



Report to: General Committee

Report Date: October 20, 2011

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**SUBJECT:** The Ontario Ministry of Environment - Markham Distribution System – Drinking Water System Inspection Report

**PREPARED BY:** Karen Dennison, M. Eng., P. Eng., Ext. 2519  
Waterworks, Manager of System Engineering  
Helena Frantzke, Ext. 2449  
Waterworks, Water Quality Coordinator

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**RECOMMENDATION:**

1. That the report entitled “The Ontario Ministry of Environment – Markham Distribution System – Drinking Water System Inspection Report” be received;
2. And that Staff be authorized and directed to do all things necessary to give effect to this resolution.

**EXECUTIVE SUMMARY:**

Not Applicable

**PURPOSE:**

The purpose of this report is to provide Council with an update on the findings of the Ministry of the Environment (MOE)’s inspection of the Markham Water Distribution System for 2011.

**BACKGROUND:**

The Safe Drinking Water Act, 2002 (SDWA) states that a provincial officer may at any reasonable time conduct an inspection for the purpose of determining compliance with regulatory requirements contained within the Act, or any of the associated regulations. Traditionally, the MOE has conducted an annual inspection of Markham’s Water Distribution System.

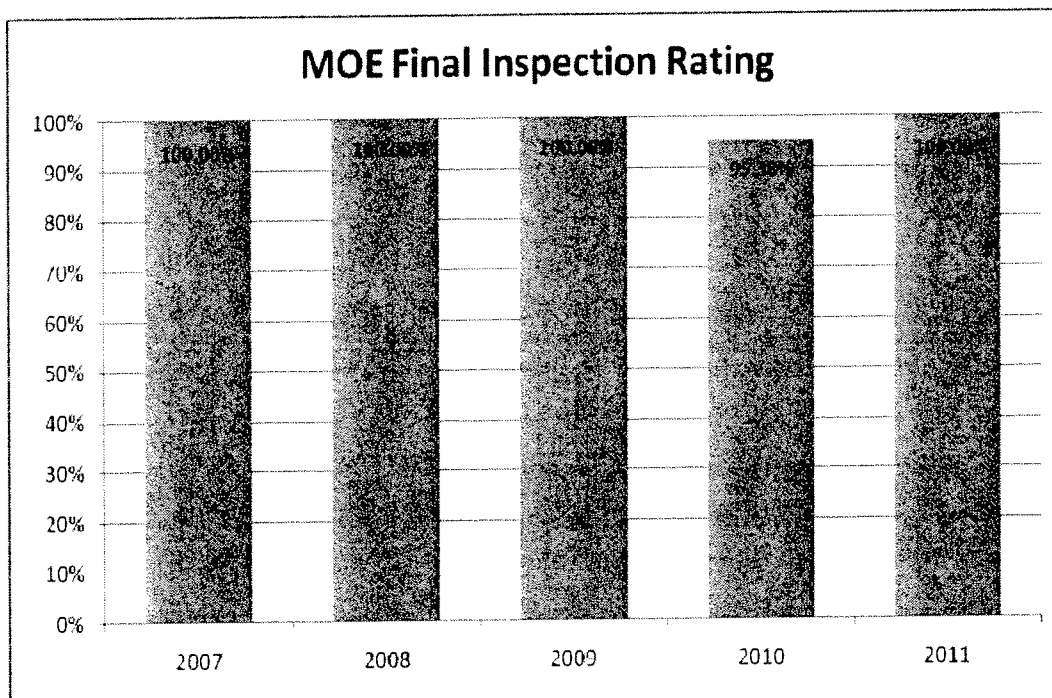
The MOE conducted an unannounced on-site inspection of the Markham Water Distribution System on July 12, 2011. The MOE Inspector reviewed Waterworks procedures, policies and records for 2011 pertaining to the system both on-site and off-site following the physical inspection.

The MOE inspection report was received on October 03, 2011, see attachment “A”. Markham was found to be 100% in compliance with the MOE’s Drinking-Water Systems Regulation 170/03.

**OPTIONS/ DISCUSSION:**

The Town of Markham was given a Final Inspection Rating of 100% during this inspection. This Inspection Rating is used to measure Municipal Residential Drinking Water System Inspection Results. The objective of the MOE Inspection is to provide a rigorous and comprehensive inspection program for municipal residential drinking water systems (MRDWS), to determine compliance under the Safe Drinking Water Act and associated regulations.

Below is a summary Markham's Final Inspection Ratings since the MOE began issuing them in 2007:



The MOE Inspection normally provides a Summary of Best Practice Issues and Recommendations as a result of the inspection. These recommendations are provided by the MOE to identify areas where drinking water quality assurance can be further improved or protected. However, this year's inspection was the first time since the annual MOE inspections began in 2004 that Markham had no new Best Practice issues or Recommendations provided by the MOE.

**FINANCIAL CONSIDERATIONS AND TEMPLATE: (external link)**

Not Applicable.

**HUMAN RESOURCES CONSIDERATIONS**

Not applicable

**ALIGNMENT WITH STRATEGIC PRIORITIES:**

Not applicable

**BUSINESS UNITS CONSULTED AND AFFECTED:**

Not applicable

The report presented herein, communicates the results of the 2011 MOE Inspection held on July 12, 2011.

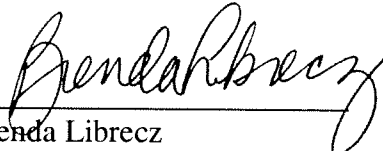
The undersigned represent the Top Management of Town of Markham's Drinking Water Distribution System and by signing below the Top Management of the Operating Authority have reviewed the MOE Inspection

**RECOMMENDED**

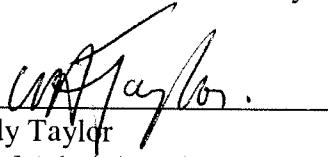
**BY:**



Peter Loukes, P. Eng.  
Director, Environmental Services



Brenda Librecz  
Commissioner, Community & Fire Services



Andy Taylor  
Chief Administrative Officer

**ATTACHMENTS:**

Attachment "A" – Ontario Ministry of the Environment, Markham Distribution System / Drinking Water System Inspection Report, July 12, 2011.



**ATTACHMENT "A"**

**Ontario Ministry of the Environment**

**MARKHAM DISTRIBUTION SYSTEM  
Drinking Water System Inspection Report**

DWS Number: 220004162

Inspection Number: 1-979T8

Date of Inspection: July 12, 2011

Inspected By: Loralyn Wild



# Ontario

Ministry of the Environment

## MARKHAM DISTRIBUTION SYSTEM Drinking Water System Inspection Report

DWS Number:	220004162
Inspection Number:	1-979T8
Date of Inspection:	Jul 12, 2011
Inspected By:	Loralyn Wild

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- D. Inspection Rating Report**

**OWNER INFORMATION:**

<b>Company Name:</b>	MARKHAM, THE TOWN OF	
<b>Street Number:</b>	101	<b>Unit Identifier:</b>
<b>Street Name:</b>	TOWN CENTRE Blvd N	
<b>City:</b>	MARKHAM	
<b>Province:</b>	ON	<b>Postal Code:</b> L3R 9W3

**CONTACT INFORMATION**

<b>Type:</b>	Manager	<b>Name:</b>	Eddy S. Y. Wu
<b>Phone:</b>	(905) 477-7000 x2445	<b>Fax:</b>	(905) 479-7772
<b>Email:</b>	ewu@markham.ca		
<b>Title:</b>	Manager, Operations and Maintenance, Waterworks Department		
<b>Type:</b>	Main Contact/Coordinator	<b>Name:</b>	Helena Frantzke
<b>Phone:</b>	(905) 477-7000 x2449	<b>Fax:</b>	(905) 479-7772
<b>Email:</b>	hfrantzke@markham.ca		
<b>Title:</b>	Water Quality Coordinator, Waterworks Department		
<b>Type:</b>	Director	<b>Name:</b>	Peter Loukes
<b>Phone:</b>	(905) 477-7000	<b>Fax:</b>	(905) 479-7772
<b>Email:</b>	ploukes@markham.ca		
<b>Title:</b>	Director, Environmental Services		
<b>Type:</b>	Manager	<b>Name:</b>	Karen Dennison
<b>Phone:</b>	(905) 477-7000 x2519	<b>Fax:</b>	(905) 479-7772
<b>Email:</b>	kdennison@markham.ca		
<b>Title:</b>	Manager, System Engineering, Waterworks Department		
<b>Type:</b>	Supervisor	<b>Name:</b>	Peter Solymos
<b>Phone:</b>	(905) 477-7000 x2830	<b>Fax:</b>	(905) 475-4732
<b>Email:</b>	psolymos@markham.ca		
<b>Title:</b>	Supervisor, Water Quality, Waterworks Department		
<b>Type:</b>	Manager	<b>Name:</b>	Noris M. Dela Cruz
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<b>Email:</b>	ndelacruz@markham.ca		
<b>Title:</b>	Manager, IMS, Waterworks Department		
<b>Type:</b>	Coordinator	<b>Name:</b>	Anna Distefano
<b>Phone:</b>	(905) 477-7000 x2162	<b>Fax:</b>	(905) 479-7772
<b>Email:</b>	adistefano@markham.ca		
<b>Title:</b>	Training Coordinator, Waterworks Department		

