

**SUMMARY REPORT**

Vaughan Water Distribution System

And

Kleinburg Water Distribution System

Reporting Period: January 1 to December 31, 2010

Schedule 22 of Ontario Regulation 170/03  
(Safe Drinking Water Act 2002)

March 2011

\* Revised April 19, 2011 to reflect updated Water Withdrawal Information

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## **Introduction**

The completion of this report serves several purposes. Firstly, it is intended to provide the Mayor and Members of Council with an understanding of the status, capabilities and capacities of the City of Vaughan's drinking water systems for the reporting period of January 1 to December 31, 2010.

Secondly, the Safe Drinking Water Act (2002) mandates that it is the City's responsibility to:

- Recognize that the people of Ontario are entitled to expect their drinking water to be safe; and,
- Provide for the protection of human health and the prevention of drinking water health hazards through the control and regulation of drinking water systems and drinking water testing.

Finally, this report has also been created to satisfy the requirements of Schedule 22 of the Ministry of the Environment (MOE), Regulation 170/03 (Summary Reports for municipalities).

Similarly, an Annual Report has been prepared for each system to fulfill Section 11 of Ontario Regulation 170/03. The Annual Report has been created to identify specific details regarding the overall quality of the City's drinking water systems and was made available on the City of Vaughan's website as of February 08, 2011.

## **System Background**

The City of Vaughan, Public Works, Water Division is responsible for the distribution of drinking water throughout the City of Vaughan (serving Vaughan and Kleinburg). Water is supplied to residential, industrial, commercial and institutional locations throughout the City at the highest quality possible.

The City purchases its drinking water from York Region prior to distribution. Specifically, water for the Vaughan Distribution System is purchased from York Region, sourced from the City of Toronto, and partially sourced from the Region of Peel. This water is from a surface water source, treated, and identified as a chloraminated water system. Water for the Kleinburg Distribution System is treated groundwater supplied from York Region wells, and operates as a chlorinated system.

Both the Vaughan Water Distribution System and the Kleinburg Water Distribution System are identified by their own drinking water system numbers through the Ministry of the Environment which are 260003097 and 260006607 respectively. Both systems have also been classified through the Ministry of the Environment as: Vaughan Water Distribution Subsystem Class II, and Kleinburg Water Distribution Subsystem Class I.

## **Executive Summary**

As already indicated, this report has been created to fulfill the requirements under Schedule 22 of Ontario Regulation 170/03 (summary reports for municipalities).

Specifically, this report is providing insight in the form of a summary on details of the individual systems within the City of Vaughan. Provided within this report are:

- an introduction,
- system background,
- executive summary,
- legislative requirements,
- new legislative requirements, and
- water withdrawal summaries under the Safe Drinking Water Act and its associated regulations.

From January 1 to December 31, 2010, there have been no provincial orders on either system, issued by the Ministry of the Environment under the Safe Drinking Water Act, 2002 (SDWA).

Comprehensive flow data for the indicated reporting period for each drinking water system is contained at the end of this report.

## **Legislative Requirements**

The City of Vaughan is bound by a number of different legislative requirements. The main components of the legislation which we operate under are:

The Safe Drinking Water Act, 2002 (SDWA),

- (a) Ontario Regulation 170/03 of the SDWA (Drinking Water Systems),
- (b) Ontario Regulation 128/04 of the SDWA (Certification of Drinking Water System Operators and Water Quality Analysts),
- (c) Ontario Regulation 169/03 of the SDWA (Ontario Drinking Water Quality Standards);
- (d) Ontario Regulation 188/07 of the SDWA (Licensing of Municipal Drinking Water Systems)

### **The Safe Drinking Water Act, 2002**

The Part Two Report of the Walkerton Inquiry, as indicated on the Ministry of the Environment's website<sup>1</sup>, has recommendations made by Commissioner Dennis O'Connor. He recommended that the Ontario government enact a Safe Drinking Water Act to deal with matters related to treatment and distribution of drinking water. As articulated by Commissioner O'Connor, the purpose of the Safe Drinking Water Act is to gather in one place, all legislation and regulations relating to the treatment and distribution of drinking water.

