



Attachment 'A'

**The Ontario Ministry of the Environment, Conservation and Parks**  
**Markham Distribution System**  
**Drinking Water Inspection Report**  
**January 19, 2022**

Dated: April 19, 2022

Ministry of Environment,  
Conservation and Parks  
*Drinking Water and Environmental  
Compliance Division*

Ministère de l'Environnement,  
de la Protection de la nature et des Parcs  
*Division de la conformité en matière d'eau  
potable et d'environnement*



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March 9, 2022

City of Markham  
101 Town Centre Blvd  
Markham, ON  
L3R 9W3

Attention: Eddy Wu, Director, Environmental Services

**RE: Markham Distribution System # 220004162  
Drinking Water Inspection Report # 1-1000PC**

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Enclosed is a copy of the inspection report prepared for the Markham Distribution System under the Ministry's focused inspection protocol to assess compliance with Safe Drinking Water Act legislation. The report is based on conditions encountered at the time of inspection, and subsequent follow-up.

**"Actions Required"** are linked to incidents of non-compliance with regulatory requirements contained within the Act, a regulation, or site-specific approvals, licenses, permits, orders or instructions. Such violations could result in the issuance of mandatory abatement instruments including Orders, tickets, penalties, or referrals to the ministry's Investigations and Enforcement Branch.

**"Recommended Actions"** convey information that the owner or operating authority should consider implementing in order to advance efforts already in place to address such issues as emergency preparedness, the availability of information to consumers, and conformance with existing and emerging industrial standards. Please note that items which appear as recommended actions do not, in themselves, constitute violations.

Section 19 of the Safe Drinking Water Act (Standard of Care) creates several obligations for individuals who exercise decision-making authority over municipal drinking water systems. Please be aware that the Ministry has encouraged such individuals, particularly municipal councillors, to take steps to be better informed about the drinking water systems over which they have decision-making authority. These steps could include asking for a

copy of this inspection report and a review of its findings. Further information about Section 19 can be found in "Taking Care of Your Drinking Water: A guide for members of municipal council" found under "Resources" on the Drinking Water Ontario website at [www.ontario.ca/drinkingwater](http://www.ontario.ca/drinkingwater).

In order to measure individual inspection results, the Ministry has established an inspection compliance risk framework based on the principles of the Inspection, Investigation & Enforcement (II&E) Secretariat and advice of internal/external risk experts.

The Inspection Summary Rating Record (IRR) provides the Ministry, the system owner and the local Public Health Unit with a summarized quantitative measure of the drinking water system's annual inspection and regulated water quality testing performance. IRR ratings are published (for the previous inspection year) in the Ministry's Chief Drinking Water Inspectors' Annual Report.

**Please note that due to a change in IT systems, the IRR cannot be generated at the same time as the inspection report. The IRR will be sent separately and prior to any public release (typically within 1-2 month of the completion of the inspection).**

I would like to thank the City of Markham staff for the assistance afforded to me during this compliance assessment. If you have any questions or concerns please contact me or Demetra Koros, Water Compliance Supervisor, Central Region at 905-409-0496.

Yours truly,



Theresa Ip  
Water Inspector | Provincial Officer Badge # 1546  
Drinking Water and Environmental Compliance Division  
Ministry of the Environment Conservation and Parks  
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ec:

Safe Water, York Region Health Services Department Health Protection Division  
Helena Frantzke, Water Quality Coordinator, City of Markham  
Peter Solymos, Water Quality Supervisor, City of Markham  
Don Ford, Senior Manager, Hydrogeology, Toronto and Region Conservation Authority  
Demetra Koros, Water Supervisor, Ministry of the Environment Conservation and Parks  
Samantha Anderson, Water Inspector, Ministry of the Environment Conservation and Parks



MARKHAM DISTRIBUTION SYSTEM  
101 TOWN CENTRE BLVD N, MARKHAM, ON, L3R 9W3  
**Inspection Report**

System Number: 220004162  
Inspection Start Date: 01/19/2022  
Inspection End Date: 02/28/2022  
Inspected By: Theresa Ip  
Badge #: 1546

A handwritten signature in black ink that reads "Theresa Ip".

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(signature)



Ministry of the Environment, Conservation and Parks  
Drinking Water Inspection

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### **1. Drinking Water System Inspection Report**

#### **Appendix:**

**A. Stakeholders Appendix**

**B. Drinking Water System Components**

**NON-COMPLIANCE/NON-CONFORMANCE ITEMS**

The following item(s) have been identified as non-compliance/non-conformance, based on a "No" response captured for a legislative or best management practice (BMP) question (s), respectively.