**CONTACT INFORMATION**

<b>Type:</b>	Manager	<b>Name:</b>	Ernie Ting
<b>Phone:</b>	(905) 477-7000 x3650	<b>Fax:</b>	(905) 479-7772
<b>Email:</b>	eting@markham.ca		
<b>Title:</b>	Manager, Infrastructure, Waterworks Department		

**INSPECTION DETAILS:**

<b>DWS Name:</b>	MARKHAM DISTRIBUTION SYSTEM
<b>DWS Address:</b>	101 TOWN CENTRE BLVD N MARKHAM L3R 9W3
<b>County/District:</b>	Markham
<b>MOE District/Area Office:</b>	York-Durham District
<b>Health Unit:</b>	YORK REGION HEALTH SERVICES DEPARTMENT
<b>Conservation Authority</b>	N/A
<b>MNR Office:</b>	N/A
<b>DWS Category:</b>	Large Municipal Residential
<b>DWS Number:</b>	220004162
<b>Inspection Type:</b>	Unannounced
<b>Inspection Number:</b>	1-979T8
<b>Date of Inspection:</b>	Jul 12, 2011
<b>Date of Previous Inspection:</b>	May 18, 2010

**DRINKING WATER SYSTEM COMPONENTS DESCRIPTION**

<b>Site (Name):</b>	Markham Operation Office		
<b>Type:</b>	Other	<b>Sub Type:</b>	Other
<b>Comments:</b>			

The Markham Distribution System (DS) is operated and maintained by the Town of Markham, and receives most of its distribution water from the City of Toronto. The York Water System was interconnected with Peel Region in 2006, but the Town of Markham does not receive any water from the Peel System under normal operating conditions. The trunk transmission lines, pumping stations, and water storage facilities located within the Markham Distribution System are owned and operated by the Regional Municipality of York and the City of Toronto.

The City of Toronto operates and maintains four surface water treatment plants utilizing chemically assisted filtration, chlorination, fluoridation and chloramination processes. The Regional Municipality of York measures and monitors the distribution water flows and volumes directed to the Town of Markham through the use of nineteen (19) flow meters located along the Richmond Hill, Vaughan, Toronto and Markham boundaries. York Region also provides water storage and pressure boosting for the Markham system.

The Markham DS provides potable water to approximately 310,000 residents of Markham. The Markham Distribution System comprises approximately 981 km of watermains, 7,772 hydrants, 7,821 valve chambers, 9,281 valves, 188 blow-offs, and approximately 72,225 service connections.



## 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 unannounced inspection of the Town of Markham Drinking Water System on July 12, 2011. Files were reviewed, staff interviewed and a tour of the facilities at 8100 Warden Avenue were conducted on this date. The Town of Markham contact for this inspection was Helena Frantzke, Water Quality Coordinator. Audit drinking water samples were collected as part of this inspection on August 4, 2011.

### TREATMENT PROCESSES

- \* The owner had ensured that all equipment was installed in accordance with the Permit and Licence or Approval issued under Part V of the SDWA.

The Markham Distribution System has been granted approval under Drinking Water Permit #021-201 and Drinking Water Licence #021-101. The Licence for the Markham Distribution System was updated on October 14, 2010, to include regulatory relief for corrective actions, as required under Section 17-9 of Schedule 17 of O. Reg. 170/03, in the event of adverse bacteriological test results indicating the presence of *Aeromonas* spp., *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Clostridium* spp., or fecal streptococci. Alternative corrective actions are listed in the amended Municipal Drinking Water Licence.

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

### DISTRIBUTION SYSTEM

## **DISTRIBUTION SYSTEM**

- \* **Backflow preventers were installed at each service connection to Industrial/Commercial/Institutional and agricultural process that were considered high hazard facilities.**

An update on the Town of Markham's Backflow Prevention Program was provided during the inspection. The Town is continuing with Phase 1 bringing 862 properties into compliance that include high risk as well as Town owned facilities and voluntary properties. 65 % of the Phase 1 properties are now in compliance with Markham's By-Law requiring backflow prevention, 26 % are in partial compliance and 9% are in non-compliance and enforcement actions are being taken.

- \* **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 the Procedure for Disinfection of Drinking Water In Ontario.**

The Town of Markham provided an updated copy of their "Watermain Repair and/or Modifications" Work Instruction document. Records of work on watermains, valves and hydrants in the Distribution System for this inspection period were reviewed onsite.

- \* **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.**
- \* **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.**

The Town of Markham has hard copy operations and maintenance manuals available at their main office at 8100 Warden Avenue. Electronic files are also available for staff to access.

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

## **LOGBOOKS**

- \* **Logs for the distribution subsystem(s) of the drinking water system contained the required information.**

Logs for the Markham Distribution System consist of work orders as well as a logbook maintained at the main office for the waterworks, 8100 Warden Avenue.

- \* **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.**

The Town of Markham does not currently have continuous monitoring equipment. Records reviewed during the inspection indicate that all tests were performed by certified operators.

## **SECURITY**

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

## **CERTIFICATION AND TRAINING**

- \* **The overall responsible operator had been designated for each subsystem.**

A schedule is issued that names the overall responsible operator for each week, a role that is rotated between the four (4) Town of Markham Waterworks Supervisors.

- \* **Operators in charge had been designated for all subsystems which comprised the drinking-water system.**
- \* **Only certified operators made adjustments to the treatment equipment.**

Logbook records and certification records indicated that work in the Markham Distribution System was performed, and/or supervised, by certified Operators.

## **WATER QUALITY MONITORING**

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

The Town of Markham has over 310, 000 residents and is required to collect a minimum of 121 drinking water samples to be tested for microbiological parameters each month. The Town of Markham has collected more than their required number of samples for this inspection period.

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

Samples were collected and tested for trihalomethanes as required for this inspection period.

- \* **All water quality monitoring requirements imposed by the Permit and Licence or Approval issued under Part V of the SDWA were being met.**

There are no additional sampling requirements under the Municipal Drinking Water Licence 021-101 currently issued to the Markham Distribution System.

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

The Town of Markham qualifies for the reduced sampling requirements and the Town has collected more than their required sixty-five (65) samples in each of the two (2) previous sampling periods to test for lead in drinking water. There were no test results that exceeded Ontario's Drinking Water Standard for lead for this inspection period.

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

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

Chlorine residual tests are conducted daily through grab samples, in addition to residual tests taken when microbiological sampling is done. All chlorine residual results are recorded in an electronic database that emails a report to Town of Markham Waterworks Reporting Compliance Group each evening to ensure that results are reviewed daily.

- \* **Records confirmed that chlorine residual tests were being conducted at the same time and at the same location that microbiological samples were obtained.**
- \* **Testing for parameters required by legislation, Order, or a Permit, Licence or Approval issued under Part V of the SDWA was conducted by laboratories in Ontario licenced to test for that parameter, or by eligible laboratories outside Ontario.**

**WATER QUALITY ASSESSMENT**

- \* **The inspector collected audit samples during the inspection.**

Drinking water samples were collected on August 4, 2011, at four (4) locations throughout Markham. Audit sample results are attached to this report.

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

**REPORTING & CORRECTIVE ACTIONS**

- \* **Corrective actions (as per Schedule 17) were taken to address adverse conditions, including any other steps that were directed by the Medical Officer of Health.**

There were nine (9) Adverse Water Quality Incident (AWQI) reports made during this inspection period. Corrective actions were taken and appropriate reporting was made for all incidents.

- \* **All required notifications of adverse water quality incidents were immediately provided as per O.Reg. 170/03 16-6.**
- \* **All reporting requirements for lead sampling were complied with as per schedule 15.1-9 of O.Reg. 170/03.**
- \* **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

**SUMMARY OF BEST PRACTICE ISSUES AND RECOMMENDATIONS**

This section provides a summary of all best practice issues identified during the inspection period. Details pertaining to these items can be found in the body of the inspection report. Best Management Practices are recommendations and not mandatory requirements, but may lead to safe drinking water for the consumer.