As recommended by Commissioner O'Connor, the provincial government passed a Safe Drinking Water Act, which expanded on the existing policies and practices and introduced new features to protect drinking water in Ontario. The Act's purpose is to protect human health through the control and regulation of drinking water systems and drinking water testing. The Act also provides legislative authority to implement 50 of the 93 recommendations made in Commissioner O'Connor's Part Two Report.

#### **(a) Ontario Regulation 170/03 (Drinking Water Systems)**

The Drinking Water Systems Regulation (O.Reg 170/03) establishes eight categories of drinking water systems, four of which are municipal, and the other four being non-municipal. Both of the City of Vaughan's water systems are categorized as Large Municipal Residential Systems, as they are municipal drinking water systems that serve major residential developments and serve more than 100 private residences<sup>2</sup>.

The Regulation contains schedules that address a number of requirements, such as:

- General obligations, treatment equipment and minimum levels of treatment
- Operational checks, sampling and testing
- Monitoring for, reporting of and corrective actions for the adverse test results and other problems
- Chemical and microbiological sampling and testing
- Engineering evaluation reports
- Summary reports
- Organic and inorganic parameters
- Warning notices for potential problems

Specific requirements of this Regulation directly related to on-going activities within both the City of Vaughan's drinking water systems include: Operational Checks (Municipal, Residential, Schedule 7), Microbiological Sampling and Testing (Large Municipal, Residential, Schedule 10), Chemical Sampling and Testing (Municipal, Large Residential, Schedule 13), Lead (Schedule

15.1), Reporting Adverse Test Results and other problems (Schedule 16), and Summary Reports for municipalities (Municipal, Residential, Schedule 22).

**(i) Schedule 7**

Schedule 7, Operational Checks for municipal, large residential systems identifies responsibility for chlorine, turbidity, and fluoride testing, as well as defines testing that can be done by a certified operator. The Vaughan and Kleinburg Water Distribution Systems are considered large municipal residential systems that provide secondary disinfection.

As part of this regulation, the City ensures that distribution samples are taken throughout the week and tested for free chlorine residual on the chlorinated system (the Kleinburg Water Distribution System), and tested for combined chlorine residual on the chloraminated system (the Vaughan Water Distribution System). For the 2010 calendar year, 509 free chlorine residuals were taken from the Kleinburg system, and 2,162 total chlorine residuals were taken from the Vaughan system.

The other two parameters identified under this schedule, do not apply to the City of Vaughan. Section 5 (1) of the Regulation specifies an exemption that the City falls within. Since we obtain all of our water from a large municipal drinking water system who provides primary disinfection, turbidity and fluoride operational checks are not activities in which the City has to participate.

**(ii) Schedule 10**

Microbiological sampling and testing for large municipal residential systems is mandated under schedule 10. The number of samples the City is required to take is based on population.

According to the population residing within the Vaughan system for 2010, a minimum of 129 samples had to be completed per month, resulting in an annual total of 1,548 microbiological samples. As samples are also taken when concerns about water quality are received, the City exceeded the minimum requirement and performed a total of 1,578 microbiological samples. The population of the Kleinburg system for 2010 required a minimum of 14 samples to be completed per month, resulting in an annual total of 168 for the year. As is the case with the Vaughan system, samples are also taken when concerns about water quality are raised. As a result, the City exceeded the requirement and performed 236 microbiological samples.

**(iii) Schedule 13**

Schedule 13, chemical sampling and testing applies to large residential systems. It involves the sampling of inorganics, organics, trihalomethanes, nitrate and nitrites, sodium, and fluoride.

As is the case with Schedule 7 above, Section 5 (1) of the regulation specifies an exemption that the City falls within. Since we obtain all of our water from a large municipal drinking water system who provides primary disinfection, inorganics, organics, nitrate and nitrites, sodium and fluoride are not sampling activities in which the City has to participate.

Trihalomethanes are not exempt, and do have to be conducted on a quarterly basis to satisfy the regulatory requirement, as part of Schedule 13-5 on both systems.

**(iv) Schedule 15.1**

This Schedule applies to sampling for lead in large, residential systems and incorporates a number of requirements. Under the legislation, samples have to be taken during the periods of December 15 to April 15, and June 15 to October 15.

During these periods, the Vaughan system is mandated to collect 100 samples from points in plumbing that serve private residences, 10 samples from points in plumbing that do not serve private residences and 20 samples from sampling points in the distribution system. The Kleinburg system is significantly smaller, and only 40 samples from plumbing that serve private residences, 4 samples from plumbing that does not serve private residences, and 8 samples from the distribution system needed to be collected.

