



Attachment 'A'

**The Ontario Ministry of the Environment  
MARKHAM DISTRIBUTION SYSTEM  
Drinking Water System Inspection Report  
May 7, 2014**

**Ministry of the Environment**

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York Durham District Office  
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**Ministère de l'Environnement**

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The City of Markham  
Waterworks Department  
101 Town Centre Boulevard  
Markham, Ontario L3R 9W3

Peter Loukes, Director, Environmental Services

**RE: Markham Distribution System (220004162)**  
**Drinking Water Inspection Report**  
**File: SI YO MA TO 540**

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Please find attached the Ministry of the Environment's inspection report for the above facility. The report details the findings of the inspection that began on May 7<sup>th</sup> 2014.

The Appendix section of the inspection includes the Stakeholder Appendix A with links to key reference and guidance materials available on the Ministry of the Environment's (MOE) website. Appendix B contains the inspection rating record and an updated risk methodology memo.

Please note the attached IRR methodology memo describing how the risk rating model has improved to better reflect the health related and administrative non-compliance found in an inspection report. IRR ratings are published (for the previous inspection year) in the Ministry's Chief Drinking Water Inspectors' Annual Report.

In the inspection report, any "*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.

Please note, you will find in the report that bullets are shown in bold print and are the consistent and standard responses to the information gathered during the inspection. Statements shown in regular font provide additional site-specific details.

Section 19 of the Safe Drinking Water Act (Standard of Care) creates a number of 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).

I would like to thank the Town of Markham staff for the assistance afforded to me during this compliance assessment. If you have any questions or concerns please contact myself or Demetra Koros, Water Supervisor, Central Region at 905-427-5630.

Yours truly,



Loralyn Wild  
Water Inspector  
Safe Drinking Water Branch  
Ministry of Environment  
Phone: (905) 427-2367

cc:

Eddy Wu, Manager, Operations & Maintenance  
Peter Solymos, Supervisor, Water Quality  
Ernie Ting, Manager, Infrastructure  
Daphne Ross, Manager, Business Compliance  
Stefan Ulman, Water Quality Coordinator  
Dr. Karim Kurji, Medical Officer of Health  
Adelina Urbanski, Commissioner of Health Services  
Bernard Mayer, Manager of Environmental Health, York Region Health Department  
Joe La Marca, Director of Health Protection, York Region Health Department  
Marion Young, Administrative Clerk, York Region Health Department  
Adele Freeman, Director, Watershed Management, Toronto Region Conservation Authority  
Demetra Koros, Water Supervisor, York Durham District Office  
York-Durham District Office, MOE



**Ministry of the Environment**

**MARKHAM DISTRIBUTION SYSTEM**

**Inspection Report**

<b>Site Number:</b>	220004162
<b>Inspection Number:</b>	1-BE3IZ
<b>Date of Inspection:</b>	May 07, 2014
<b>Inspected By:</b>	Loralyn Wild



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- A. Stakeholders Appendix
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**OWNER INFORMATION:**

**Company Name:** MARKHAM, THE CORPORATION OF THE CITY OF  
**Street Number:** 101 **Unit Identifier:**  
**Street Name:** TOWN CENTRE Blvd N  
**City:** MARKHAM  
**Province:** ON **Postal Code:** L3R 9W3

**CONTACT INFORMATION**

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**Type:** Supervisor **Name:** Peter Solymos  
**Phone:** (905) 477-7000 x2830 **Fax:** (905) 475-4732  
**Email:** psolymos@markham.ca  
**Title:** Supervisor, Water Quality, Waterworks Department

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**Type:** Manager **Name:** Eddy S. Y. Wu  
**Phone:** (905) 477-7000 x2445 **Fax:** (905) 479-7772  
**Email:** ewu@markham.ca  
**Title:** Manager, Operations and Maintenance, Waterworks Department

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**INSPECTION DETAILS:**

**Site Name:** MARKHAM DISTRIBUTION SYSTEM  
**Site Address:** 101 TOWN CENTRE BLVD N MARKHAM L3R 9W3  
**County/District:** Markham  
**MOE District/Area Office:** York-Durham District  
**Health Unit:** YORK REGION HEALTH SERVICES DEPARTMENT  
**Conservation Authority:** N/A  
**MNR Office:** N/A  
**Category:** Large Municipal Residential  
**Site Number:** 220004162  
**Inspection Type:** Unannounced  
**Inspection Number:** 1-BE3IZ  
**Date of Inspection:** May 07, 2014  
**Date of Previous Inspection:** May 07, 2013

**COMPONENTS DESCRIPTION**

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**Site (Name):** MOE DWS Mapping  
**Type:** DWS Mapping Point **Sub Type:**  
**Comments:**  
Not Applicable

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**Site (Name):** Markham Operation Office**Type:** Other**Sub Type:** Other**Comments:**

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.