**Question Group: Other Inspection Findings**

<b>Question ID</b>	MRDW1116000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Were the inspection questions sufficient to address other identified best practice issues?	BMP	Not Applicable
<b>Observation/Corrective Action(s)</b>		
<p>The following issues were also noted during the inspection:</p> <p>1. In reference to question MRDW1035000 (page 7):</p> <p>Schedule 6-5(3) of O. Reg 170/03 requires that test results recorded under paragraph 1 or 2 of Schedule 6-5(1) be examined within 72 hours after the tests are conducted. Though the City is receiving test results from the continuous analyzers via e-mail every 72 hours and they are reviewed by Waterworks Supervisors, there is currently no documentation method in place. It is recommended that the City of Markham develop and implement a procedure detailing the process for documenting the 72 hour review of results from continuous analyzers as per section 6-5(1) of O. Reg. 170/03.</p> <p>2. In reference to questions MRDW1108000 (page 8) and MRDW1061000 (page 18):</p> <p>Schedule 6-5 of O. Reg. 170/03 stipulates that in the event of a continuous analyzer triggering an alarm a certified operator must promptly be dispatched to the location where tests are conducted to take appropriate action, unless within two minutes, a further test result indicates that the parameter was no longer above the maximum alarm standard or below the minimum alarm standard.</p> <p>O. Reg. 128/04 section 27(5) stipulates that the following is to be recorded in logs or other record keeping mechanisms:</p> <ul style="list-style-type: none"> <li>•The date, the time of day the shift began and ended and the number or designation of the shift.</li> <li>•The names of all operators on duty during the shift.</li> <li>•Any departures from normal operating procedures that occurred during the shift and the time they occurred.</li> <li>•Any special instructions that were given during the shift to depart from normal operating procedures and the person who gave the instructions.</li> <li>•Any unusual or abnormal conditions that were observed in the subsystem during the shift, any action that was taken and any conclusions drawn from the observations.</li> <li>•Any equipment that was taken out of service or ceased to operate during the shift and any action taken to maintain or repair equipment during the shift.</li> </ul> <p>During the inspection it was determined that on one occasion maintenance was conducted on a continuous analyzer, which resulted in an alarm being triggered. The alarm triggered remained below</p>		

the minimum alarm standard for more than 2 minutes. Details of the maintenance activity, the alarm, or any other corrective action was not recorded in the logbook. It is recommended that the City of Markham review and update any SOPs relating to logbook completion and alarm response. Additionally, it is recommended that the City of Markham conduct training/retraining with all operators to ensure they are aware of proper logbook and alarm response procedures.

### INSPECTION DETAILS

This section includes all questions that were assessed during the inspection.

Ministry Program: Regulated Activity: DRINKING WATER : DW Municipal Residential

<b>Question ID</b>	MRDW1001000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
What was the scope of this inspection?	Information	Not Applicable
<b>Observation</b>		
<p>The primary focus of this inspection is to confirm compliance with Ministry of the Environment, Conservation and Parks (MECP) legislation as well as evaluating conformance with ministry drinking water policies and guidelines during the inspection period. The ministry utilizes a comprehensive, multi-barrier approach in the inspection of water systems that focuses on the source, treatment, and distribution components as well as management practices.</p> <p>This drinking water system is subject to the legislative requirements of the Safe Drinking Water Act, 2002 (SDWA) and regulations made therein, including Ontario Regulation 170/03, "Drinking Water Systems" (O.Reg. 170/03). This inspection has been conducted pursuant to Section 81 of the SDWA.</p> <p>This inspection report does not suggest that all applicable legislation and regulations were evaluated. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements. A remote announced inspection was conducted for the Markham Distribution System (the system). The inspection was conducted by the Ministry of Environment, Conservation and Parks (MECP) by Provincial Officer, Theresa Ip and Water Inspector, Sam Anderson.</p> <p>The City of Markham (The City) owns and operates this drinking water system. The City receives treated water from the City of Toronto and the Region of Peel. York Region provides water storage, pressure boosting, and acts as a wholesaler of the water to the system. The City of Toronto, Region of Peel, and York Region treatment and distribution systems are inspected separately from the Markham Distribution System.</p> <p>The inspection review period is from February 3, 2021 to January 19, 2022.</p> <p>The inspection included compliance assessment with all applicable MECP legislation, an inspection of the procedures used within the system, and a review of records. Documents reviewed in association with this report include, but were not limited to:</p> <ol style="list-style-type: none"> <li>1) MECP Municipal Drinking Water Licence (MDWL) Number 021-101, Issue Number 10, dated May 20, 2021;</li> <li>2) MECP Drinking Water Work Permit (DWWP) Number 021-201, Issue Number 4, dated July 22, 2019;</li> <li>3) Other documents provided by and maintained by the owner/ operating authority for the purpose</li> </ol>		



of completing the inspection.

<b>Question ID</b>	MRDW1000000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Does this drinking water system provide primary disinfection?	Information	Not Applicable
<b>Observation</b>		
This Drinking Water System provides for only secondary disinfection and distribution of water. Primary disinfection is undertaken by another regulated Drinking Water System which provides treated water to this Drinking Water System.		