As a result of data collected during the sampling periods in 2008 and 2009, both the Vaughan Distribution System and the Kleinburg Distribution System qualified for a reduction in lead sampling requirements, as both systems completed four consecutive periods in which 10% of samples taken were not more than 5 µg/L (parts per million). The Vaughan Distribution System qualified for, and completed, two reduced sampling phases for 2010. These new sampling requirements mandate 50 samples be collected from plumbing that serves private residences, 5 samples from plumbing that does not serve private residences and 10 samples from the distribution system. Similarly, the Kleinburg Distribution System qualified for reduced sampling and frequency. The original legislation ceases to apply, as the Kleinburg Distribution System serves less than 50,000 people, however the City is required to conduct sampling at a reduced rate in sample locations every third year.

On February 11, 2011, the City of Vaughan received Certificate of Approval Number PB260003097RR-01 (Vaughan Distribution System), and Certificate of Approval Number PB260006607RR-01 (Kleinburg Distribution System), granting regulatory relief from the mandated lead sampling program, starting from the December 15, 2010 sampling period onward. New requirements for the Vaughan and Kleinburg Distribution Systems are based on a three year cycle. Each of the two phases within each cycle will require 10 distribution samples from the Vaughan Distribution System and 4 distribution samples from the Kleinburg Distribution System, testing for pH and alkalinity and lead for the first of the three consecutive years. Both phases of the second and third consecutive years must be sampled for pH, alkalinity only. These Certificates of Approval are valid from the date of issue and expire only if 10% of samples taken exceed 5 µg/L.

#### **(v) Schedule 16**

Reporting adverse test results and other problems is mandated under Schedule 16. The schedule defines the City's duty to report in the event that any drinking water test result exceeds any of the standards prescribed by schedules 1, 2, or 3 of the Ontario Drinking Water Quality Standards (O.Reg 169/03), along with other specific parameters as identified within the schedule such as chlorine residuals, fluoride, and viruses.

The City's reporting duties involve immediate written and oral notification. The City notifies both the Ministry of the Environment Spills Action Center (SAC), and the Medical Officer of Health at local health unit, indicating the type of adverse result, the exceedence value, date of original sample, chain of custody submission number, chlorine residuals of the original result, location of original sample, location and chlorine residuals of re-samples (including the source, upstream, and downstream), what actions are being taken in response to the adverse results, and if any further action is required. Once re-samples have been analyzed by the laboratory and received by the City, a notice of issue resolution is immediately reported back to both the Ministry of the Environment Spills Action Center and the Medical Officer of Health at the local health unit. The total number of adverse test results are reported in the Annual Report, which is posted for the public no later than February 28<sup>th</sup>, each year. For 2010, a total of 6 adverse samples were reported in the Vaughan system and 2 adverse samples were reported in the Kleinburg system.

**(vi) Schedule 22 and Section 11**

Summary Reports for municipalities for large municipal residential systems are identified within Schedule 22. The requirements of the report are listed within it, and annual submissions for previous calendar year, must go to Members of Council by March 31 of the following year. The City also makes this report available on the City's website, and is also available in hard copy to the public at the City's Joint Operations Centre located at 2800 Rutherford Road, in Vaughan. The report is made available to any and all other interested parties.

Similarly, Annual Reports defined under section 11 of the Regulation are prepared for submission no later than February 28th of the year following the previous calendar year which is being reported on. The requirements of the content required within this report are also defined in the legislation. The City ensures that effective steps are taken to advise users that copies of the report are available, without charge, and how copies may be obtained. This report is also made available on the City website and updated yearly.

**(b) Ontario Regulation 128//04 (Certification of Drinking Water System Operators and Water Quality Analysts)**

This Regulation establishes the training and certification requirements that must be satisfied by certified operators and water quality analysts<sup>3</sup>.

These training requirements came into effect on August 1, 2005. Requirements include taking mandatory training courses approved by the Director of the Ministry of Environment. These hours of training are counted toward an operator's continuing education hours, and accumulate over a period of three years, at which time the license can be renewed.