In the interest of continuous improvement in the interim, it is recommended that owners and operators develop an awareness of the following practices and consider measures to implement them so that all drinking water systems continuously improve their processes.

Not Applicable

**SIGNATURES**

Inspected By:

Loralyn Wild

Signature: (Provincial Officer):




Reviewed &amp; Approved By:

Demetra Koros

Signature: (Supervisor):



Review &amp; Approval Date:

 30, 2011

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.



**Ministry of the Environment  
Drinking Water Inspection Report**

**APPENDIX A**

**DRINKING WATER SYSTEM COMPONENTS DESCRIPTION**



**DRINKING WATER SYSTEM COMPONENTS DESCRIPTION**

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**Name:** Markham Operation Office**Station Id #:****Type:** Other**Sub Type:** Other**Street Number:** 8100**Street Name:** Warden Ave**Lot:****Concession:****Part:****Reference Plan:****Map Datum:** NAD 83**Geo-Referencing Method:** GPS**Accuracy Estimate:** 10-30 Meters (Med Quality GPS)**Location Reference:** Entrance to Object**UTM Zone:** 17**UTM Northing:****UTM Easting:****Latitude:****Longitude:**

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**Ministry of the Environment  
Drinking Water Inspection Report**

**APPENDIX B**

**LICENSE/DRINKING WATER PERMIT**



## MUNICIPAL DRINKING WATER LICENCE

**Licence Number: 021-101**

**Issue Number: 2**

Pursuant to the *Safe Drinking Water Act*, 2002, S.O. 2002, c. 32, and the regulations made thereunder and subject to the limitations thereof, this municipal drinking water licence is issued under Part V of the *Safe Drinking Water Act*, 2002, S.O. 2002, c. 32 to:

### **The Corporation of the Town of Markham**

**101 Town Center Blvd.  
Markham, ON  
L3R 9W3**

For the following municipal residential drinking water system:

### **Markham Distribution System**

This municipal drinking water licence includes the following:

<b>Schedule</b>	<b>Description</b>
Schedule A	Drinking Water System Information
Schedule B	General Conditions
Schedule C	System-Specific Conditions
Schedule D	Conditions for Relief from Regulatory Requirements

DATED at TORONTO this 14th day of October, 2010

Signature

A handwritten signature in black ink, appearing to read "A. Ahmed", written over a horizontal line.

Aziz Ahmed, P.Eng.  
Director  
Part V, *Safe Drinking Water Act*, 2002

## Schedule A: Drinking Water System Information

System Owner	The Corporation of the Town of Markham
Licence Number	021-101
Drinking Water System Name	Markham Distribution System
Schedule A Issue Date	October 14th, 2010

The following information is applicable to the above drinking water system and forms part of this licence:

### Licence

First Licence Issue Date	August 14, 2009
Licence Expiry Date	August 13, 2014
Application for Licence Renewal Date	February 11, 2014

### Drinking Water Works Permit

Drinking Water System Name	Permit Number	Issue Date
Markham Distribution System	021-201	August 14, 2009

### Permit To Take Water

Water Taking Locations	Permit Number	Issue Date
Not Applicable	Not Applicable	Not Applicable

### Financial Plans

The Financial Plan Number for the Financial Plan required to be developed for this drinking water system in accordance with O. Reg. 453/07 shall be:	021-301
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### Accredited Operating Authority

Drinking Water System or Operational Subsystems	Accredited Operating Authority	Operational Plan Number
Markham Distribution System	The Corporation of the Town of Markham	021-401

## Schedule B: General Conditions

System Owner	The Corporation of the Town of Markham
Licence Number	021-101
Drinking Water System Name	Markham Distribution System
Schedule B Issue Date	October 14th, 2010

### 1.0 Definitions

1.1 Words and phrases not defined in this licence and the associated drinking water works permit shall be given the same meaning as those set out in the SDWA and any regulations made in accordance with that act, unless the context requires otherwise.

1.2 In this licence and the associated drinking water works permit:

"**adverse effect**", "**contaminant**" and "**natural environment**" shall have the same meanings as in the EPA;

"**alteration**" may include the following in respect of this drinking water system:

- (a) An addition to the system,
- (b) A modification of the system,
- (c) A replacement of part of the system, and
- (d) An extension of the system;

"**compound of concern**" means a contaminant that, based on generally available information, may be emitted from a component of the drinking water system to the atmosphere in a quantity that is significant either in comparison to the relevant point of impingement limit or if a point of impingement limit is not available for the compound, then based on generally available toxicological information, the compound has the potential to cause an adverse effect as defined by the EPA at a point of impingement;

"**Director**" means a Director appointed pursuant to section 6 of the SDWA for the purposes of Part V of the SDWA;

"**drinking water works permit**" means the drinking water works permit for the drinking water system as identified in Schedule A of this licence;

"**emission summary table**" means the table that was prepared by a Professional Engineer in accordance with O. Reg. 419/05 and the procedure document listing the appropriate point of impingement concentrations of each compound of concern emitted from a component of the drinking water system and providing comparison to the corresponding point of impingement limit;

"**EPA**" means the *Environmental Protection Act*, R.S.O. 1990, c. E.19;

"**financial plan**" means the financial plan required by O. Reg. 453/07 and the conditions of this licence;

**"licence"** means this municipal drinking water licence for the municipal drinking water system identified in Schedule A of this licence;

**"operational plan"** means an operational plan developed in accordance with the Director's Directions – Minimum Requirements for Operational Plans made under the authority of subsection 15(1) of the SDWA;

**"owner"** means the owner of the drinking water system as identified in Schedule A of this licence;

**"point of impingement"** means any point in the natural environment that is not on the same property as the source of the contaminant and as defined by section 2 of O. Reg. 419/05;

**"point of impingement limit"** means the appropriate standard from Schedule 1, 2 or 3 of O. Reg. 419/05 and if a standard is not provided for a compound of concern, the appropriate criteria listed in the Ministry of the Environment publication titled "Summary of Standards and Guidelines to support Ontario Regulation 419: Air Pollution – Local Air Quality (including Schedule 6 of O. Reg. 419 on Upper Risk Thresholds)", dated February 2008, as amended;

**"procedure document"** means the Ministry of the Environment procedure titled "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated July 2005, as amended;

**"Professional Engineer"** means a Professional Engineer who has been licenced to practice in the Province of Ontario;

**"provincial officer"** means a provincial officer appointed pursuant to section 8 of the SDWA;

**"publication NPC-205"** means the Ministry of the Environment publication titled "Sound Level Limits for Stationary Sources in Class 1 & 2 Areas (Urban)" dated October 1995, as amended;

**"publication NPC-207"** means the Ministry of the Environment draft technical publication titled "Impulse Vibration in Residential Buildings" dated November 1983, supplementing the Ministry of the Environment "Model Municipal Noise Control By-law, Final Report" dated August 1978;

**"publication NPC-232"** means the Ministry of the Environment publication titled "Sound Level Limits for Stationary Sources in Class 3 Areas (Rural)" dated October 1995, as amended;

**"SDWA"** means the *Safe Drinking Water Act*, 2002, S.O. 2002, c. 32;

"sensitive populations" means any one or a combination of the following locations where the health effects of nitrogen oxides emissions from emergency generator(s) shall be considered using the point of impingement limit instead of the Ministry of the Environment screening level for emergency generator(s):

- (a) health care units (e.g., hospitals and nursing homes),
- (b) primary/junior public schools,
- (c) day-care facilities, and
- (d) playgrounds;

## **2.0 Applicability**

- 2.1 In addition to any other requirements, the drinking water system identified above shall be established, altered and operated in accordance with the conditions of the drinking water works permit and this licence.

## **3.0 Licence Expiry**

- 3.1 This licence expires on the date identified as the licence expiry date in Schedule A of this licence.

## **4.0 Licence Renewal**

- 4.1 Any application to renew this licence shall be made on or before the date identified as the application for licence renewal date set out in Schedule A of this licence.

## **5.0 Compliance**

- 5.1 The owner and operating authority shall ensure that any person authorized to carry out work on or to operate any aspect of the drinking water system has been informed of the SDWA, all applicable regulations made in accordance with that act, the drinking water works permit and this licence and shall take all reasonable measures to ensure any such person complies with the same.

## **6.0 Licence and Drinking Water Works Permit Availability**

- 6.1 At least one copy of this licence and the drinking water works permit shall be stored in such a manner that they are readily viewable by all persons involved in the operation of the drinking water system.

## **7.0 Permit To Take Water**

Not applicable.

## **8.0 Financial Plan**

- 8.1 The owner of the drinking water system, by the later of July 1, 2010 and the date that is six months after the date the first licence for the system is issued, shall prepare and approve financial plans for the system that satisfy the requirements prescribed under section 3 of O. Reg. 453/07.

