticide.
Picloram	2	ND	190	ug/L	No	Industrial herbicide.
Polychlorinated Biphenyls(PCB)	2	ND	3	ug/L	No	Residue from various industrial uses.
Prometryne	2	ND	1	ug/L	No	Agricultural herbicide.
Simazine	2	ND	10	ug/L	No	Agricultural herbicide.
Terbufos	2	ND	1	ug/L	No	Agricultural insecticide.
Tetrachloroethylene (perchloroethylene)	2	ND	10	ug/L	No	Leaching from PVC pipes; discharge from factories; dry cleaners and auto shops (metal degreaser).
2,3,4,6 - Tetrachlorophenol	2	ND	100	ug/L	No	Wood preservative.
Triallate	2	ND	230	ug/L	No	Agricultural herbicide.
Trichloroethylene	2	ND	5	ug/L	No	Metal degreasing sites and other factories.

Ajax DWS Table 9 continued

Parameter	Number of Samples	Results Range	MAC	Unit of Measure	MAC Exceedance	Potential Sources
2,4,6-Trichlorophenol	2	Non-Detect (ND)	5	Microgram per Litre (ug/L)	No	Pesticide manufacturing.
Trifluralin	2	ND	45	ug/L	No	Agricultural herbicide.
Vinyl Chloride	2	ND	1	ug/L	No	Leaching from PVC pipes; discharge from plastics factories.

Ajax DWS Table 10

Inorganic or Organic Parameter(s) that Exceed Half the Standard Prescribed in Schedule 2 of the Ontario Drinking Water Quality Standards.

No inorganic or organic parameters exceeded half the maximum allowable concentration in 2018.

Parameter	Result	Unit of Measure	Date of Sample
Not Applicable (N/A)	N/A	N/A	N/A