<b>Question ID</b>	MRDW1033000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Is the secondary disinfectant residual measured as required for the large municipal residential distribution system?	Legislative	SDWA   O. Reg. 170/03   7-2   (3), SDWA   O. Reg. 170/03   7-2   (4)
<b>Observation</b>		
The secondary disinfectant residual was measured as required for the distribution system. The Markham Distribution System serves a population of 351, 251, according to the current drinking water system profile. The system is classified as a large municipal residential drinking water system. Distribution chlorine residuals are measured by two (2) continuous on-line analyzers. Additionally, operations staff collect grab samples using a hand-held unit when conducting microbiological sampling, weekly dead-end hydrant flushing, and when there are watermain breaks.		

<b>Question ID</b>	MRDW1037000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Are all continuous monitoring equipment utilized for sampling and testing required by O. Reg. 170/03, or MDWL or DWWP or order, equipped with alarms or shut-off mechanisms that satisfy the standards described in Schedule 6?	Legislative	SDWA   O. Reg. 170/03   6-5   (1) 1-4, SDWA   O. Reg. 170/03   6-5   (1) 5-10, SDWA   O. Reg. 170/03   6-5   (1.1)
<b>Observation</b>		
All continuous monitoring equipment utilized for sampling and testing required by O. Reg. 170/03, or Municipal Drinking Water Licence or Drinking Water Works Permit or order, were equipped with alarms or shut-off mechanisms that satisfy the standards described in Schedule 6.		
Standard Operating Procedure (SOP) Continuous Chlorine Analyzer - Monitoring, last revised		

February 24, 2021 was provided for review as part of the inspection. The minimum combined chlorine residual to meet secondary disinfection requirements in the system is 0.25 mg/L. In the event of a combined chlorine residual reading that is  $\leq 0.40$  mg/L,  $\geq 2.10$  mg/L,  $\leq 0.25$  mg/L, or  $\geq 3.00$  mg/L; or a loss of communication (ex. loss of power) at either of the continuous analyzers in the system an alarm is sent to the SCADA standby phone, and all Waterworks Supervisor's cell phones.

<b>Question ID</b>	MRDW1038000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Is continuous monitoring equipment that is being utilized to fulfill O. Reg. 170/03 requirements performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and recording data with the prescribed format?	Legislative	SDWA   O. Reg. 170/03   6-5   (1) 1-4
<b>Observation</b>		
Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and recording data with the prescribed format. Two continuous chlorine analyzers are used to monitor the secondary disinfection residual in the system. Results, as well as the date, time, and location of the test are recorded every two minutes.		

<b>Question ID</b>	MRDW1035000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Are operators examining continuous monitoring test results and are they examining the results within 72 hours of the test?	Legislative	SDWA   O. Reg. 170/03   6-5   (1) 1-4, SDWA   O. Reg. 170/03   6-5   (1) 5-10
<b>Observation</b>		
Operators were examining continuous monitoring test results and they were examining the results within 72 hours of the test. SOP Continuous Chlorine Analyzer - Monitoring, last revised February 24, 2021 was provided for review. This procedure details that the Waterworks Supervisors are to review the data results from the continuous chlorine analyzers within 72 hours. Through interview it was determined that results are automatically e-mailed, and then reviewed.		
Please see question MRDW1116000 on page 17 regarding other best practice issues.		

<b>Question ID</b>	MRDW1040000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Are all continuous analysers calibrated, maintained, and operated, in accordance with the manufacturer's instructions	Legislative	SDWA   O. Reg. 170/03   6-5   (1)

or the regulation?		1-4,SDWA   O. Reg. 170/03   6-5   (1)5-10
<b>Observation</b>		
All continuous analysers were calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation. HACH Certificates of Instrument Performance were provided for review as part of the inspection. Continuous analyzers for chlorine were last serviced and calibrated on July 28, 2021. Review of chlorine residual records revealed that continuous analyzers are verified by operators every 3-5 days. Adjustments are made to the analyzers as needed.		

<b>Question ID</b>	MRDW1108000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Where continuous monitoring equipment used for the monitoring of free chlorine residual, total chlorine residual, combined chlorine residual or turbidity, required by Regulation 170, an Order, MDWL, or DWWP issued under Part V, SDWA, has triggered an alarm or an automatic shut-off, did a qualified person respond in a timely manner and take appropriate actions?	Legislative	SDWA   O. Reg. 170/03   6-5   (1) 1-4,SDWA   O. Reg. 170/03   6-5   (1)5-10,SDWA   O. Reg. 170/03   6-5   (1.1)
<b>Observation</b>		
Where required continuous monitoring equipment used for the monitoring of chlorine residual and/or turbidity triggered an alarm or an automatic shut-off, a qualified person responded in a timely manner and took appropriate actions.		
See question MRDW1116000 on page 17 for other best practice issues.		