- 8.2 The owner of the drinking water system shall ensure that every financial plan prepared in accordance with subsections 2 (1) and 3 (1) of O. Reg. 453/07 contains on the front page of the financial plan, the appropriate financial plan number as set out in Schedule A of this licence.

## 9.0 Interpretation

- 9.1 Where there is a conflict between the provisions of this licence and any other document, the following hierarchy shall be used to determine the provision that takes precedence:
- 9.1.1 The SDWA;
  - 9.1.2 A condition imposed in this licence that explicitly overrides a prescribed regulatory requirement;
  - 9.1.3 A condition imposed in the drinking water works permit that explicitly overrides a prescribed regulatory requirement;
  - 9.1.4 Any regulation made under the SDWA;
  - 9.1.5 Any provision of this licence that does not explicitly override a prescribed regulatory requirement;
  - 9.1.6 Any provision of the drinking water works permit that does not explicitly override a prescribed regulatory requirement;
  - 9.1.7 Any application documents listed in this licence, or the drinking water works permit from the most recent to the earliest; and
  - 9.1.8 All other documents listed in this licence, or the drinking water works permit from the most recent to the earliest.
- 9.2 If any requirement of this licence or the drinking water works permit is found to be invalid by a court of competent jurisdiction, the remaining requirements of this licence and the drinking water works permit shall continue to apply.
- 9.3 The issuance of and compliance with the conditions of this licence and the drinking water works permit does not:
- 9.3.1 Relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement, including the *Environmental Assessment Act*, R.S.O. 1990, c. E.18; and
  - 9.3.2 Limit in any way the authority of the appointed Directors and provincial officers of the Ministry of the Environment to require certain steps be taken or to require the owner to furnish any further information related to compliance with the conditions of this licence or the drinking water works permit.



- 9.4** For greater certainty, nothing in this licence or the drinking water works permit shall be read to provide relief from regulatory requirements in accordance with section 46 of the SDWA, except as expressly provided in the licence or the drinking water works permit.

## **10.0 Adverse Effects**

- 10.1** Nothing in this licence or the drinking water works permit shall be read as to permit:
- 10.1.1** The discharge of a contaminant into the natural environment that causes or is likely to cause an adverse effect; or
- 10.1.2** The discharge of any material of any kind into or in any waters or on any shore or bank thereof or into or in any place that may impair the quality of the water of any waters.
- 10.2** All reasonable steps shall be taken to minimize and ameliorate any adverse effect on the natural environment or impairment of the quality of water of any waters resulting from the operation of the drinking water system including such accelerated or additional monitoring as may be necessary to determine the nature and extent of the effect or impairment.
- 10.3** Fulfillment of one or more conditions imposed by this licence or the drinking water works permit does not eliminate the requirement to fulfill any other condition of this licence or the drinking water works permit.

## **11.0 Change of Owner or Operating Authority**

- 11.1** This licence is not transferable without the prior written consent of the Director.
- 11.2** The owner shall notify the Director in writing of a change of any operating authority identified in Schedule A of this licence.

## **12.0 Information to be Provided**

- 12.1** Any information requested by a Director or a provincial officer concerning the drinking water system and its operation, including but not limited to any records required to be kept by this licence or the drinking water works permit, shall be provided upon request.

## **13.0 Records Retention**

- 13.1** Except as otherwise required in this licence or the drinking water works permit, any records required by or created in accordance with this licence or the drinking water works permit, other than the records specifically referenced in section 12 of O. Reg. 170/03, shall be retained for at least 5 years and made available for inspection by a provincial officer, upon request.

## **14.0 Chemicals and Materials**

- 14.1** All chemicals and materials used in the alteration or operation of the drinking water system that come into contact with water within the system shall meet all applicable

standards set by both the American Water Works Association ("AWWA") and the American National Standards Institute ("ANSI") safety criteria standards NSF/60 and NSF/61.

- 14.2** The most current chemical and material product registration documentation from a testing institution accredited by either the Standards Council of Canada or by the American National Standards Institution ("ANSI") shall be available at all times for each chemical and material used in the operation of the drinking water system that comes into contact with water within the system.

- 14.3** Conditions 14.1 and 14.2 do not apply in the case of the following:

14.3.1 Water pipe and pipe fittings meeting AWWA specifications made from ductile iron, cast iron, PVC, fibre and/or steel wire reinforced cement pipe or high density polyethylene (HDPE);

14.3.2 Articles made from stainless steel, glass, HDPE or Teflon□;

14.3.3 Cement mortar for watermain lining and for water contacting surfaces of concrete structures made from washed aggregates and Portland cement;

14.3.4 Food grade oils and lubricants; or

14.3.5 Any particular chemical or material where the owner has written documentation signed by the Director that indicates that the Ministry of the Environment is satisfied that the chemical or material is acceptable for use within the drinking water system and the chemical or material is only used as permitted by the documentation.

## **15.0 Drawings**

- 15.1** All drawings and diagrams in the possession of the owner that show any treatment subsystem as constructed shall be retained by the owner unless the drawings and diagrams are replaced by a revised or updated version showing the subsystem as constructed subsequent to the alteration.

- 15.2** Any alteration to any treatment subsystem shall be incorporated into process flow diagrams, process and instrumentation diagrams, and record drawings and diagrams within one year of the substantial completion of the alteration.

- 15.3** Process flow diagrams and process and instrumentation diagrams for any treatment subsystem shall be kept in a place, or made available in such a manner, that they may be readily viewed by all persons responsible for all or part of the operation of the drinking water system.

## **16.0 Operations and Maintenance Manual**

- 16.1** An up-to-date operations and maintenance manual or manuals shall be maintained and applicable parts of the manual or manuals shall be made available for reference by all persons responsible for all or part of the operation or maintenance of the drinking water system.

- 16.2** The operations and maintenance manual or manuals, shall include at a minimum:
- 16.2.1 The requirements of this licence and associated procedures;
  - 16.2.2 The requirements of the drinking water works permit for the drinking water system;
  - 16.2.3 Procedures for monitoring and recording the in-process parameters necessary for the control of any treatment subsystem and for assessing the performance of the drinking water system;
  - 16.2.4 Procedures for the operation and maintenance of monitoring equipment;
  - 16.2.5 Contingency plans and procedures for the provision of adequate equipment and material to deal with emergencies, upset conditions and equipment breakdown;
  - 16.2.6 Procedures for dealing with complaints related to the drinking water system, including the recording of the nature of the complaint and any investigation and corrective action taken in respect of the complaint;
- 16.3** Procedures necessary for the operation and maintenance of any alterations to the drinking water system shall be incorporated into the operations and maintenance manual or manuals prior to those alterations coming into operation.

## Schedule C: System-Specific Conditions

System Owner	The Corporation of the Town of Markham
Licence Number	021-101
Drinking Water System Name	Markham Distribution System
Schedule C Issue Date	October 14th, 2010

### 1.0 Additional Sampling, Testing and Monitoring

#### Drinking Water Health and Non-Health Related Parameters

- 1.1** For a drinking water system or drinking water subsystem identified in column 1 of Tables 1 and 2 and in addition to any other sampling, testing and monitoring that may be required, sampling, testing and monitoring shall be undertaken for a test parameter listed in column 2 at the sampling frequency listed in column 3 and at the monitoring location listed in column 4 of the same row.

**Table 1: Drinking Water Health Related Parameters**

Column 1 Drinking Water System or Drinking Water Subsystem Name	Column 2 Test Parameter	Column 3 Sampling Frequency	Column 4 Monitoring Location
Not Applicable	Not Applicable	Not Applicable	Not Applicable

**Table 2: Drinking Water Non-Health Related Parameters**

Column 1 Drinking Water System or Drinking Water Subsystem Name	Column 2 Test Parameter	Column 3 Sampling Frequency	Column 4 Monitoring Location
Not Applicable	Not Applicable	Not Applicable	Not Applicable

### 2.0 Studies Required

Not applicable.

## Schedule D: Conditions for Relief from Regulatory Requirements

System Owner	The Corporation of the Town of Markham
Licence Number	021-101
Drinking Water System Name	Markham Distribution System
Schedule D Issue Date	October 14th, 2010

### 1.0 Lead Regulatory Relief

- 1.1 Any relief from regulatory requirements previously authorized by the Director in respect of the drinking water system under section 38 of the SDWA in relation to the sampling, testing or monitoring requirements contained in Schedule 15.1 of O. Reg. 170/03 shall remain in force until such time as Schedule 15.1 of O. Reg. 170/03 is amended after June 1, 2009.