The criteria for Director approved continuing education, and on-the-job training required under this regulation, is defined in the Ministry of the Environment's Guideline 4.2 and 4.3<sup>4</sup>. In order to renew a certificate, operators and water quality analysts must complete this training.

The hours of training for operators are based on the class of the subsystem. In the City of Vaughan, there are two subsystems. The first subsystem is the Vaughan Water Distribution System which meets the criteria of a Class II system. Requirements for a Class II system are 12 continuing education hours, and 23 on-the-job practical training hours, totaling 35 hours per year. The second subsystem is the Kleinburg Water Distribution System, which is identified as a Class I system. These requirements include 7 hours of continuing education hours and 23 hours of on-the-job practical training hours, totaling 30 hours per year. All operating hours can be averaged over the three year period in which the operators certificate is valid, in order to renew. This means that in order to renew a Class II license, 105 hours of training must be completed, and similarly, 90 hours for a Class I system.

The City of Vaughan's water operators operate within both the Kleinburg and Vaughan Water Distribution Systems. As such, all operators are responsible for maintaining enough hours to satisfy a Class II system.

**(c) Ontario Regulation 169/03 (Ontario Drinking Water Quality Standards (ODWQS))**

The Ontario Drinking Water Quality Standard (ODWQS) identifies the minimum level of drinking water quality acceptable for human consumption.

The City of Vaughan assesses the acceptability of water through compliance with the following standards<sup>5</sup>:

- Schedule 1. Microbiological Standards
- Schedule 2. Chemical Standards
- Schedule 3. Radiological Standards

As this Regulation indicates the minimum standard, exceedence of these values represents the point of which adverse reporting comes into effect. Again, these are reported publicly in the Annual Report, which is posted on the City's web site.

#### **(d) Ontario Regulation 188/07 (Licensing of Municipal Drinking Water Systems)**

The Safe Drinking Water Act, 2002 (SDWA) requires Owners and Operating Authorities of municipal residential drinking water systems to have an accredited Operating Authority. In order to become accredited, an Operating Authority must establish and maintain a Quality Management System (QMS). Minimum requirements for the QMS are specified within the Drinking Water Quality Management Standard (DWQMS). Ontario Regulation 188/07<sup>6</sup> of the SDWA, has been established to aid in the licensing of the municipal drinking water systems.

#### **Drinking Water Quality Management Standard (DWQMS)**

Fourteen of the recommendations in the final report of the Walkerton Inquiry relate to the development of the new approvals framework for municipal residential drinking water systems. The new program, the Municipal Drinking Water Licence Program, is based on Recommendation No. 71 of the Walkerton Inquiry Part Two Report, which states:

*The Ministry of the Environment should require the owners of municipal water systems to obtain an owner's licence for the operation of their waterworks. In order to obtain a licence, an owner should have<sup>7</sup>:*

1. a certificate of approval for the facility;
2. a permit to take water;
3. approved operational plans;
4. an approved financial plan; and
5. an accredited operating authority

#### **Requirements 1 and 2**

The first two requirements, the City of Vaughan does not require. A certificate of approval for the distribution system, and a permit to take water has not been issued, as the City does not take water, but purchases it from York Region.

#### **Requirements 3 and 5**

Requirements three and five (approved operational plan, and an accredited operating authority) were new to the water sector and to the Ministry of the Environment. These two requirements are directly related to the Walkerton Inquiry Report's recommendation that Owners and Operating Authorities move towards the concepts of the quality management approach into their operation and management of the drinking water system.

The Drinking Water Quality Management Standard has 21 elements which relate to quality management and the risk assessment/risk management of critical control points. The Operational Plan documents the processes and procedures that the Owner and Operating Authority have in place to meet the requirements of the DWQMS. The Operating Authority, in consultation with the Owner, prepared an Operational plan, which outlines how the City is meeting the requirements of the standard. The City of Vaughan successfully completed and submitted the Operational Plan to the Ministry, prior to the January 1, 2009 deadline.

On June 11 & 12, 2009, an on-site verification audit was conducted by Canadian General Standards Board to determine whether the drinking water Quality Management System (QMS) conforms to the requirements of the Ontario Ministry of the Environment's (MOE) Drinking Water Quality Management Standard (DWQMS).