<b>Question ID</b>	MRDW1018000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Has the owner ensured that all equipment is installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit?	Legislative	SDWA   31   (1)
<b>Observation</b>		
The owner had ensured that all equipment was installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit. Schedule A of the DWWP #021-201 Issue 4 contains the watermains within the City of Markham - Markham Distribution System. Schedule C of the DWWP contained no additional components.		

<b>Question ID</b>	MRDW1020000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Is the owner/operating authority able to demonstrate that,	Legislative	SDWA   31   (1)

when required during the inspection period, Form 1 documents were prepared in accordance with their Drinking Water Works Permit?		
<b>Observation</b>		
The owner/operating authority was in compliance with the requirement to prepare Form 1 documents as required by their Drinking Water Works Permit during the inspection period. During the inspection review period, six (6) "Form 1 - Record of Watermains Authorized as a Future Alteration" documents were prepared and reviewed.		

<b>Question ID</b>	MRDW1025000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Were all parts of the drinking water system that came in contact with drinking water (added, modified, replaced or extended) disinfected in accordance with a procedure listed in Schedule B of the Drinking Water Works Permit?	Legislative	SDWA   31   (1)
<b>Observation</b>		
All parts of the drinking water system were disinfected in accordance with a procedure listed in Schedule B of the Drinking Water Works Permit. Work Instruction (WI) Operations & Maintenance (O&M) 4.1.00 Revision 13.0, dated February 26, 2021 for Watermain Repairs and/or Modifications was provided for review during the inspection. Nine (9) Log Breaks & Repairs Cut Sheets which detail watermain repairs, and records from four (4) new watermain construction projects were also provided for review. The records provided indicate that all parts of the drinking water system were disinfected in accordance with Schedule B of the Drinking Water Works Permit.		

<b>Question ID</b>	MRDW1062000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Do records or other record keeping mechanisms confirm that operational testing not performed by continuous monitoring equipment is being done by a certified operator, water quality analyst, or person who meets the requirements of O. Reg. 170/03 7-5?	Legislative	SDWA   O. Reg. 170/03   7-5
<b>Observation</b>		
Records or other record keeping mechanisms confirmed that operational testing not performed by continuous monitoring equipment was being done by a certified operator, water quality analyst, or person who suffices the requirements of O. Reg. 170/03 7-5.		

<b>Question ID</b>	MRDW1060000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Do the operations and maintenance manuals meet the requirements of the DWWP and MDWL issued under Part V	Legislative	SDWA   31   (1)

of the SDWA?		
<b>Observation</b>		
<p>The operations and maintenance manuals met the requirements of the Drinking Water Works Permit and Municipal Drinking Water Licence issued under Part V of the SDWA. O&amp;M manuals were provided for review as part of the inspection. Operators have access to O&amp;M manuals via the software Intellex. Operators are notified of updates to O&amp;M manuals at regular monthly meetings, and training is conducted as necessary.</p>		

<b>Question ID</b>	MRDW1071000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Has the owner provided security measures to protect components of the drinking water system?	BMP	Not Applicable
<b>Observation</b>		
<p>The owner had provided security measures to protect components of the drinking water system. The City has an automated bulk water station located at 555 Miller Avenue. Pre-paid water access FOB keys can be purchased. Commercial water suppliers or contractors can hook up to the water station 24 hours a day.</p> <p>The City has Backflow Prevention Bylaw 2012-27 in place, which reduces the chance of water contamination through backflow incidents at cross connections.</p> <p>By-law #2019-53, Water Use was also provided for review, which limits access to hydrants. Furthermore, the City has a number of programs in place to limit hydrant access including anti-tamper devices, public education campaigns, and other water access options (water bulk station and hydrant permits).</p>		

<b>Question ID</b>	MRDW1073000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Has the overall responsible operator been designated for all subsystems which comprise the drinking water system?	Legislative	SDWA   O. Reg. 128/04   23   (1)
<b>Observation</b>		
<p>The overall responsible operator has been designated for each subsystem.</p> <p>System Level Document 11— Personal Coverage, Revision 8.0, effective March 31, 2020 was provided for review as part of the inspection. This procedure details that the Overall Responsible Operator (ORO) is designated to be the Operation &amp; Maintenance Manager, or the Waterworks Supervisors who are assigned as stand-by ORO on a rotational basis.</p>		

<b>Question ID</b>	MRDW1074000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Have operators in charge been designated for all subsystems for which comprise the drinking water system?	Legislative	SDWA   O. Reg. 128/04   25   (1)

<b>Observation</b>
Operators-in-charge had been designated for all subsystems which comprised the drinking water system. System Level Document 11— Personal Coverage, Revision 8.0, effective March 31, 2020 was provided for review as part of the inspection. This procedure details that all operators who possess a certification of Class 1 or higher are designated as operators-in-charge for the system.