### 2.0 Corrective Action Relief

#### 2.0 Other Regulatory Relief

- 2.1 Subject to Condition 2.2 below, the provisions of Section 17-9 of Schedule 17 of O. Reg. 170/03 do not apply to the drinking water system with respect to corrective action in the event of adverse bacteriological test results indicating the presence of *Aeromonas* spp., etc., if the drinking water system provides chloramination.
- 2.2 For the purpose of Section 18 of the SDWA, in respect of *Aeromonas* spp., *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Clostridium* spp., or fecal *streptococci* (Group D *streptococci*), and subject to the condition above, the owner of the drinking water system and the operating authority for the system shall ensure that the following corrective action is taken:
- a. Resample and test as soon as reasonably possible.
  - b. If *Aeromonas* spp., *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Clostridium* spp., or fecal *streptococci* (Group D *streptococci*) are detected under paragraph a) above, immediately flush the watermains to ensure that a combined chlorine residual of at least 0.25 milligram per litre is achieved at all points in the affected parts of the distribution system.
  - c. Continue to resample and test until *Aeromonas* spp., *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Clostridium* spp., or fecal *streptococci* (Group D *streptococci*) are not detected in any of the samples from two consecutive sets of samples taken 24 to 48 hours apart or as otherwise directed by the Medical Officer of Health.
  - d. Take such other steps as are directed by the Medical Officer of Health.

- 2.3** Subject to Condition 2.4 below, the following provisions of O. Reg, 170/03 do not apply to the drinking water system with respect to corrective action in the event of an adverse bacteriological test results indicating the presence of E. coli or total coliforms, if the drinking water system provides chloramination:
- a** Paragraph 2 of Section 17-5 Schedule 17 - E. coli  
Immediately increase the chlorine or chloramination dose and flush the watermain to ensure that a combined chlorine residual of at least 1.0 milligram per litre is achieved at all points in the affected parts of the distribution system.
  - b** Paragraph 2 of Section 17-6 Schedule 17 - total coliforms  
If total coliforms are detected under paragraph 1 of Section 17-6 Schedule 17, immediately increase the chlorine or chloramination dose and flush the watermain to ensure that a combined chlorine residual of at least 1.0 milligram per litre is achieved at all points in the affected parts of the distribution system, if the drinking water system provides chloramination.
- 2.4** For the purpose of Section 18 of the SDWA, and subject to condition above, the following corrective action in the event of an adverse bacteriological test results indicating the presence of E. coli or total coliforms from treated water samples collected in the distribution system shall apply:
- a** Immediately flush the watermain to ensure that a combined chlorine residual of at least 0.25 milligram per litre is achieved at all points in the affected parts of the distribution system.
- 2.5** For purposes of subsection 10-2 of Schedule 10 of Reg. 170/03 a drinking water system serves a population if its distribution system is directly connected to the plumbing that serves the population.



## DRINKING WATER WORKS PERMIT

**Permit Number: 021-201**

**Issue Number: 1**

Pursuant to the *Safe Drinking Water Act, 2002*, S.O. 2002, c. 32, and the regulations made thereunder and subject to the limitations thereof, this drinking water works permit is issued under Part V of the *Safe Drinking Water Act, 2002*, S.O. 2002, c. 32 to:

### **The Corporation of the Town of Markham**

**101 Town Center Blvd.  
Markham ON L3R 9W3**

For the following municipal residential drinking water system:

### **Markham Distribution System**

This drinking water works permit includes the following:

<b>Schedule</b>	<b>Description</b>
Schedule A	Drinking Water System Description
Schedule B	General
Schedule C	All documents issued as Schedule C to this drinking water works permit which authorize alterations to the drinking water system

DATED at TORONTO this 14th day of August, 2009

Signature

A handwritten signature in black ink that reads "Aziz Ahmed". The signature is written in a cursive style and is underlined with a single horizontal stroke.

Aziz Ahmed, P.Eng.  
Director  
Part V, *Safe Drinking Water Act, 2002*

## Schedule A: Drinking Water System Description

System Owner	The Corporation of the Town of Markham
Permit Number	021-201
Drinking Water System Name	Markham Distribution System
Schedule A Issue Date	August 14th, 2009

### 1.0 System Description

- 1.1 The following is a summary description of the works comprising the above drinking water system:

#### Overview

The **Markham Distribution System** consists of three primary pressure districts and approximately 955 kilometers of watermains and transmission mains.

Raw water from Lake Ontario is treated by the City of Toronto and the Regional Municipality of Peel. Potable water from these systems is transmitted to the Regional Municipality of York which sells it wholesale to local municipalities including the Town of Markham.

## Markham Distribution System

### Watermains

- 1.2 Watermains within the distribution system comprise:
- 1.2.1 Watermains that have been set out in each document or file identified in column 1 of Table 1.

Table 1: Watermains	
Column 1 Document or File Name	Column 2 Date
Markham WDS map for DWQMS-24X36.pdf	1/22/2009

- 1.2.2 Watermains that have been added, modified, replaced or extended further to the provisions of Schedule C of this drinking water works permit on or after the date identified in column 2 of Table 1 for each document or file identified in column 1.
- 1.2.3 Watermains that have been added, modified, replaced or extended further to an authorization by the Director on or after the date identified in column 2 of Table 1 for each document or file identified in column 1.



## **Schedule B: General**

System Owner	<b>The Corporation of the Town of Markham</b>
Permit Number	<b>021-201</b>
Drinking Water System Name	<b>Markham Distribution System</b>
Schedule B Issue Date	<b>August 14th, 2009</b>

### **1.0 Applicability**

- 1.1** In addition to any other requirements, the drinking water system identified above shall be altered and operated in accordance with the conditions of this drinking water works permit and the licence.
- 1.2** The definitions and conditions of the licence shall also apply to this drinking water works permit.

### **2.0 Alterations to the Drinking Water System**

- 2.1** Any document issued by the Director as a Schedule C to this drinking water works permit shall provide authority to alter the drinking water system in accordance, where applicable, with the conditions of this drinking water works permit and the licence.
- 2.2** All Schedule C documents issued by the Director for the drinking water system shall form part of this drinking water works permit.
- 2.3** All parts of the drinking water system in contact with drinking water which are:
  - 2.3.1** Added, modified, replaced, extended; or
  - 2.3.2** Taken out of service for inspection, repair or other activities that may lead to contamination,shall be disinfected before being put into service in accordance with the provisions of the AWWA C651 – Standard for Disinfecting Water Mains; AWWA C652 – Standard for Disinfection of Water-Storage Facilities; AWWA C653 – Standard for Disinfection of Water Treatment Plants; or an equivalent procedure.
- 2.4** The owner shall notify the Director within thirty (30) days of the placing into service or the completion of any addition, modification, replacement or extension of the drinking water system which had been authorized through:
  - 2.4.1** Schedule B to this drinking water works permit which would require an alteration of the description of a drinking water system component described in Schedule A of this drinking water works permit;
  - 2.4.2** Any Schedule C to this drinking water works permit respecting works other than watermains; or
  - 2.4.3** Any approval issued prior to the issue date of the first drinking water works permit respecting works other than watermains which were not in service at the time of the issuance of the first drinking water works permit.

- 2.5** For greater certainty, the notification requirements set out in condition 2.4 do not apply to any addition, modification, replacement or extension in respect of the drinking water system which:
- 2.5.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03;
  - 2.5.2 Constitutes maintenance or repair of the drinking water system; or
  - 2.5.3 Is a watermain authorized by condition 3.1 of Schedule B of this drinking water works permit.
- 2.6** The owner shall notify the legal owner of any part of the drinking water system that is prescribed as a municipal drinking water system by section 2 of O. Reg. 172/03 of the requirements of the licence and this drinking water works permit as applicable to the prescribed system.
- 2.7** For greater certainty, any alteration to the drinking water system made in accordance with this drinking water works permit may only be carried out after other legal obligations have been complied with including those arising from the *Environmental Assessment Act*, *Niagara Escarpment Planning and Development Act*, *Oak Ridges Moraine Conservation Act*, 2001 and *Greenbelt Act*, 2005.