The Markham Distribution System provides potable water to approximately 310,000 residents of Markham and consists of approximately 1006 km of watermains, 7,999 hydrants, 7,820 valves, and 74,382 service connections.

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## INSPECTION SUMMARY

### INTRODUCTION

- \* The primary focus of this inspection is to confirm compliance with Ministry of the Environment legislation and authorizing documents such as Orders and Certificates of Approval, as well as evaluating conformance with Ministry drinking water related policies and guidelines during the inspection period.

This report is based on an inspection of a "stand alone connected distribution system". This type of system receives treated water from a separately owned "donor" system. This report contains all of the elements required to assess key compliance and conformance issues associated with a "receiver" system to ensure that the system was not being operated or managed in a "deficient" condition, as defined under O. Reg. 172/03. The report does not contain items associated with the inspection of the donor system, such as source waters, intakes/wells and treatment facilities.

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.

Your system was chosen for a focused inspection during this inspection cycle because inspection findings over the past three years were such that the number of violations were minimal or non existent, there were few or no orders issued to you that were of significance in the maintenance of water potability and there were no deficiencies as defined in O. Reg. 172/03. The undertaking of a focused inspection at your drinking water system during this year's inspection cycle does not ensure that a similar type of inspection will be conducted at any point in the future.

Drinking Water Inspector Loralyn Wild began conducting an inspection of the Markham Distribution System on May 7, 2014. The Town of Markham owns and operates this Drinking Water System. The main contacts for this inspection was Peter Solymos. Files were reviewed and staff interviewed at the Markham Operations Office at 8100 Warden Avenue.

The City of Markham (The City) receives treated Lake Ontario water from the City of Toronto and Region of Peel. The Region of York (The Region) provides water storage and pressure boosting to the City and acts as a wholesaler of water to the System. The City of Toronto, Region of Peel, and Region of York treatment and distribution systems were inspected separately from the Markham Distribution System.

For the purpose of this report "The Ministry" refers to the Ontario Ministry of the Environment and "The Town" refers to the Town of Markham.

### TREATMENT PROCESSES

- \* The owner had ensured that all equipment was installed in accordance with Schedule A and Schedule C of the Drinking Water Works Permit.

The Markham Distribution System operates under Municipal Drinking Water Licence Number 021-101, Issue Number 3 (The Licence) and Drinking Water Works Permit Number 021-201 (The Permit).

- \* 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.

Records reviewed during the inspection were in compliance with requirements under Condition 3.0 in the DWWP: "Watermain Addition, Modification, Replacements and Extensions".



**TREATMENT PROCESSES**

- \* The Operator-in-Charge had ensured that all equipment used in the processes was monitored, inspected, and evaluated.

**TREATMENT PROCESS MONITORING**

- \* The secondary disinfectant residual was measured as required for the distribution system.

Grab samples were collected and tested for chlorine residuals daily, in addition to chlorine residual tests conducted during flushing and microbiological sampling during this inspection period.

**DISTRIBUTION SYSTEM**

- \* Existing parts of the distribution system that were taken out of service for inspection, repair or other activities that may lead to contamination, and all new parts of the distribution system that came in contact with drinking water, were disinfected in accordance with Schedule B, Condition 2.3 of the Drinking Water Works Permit.

Condition 2.3 of the Permit requires all parts of the system in contact with drinking water which are added, modified, replaced, extended, or taken out of service for inspection, repair or other activities that may lead to contamination, be disinfected before being put into service in accordance with the provisions of the AWWA C651 - Standard for Disinfecting Watermains, or an equivalent procedure.

At the time of the inspection Drinking Water Quality Management Standard procedure documents were in place that met the provisions in AWWA C651. Watermain break and commissioning records demonstrating that applicable disinfection procedures were followed were provided for review at the time of the inspection.