<b>Question ID</b>	MRDW1075000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Do all operators possess the required certification?	Legislative	SDWA   O. Reg. 128/04   22
<b>Observation</b>		
All operators possessed the required certification. All operators working on the system were cross-reference with the Ontario Water and Wastewater Certification Office, and were confirmed to have the required certification.		

<b>Question ID</b>	MRDW1099000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Do records show that all water sample results taken during the inspection review period did not exceed the values of tables 1, 2 and 3 of the Ontario Drinking Water Quality Standards (O. Reg.. 169/03)?	Information	Not Applicable
<b>Observation</b>		
Records did not show that all water sample results taken during the inspection review period did not exceed the values of tables 1, 2 and 3 of the Ontario Drinking Water Quality Standards (O. Reg. 169/03). During the inspection review period there were ten (10) incidents that resulted in exceedances to the Ontario Drinking Water Quality Standards. A summary of the incidents are as follows:		
AWQI 154370: Notified on June 23, 2021 of a sample collected from the distribution that contained Total Coliform (TC)=49 CFU/100 mL. Corrective action taken, and no indication of an adverse test result in resamples collected on June 22 and June 23, 2021. No further action was required.		
AWQI 154537: Notified on July 6, 2021 of a sample collected from the distribution that came back with no data due to overgrown plate with target for both E. coli (EC) and TC. Corrective action taken, and no indication of an adverse test result in resamples collected on July 6 and July 7, 2021. No further action was required.		
AWQI 154538: Notified on July 6, 2021 of a sample collected from the distribution that came back EC=1 CFU/100 mL and TC=1 CFU/100 mL . Corrective action taken, and no indication of an adverse test result in resamples collected on July 6 and July 7, 2021. No further action was required.		

AWQI 154758: Notified on July 20, 2021 of a sample collected from the distribution that contained TC=4 CFU/100 mL. Corrective action taken, and no indication of an adverse test result in resamples collected on July 20 and July 21, 2021. No further action was required.

AWQI 154861: Notified on July 27, 2021 of a sample collected from the distribution that came back with no data due to overgrown plate with target for both EC and TC. Corrective action taken, and no indication of an adverse test result in resamples collected on July 27 and July 28, 2021. No further action was required.

AWQI 154860: Notified on July 27, 2021 of a sample collected from the distribution that contained TC=30 CFU/100 mL, and a duplicate of the sample that contained TC=26 CFU/100 mL. Corrective action taken, and no indication of an adverse test result in resamples collected on July 27 and July 29, 2021. No further action was required.

AWQI 154949: Notified on August 4, 2021 of a sample collected from the distribution that contained TC=1 CFU/100 mL. Corrective action taken, and no indication of an adverse test result in resamples collected on August 4 and August 5, 2021. No further action was required.

AWQI 155668: Notified on September 27, 2021 of a sample collected from the distribution that contained NDMA=0.0160 µg/L. Corrective action taken, and no indication of an adverse test result in resample collected on September 28, 2021. No further action was required.

AWQI 155995: Notified on October 14, 2021 of a sample collected from the distribution that came back with no data due to overgrown plate for both EC and TC. Corrective action taken, and no indication of an adverse test result in resamples collected on October 14 and October 15, 2021. No further action was required.

AWQI 156478: Notified on November 9, 2021 of a sample collected from the distribution that contained TC=13 CFU/100 mL. Corrective action taken, and no indication of an adverse test result in resamples collected on November 9 and November 10, 2021. No further action was required.

<b>Question ID</b>	MRDW1094000		
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>	
Are all water quality monitoring requirements imposed by the MDWL and DWWP being met?	Legislative	SDWA   31   (1)	
<b>Observation</b>			
All water quality monitoring requirements imposed by the MDWL or DWWP issued under Part V of the SDWA were being met. The MDWL states that nitrosodimethylamine is to be sampled quarterly from the farthest point in the distribution system. Nitrosodimethylamine was sampled for on the following dates: February 10, 2021 June 2, 2021 September 14, 2021 September 28, 2021 (resample from previous) November 23, 2021			

<b>Question ID</b>   MRDW1096000		
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Do records confirm that chlorine residual tests are being conducted at the same time and at the same location that microbiological samples are obtained?	Legislative	SDWA   O. Reg. 170/03   6-3   (1)
<b>Observation</b>		
Records confirmed that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.		

<b>Question ID</b>   MRDW1081000		
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Are all microbiological water quality monitoring requirements for distribution samples being met?	Legislative	SDWA   O. Reg. 170/03   10-2   (1),SDWA   O. Reg. 170/03   10-2   (2),SDWA   O. Reg. 170/03   10-2   (3)
<b>Observation</b>		
All microbiological water quality monitoring requirements for distribution samples were being met. Given that the population served by the system is 351, 251 people, according to the current drinking water system profile, the minimum requirement for distribution samples is 135 per month with a minimum three (3) samples taken each week. During the inspection period more than three (3) samples per week, and more than 135 samples per month were taken and tested for EC and TC, additionally more than 25% of samples collected per month were tested for heterotrophic plate count (HPC).		