### **3.0 Watermain Additions, Modifications, Replacements and Extensions**

- 3.1** The drinking water system may be altered by adding, modifying, replacing or extending a watermain within the distribution system subject to the following conditions:
- 3.1.1 The design of the watermain addition, modification, replacement or extension:
    - a) Has been prepared by a Professional Engineer;
    - b) Has been designed only to transmit water and has not been designed to treat water;
    - c) Satisfies the design criteria set out in the Ministry of the Environment publication "Watermain Design Criteria for Future Alterations Authorized under a Drinking Water Works Permit – March 2009", as amended from time to time; and
    - d) Is consistent with or otherwise addresses, the design objectives contained within the Ministry of the Environment publication "Design Guidelines for Drinking Water Systems, 2008", as amended from time to time.
  - 3.1.2 The maximum demand for water exerted by consumers who are serviced by the addition, modification, replacement or extension of the watermain will not result in an exceedance of the rated capacity of a treatment subsystem or the maximum flow rate for a treatment subsystem component as specified in the licence, or the creation of adverse conditions within the drinking water system.
  - 3.1.3 The watermain addition, modification, replacement or extension will not adversely affect the distribution system's ability to maintain a minimum pressure of 140 kPa at ground level at all points in the distribution system under maximum day demand plus fire flow conditions.

- 3.1.4 Secondary disinfection will be provided to water within the added, modified, replaced or extended watermain to meet the requirements of O. Reg. 170/03.
- 3.1.5 The watermain addition, modification, replacement or extension is wholly located within the municipal boundary over which the owner has jurisdiction.
- 3.1.6 The owner of the drinking water system consents to the watermain addition, modification, replacement or extension.
- 3.1.7 A Professional Engineer has verified in writing that the watermain addition, modification, replacement or extension meets the requirements of condition 3.1.1.
- 3.1.8 The owner of the drinking water system has verified in writing that the watermain addition, modification, replacement or extension meets the requirements of conditions 3.1.2 to 3.1.6.
- 3.2** The authorization for the addition, modification, replacement or extension of a watermain provided for in condition 3.1 does not include the addition, modification, replacement or extension of a watermain that:
  - 3.2.1 Passes under or through a body of surface water, unless trenchless construction methods are used;
  - 3.2.2 Has a nominal diameter greater than 750 mm;
  - 3.2.3 Connects to another drinking water system; or
  - 3.2.4 Results in the fragmentation of the drinking water system.
- 3.3** The verifications required in conditions 3.1.7 and 3.1.8 shall be:
  - 3.3.1 Recorded on "Form 1 – Record of Watermains Authorized as a Future Alteration" as published by the Ministry of the Environment; and
  - 3.3.2 Retained for a period of ten (10) years by the owner.
- 3.4** For greater certainty, the verification requirements set out in condition 3.3 do not apply to any addition, modification, replacement or extension in respect of the drinking water system which:
  - 3.4.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03; or
  - 3.4.2 Constitutes maintenance or repair of the drinking water system.
- 3.5** The document or file referenced in Column 1 of Table 1 of Schedule A of this drinking water works permit that sets out watermains shall be retained by the owner and shall be updated to include watermain additions, modifications, replacements and extensions within 12 months of the addition, modification, replacement or extension.
- 3.6** The updates required by condition 3.5 shall include watermain location relative to named streets or easements and watermain diameter.

**4.0 Minor Modifications to the Drinking Water System**

- 4.1** The drinking water system may be altered by modifying or replacing the following components:
- 4.1.1 Treatment process or treated water pumps;
  - 4.1.2 Chemical metering or chemical handling pumps;
  - 4.1.3 Valves;
  - 4.1.4 Instrumentation and controls;
  - 4.1.5 Cathodic corrosion protection; or
  - 4.1.6 Spill containment works.
- 4.2** The drinking water system may be altered by replacing the following:
- 4.2.1 Treatment process or treated water piping within the treatment subsystem.
- 4.3** The modification or replacement of a drinking water system component set out in condition 4.1 or the replacement of a drinking water system component set out in condition 4.2 must not result in:
- 4.3.1 An exceedance of a treatment subsystem rated capacity or a treatment subsystem component maximum flow rate as specified in the licence;
  - 4.3.2 The bypassing of any unit process within a treatment subsystem;
  - 4.3.3 A deterioration in the quality of drinking water provided to consumers;
  - 4.3.4 A reduction in the reliability or redundancy of any component of the drinking water system;
  - 4.3.5 An negative impact on the ability to undertake compliance and other monitoring; or
  - 4.3.6 An adverse effect on the environment.
- 4.4** The owner shall verify in writing that the modification or replacement of drinking water system components in accordance with conditions 4.1 and 4.2 has met the requirements of the conditions listed in condition 4.3.
- 4.5** The verifications required in condition 4.4 shall be:
- 4.5.1 Recorded on "Form 2 – Record of Minor Modifications or Replacements to the Drinking Water System" as published by the Ministry of the Environment; and
  - 4.5.2 Retained for a period of ten (10) years by the owner.
- 4.6** For greater certainty, the verification requirements set out in conditions 4.4 and 4.5 do not apply to any modification or replacement in respect of the drinking water system which:

4.6.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03; or

4.6.2 Constitutes maintenance or repair of the drinking water system.

**4.7** The owner shall update any drawings maintained for the drinking water system to reflect the modification or replacement of the works, where applicable.

## **5.0 Equipment with Emissions to the Air**

**5.1** The drinking water system may be altered by adding, modifying or replacing any of the following drinking water system components that may discharge or alter the rate or manner of a discharge of a compound of concern to the atmosphere:

5.1.1 Any equipment, apparatus, mechanism or thing that is used for the transfer of outdoor air into a building or structure that is not a cooling tower;

5.1.2 Any equipment, apparatus, mechanism or thing that is used for the transfer of indoor air out of a space used for the production, processing, repair, maintenance or storage of goods or materials, including chemical storage;

5.1.3 Laboratory fume hoods used for drinking water testing, quality control and quality assurance purposes;

5.1.4 Low temperature handling of compounds with a vapor pressure of less than 1 kilopascal;

5.1.5 Maintenance welding stations;

5.1.6 Minor painting operations used for maintenance purposes;

5.1.7 Parts washers for maintenance shops;

5.1.8 Emergency chlorine and ammonia gas scrubbers;

5.1.9 Venting for activated carbon units for drinking water taste and odour control;

5.1.10 Venting for a stripping unit for methane removal from a groundwater supply;

5.1.11 Natural gas or propane fired boilers, water heaters, space heaters and make-up air units with a total facility-wide heat input rating of less than 20 million kilojoules per hour, and with an individual fuel energy input of less than or equal to 10.5 gigajoules per hour; and

5.1.12 Emergency generators that fire No. 2 fuel oil (diesel fuel) with a sulphur content of 0.5 per cent or less measured by weight, natural gas, propane, gasoline or biofuel, and that are used for emergency duty only with periodic testing.

**5.2** The owner shall not add, modify or replace a drinking water system component set out in condition 5.1 for an activity that is not directly related to the treatment and distribution of drinking water.

- 5.3 The emergency generators identified in condition 5.1.12 shall not be used for non-emergency purposes including the generation of electricity for sale or for peak shaving purposes.
- 5.4 The owner shall prepare an emission summary table for nitrogen oxide emissions only, for each addition, modification or replacement of emergency generators identified in condition 5.1.12.

#### Performance Limits

- 5.5 The owner shall ensure that a drinking water system component identified in conditions 5.1.1 to 5.1.12 is operated at all times to comply with the following limits:
  - 5.5.1 For equipment other than emergency generators, the maximum concentration of any compound of concern at a point of impingement shall not exceed the corresponding point of impingement limit;
  - 5.5.2 For emergency generators, the maximum concentration of nitrogen oxides at sensitive populations shall not exceed the applicable point of impingement limit, and at non-sensitive populations shall not exceed the Ministry of the Environment half-hourly screening level of 1880 ug/m<sup>3</sup> as amended;
  - 5.5.3 The noise emissions comply at all times with the limits set out in publication NPC-205 and/or publication NPC-232, as applicable; and
  - 5.5.4 The vibration emissions comply at all times with the limits set out in publication NPC-207.
- 5.6 The owner shall verify in writing that any addition, modification or replacement of works in accordance with condition 5.1 has met the requirements of the conditions listed in condition 5.5.
- 5.7 The owner shall document how compliance with the performance limits outlined in 5.5.3 and 5.5.4 is being achieved, through noise abatement equipment and/or operational procedures.
- 5.8 The verifications required in condition 5.6 shall be:
  - 5.8.1 Recorded on "Form 3 – Record of Addition, Modification or Replacement of Equipment Discharging a Contaminant of Concern to the Atmosphere" as published by the Ministry of the Environment.
  - 5.8.2 Retained for a period of ten (10) years by the owner.
- 5.9 For greater certainty, the verification requirements set out in conditions 5.6 and 5.8 do not apply to any addition, modification or replacement in respect of the drinking water system which:
  - 5.9.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03; or
  - 5.9.2 Constitutes maintenance or repair of the drinking water system.

- 5.10** The owner shall update any drawings maintained for the works to reflect the addition, modification or replacement of the works, where applicable.