- \* Based on the records available the owner was able to maintain proper pressures in the distribution system.

**OPERATIONS MANUALS**

- \* The operations and maintenance manuals contained plans, drawings and process descriptions sufficient for the safe and efficient operation of the system.

Up to date plans, manuals and maps of the distribution system were available at the Town of Markham operations centre at 8100 Warden Avenue, Markham.

- \* The operations and maintenance manuals did meet the requirements of the Permit and Licence or Approval issued under Part V of the SDWA.

**LOGBOOKS**

- \* 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.

**SECURITY**

- \* The owner had provided security measures to protect components of the drinking-water system.

**CERTIFICATION AND TRAINING**

**CERTIFICATION AND TRAINING**

- \* The overall responsible operator had been designated for each subsystem.
- \* Operators in charge had been designated for all subsystems which comprised the drinking-water system.

**WATER QUALITY MONITORING**

- \* All microbiological water quality monitoring requirements for distribution samples were being met.

For the current population served by this system, 131 samples are to be collected monthly and analyzed for microbiological parameters. Sample data for this inspection period showed that more than the required amount of samples have been collected.

- \* All trihalomethanes water quality monitoring requirements prescribed by legislation were conducted within the required frequency.

The Town is required to sample for trihalomethanes every 3 months and sample records reviewed indicate that this requirement was met during the inspection period.

- \* All sampling requirements for lead prescribed by schedule 15.1 of O. Reg. 170/03 were being met.

On November 1st, 2011, the System received relief from regulatory requirements for lead sampling as required by Schedule 15.1 of Ontario Regulation 170/03. Table two (2) and four (4) of Schedule D of the Licence outlines the lead sampling requirements for the System. The owner/operator is required to collect lead samples from ten (10) locations in the distribution system between the dates of:

December 15th, 2011 to April 15th, 2012;

June 15th, 2012 to October 15th, 2012;

December 15th, 2012 to April 15th, 2013;

June 15th, 2013 to October 15th, 2013;

December 15th, 2013 to April 15th, 2014;

June 15th, 2014 to October 15th, 2014;

December 15th, 2014 to April 15th, 2015;

June 15th, 2015 to October 15th, 2015;

December 15th, 2015 to April 15th, 2016; and,

June 15th, 2016 to October 15th, 2016.

At the time of the inspection, lead sample results were provided for review. The required amount of lead samples were collected according to sampling procedures for the periods of

June 15th, 2013 to October 15th, 2013; and,

December 15th, 2013 to April 15th, 2014.

- \* Records confirmed that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.

**WATER QUALITY ASSESSMENT**

**WATER QUALITY ASSESSMENT**

- \* **Records show that water sample results taken during the review period met the Ontario Drinking Water Quality Standards (O. Reg. 169/03), with the following exceptions:**

There were eight (8) samples collected and tested for microbiological parameters that had a result with Total Coliform present for this review period. The Ontario Drinking Water Quality Standard for Total Coliform is not detectable. Resamples were collected and corrective actions taken for all adverse test results until results met the Ontario Drinking Water Quality Standards for microbiological parameters.

**REPORTING & CORRECTIVE ACTIONS**

- \* **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.**
- \* **Corrective actions as directed by the Medical Officer of Health had been taken by the owner and operating authority to address exceedances of the lead standard.**
- \* **All required notifications of adverse water quality incidents were immediately provided as per O. Reg. 170/03 16-6.**
- \* **All changes to the system registration information were provided within ten (10) days of the change.**

**NON-COMPLIANCE WITH REGULATORY REQUIREMENTS AND ACTIONS REQUIRED**

This section provides a summary of all non-compliance with regulatory requirements identified during the inspection period, as well as actions required to address these issues. Further details pertaining to these items can be found in the body of the inspection report.

Not Applicable

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**SUMMARY OF RECOMMENDATIONS AND BEST PRACTICE ISSUES**

This section provides a summary of all recommendations and best practice issues identified during the inspection period. Details pertaining to these items can be found in the body of the inspection report. In the interest of continuous improvement in the interim, it is recommended that owners and operators develop an awareness of the following issues and consider measures to address them.