<b>Question ID</b>   MRDW1086000		
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Are all haloacetic acid water quality monitoring requirements prescribed by legislation conducted within the required frequency and at the required location?	Legislative	SDWA   O. Reg. 170/03   13-6.1   (1),SDWA   O. Reg. 170/03   13-6.1   (2),SDWA   O. Reg. 170/03   13-6.1   (3), SDWA   O. Reg. 170/03   13-6.1   (4),SDWA   O. Reg. 170/03   13-



		6.1   (5),SDWA   O. Reg. 170/03   13-6.1   (6)
<b>Observation</b>		
<p>All haloacetic acid water quality monitoring requirements prescribed by legislation are being conducted within the required frequency and at the required location. As per Schedule 13-6.1(1) of O. Reg. 170/03 samples for haloacetic acid are required to be collected and tested quarterly. During the inspection review period the system collected haloacetic acid samples on:</p> <p>February 10, 2021 June 2, 2021 June 3, 2021 August 27, 2021 August 31, 2021. November 23, 2021</p>		

<b>Question ID</b>	MRDW1087000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Have all trihalomethane water quality monitoring requirements prescribed by legislation been conducted within the required frequency and at the required location?	Legislative	SDWA   O. Reg. 170/03   13-6   (1)
<b>Observation</b>		
<p>All trihalomethane water quality monitoring requirements prescribed by legislation were conducted within the required frequency and at the required location. As per Schedule 13-6(1) of O. Reg. 170/03 samples for trihalomethanes are required to be collected and tested quarterly. During the inspection review period the system collected trihalomethane samples on:</p> <p>February 10, 2021 June 2, 2021 August 27, 2021 November 23, 2021</p>		

<b>Question ID</b>	MRDW1100000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Did any reportable adverse/exceedance conditions occur during the inspection period?	Information	Not Applicable
<b>Observation</b>		
<p>There were reportable adverse/exceedances during the inspection period. In addition to the ten adverse water quality incidents that were summarize in question MRDW1099000 on page 11, the following adverse events also occurred during the inspection period:</p> <p>AWQI 155171: Notified on August 19, 2021 of a category 2 watermain break in the system. Corrective action taken, and no indication of an adverse test result in sample collected on August 20, 2021. No further action was required.</p>		

AWQI 155611: Notified on September 22, 2021 of a category 2 watermain break in the system. Corrective action taken, and no indication of an adverse test result in sample collected on September 23, 2021. No further action was required.

<b>Question ID</b>	MRDW1101000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Have corrective actions (as per Schedule 17) been taken to address adverse conditions, including any other steps as directed by the Medical Officer of Health?	Legislative	SDWA   O. Reg. 170/03   17-1, SDWA   O. Reg. 170/03   17-10   (1),SDWA   O. Reg. 170/03   17-10   (2),SDWA   O. Reg. 170/03   17-11,SDWA   O. Reg. 170/03   17-12,SDWA   O. Reg. 170/03   17-13,SDWA   O. Reg. 170/03   17-14,SDWA   O. Reg. 170/03   17-2,SDWA   O. Reg. 170/03   17-3,SDWA   O. Reg. 170/03   17-4,SDWA   O. Reg. 170/03   17-5,SDWA   O. Reg. 170/03   17-6,SDWA   O. Reg. 170/03   17-9
<b>Observation</b>		
Corrective actions (as per Schedule 17) had been taken to address adverse conditions, including any other steps that were directed by the Medical Officer of Health.		

<b>Question ID</b>	MRDW1113000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Have all changes to the system registration information been provided to the Ministry within ten (10) days of the change?	Legislative	SDWA   O. Reg. 170/03   10.1   (3)
<b>Observation</b>		
All changes to the system registration information were provided within ten (10) days of the		

change. In January 2022, the Water Quality Coordinator submitted an updated Drinking Water System Profile Information form to the MECP to update on population and information for key contacts at the City.

<b>Question ID</b>	MRDW1104000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Were all required verbal notifications of adverse water quality incidents immediately provided as per O. Reg. 170/03 16-6?	Legislative	SDWA   O. Reg. 170/03   16-6   (1),SDWA   O. Reg. 170/03   16-6   (2),SDWA   O. Reg. 170/03   16-6   (3),SDWA   O. Reg. 170/03   16-6   (3.1),SDWA   O. Reg. 170/03   16-6   (3.2), SDWA   O. Reg. 170/03   16-6   (4),SDWA   O. Reg. 170/03   16-6   (5),SDWA   O. Reg. 170/03   16-6   (6)
<b>Observation</b>		
All required notifications of adverse water quality incidents were immediately provided as per O. Reg. 170/03 16-6. All required notifications of adverse water quality incidents were immediately provided as per O. Reg. 170/03 16-6. A review of Section 1 - Written Notice by Licensed Laboratory and Section 2A - Written Notice by Drinking Water System forms submitted by the system and the lab to the MECP indicates that verbal notifications of AWQIs were provided as per Schedule 16-6 of O. Reg. 170/03.		