## **6.0 Previously Approved Works**

- 6.1** The owner may add, modify, replace or extend, and operate part of a municipal drinking water system if:
- 6.1.1** An approval was issued after January 1, 2004 under section 36 of the SDWA in respect of the addition, modification replacement or extension and operation of that part of the municipal drinking water system;
  - 6.1.2** The approval expired by virtue of subsection 36(4) of the SDWA; and
  - 6.1.3** The addition, modification, replacement or extension commenced within five years of the date that activity was approved by the expired approval.

**Form 1 – Record of Watermains Authorized as a Future Alteration**
**Part 1 – Drinking Water Works Permit Number:** \_\_\_\_\_

*(Insert the Drinking Water Works Permit number authorizing the addition, modification, replacement or extension of watermains)*
**Part 2 – Description of watermain addition, modification, replacement or extension (Use attachments if required)**

The description shall include:

- 1) A brief description above of the undertaking (e.g. street name(s); subdivision name; project name); and
- 2) An attachment including a plan view drawing identifying at a minimum:
  - a) location(s) of the undertaking (e.g. showing street names, easements, etc.); and
  - b) nominal diameter of the watermain(s) associated with the addition, modification, replacement or extension.

**Part 3 – Verification by Professional Engineer**

I hereby verify that I am a Professional Engineer who is licensed to practice in the Province of Ontario and the design of the watermain addition, modification, replacement or extension:

- 1) Has been prepared by a Professional Engineer who is licensed to practice in the Province of Ontario;
- 2) Has been designed only to transmit water and has not been designed to treat water;
- 3) Satisfies the design criteria set out in the Ministry of the Environment publication "Watermain Design Criteria for Future Alterations Authorized under a Drinking Water Works Permit – March 2009", as amended from time to time; and
- 4) Is consistent with or otherwise addresses, the design objectives contained within the Ministry of the Environment publication "Design Guidelines for Drinking Water Systems, 2008", as amended from time to time.

Name: (Print) \_\_\_\_\_ Signature: \_\_\_\_\_

PEO Licence Number: \_\_\_\_\_ Date: \_\_\_\_\_

**Part 4 – Verification by Owner**

I hereby verify that:

- 1) The maximum demand for water exerted by consumers who are serviced by the addition, modification, replacement or extension of the watermain will not result in an exceedance of the rated capacity of a treatment subsystem or the maximum flow rate for a treatment subsystem component as specified in the licence, or the creation of adverse conditions within the drinking water system;
- 2) The watermain addition, modification, replacement or extension will not adversely affect the distribution system's ability to maintain a minimum pressure of 140 kPa at ground level at all points in the distribution system under maximum day demand plus fire flow conditions.
- 3) Secondary disinfection will be provided to water within the added, modified, replaced or extended watermain to meet the requirements of O. Reg. 170/03;
- 4) The watermain addition, modification, replacement or extension is wholly located within the municipal boundary over which the owner has jurisdiction;
- 5) The owner consents to the watermain addition, modification, replacement or extension; and
- 6) I am authorized by the owner to complete this verification.

Name of Owner: (Print) \_\_\_\_\_

Name: (Print) \_\_\_\_\_ Signature: \_\_\_\_\_  
Owner Representative

Date: \_\_\_\_\_



**Form 2 – Record of Minor Modifications or Replacements to the Drinking Water System****Part 1 – Drinking Water Works Permit Number:** \_\_\_\_\_*(Insert the Drinking Water Works Permit number authorizing minor modifications or replacements to the Drinking Water System)***Part 2 – Description of Minor Modifications or Replacements (Use attachments if required)**

The description shall include:

- 1) An identification of the system component being modified or replaced;
- 2) The location of the works being modified or replaced; and
- 3) A brief description of the modification or replacement.

**Part 3 – Verification by Owner**

I hereby verify that:

- 1) The minor modifications or replacements described in Part 2 of this form meets the requirements of the conditions of the Drinking Water Works Permit identified in Part 1 of this form which authorizes the minor modifications or replacements; and
- 2) I am authorized by the owner to complete this verification.

Name of Owner: (Print) \_\_\_\_\_

Name: (Print) \_\_\_\_\_  
Owner Representative

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**Form 3 – Record of Addition, Modification or Replacement of Equipment  
Discharging a Contaminant of Concern to the Atmosphere**

**Part 1 – Drinking Water Works Permit Number:** \_\_\_\_\_

*(Insert the Drinking Water Works Permit number authorizing the addition, modification or replacement of equipment discharging a contaminant of concern to the atmosphere)*

**Part 2 – Description of Equipment Added, Modified or Replaced (Use attachments if required)**

*The description shall include:*

- 1) A brief description of the undertaking; and
- 2) An attachment including a plan view drawing identifying at a minimum the location of the undertaking and the location of the stack or vent discharging to the atmosphere

**Part 3 – Verification by Owner**

I hereby verify that:

- 1) The addition, modification or replacement of equipment discharging a contaminant of concern to the atmosphere described in Part 2 of this form meets the requirements of the conditions of the Drinking Water Works Permit identified in Part 1 which authorizes the addition, modification or replacement;
- 2) Where required, an Emission Summary Table was prepared by a Professional Engineer who is licensed to practice in the Province of Ontario; and
- 3) I am authorized by the owner to complete this verification.

Name of Owner: (Print) \_\_\_\_\_

Name: (Print) \_\_\_\_\_ Signature: \_\_\_\_\_  
Owner Representative

Date: \_\_\_\_\_



**Ministry of the Environment  
Drinking Water Inspection Report**

**APPENDIX C**

**MOE AUDIT SAMPLE RESULTS**

Print Date: Aug. 23, 2011 04:35 PM By REPORTADMIN

\*\*\*\* REPRINTED \*\*\*\*

Login: C187300

Program Code 130071401      Program: MOE OPERATIONS DIVISION  
Study: WATER, COMMUNAL  
Project: CENTRAL REG. - YORK-DURHAM DIS  
Activity: WTP MUNIC INSPECT/ADVERS NOTIF  
Organization: District Manager York-Durham

Org. Id: 4514

Mail this copy to :  
  
WILD, LORALYN  
MOE - YORK-DURHAM DISTRICT OFFICE  
230 WESTNEY ROAD SOUTH, 5TH FLOOR  
AJAX,ONT  
L1S 7J5

Final reports to : RAPHAEL, PAULINE  
WILD, LORALYN  
SAFEDRINKINGWATERBRANCH.CALENDAR.MOE  
PIROSKO, RUDY

Approved for release by : RUSTY MOODY      Manager, Spectroscopy Section

Approved date : Aug. 23, 2011

Inquires to : RUSTY MOODY  
PETER DROUIN

Telephone : 416-235-5863

Telephone : 416-235-5850

LOGIN DESCRIPTION: 220004162 MARKHAM DISTRIBUTION SYSTEM LORALYN WILD 905-427-5638

The results relate only to items tested.

To provide customer service feedback on this report and/or other services provided by LaSB, please contact the LaSB HelpDesk at 416-235-6030 or the Customer Service Manager at 416-235-5831

This report contains confidential information intended only for the person(s) to whom it is addressed. Any unauthorized disclosure, copying, other distribution of this report, or taking any action on its content is strictly prohibited. If you have received this report in error, please contact the LaSB HelpDesk at 416-235-6030 or the Customer Service Manager at 416-235-5831

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Login: C187300

Field Id Station ID  
LWMDS- 2200041628001  
1 Sample ID  
C187300-0001  
MOE\*LIMS Products Requested:  
WD E3226A PA3226

Sample Location Description  
141 JOHN BUTTON BLVD. DISTRIBUTION  
Sample Comment Description  
Sampling Date 04 AUG 2011 Time 10:11 Zone 5  
Sampler Information

Field Id Station ID  
LWMDS- 2200041628001  
2 Sample ID  
C187300-0002  
MOE\*LIMS Products Requested:  
WD E3226A PA3226

Sample Location Description  
100 LEE AVE. DISTRIBUTION  
Sample Comment Description  
Sampling Date 04 AUG 2011 Time 10:29 Zone 5  
Sampler Information

Field Id Station ID  
LWMDS- 2200041628001  
3 Sample ID  
C187300-0003  
MOE\*LIMS Products Requested:  
WD E3226A PA3226

Sample Location Description  
45 SIR TRISTFAN PL. DISTRIBUTION  
Sample Comment Description  
Sampling Date 04 AUG 2011 Time 10:54 Zone 5  
Sampler Information

Field Id Station ID  
LWMDS- 2200041628001  
7 Sample ID  
C187300-0004  
MOE\*LIMS Products Requested:  
WD E3144B VOL3144