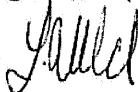
Not Applicable

**SIGNATURES**

Inspected By:

Loralyn Wild

Signature: (Provincial Officer):



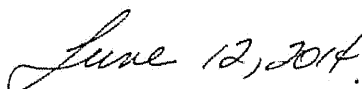
Reviewed &amp; Approved By:

Demetra Koros

Signature: (Supervisor):



Review &amp; Approval Date:



Note: This inspection does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they apply or may apply to this facility. It is, and remains, the responsibility of the owner and/or operating authority to ensure compliance with all applicable legislative and regulatory requirements.



## **APPENDIX A**

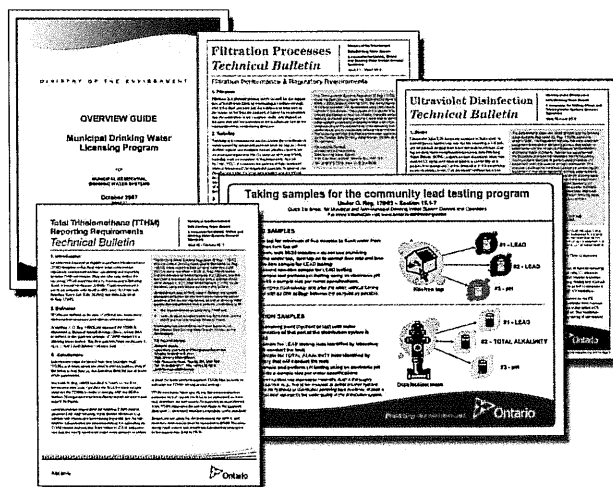
### **STAKEHOLDER APPENDIX**

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

Many useful materials are posted on the Ministry of the Environment's **Drinking Water Ontario** website at [www.ontario.ca/drinkingwater](http://www.ontario.ca/drinkingwater) to help in the operation of your drinking water system.

Below is a list of key materials frequently used by owners and operators of municipal drinking water systems. To read or download these materials, go to **Drinking Water Ontario** and search in the **Resources** section by **Publication Number**.

Visit **Drinking Water Ontario** for more useful materials. Contact the Public Information Centre if you need assistance or have questions at 1-800-565-4923/416-325-4000 or [picemail.moe@ontario.ca](mailto:picemail.moe@ontario.ca).



PUBLICATION NUMBER	PUBLICATION TITLE
4448e01	Procedure for Disinfection of Drinking Water in Ontario
7152e	Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids
7467	Filtration Processes Technical Bulletin
7685	Ultraviolet Disinfection Technical Bulletin
8215	Total Trihalomethane (TTHM) Reporting Requirements Technical Bulletin (February 2011)
2601e	Overview Guide: Municipal Drinking Water Licensing Program
0000	Municipal Drinking Water Licensing Program Bulletin, Issue 1, January 2011
0000	Certification Guide for Operators and Water Quality Analysts
6560e	Taking Samples for the Community Lead Testing Program
7423e	Community Sampling and Testing for Lead: Standard and Reduced Sampling and Eligibility for Exemption
7128e	Drinking Water System Contact List
4449e01	Technical Support Document for Ontario Drinking Water Quality Standards

[ontario.ca/drinkingwater](http://ontario.ca/drinkingwater)

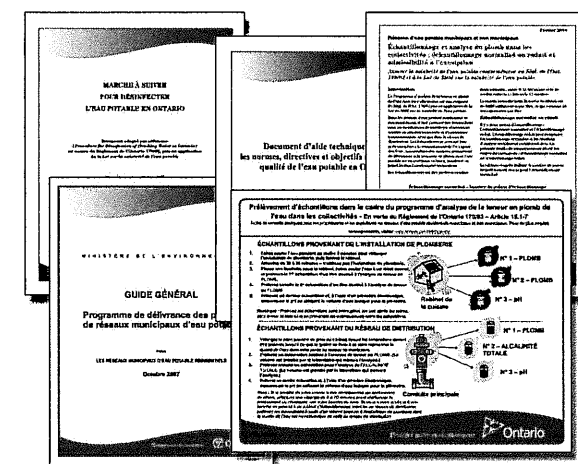


# Principaux guides et documents de référence sur les réseaux résidentiels municipaux d'eau potable

Beaucoup de documentation sur le fonctionnement d'un réseau d'eau potable se trouve sur le site Web du **ministère de l'Environnement**.

