The 2020 Annual Drinking Water Quality Report:

Burlington, Burloak and Oakville Water Treatment Plants and the South Halton Distribution Subsystem

February 2021

Halton REGION

Introduction

Halton is committed to providing safe drinking water to all of our customers. As mandated by the *Safe Drinking Water Act, 2002*, this annual Water Quality Report includes:

- a description of the water treatment process and chemicals used;
- any major expenses to install, repair or upgrade equipment in the system; and,
- the results of our water tests and how they compare to provincial regulatory standards.

In the Burlington, Burloak and Oakville Water Treatment Plants and in the South Halton Water Distribution Subsystem, all provincial regulatory monitoring requirements were met or surpassed in the current reporting year.

Burlington Water Treatment Plant

Drinking Water System Number: 220001664

The Burlington Water Treatment Plant (WTP), located at 3249 Lakeshore Road, Burlington, has a rated capacity to produce 263 ML/d (million litres per day) of treated drinking water. The raw water source is Lake Ontario.

The facility is a conventional filtration treatment plant with a process that consists of coagulation, flocculation and sedimentation using the Actiflo® process (microsand ballasted clarification), filtration, fluoridation, ozonation (disinfection and taste and odour control) and chlorination (disinfection). Seasonally, the water is chlorinated at the intake for mussel control. The treatment chemicals used in the current reporting year were:

- chlorine gas (disinfection and control of particle counts on filters and mussel formation at the intakes);
- hydrofluosilicic acid (fluoridation);
- polyaluminum chloride with provision to switch to aluminum sulphate (coagulation);
- polymer (coagulation aid);
- waste polymer (waste treatment aid);
- sodium bisulphite or calcium thiosulphate (dechlorination and ozone quenching);
- sodium metabisulphite (waste dechlorination);
- liquid oxygen (ozone generation).

The plant is controlled through a Supervisory Control and Data Acquisition (SCADA) system that is monitored twenty-four hours per day, seven days per week. The treated drinking water is pumped into the South Halton Distribution Subsystem which serves Burlington, Oakville and areas of Milton and Halton Hills.

Burloak Water Treatment Plant

Drinking Water System Number: 260085436

The Burloak Water Treatment Plant (WTP), located at 3380 Rebecca Street, Oakville, has a rated capacity to produce 55 ML/d (million litres per day) of treated drinking water. The facility is a membrane filtration treatment plant with a process that consists of flocculation, ultra-filtration (via membranes), ultra-violet irradiation, ozonation (disinfection and taste and odour control), fluoridation and chlorination (disinfection). Seasonally, the water is chlorinated at the intake for mussel control. The treatment chemicals used in the current reporting year were:

- chlorine gas (disinfection and mussel control);
- hydrofluosilicic acid (fluoridation);
- polyaluminum chloride (used as part of a trial);
- citric acid (clean membranes);
- sodium bisulphite (dechlorination and ozone quenching);
- liquid oxygen (ozone generation); and
- potassium hydroxide (pH adjustment on waste system).

The plant is controlled through a SCADA system that is monitored twenty-four hours per day, seven days per week. The treated drinking water is pumped into the South Halton Distribution Subsystem which serves Burlington, Oakville and areas of Milton and Halton Hills.

Oakville Water Treatment Plant

Drinking Water System Number: 220001637

The Oakville Water Treatment Plant (WTP), located at 21 Kerr Street, Oakville, has a rated capacity to produce 109 ML/d (million litres per day) of treated drinking water. The raw water source is Lake Ontario.

The facility is a conventional filtration treatment plant with a process that consists of coagulation, flocculation and sedimentation using the Actiflo® process (microsand ballasted clarification), filtration, fluoridation, ozonation (disinfection and taste and odour control) and chlorination (disinfection). Seasonally, the water is chlorinated at the intake for mussel control. The treatment chemicals used in the current reporting year were:

- chlorine gas (disinfection and mussel control);
- hydrofluosilicic acid (fluoridation);
- polyaluminum chloride with provision to switch to aluminum sulphate (coagulation);
- polymer - solid (coagulation aid);
- polymer - liquid (filtration and residue management aid);
- liquid oxygen (ozone generation);
- provision for hydrogen peroxide addition (taste and odour control); and
- calcium thiosulphate (dechlorination and ozone quenching).

The plant is controlled through a SCADA system that is monitored twenty-four hours per day, seven days per week. The treated drinking water is pumped into the South Halton Distribution Subsystem which serves Burlington, Oakville and areas of Milton and Halton Hills.