<b>Question ID</b>	MRDW1114000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Does the owner have evidence that, when required, all legal owners associated with the DWS were notified of the requirements of the Licence & Permit?	Legislative	SDWA   31   (1)
<b>Observation</b>		
The owner had evidence that all required notifications to all legal owners associated with the Drinking Water System had been made during the inspection period. Through interview it was determined that all legal owners associated with the system were notified of the requirements of the MDWL and DWWP as part of the development and planning stages of projects, this is tracked in a software used by the City throughout this process.		

Question ID		
MRDW1116000		
Question	Question Type	Legislative Requirement
Were the inspection questions sufficient to address other identified best practice issues?	BMP	Not Applicable
Observation		
<p>The following issues were also noted during the inspection:</p> <p>1. In reference to question MRDW1035000 (page 7):</p> <p>Schedule 6-5(3) of O. Reg 170/03 requires that test results recorded under paragraph 1 or 2 of Schedule 6-5(1) be examined within 72 hours after the tests are conducted. Though the City is receiving test results from the continuous analyzers via e-mail every 72 hours and they are reviewed by Waterworks Supervisors, there is currently no documentation method in place. It is recommended that the City of Markham develop and implement a procedure detailing the process for documenting the 72 hour review of results from continuous analyzers as per section 6-5(1) of O. Reg. 170/03.</p> <p>2. In reference to questions MRDW1108000 (page 8) and MRDW1061000 (page 18):</p> <p>Schedule 6-5 of O. Reg. 170/03 stipulates that in the event of a continuous analyzer triggering an alarm a certified operator must promptly be dispatched to the location where tests are conducted to take appropriate action, unless within two minutes, a further test result indicates that the parameter was no longer above the maximum alarm standard or below the minimum alarm standard.</p> <p>O. Reg. 128/04 section 27(5) stipulates that the following is to be recorded in logs or other record keeping mechanisms:</p> <ul style="list-style-type: none"> <li>•The date, the time of day the shift began and ended and the number or designation of the shift.</li> <li>•The names of all operators on duty during the shift.</li> <li>•Any departures from normal operating procedures that occurred during the shift and the time they occurred.</li> <li>•Any special instructions that were given during the shift to depart from normal operating procedures and the person who gave the instructions.</li> <li>•Any unusual or abnormal conditions that were observed in the subsystem during the shift, any action that was taken and any conclusions drawn from the observations.</li> <li>•Any equipment that was taken out of service or ceased to operate during the shift and any action taken to maintain or repair equipment during the shift.</li> </ul> <p>During the inspection it was determined that on one occasion maintenance was conducted on a continuous analyzer, which resulted in an alarm being triggered. The alarm triggered remained below the minimum alarm standard for more than 2 minutes. Details of the maintenance activity, the alarm, or any other corrective action was not recorded in the logbook. It is recommended that the City of Markham review and update any SOPs relating to logbook completion and alarm</p>		

response. Additionally, it is recommended that the City of Markham conduct training/retraining with all operators to ensure they are aware of proper logbook and alarm response procedures.

<b>Question ID</b>	MRDW1117000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Are there any other DWS related items that should be recognized in this report?	Information	Not Applicable
<b>Observation</b>		
The following items are noted as being relevant to the Drinking Water System:		
As part of the inspection records from four (4) new watermain construction projects were provided for review. The system is reminded to ensure records relating to new watermain construction are wholesome and complete.		

<b>Question ID</b>	MRDW1059000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Do the operations and maintenance manuals contain plans, drawings and process descriptions sufficient for the safe and efficient operation of the system?	Legislative	SDWA   O. Reg. 128/04   28
<b>Observation</b>		
The operations and maintenance manuals contained plans, drawings and process descriptions sufficient for the safe and efficient operation of the system. Maps depicting the City of Markham Microsampling Locations, and the Markham Water Distribution System, including valve and hydrant locations were provided for review as part of the inspection. Additionally, the Quality Management System Operational Plan Markham Distribution System was reviewed, this document contains a detailed description of the system.		

<b>Question ID</b>	MRDW1061000	
<b>Question</b>	<b>Question Type</b>	<b>Legislative Requirement</b>
Are logbooks properly maintained and contain the required information?	Legislative	SDWA   O. Reg. 128/04   27   (1), SDWA   O. Reg. 128/04   27   (2), SDWA   O. Reg. 128/04   27   (3), SDWA   O. Reg. 128/04   27   (4), SDWA   O. Reg. 128/04   27   (5), SDWA   O. Reg. 128/04   27   (6),

		SDWA   O. Reg. 128/04   27   (7)
<b>Observation</b>		
Logbooks were properly maintained and contained the required information.		
See question MRDW1116000 on page 17 for other best practice issues.		