Vous trouverez ci-dessous la liste des principaux documents que les propriétaires et les exploitants de réseaux municipaux d'eau potable utilisent fréquemment. Pour lire ou télécharger ces documents, allez sur le site Web du Ministère, et effectuez une recherche par numéro de publication dans la section RESSOURCES.

Consultez le site d'**Eau potable Ontario** pour obtenir d'autre documentation. Communiquez avec le Centre d'information du public au 1 800 565-4923



ou au 416 325-4000, ou encore à **picemail.moe@ontario.ca** si vous avez des questions ou besoin d'aide.

NUMÉRO DE PUBLICATION	TITRE DE LA PUBLICATION
4448f01	Marche à suivre pour désinfecter l'eau potable en Ontario
7152e	Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids (en anglais seulement)
7467	Filtration Processes Technical Bulletin (en anglais seulement)
7685	Ultraviolet Disinfection Technical Bulletin (en anglais seulement)
8215	Total Trihalomethane (TTHM) Reporting Requirements Technical Bulletin (février 2011) (en anglais seulement)
2601f	Guide général - Programme de délivrance des permis de réseaux municipaux d'eau potable
0000	Bulletin du Programme des permis de réseaux municipaux d'eau potable, numéro 1, janvier 2011
0000	Guide sur l'accréditation des exploitants de réseaux d'eau potable et des analystes de la qualité de l'eau de réseaux d'eau potable
6560f	Prélèvement d'échantillons dans le cadre du programme d'analyse de la teneur en plomb de l'eau dans les collectivités
7423f	Échantillonnage et analyse du plomb dans les collectivités : échantillonnage normalisé ou réduit et admissibilité à l'exemption
7128f	Liste des personnes-ressources du réseau d'eau potable
4449f01	Document d'aide technique pour les normes, directives et objectifs associés à la qualité de l'eau potable en Ontario

[ontario.ca/drinkingwater](http://ontario.ca/drinkingwater)



**APPENDIX B**  
**INSPECTION RATING RECORD**

Ministry of the Environment - Inspection Summary Rating Record (Reporting Year - 2014-2015)

**DWS Name:** MARKHAM DISTRIBUTION SYSTEM  
**DWS Number:** 220004162  
**DWS Owner:** Markham, The Corporation Of The City Of  
**Municipal Location:** Markham

**Regulation:** O.REG 170/03  
**Category:** Large Municipal Residential System  
**Type Of Inspection:** Adhoc  
**Inspection Date:** May 7, 2014  
**Ministry Office:** York-Durham District

Maximum Question Rating: 251

Inspection Module	Non-Compliance Rating
Treatment Processes	0 / 39
Distribution System	0 / 21
Operations Manuals	0 / 28
Logbooks	0 / 14
Certification and Training	0 / 14
Water Quality Monitoring	0 / 51
Reporting & Corrective Actions	0 / 63
Treatment Process Monitoring	0 / 21
<b>TOTAL</b>	<b>0 / 251</b>

Inspection Risk Rating 0.00%

**FINAL INSPECTION RATING: 100.00%**

**Ministry of the Environment - Detailed Inspection Rating Record (Reporting Year - 2014-2015)**

**DWS Name:** MARKHAM DISTRIBUTION SYSTEM  
**DWS Number:** 220004162  
**DWS Owner:** Markham, The Corporation Of The City Of  
**Municipal Location:** Markham

