Document 1

City of Ottawa Drinking Water Systems 2022

Regulatory requirements and compliance with Safe Drinking Water Act (2002)

Drinking water systems: Lemieux Island WPP; Britannia WPP and Central Distribution System; Carp Well System; Munster Well

System; Kings Park Well System; Richmond West Well System; Shadow Ridge Well System; Vars Well System

Source Water: Ottawa River & various groundwater sources for municipal well systems

Date of report: March 31st, 2023

| Description | Legislation | Regulatory Requirement | Britannia WPP | Lemieux Island WPP | Carp Well | Munster Well | Kings Park Well | Richmond West Well | Shadow Ridge Well | Vars Well | |
|----------------------------------|-----------------------------|--|------------------|--------------------------|--------------|-----------------|-----------------------|--------------------------|-------------------------|--------------|--|
| Water Treatment | | | | | | | | | | | |
| Raw (river/well) water taking | PTTW | Raw water flow must be <pttw< td=""><td>٧</td><td>٧</td><td>٧</td><td>٧</td><td>٧</td><td>٧</td><td>٧</td><td>٧</td></pttw<> | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | |
| Raw (river/well) water taking | PTTW | Daily raw water taking flow rates for previous year must be submitted to MECP by March 31 | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | |
| Treated water production | MDWL Sch.(C) 1.0 | Treated water flow must be <mdwl< td=""><td>٧</td><td>٧</td><td>٧</td><td>٧</td><td>٧</td><td>٧</td><td>٧</td><td>٧</td></mdwl<> | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | |
| Treatment barriers | O.Reg.170/ 03 Sch.1.4 | Treatment must include chemically assisted filtration for surface water systems | ٧ | ٧ | n/a | n/a | n/a | n/a | n/a | n/a | |

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| Well protection | O.Reg.170/ 03 Sch.1.2 | Wells must be constructed and maintained to prevent surface water and contaminants from entering the well | n/a | n/a | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| Treatment barriers | O.Reg.170/ 03 Sch.1.2 | Treatment barriers must be operated: (i) whenever water is being supplied, (ii) in accordance with the <i>Procedure for Disinfection</i> , & (iii) to achieve the design capability | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| Pathogen removal | MDWL Sch.(E) 1.0 | Treatment plants must be designed and operated to achieve: 3-log (99.9%) reduction of Crypto-plants 4-log (99.99%) reduction of Giardia-plants 5-log (99.999%) reduction of Virus-plants 2 (99%) log-Virus inactivation for Carp, KP, Munster, Vars; 2/3/4-log reduction Crypto/Giardia/Virus for Shadow Ridge; 4-log virus inactivation for Richmond West; | V | V | V | V | V | ٧ | V | V |
| Filter turbidity monitoring | O.Reg.170/ 03 Sch.7.3 | Each filter must operate with a dedicated continuous analyzer to monitor filter effluent turbidity | ٧ | ٧ | n/a | n/a | n/a | n/a | V | n/a |

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| Filter turbidity performance | O.Reg.170/ 03 Procedure for Disinfectio n | Filter effluent turbidity measurements must be <0.3 NTU in 95% of monthly readings; Shadow Ridge <0.2 NTU in >99% of monthly readings | ٧ | ٧ | n/a | n/a | n/a | n/a | ٧ | n/a |
| Secondary disinfection | O.Reg.170/ 03 Sch.1.5 | Secondary disinfection equipment must be capable of providing 1.0 mg/L combined chlorine (chloramine-Central), 0.2 mg/L free chlorine(wells) throughout the distribution system | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| Continuous analyzers | O.Reg.170/ 03 Sch.6.5, Sch.7.2 | Must provide minimum testing frequency, alarm settings, operator response, data review within 72 hours, chlorine at CT outlet, calibration | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| Chemicals and materials | MDWL Section 14.0 | Chemicals and materials in contact with drinking water must meet standards NSF/60, NSF/61, & NSF 372 | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| Waste & residual management | MDWL Sch.(C) 1.5 | Total suspended solids <25 mg/L (annual average); Total chlorine <0.02 mg/L (maximum); pH between 6.0 and 9.5 units | ٧ | ٧ | n/a | n/a | n/a | n/a | n/a | n/a |
| Calibration of flow measuring devices | MDWL Sch.(C) 2.0 | Annual calibration for raw water and treated water flow meters | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |

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| Harmful Algal Bloom Response plan (HAB) | MDWL #008-102 Sch.(C) 6.0 | Response plan for sampling and reporting of HAB. Sample monthly between May – Oct and monitor shoreline with trigger levels & response actions | NO ³ | NO ³ | n/a | n/a | n/a | n/a | n/a | n/a |
| | | , | Water Qual | ity | | | | | | |
| Microbiological sampling & testing | O.Reg.170/ 03 Sch.10.2, 10.3, & 10.4 | Raw water – weekly TC/EC Treated water – weekly TC/EC Treated water – weekly HPC Distribution – monthly TC/EC Distribution – monthly HPC | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| Chemical sampling & testing | O.Reg.170/ 03 Sch.13.2, Sch.13.3 | Inorganics (9 trace metals) – Organics (56 chemicals) – | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| Turbidity in source wells | O.Reg.170/ 03 Sch.7.3 | Monthly turbidity measurements in each source well (12 x 2 wells = 24 tests required per year) | n/a | n/a | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| Trihalomethanes haloacetic acids, nitrate, nitrite, & sodium | O.Reg.170/ 03 Sch.13.6, 13.6.1, 13.7, & 13.8 | trihalomethanes – 4/year (dist.) haloacetic acids – 4/year (dist.) nitrate/nitrite – 4/year sodium – 1 sample every 5 years | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| Chlorine residual testing in distribution system | O.Reg.170/ 03 Sch.7.2.3 | At least 7 samples per week, either daily or 4/3 at least 48 hours apart with multiple locations | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |

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| Chlorine readings for bacteriological samples | O.Reg.170/ 03 Sch.6.3 | Chlorine residual must be measured and recorded for every bacteriological sample taken | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| Fluoride testing | O.Reg.170/ 03 Sch.7.4 | Fluoride concentration measured at least once per day (n=365 tests per year) if system adds fluoride | ٧ | ٧ | n/a | n/a | n/a | n/a | n/a | n/a |
| Increased frequency of testing for chemicals | O.Reg.170/ 03 Sch.13.5 | Increase test frequency to quarterly if test result exceeds half the Ontario Drinking Water Quality Standard | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| Lead testing in consumer tap water | O.Reg.170/ 03 Sch.15.1 | Twice per year, conduct 30- minute stagnation sampling in customer homes with lead service pipes, buildings, and distribution locations; 90 th percentile lead concentrations for Litre-1 and Litre-2 must be <10 ppb | V ¹ | √ ¹ | V | ٧ | V | √¹ | ٧ | ٧ |
| Duty to report adverse water quality test results | O.Reg.170/ 03 Sch.16.3, 16.4, 16.6, 16.7, 16.8, 16.9 | Report immediately to MOH, MECP, written report within 24 hours, corrective actions taken, resolution notice within 7 days | NO ² | NO ² | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| Corrective actions for adverse water quality | O.Reg.170/ 03 Sch.17.2 – 17.13 | Specific corrective actions are required for each type of Adverse Water Quality event: improper disinfection, filter turbidity, chlorine residual, E.coli, total | ٧ | V | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |

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| | | coliforms, <i>Aeromonas</i> , chemical MAC, pesticide, sodium | | | | | | | | |
| Retention of records | O.Reg.170/ 03 Section 13 | 2 years – operational checks & microbiological testing 6 years – chemical testing, lead testing, corrective actions, annual & summary reports 15 years – sodium, fluoride, Engineer Reports | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| Notification of laboratory testing | O.Reg.170/ 03 Sch.6.9 | Must provide written notification to the MECP for the identity of the Laboratory performing regulatory testing of water samples | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| Laboratory testing of drinking water samples | O.Reg.248/ 03 Section 1 | Analysis of parameters with a health-based drinking water quality standard must be performed by a licensed and accredited laboratory | ٧ | ٧ | ٧ | V | ٧ | ٧ | ٧ | ٧ |
| Research - laboratory testing of water samples | O.Reg.248/ 03 Section 5 | Provide written MECP forms for research samples being analyzed in non-licensed laboratories, updated to 2023 – 2025 (microplastics, tritium, PFAS,) | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| | | Wa | ater Distrib | ution | | | | | | |
| Repair and disinfection of watermains | DWWP Sch.B 2.3 | All watermains or related fixtures that come in contact with drinking water must be disinfected as per the MECP Watermain Disinfection Procedure and/or AWWA | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |

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| | | Standard C651 before being put into service | | | | | | | | |
| | | Ope | rator Certif | ication | | | | | | |
| Overall Responsible Operator (ORO) | O.Reg.128/ 04 | Overall Responsible Operator must be certified to level of the system: Level-4 (Treatment) & Level-3 (Distribution); can be one level lower for up to 150 days per year | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| Treatment & distribution operators | O.Reg.170/ 03 Sch.1.2; O.Reg.128/ 04 Sch.22 | All adjustments to water treatment and distribution system must be carried out by certified operators | ٧ | V | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| Water quality testing | O.Reg.170/ 03 Sch.7.5 | All drinking water tests must be performed by a Certified Operator or Water Quality Analyst | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| | | Report | s & Record | -keeping | | | | | | |
| Logbooks and record keeping | O.Reg.128/ 04 | Operators shall ensure that all logbooks are properly maintained and completed for each shift by the operator-in-charge or overall responsible operator | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| Summary reports | O.Reg.170/ 03 Sch.22.2 | Prepare and transmit Summary Report for each water system to municipal council by March 31 st of the next calendar year | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |

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| Annual reports | O.Reg.170/ 03 Section 11 | Prepare Annual Report for each water system and make available to public by February 28 th of the next calendar year | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| Alterations to the system | DWWP Sch.B 4.0 | Any alteration of the treatment system must be documented in Forms 2/3 – Record of Minor Modification, retained on-site for 10 years | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |
| Alterations to the system | DWWP Sch.B 4.0 | Any alteration of the water mains must be documented in Form 1 – Record of Water Mains Authorized as a Future Alteration, retained on-site for 10 years | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ | ٧ |

Notes for items of non-compliance:

- 1. <u>Lead testing in consumer tap water</u> In March of 2020, as a result of the COVID-19 pandemic, all in-home lead sampling was suspended in order to protect both the homeowner and our employees. Since the MECP lead sampling requires water operators to enter the resident's home to conduct testing, the City of Ottawa applied for and received relief for the winter (Dec 15, -Apr 15, 2020/2021 & 2021/2022) & summer (Jun 15 Oct 15, 2021 & 2022) rounds of lead sampling. The City complied with regulatory requirements since relief was granted by MECP due to COVID.
- 2. <u>Delayed resolution notification of Adverse Water Quality Incident (AWQI):</u> A low chlorine residual was reported, in a distribution system water sample, from a watermain on Fallowfield Road on October 31, 2022 and was not closed off (form 2B) within the required time limit of seven days from date of resolution. Field staff verbally notified the Ministry and Ottawa Public Health and provided the required written notification but did not send the resolution (form 2B) within the required seven days from resolution. Additional training was provided for Water Distribution staff to review AWQI reporting requirements and going forward the Distribution branch has added AWQI follow-up to their weekly meetings
- 3. <u>Training related to Harmful Algal Bloom (HAB) monitoring</u>: As part of the harmful algal monitoring requirements under the MDWL, all relevant drinking water staff are to be trained each year on the HAB monitoring plan, in addition to the reporting and sampling procedures, prior to the summer season. When the plan was first implemented, staff were trained during the biannual operator training sessions. Further training of plant operating staff has not been repeated since the sampling is being completed by a smaller team of trained

operators from the Water Quality Assurance unit. The City will provide training to relevant staff prior to further HAB monitoring seasons and will document the completion of the training in accordance with our MDWLs.

Regulations, Licenses, & Permits:

MDWL - Municipal Drinking Water License

DWWP – Drinking Water Works Permit

PTTW – Permit To Take Water

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

O.Reg.169/03 – Ontario Drinking Water Quality Standards

O.Reg.248/03 - Drinking Water Testing Services

O.Reg.128/04 – Certification of Drinking Water Systems Operators

O.Reg.188/07 – Licensing of Municipal Drinking Water systems

O.Reg.170/03 (Appendix) – Procedure for Disinfection of Drinking Water in Ontario

O.Reg.170/03 (Sch.15.1) – Community Lead Testing Program

AWWA – American Water Works Association

Glossary:

NOTE: water quality testing refers to treated water samples unless otherwise stated

ML/d = mega-Litres per day = million Litres per day

WPP = Water Purification Plant

TC = Total Coliform bacteria, units of (cfu/100mL)

EC = E.coli bacteria, units of (cfu/100mL)

HPC = Heterotrophic Plate Count bacteria, units of (cfu/mL)

PS = Pump Station

MAC = maximum acceptable concentration for Ontario Drinking Water Standards

MOH = Medical Officer of Health

MECP = Ministry of Environment and Climate Change

n/a-=not applicable for that system

^{*}regulatory relief provided by Ministry during COVID19 for in-home testing of lead in tap water