## **APPENDIX A**

### **STAKEHOLDER APPENDIX**

# Key Reference and Guidance Material for Municipal Residential Drinking Water Systems

Many useful materials are available to help you operate your drinking water system. Below is a list of key materials owners and operators of municipal residential drinking water systems frequently use.

To access these materials online click on their titles in the table below or use your web browser to search for their titles. Contact the Ministry if you need assistance or have questions at 1-866-793-2588 or [waterforms@ontario.ca](mailto:waterforms@ontario.ca).

For more information on Ontario's drinking water visit [www.ontario.ca/drinkingwater](http://www.ontario.ca/drinkingwater)



PUBLICATION TITLE	PUBLICATION NUMBER
<b>FORMS:</b> Drinking Water System Profile Information Laboratory Services Notification Adverse Test Result Notification	012-2149E 012-2148E 012-4444E
Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils	Website
Procedure for Disinfection of Drinking Water in Ontario	Website
Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids	Website
Filtration Processes Technical Bulletin	Website
Ultraviolet Disinfection Technical Bulletin	Website
Guide for Applying for Drinking Water Works Permit Amendments, & License Amendments	Website
Certification Guide for Operators and Water Quality Analysts	Website
Guide to Drinking Water Operator Training Requirements	9802E
Community Sampling and Testing for Lead: Standard and Reduced Sampling and Eligibility for Exemption	Website
Drinking Water System Contact List	7128E01
Ontario's Drinking Water Quality Management Standard - Pocket Guide	Website
Watermain Disinfection Procedure	Website
List of Licensed Laboratories	Website





## **APPENDIX B**

# **DRINKING WATER SYSTEM COMPONENTS**

## DWS Component Information Report for 220004162

as of 08-MAR-2022

### Drinking Water System Profile Information

**DWS #** 220004162  
**MOE Assigned Name** Markham Distribution System  
**Category** LMRS  
**Regulation** O.REG 170/03  
**DWS Type** Distribution System  
**Source Type** Distribution  
**Address** 101 Town Centre Boulevard North, Markham, Ontario, L3R 9W3, Canada  
**Region** Central Region  
**District** York-Durham District  
**Municipality** Markham  
**Public Health Unit** York Region Health Services Department

LWIS Component Name	LWIS Component Type	LWIS Component Sub-Type	Component Address	Comments
Markham Operation Office	Other	Other	8100 Warden Ave, Unit: Markham,	<p>The Markham Distribution System is owned and operated by the City of Markham, and receives treated water from the City of Toronto and the Region of Peel. The trunk transmission lines, pumping stations, and water storage facilities located within the City of Markham are owned and operated by the Region of York. The Region of York measures and monitors the distribution water flows and volumes directed to the City of Markham through the use of nineteen (19) flow meters located along the Richmond Hill, Vaughan, Stouffville, Toronto and Markham boundaries.</p> <p>The Markham Distribution System provides potable water to approximately 350,000 residents of Markham and consists of approximately 1,092 km of watermains, 8,803 hydrants, 11,239 valves, and 83,116 service connections.</p>

Ministry of the Environment, Conservation and Parks - Inspection Summary Rating Record (Reporting Year - 2021-2022)

**DWS Name:** MARKHAM DISTRIBUTION SYSTEM  
**DWS Number:** 220004162  
**DWS Owner:** THE CORPORATION OF THE CITY OF MARKHAM  
**Municipal Location:** MARKHAM

**Regulation:** O.REG. 170/03  
**DWS Category:** DW Municipal Residential  
**Type of Inspection:** Focused  
**Inspection Date:** Jan-19-2022  
**Ministry Office:** York Durham District Office

Maximum Risk Rating: 329

Inspection Module	Non Compliance Rating
Treatment Processes	0 / 130
Operations Manuals	0 / 28
Logbooks	0 / 18
Certification and Training	0 / 28
Water Quality Monitoring	0 / 51
Reporting & Corrective Actions	0 / 74
<b>Overall - Calculated</b>	<b>0 / 329</b>

Inspection Risk Rating: 0.00%

Final Inspection Rating: 100.00%

Ministry of the Environment, Conservation and Parks - Detailed Inspection Rating Record (Reporting Year - 2021-2022)

**DWS Name:** MARKHAM DISTRIBUTION SYSTEM  
**DWS Number:** 220004162  
**DWS Owner Name:** THE CORPORATION OF THE CITY OF MARKHAM  
**Municipal Location:** MARKHAM

**Regulation:** O.REG. 170/03  
**DWS Category:** DW Municipal Residential  
**Type of Inspection:** Focused  
**Inspection Date:** Jan-19-2022  
**Ministry Office:** York Durham District Office

*All legislative requirements were met. No detailed rating scores.*

Maximum Question Rating: 329

Inspection Risk Rating: 0.00%

**FINAL INSPECTION RATING: 100.00%**