**Regulation:** O.REG 170/03  
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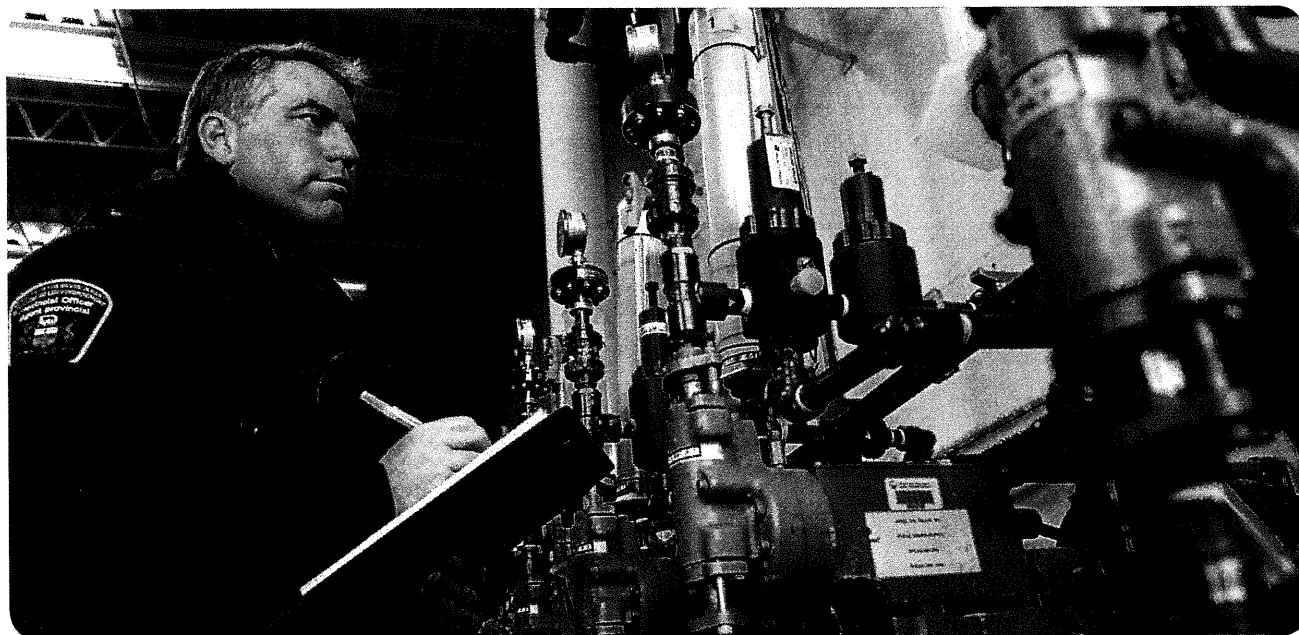
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**Maximum Question Rating:** 251

<b>Inspection Risk Rating</b>	<b>0.00%</b>
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<b>FINAL INSPECTION RATING:</b>	<b>100.00%</b>
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# APPLICATION OF THE **RISK METHODOLOGY** USED FOR MEASURING MUNICIPAL RESIDENTIAL DRINKING WATER SYSTEM INSPECTION RESULTS



The Ministry of the Environment (MOE) has a rigorous and comprehensive inspection program for municipal residential drinking water systems (MRDWS). Its objective is to determine the compliance of MRDWS with requirements under the Safe Drinking Water Act and associated regulations. It is the responsibility of the municipal residential drinking water system owner to ensure their drinking water systems are in compliance with all applicable legal requirements.

This document describes the risk rating methodology, which has been applied to the findings of the Ministry's MRDWS inspection results since fiscal year 2008-09. The primary goals of this assessment

are to encourage ongoing improvement of these systems and to establish a way to measure this progress.

MOE reviews the risk rating methodology every three years.

The Ministry's Municipal Residential Drinking Water Inspection Protocol contains up to 14 inspection modules and consists of approximately 120 regulatory questions. Those protocol questions are also linked to definitive guidance that ministry inspectors use when conducting MRDWS inspections. The questions address a wide range of regulatory issues, from administrative procedures

[ontario.ca/drinkingwater](http://ontario.ca/drinkingwater)

to drinking water quality monitoring. Additionally, the inspection protocol contains a number of non-regulatory questions.

A team of drinking water specialists in the ministry have assessed each of the inspection protocol regulatory questions to determine the risk (not complying with the regulation) to the delivery of safe drinking water. This assessment was based on established provincial risk assessment principles, with each question receiving a risk rating referred to as the Question Risk Rating. Based on the number of areas where a system is deemed to be non-compliant during the inspection, and the significance of these areas to administrative, environmental, and health consequences, a risk-based inspection rating is calculated by the ministry for each drinking water system.

It is important to be aware that an inspection rating that is less than 100 per cent does not mean that the drinking water from the system is unsafe. It shows areas where a system's operation can improve. To that end, the ministry works with owners and operators of systems to make sure they know what they need to do to achieve full compliance.

The inspection rating reflects the inspection results of the specific drinking water system for the reporting year. Since the methodology is applied consistently over a period of years, it serves as a comparative measure both provincially and in relation to the individual system. Both the drinking water system and the public are able to track the performance over time, which encourages continuous improvement and allows systems to identify specific areas requiring attention.