South Halton Water Distribution Subsystem

Drinking Water System Number: 260085462

The South Halton Distribution Subsystem is registered separately from the three water treatment plants; Burlington, Burloak and Oakville WTPs which provide the drinking water. The South Halton Distribution Subsystem serves Burlington, Oakville and areas of Milton and Halton Hills.

What Improvements Are We Making?

In the current reporting year, approximately $5,118,000 was spent on capital upgrades to the Burlington, Burloak and Oakville treatment facilities and South Halton outlying stations. Projects included:

- upgrades at Burlington WTP - replacement of high lift and low lift pumps and installation of variable-frequency drives (VFD);
- plan ultra-filtration membrane replacements at Burloak WTP; construction to commence in 2021
- modernized Operational Control Centre (OCC) for Halton Drinking Water Systems at the Burloak WTP
- Battery Energy Storage System feasibility study at the Oakville WTP
- Beaufort and Washburn Reservoir expansion;
- Brant Street Reservoir repairs;
- Neyagawa Booster Station optimization; and

Approximately $37,620,000 was spent on water main projects in Oakville, Burlington and Milton (lake based) which are all connected to the South Halton Distribution Subsystem. In addition to capital upgrades, Halton continued to support the production and delivery of high quality, safe drinking water through water sampling and monitoring above the provincial requirements, ongoing upgrades to the SCADA monitoring and infrastructure management systems, oversight of cross-connection control, an update of the Water Master Plan, water efficiency programs and optimization of water treatment processes. Work also continued on the Drinking Water Quality Management System, a provincial requirement to support the licensing of municipal drinking water systems which came into effect for Halton in January 2009.

Partnership for Safe Water Directors Award

Halton Region is the first municipality in Canada to receive the Partnership for Safe Water Directors Award from the American Water Works Association (AWWA) for outstanding commitment to high quality drinking water and treatment. The AWWA's Partnership for Safe Water is a collaboration of six established drinking water organizations who came together to create a comprehensive, voluntary program designed to optimize water treatment plant performance. This international partnership includes more than 250 water service providers and 400 treatment plants in Canada and the United States. This award recognizes the achievements of the Burlington, Burloak and Oakville water treatment plants.

Water Quality Testing

A large number of water quality tests are performed each and every day, in accordance with the *Safe Drinking Water Act, 2002* and regulations. The following sections provide a summary of the test results.

Terms

CFU/100 mL	Colony-forming units per 100 millilitres of water
µg/L	micrograms per litre
mg/L	milligrams per litre
Standard	Ontario Drinking Water Quality Standard, O.Reg. 169/03

Microbiological Testing

	Number of Samples	*E. coli* Results (min - max)	Total Coliform Results (min - max)	Number of Heterotrophic Plate Count* Samples	Heterotrophic Plate Count Results (min – max)
Raw Water Burlington	52	0 – 30	0 – 1330	N/A	N/A
Treated Water Burlington	52	0 – Absent	0 – Absent	52	0 - 2
Raw Water Oakville	52	0 – 130	0 - 1640	N/A	N/A
Treated Water Oakville	52	0 – Absent	0 – Absent	52	0 - 3
Raw Water Burloak	52	0 - 200	0 – 3000	N/A	N/A
Treated Water Burloak	52	0 – Absent	0 – Absent	52	0 - 7
Distribution	2643	0 – Absent	0 - Present	1981	0 - 313

Microbiological standards for treated and distributed water:

E.coli	not detected
Total Coliforms	not detected
HPC	Heterotrophic Plate Counts are conducted on some treated and distribution system samples. The HPC test is used as a tool to monitor overall quality, but the results are not indicators of water safety. There is no Drinking Water Quality Standard for HPC.

Operational Testing

At all three WTPs, continuous analyzers measure and record the results of chlorine residual, turbidity and fluoride residual throughout the treatment process and in the treated water several times per minute, twenty-four hours per day, seven days per week. All of the readings are validated by an operator and are also reviewed by the Ministry of the Environment, Conservation and Parks (MECP) Inspector. As well, Halton operators measure the chlorine in the distributed water. 'Adverse' test results must be reported if there is an indication that primary inactivation (disinfection) may not have been achieved, if the turbidity of filtered water is >1.0 NTU, if the fluoride residual is >1.5 mg/L or if a free chlorine residual in the distribution system is <0.05 mg/L. In the current reporting year, all validated readings and test results for these parameters were within the ranges required by regulation.