Sample Location Description  
25 LANARK RD. SAMPLE STATION  
DISTRIBUTION  
Sample Comment Description  
Sampling Date 04 AUG 2011 Time 10:00 Zone 5  
Sampler Information  
WD E3226A PA3226  
WD E3473 PB3473

Login: C187300

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Field ID:  
Sample ID:  
MOE/LIMS ID:  
Station ID:  
Collect Date:  
Sample Location Description:

LWMDS-1  
C187300-0001  
2011WD31-00164  
2200041628001  
04 AUG 2011  
141 JOHN BUTTON BLVD. DISTRIBUTION

LWMDS-2  
C187300-0002  
2011WD31-00165  
2200041628001  
04 AUG 2011  
100 LEE AVE. DISTRIBUTION

LWMDS-3  
C187300-0003  
2011WD31-00166  
2200041628001  
04 AUG 2011  
45 SIR TRISTFAN PL. DISTRIBUTION

Sample Comments Description:

Listid	Parmname	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1	Value	Units	Qual	Rmk1
--------	----------	-------	-------	------	------	-------	-------	------	------	-------	-------	------	------

3226L1 NT: Total Collforms

See Non-Target Textual result

See Non-Target Textual result

See Non-Target Textual result

Login: C187300

Field ID: LWMD5-7  
Sample ID: C187300-0004  
MOE LIMS ID: 2011WDD31-00167  
Station ID: 2200041628001  
Collect Date: 04 AUG 2011  
Sample Location Description: 25 LANARK RD. SAMPLE STATION

DISTRIBUTION

Sample Comments Description:

Listid	Parmname	Value	Units	Qual	Rmk1
3144L1	Chloroethene	.05	ug/L	<=W	
	1,1-dichloroethene	.05	ug/L	<=W	
	Dichloromethane	.2	ug/L	<=W	
	Tert-butyl methyl ether	.05	ug/L	<=W	
	trans-1,2-dichloroethene	.05	ug/L	<=W	
	Diisopropylether	.05	ug/L	<=W	
	1,1-dichloroethane	.05	ug/L	<=W	
	cis-1,2-dichloroethene	.05	ug/L	<=W	
	Chloroform	5.3	ug/L	<=W	
	1,1,1-trichloroethane	.05	ug/L	<=W	
	Carbon tetrachloride	.2	ug/L	<=W	
	1,2-dichloroethane	.05	ug/L	<=W	
	Benzene	.05	ug/L	<=W	
	Trichloroethene	.05	ug/L	<=W	
	1,2-dichloropropane	.05	ug/L	<=W	
	Bromodichloromethane	4.8	ug/L	<=W	
	Dichloroacetonitrile	.5	ug/L	<=W	
	Toluene	.05	ug/L	<=W	
	1,1,2-trichloroethane	.1	ug/L	<=W	
	Tetrachloroethene	.05	ug/L	<=W	
	Dibromochloromethane	2.8	ug/L	<=W	
	1,2-dibromoethane	.1	ug/L	<=W	
	Chlorobenzene	.05	ug/L	<=W	
	Ethylbenzene	.05	ug/L	<=W	
	m- and p-xylene	0.10	ug/L	<T	
	o-xylene	.05	ug/L	<=W	
	Styrene	.05	ug/L	<=W	
	Bromoform	.5	ug/L	<=W	
	1,1,2,2-tetrachloroethane	.2	ug/L	<=W	
	1,3-dichlorobenzene	.05	ug/L	<=W	
	1,4-dichlorobenzene	.05	ug/L	<=W	
	1,2-dichlorobenzene	.05	ug/L	<=W	
	Trihalomethanes; total	13.0	ug/L	<=W	
3226L1	NT: Total Coliforms	See Non-Target Textual result			
3473L3	Lead	.7	ug/L	+/-0.16	

Login: **C187300**

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**CODE DESCRIPTION**

NDAT NO DATA: ABSENT NT: TOTAL COLIFORMS  
NDDN NO DATA: NOT DETECTED NT: DETERIORATION INDICATORS  
<T A MEASURABLE TRACE AMOUNT; INTERPRET WITH CAUTION  
<=W NO MEASURABLE RESPONSE (ZERO); <REPORTED VALUE  
BG BACTERIAL GROWTH DETECTED AT 48 HR. NO ACID/GAS  
NDAE NO DATA: ABSENT NT: ESCHERICHIA COLI

**NON-TARGET TEXTUAL RESULT**

Sample ID: C187300-0001	Listid : 3226L1	Parmname : NT: Total Coliforms	Value:	Units: c/100mL	Qual: NDAT	Remarks:
Absent						
Sample ID: C187300-0001	Listid : 3226L1	Parmname : NT: Escherichia coli	Value:	Units: c/100mL	Qual: NDAE	Remarks:
Absent						
Sample ID: C187300-0001	Listid : 3226L1	Parmname : NT: Deterioration Indicators	Value:	Units: c/100mL	Qual: NDDN	Remarks:
Not Detected						
Sample ID: C187300-0002	Listid : 3226L1	Parmname : NT: Total Coliforms	Value:	Units: c/100mL	Qual: NDAT	Remarks:
Absent						
Sample ID: C187300-0002	Listid : 3226L1	Parmname : NT: Escherichia coli	Value:	Units: c/100mL	Qual: NDAE	Remarks:
Absent						
Sample ID: C187300-0002	Listid : 3226L1	Parmname : NT: Deterioration Indicators	Value:	Units: c/100mL	Qual: NDDN	Remarks:
Not Detected						
Sample ID: C187300-0003	Listid : 3226L1	Parmname : NT: Total Coliforms	Value:	Units: c/100mL	Qual: NDAT	Remarks:
Absent						
Sample ID: C187300-0003	Listid : 3226L1	Parmname : NT: Escherichia coli	Value:	Units: c/100mL	Qual: NDAE	Remarks:
Absent						
Sample ID: C187300-0003	Listid : 3226L1	Parmname : NT: Deterioration Indicators	Value:	Units: c/100mL	Qual: NDDN	Remarks: BG
Not Detected						



Login: C187300

Print Date: Aug. 23, 2011 04:35 PM By REPORTADMIN

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# NON-TARGET TEXTUAL RESULT

Sample ID: C187300-0004	Listid : 3226L1	Parmname : NT: Total Coliforms	Value:	Units: c/100mL	Qual: NDAT	Remarks:
Absent						
Sample ID: C187300-0004	Listid : 3226L1	Parmname : NT: Escherichia coli	Value:	Units: c/100mL	Qual: NDAE	Remarks:
Absent						
Sample ID: C187300-0004	Listid : 3226L1	Parmname : NT: Deterioration Indicators	Value:	Units: c/100mL	Qual: NDDN	Remarks:
Not Detected						

## TEXT COMMENT

## Product Completion

Sample ID	Matrix	Method	Product	Analytical Department	Completion Date
C187300-0001	WD	E3226A	PA3226	6510	08-AUG-11
C187300-0002	WD	E3226A	PA3226	6510	08-AUG-11
C187300-0003	WD	E3226A	PA3226	6510	08-AUG-11
C187300-0004	WD	E3144B	VOL3144	4410	23-AUG-11
C187300-0004	WD	E3226A	PA3226	6510	08-AUG-11
C187300-0004	WD	E3473	PB3473	6410	09-AUG-11

\*\*\* End of Report \*\*\*



**Ministry of the Environment  
Drinking Water Inspection Report**

**APPENDIX D  
INSPECTION RATING REPORT**

**Ministry of the Environment - Inspection Summary Rating Record (Reporting Year - 2011-2012)**

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

**Regulation:** O.REG 170/03  
**Category:** Large Municipal Residential System  
**Type Of Inspection:** Adhoc  
**Inspection Date:** July 13, 2011  
**Ministry Office:** York-Durham District

**Maximum Question Rating:** 289

<b>Inspection Module</b>	<b>Non-Compliance Rating</b>
Treatment Processes	0 / 35
Distribution System	0 / 21
Operations Manuals	0 / 28
Logbooks	0 / 18
Certification and Training	0 / 28
Water Quality Monitoring	0 / 102
Reporting & Corrective Actions	0 / 57
<b>TOTAL</b>	<b>0 / 289</b>

**Inspection Risk Rating** 0.00%

**FINAL INSPECTION RATING:** 100.00%

**Ministry of the Environment - Detailed Inspection Rating Record (Reporting Year - 2011-2012)**

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

**Regulation:** O.REG 170/03  
**Category:** Large Municipal Residential System  
**Type Of Inspection:** Adhoc  
**Inspection Date:** July 13, 2011  
**Ministry Office:** York-Durham District

**Maximum Question Rating:** 289

<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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