The ministry's annual inspection program is an important aspect of our drinking water safety net. The ministry and its partners share a common commitment to excellence and we continue to work toward the goal of 100 per cent regulatory compliance.

## Determining Potential to Compromise the Delivery of Safe Water

The risk management approach used for MRDWS is aligned with the Government of Ontario's Risk Management Framework. Risk management is a systematic approach to identifying potential hazards; understanding the likelihood and consequences of the hazards; and taking steps to reduce their risk if necessary and as appropriate.

The Risk Management Framework provides a formula to be used in the determination of risk:

$$\text{RISK} = \text{LIKELIHOOD} \times \text{CONSEQUENCE}$$

(of the consequence)

Every regulatory question in the inspection protocol possesses a likelihood value (L) for an assigned consequence value (C) as described in **Table 1** and **Table 2**.

**TABLE 1:**

Likelihood of Consequence Occurring	Likelihood Value
0% - 0.99% (Possible but Highly Unlikely)	L = 0
1 - 10% (Unlikely)	L = 1
11 - 49% (Possible)	L = 2
50 - 89% (Likely)	L = 3
90 - 100% (Almost Certain)	L = 4

**TABLE 2:**

Consequence	Consequence Value
Medium Administrative Consequence	C = 1
Major Administrative Consequence	C = 2
Minor Environmental Consequence	C = 3
Minor Health Consequence	C = 4
Medium Environmental Consequence	C = 5
Major Environmental Consequence	C = 6
Medium Health Consequence	C = 7
Major Health Consequence	C = 8

The consequence values (0 through 8) are selected to align with other risk-based programs and projects currently under development or in use within the ministry as outlined in **Table 2**.

The Question Risk Rating for each regulatory inspection question is derived from an evaluation of every identified consequence and its corresponding likelihood of occurrence:

- All levels of consequence are evaluated for their potential to occur
- Greatest of all the combinations is selected.

The Question Risk Rating quantifies the risk of non-compliance of each question relative to the others. Questions with higher values are those with a potentially more significant impact on drinking water safety and a higher likelihood of occurrence. The highest possible value would be 32 (4×8) and the lowest would be 0 (0×1).

**Table 3** presents a sample question showing the risk rating determination process.

<b>TABLE 3:</b>							
<b>Does the Operator in Charge ensure that the equipment and processes are monitored, inspected and evaluated?</b>							
<b>Risk = Likelihood × Consequence</b>							
C=1	C=2	C=3	C=4	C=5	C=6	C=7	C=8
Medium Administrative Consequence	Major Administrative Consequence	Minor Environmental Consequence	Minor Health Consequence	Medium Environmental Consequence	Major Environmental Consequence	Medium Health Consequence	Major Health Consequence
L=4 (Almost Certain)	L=1 (Unlikely)	L=2 (Possible)	L=3 (Likely)	L=3 (Likely)	L=1 (Unlikely)	L=3 (Likely)	L=2 (Possible)
R=4	R=2	R=6	R=12	R=15	R=6	R=21	R=16

## Application of the Methodology to Inspection Results

Based on the results of a MRDWS inspection, an overall inspection risk rating is calculated. During an inspection, inspectors answer the questions that relate to regulatory compliance and input their responses as “yes”, “no” or “not applicable” into the Ministry’s Laboratory and Waterworks Inspection System (LWIS) database. A “no” response indicates non-compliance. The maximum number of regulatory questions asked by an inspector varies by: system (i.e., distribution, stand-alone), type of inspection (i.e., focused, detailed), and source type (i.e., groundwater, surface water).