Chemical Testing

Inorganic Parameters – Treated Water (unless otherwise noted)

Parameter	Sample Date	Unit of Measure	Burlington Result	Oakville Result	Burloak Result	Standard	Exceedance of Standard
Antimony	04/20/20	mg/L	0.0005	<0.0005	0.0005	0.006	No
Arsenic	04/20/20	mg/L	<0.001	<0.001	<0.001	0.01	No
Barium	04/20/20	mg/L	0.025	0.019	0.022	1.0	No
Boron	04/20/20	mg/L	0.024	0.024	0.025	5.0	No
Bromate (latest running annual average)	12/07/20	mg/L	0.004	0.003	0.006	0.01 (running annual average)	No
Cadmium	04/20/20	mg/L	<0.0005	<0.0005	<0.0005	0.005	No
Chromium	04/20/20	mg/L	<0.001	<0.001	<0.001	0.05	No
Mercury	04/20/20	mg/L	<0.00005	<0.00005	<0.00005	0.001	No
Selenium	04/20/20	mg/L	<0.001	<0.001	<0.001	0.05	No
Sodium	12/14/20	mg/L	14.3	16.5	15.2	20	No
Uranium	04/20/20	mg/L	<0.001	<0.001	<0.001	0.02	No
Fluoride	12/14/20	mg/L	0.67	0.60	0.66	1.5	No
Nitrite	11/16/20	mg/L	<0.02	<0.02	<0.02	1.0	No
Nitrate	11/16/20	mg/L	0.40	0.36	0.33	10.0	No

Organic Parameters – Treated Water (unless otherwise noted)

Parameter	Sample Date	Unit of Measure	Burlington Result	Oakville Result	Burloak Result	Standard	Exceedance of Standard
Alachlor	04/20/20	µg/L	<0.50	<0.50	<0.50	5	No
Atrazine + N-dealkylated metobolites	04/20/20	µg/L	<1.0	<1.0	<1.0	5	No
Azinphos-methyl	04/20/20	µg/L	<2.0	<2.0	<2.0	20	No
Benzene	04/20/20	µg/L	<0.10	<0.10	<0.10	1	No
Benzo(a)pyrene	04/20/20	µg/L	<0.0050	<0.0050	<0.0050	0.01	No
Bromoxynil	04/20/20	µg/L	<0.50	<0.50	<0.50	5	No
Carbaryl	04/20/20	µg/L	<5.0	<5.0	<5.0	90	No
Carbofuran	04/20/20	µg/L	<5.0	<5.0	<5.0	90	No
Carbon Tetrachloride	04/20/20	µg/L	<0.10	<0.10	<0.10	2	No
Chlorpyrifos	04/20/20	µg/L	<1.0	<1.0	<1.0	90	No
Diazinon	04/20/20	µg/L	<1.0	<1.0	<1.0	20	No
Dicamba	04/20/20	µg/L	<1.0	<1.0	<1.0	120	No
1,2-Dichlorobenzene	04/20/20	µg/L	<0.20	<0.20	<0.20	200	No
1,4-Dichlorobenzene	04/20/20	µg/L	<0.20	<0.20	<0.20	5	No
1,2-Dichloroethane	04/20/20	µg/L	<0.20	<0.20	<0.20	5	No