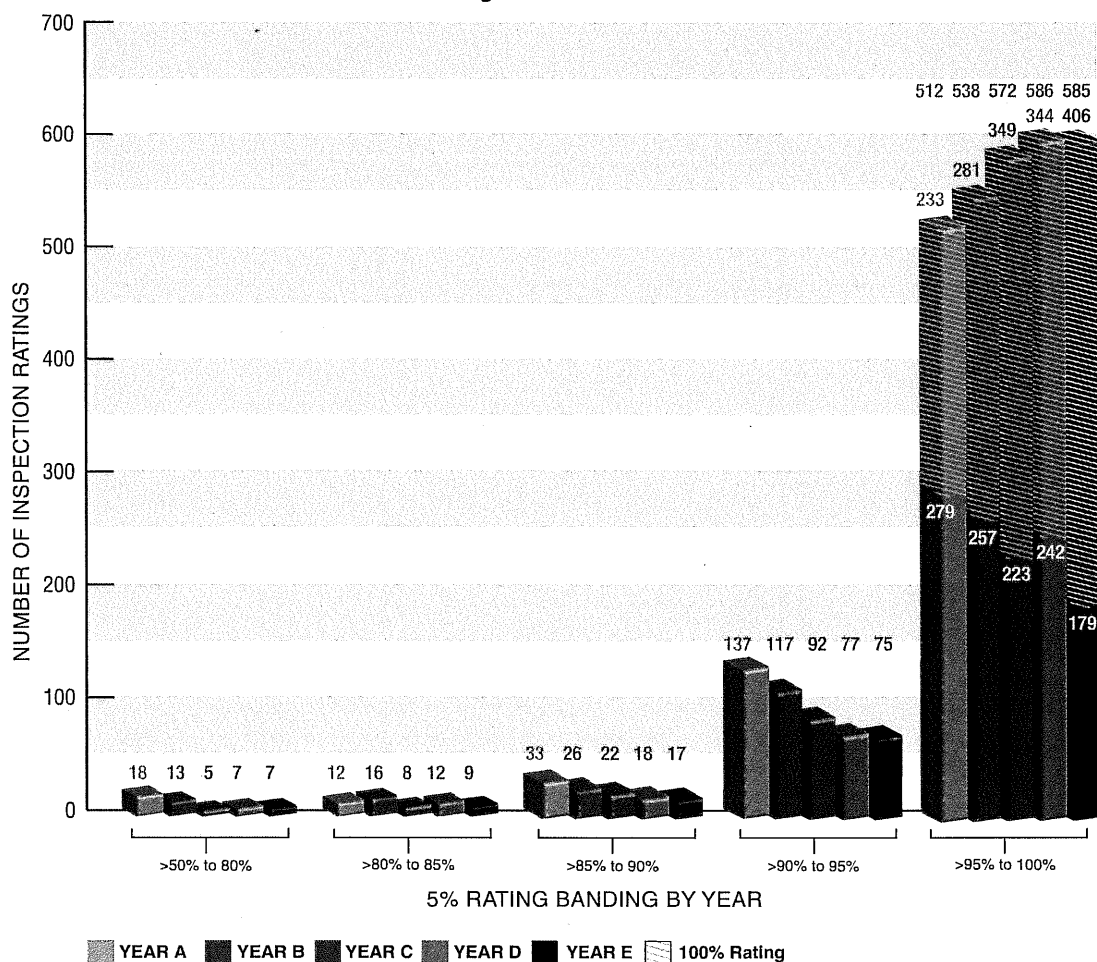
The risk ratings of all non-compliant answers are summed and divided by the sum of the risk ratings of all questions asked (maximum question rating). The resulting inspection risk rating (as a percentage) is subtracted from 100 per cent to arrive at the final inspection rating.

## Application of the Methodology for Public Reporting

The individual MRDWS Total Inspection Ratings are published with the ministry's Chief Drinking Water Inspector's Annual Report.

**Figure 1** presents the distribution of MRDWS ratings for a sample of annual inspections. Individual drinking water systems can compare against all the other inspected facilities over a period of inspection years.

**Figure 1: Year Over Year Distribution of MRDWS Ratings**



## Reporting Results to MRDWS Owners/Operators

A summary of inspection findings for each system is generated in the form of an Inspection Rating Record (IRR). The findings are grouped into the 14 possible modules of the inspection protocol,

which would provide the system owner/operator with information on the areas where they need to improve. The 14 modules are:

- |                         |                        |                                       |  |
|-------------------------|------------------------|---------------------------------------|--|
| 1. Source               | 5. Process Wastewater  | 9. Contingency and Emergency Planning | 12. Water Quality Monitoring                       |
| 2. Permit to Take Water | 6. Distribution System | 10. Consumer Relations                | 13. Reporting, Notification and Corrective Actions |
| 3. Capacity Assessment  | 7. Operations Manuals  | 11. Certification and Training        | 14. Other Inspection Findings                      |
| 4. Treatment Processes  | 8. Logbooks            |                                       |  |

For further information, please visit [www.ontario.ca/drinkingwater](http://www.ontario.ca/drinkingwater)