Parameter	Sample Date	Unit of Measure	Burlington Result	Oakville Result	Burloak Result	Standard	Exceedance of Standard
1,1-Dichloroethylene (vinylidene chloride)	04/20/20	µg/L	<0.10	<0.10	<0.10	14	No
Dichloromethane	04/20/20	µg/L	<0.50	<0.50	<0.50	50	No
2-4 Dichlorophenol	04/20/20	µg/L	<0.25	<0.25	<0.25	900	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	04/20/20	µg/L	<1.0	<1.0	<1.0	100	No
Diclofop-methyl	04/20/20	µg/L	<0.90	<0.90	<0.90	9	No
Dimethoate	04/20/20	µg/L	<2.5	<2.5	<2.5	20	No
Diquat	04/20/20	µg/L	<7.0	<7.0	<7.0	70	No
Diuron	04/20/20	µg/L	<10	<10	<10	150	No
Glyphosate	04/20/20	µg/L	<10	<10	<10	280	No
HAA (latest running annual average)	11/16/20	µg/L	<5.0	<5.0	<5.0	80 (running annual average)	No
2-Methyl-4-chlorophenoxyacetic acid	04/20/20	µg/L	<10	<10	<10	100	No
Malathion	04/20/20	µg/L	<5.0	<5.0	<5.0	190	No
Metolachlor	04/20/20	µg/L	<0.50	<0.50	<0.50	50	No
Metribuzin	04/20/20	µg/L	<5.0	<5.0	<5.0	80	No
Monochlorobenzene	04/20/20	µg/L	<0.10	<0.10	<0.10	80	No
Paraquat	04/20/20	µg/L	<1.0	<1.0	<1.0	10	No
Pentachlorophenol	04/20/20	µg/L	<0.50	<0.50	<0.50	60	No
Phorate	04/20/20	µg/L	<0.50	<0.50	<0.50	2	No
Picloram	04/20/20	µg/L	<5.0	<5.0	<5.0	190	No
Polychlorinated Biphenyls(PCB)	04/20/20	µg/L	<0.05	<0.05	<0.05	3	No
Prometryne	04/20/20	µg/L	<0.25	<0.25	<0.25	1	No
Simazine	04/20/20	µg/L	<1.0	<1.0	<1.0	10	No
THM - Distribution (latest running annual average)	11/17/20	µg/L	28.1	28.1	28.1	100 (running annual average)	No
Terbufos	04/20/20	µg/L	<0.50	<0.50	<0.50	1	No
Tetrachloroethylene	04/20/20	µg/L	<0.10	<0.10	<0.10	10	No
2,3,4,6-Tetrachlorophenol	04/20/20	µg/L	<0.50	<0.50	<0.50	100	No
Triallate	04/20/20	µg/L	<1.0	<1.0	<1.0	230	No
Trichloroethylene	04/20/20	µg/L	<0.10	<0.10	<0.10	5	No
2,4,6-Trichlorophenol	04/20/20	µg/L	<0.50	<0.50	<0.50	5	No
Trifluralin	04/20/20	µg/L	<1.0	<1.0	<1.0	45	No
Vinyl Chloride	04/20/20	µg/L	<0.20	<0.20	<0.20	1	No

Additional Testing Required by the Municipal Drinking Water Licence

Parameter	Date Sampled	Burlington Result	Oakville Result	Burloak Result	Exceedance of Specified Concentration
Suspended solids in the treated wastewater at point of discharge (composite or automatic sampler)	Monthly (January to December)	4.9 mg/L (average) Max. per MDWL = 15 mg/L	35 mg/L (average) Max. per MDWL = 25 mg/L	24 mg/L[1] (average) Max. per MDWL = 15 mg/L	Yes[1&2]

1 The suspended solids limits for the water treatment plants are only applicable when the plants are discharging waste to the natural environment (i.e. storm sewer system). At the Burloak Water Treatment Plant, the waste discharges to the sanitary sewer system and the discharge to storm valve is normally closed, meaning that the limit of 15 mg/L is not applicable unless this operational practice changes.

2 At the Oakville Water Treatment Plant, the Gravity Thickener has been out of service since November 17, 2020 due to mechanical failure. Approval was provided by the MECP (on November 19, 2020) for temporary relief of complying with the annual average monthly suspended solids concentration limit of 25 mg/L until emergency repairs can be completed.

'Adverse' Results Notifications

The following tables show the notices of 'adverse' water quality results submitted in accordance with the *Safe Drinking Water Act, 2002* to the MECP and the Medical Officer of Health.

Date	Location	Adverse Condition	Corrective Action	Notice of Issue Resolution
May 4, 2020	Distribution	Presence/Absence confirmed Total Coliform	System flushed, resampled, and resample results passed	May 6, 2020
July 23, 2020	Distribution	Presence/Absence confirmed Total Coliform	System flushed, resampled, and resample results passed	July 25, 2020
November 12, 2020	Distribution	Murky water and settled particles observed in the new Ashgrove Reservoir	Resamples collected and results within acceptable limits	November 16, 2020

Community-Wide Lead Sampling Program Results

Under the Community-Wide Lead Sampling Program, samples were collected from forty-three sampling points located throughout the South Halton Distribution Subsystem in the current reporting year. One of the samples contained lead concentrations above the standard of 10 µg/L.

Date	Location	Adverse Condition	Corrective Action	Notice of Issue Resolution
March 3, 2020	Consumer	Lead = 10.8 µg/L	Health Department followed up with the Consumer	March 5, 2020

Microcystin Sampling Results

Under the direction of the MECP, Microcystin samples were collected on a weekly basis from June to October, from Oakville, Burlington and Burloak water treatment plants. None of the samples contained Microcystin concentrations at or above the standard of 1.5 µg/L. The results for all raw and treated samples were <0.1 µg/L for Total Microcystin.

More Information or Questions

The related annual drinking water Flow Summary Report is published on or before March 31 each year on halton.ca.

Halton Region

Dial 311 or 905-825-6000
Toll free: 1-866-4HALTON (1-866-442-5866)
TTY: 905-827-9833
www.halton.ca