The results of the audit showed no non-conformances were found, and outlined seven opportunities for improvement. A Full Scope – Entire accreditation certificate was formally issued to the Corporation of the City of Vaughan on July 7, 2009. The City of Vaughan received its Drinking Water Works Permits and Municipal Drinking Water Licences on July 27, 2009, which are a modified version of the existing Certificate of Approval framework.

As participants of the full scope accreditation process for the DWQMS, the City of Vaughan was required to submit information for the annual surveillance audit (conducted by the CGSB – the Canadian General Standards Board) by June 7<sup>th</sup>, 2010 to maintain accreditation. The City of Vaughan submitted the documentation, and remains in compliance with this legislation. The City is still fully accredited for both the Vaughan Distribution System and the Kleinburg Distribution System.

#### Requirement 4

Requirement four, an approved Financial Plan, has been developed as part of the Sustainable Sewage and Water Systems Act (SWSSA). The City's financial plan was approved by Council on June 11, 2010, submitted to the Ministry of the Environment on June 18, 2010, and submitted to the Ministry of Municipal Affairs and Housing on June 25, 2010.

## Water Withdrawal Summary

### Vaughan Water Distribution System

As previously indicated, York Region receives water from the City of Toronto and Peel Region and supplies it to the City of Vaughan (Vaughan Water Distribution System) for distribution. The total volume of water supplied from the York Region system for the reporting period of January 1, 2010 to December 31, 2010 was 42,132,849m<sup>3</sup>.

Monthly flows for the Vaughan Water Distribution System are indicated in the table below:

Month	Volume (m <sup>3</sup> )
January	3,242,299
February	3,062,749
March	3,084,705
April	3,196,722
May	3,820,742
June	3,758,619
July	4,208,631
August	4,124,723
September	3,623,975
October	3,321,815
November	2,929,518
December	3,126,137 *

The "Daily Instantaneous Peak Flow" for January 1 to December 31, 2010 is unavailable from York Region (the supplier) for the Vaughan Water Distribution System.

\* Volume adjusted on April 19, 2011, based on updated information from York Region

### Kleinburg Water Distribution System

York Region supplies groundwater through production wells to the City of Vaughan (Kleinburg Water Distribution System) for distribution. The total volume of water supplied from the York Region system for the reporting period of January 1, 2010 to December 31, 2010 was 632,214 m<sup>3</sup>.

The maximum allowable daily water taking and the actual maximum recorded daily water taking by the Region of York to supply the Kleinburg Water Distribution System are presented below:

Production Well Number	Permitted Daily Withdrawal (Litres)	Actual Maximum Daily Withdrawal (Litres)	Percentage of Permitted Daily Withdrawal During peak Demand
Well 2	950,400	51,942 – July 12, 2010	0%
Well 3/4**	5,237,000	4,273,250 – July 7, 2010	0.3%

\*Kleinburg well 2 is typically used as a standby well

\*\*Kleinburg well 4 is pumped into well 3 common header, flow is recorded through well 4 metering

Monthly flows for the Kleinburg Water Distribution System for January 1 to December 31, 2010 are indicated in the table below:

Month	Volume (m <sup>3</sup> )
January	39,080
February	34,497
March	37,260
April	43,157
May	74,598
June	63,889
July	90,340
August	79,408
September	57,082
October	40,074
November	34,618
December	38,211

The withdrawal rates provided by York Region from the production wells to supply the Kleinburg Water Distribution System did not exceed the allowable limits during the period of January 1 to December 31, 2010.

## List of References

- <sup>1</sup> <http://www.ene.gov.on.ca/envision/water/sdwa/index.htm>
- <sup>2</sup> <http://www.e-laws.gov.on.ca/Download?dID=439555>
- <sup>3</sup> Ontario Ministry of the Environment (2008). Ontario Ministry of the Environment Entry-Level Course for Drinking Water Operators Classroom Manual, Second Edition. Ontario, Canada: Queens Printer
- <sup>4</sup> <http://www.ontario.ca/drinkingwater/45%20Phase%20In%20of%20New%20Training%20-Requirements.doc>
- <sup>5</sup> Ontario Ministry of the Environment (2008). Ontario Ministry of the Environment Entry-Level Course for Drinking Water Operators Classroom Manual, Second Edition. Ontario, Canada: Queens Printer
- <sup>6</sup> [http://www.e-laws.gov.on.ca/html/regs/english/elaws\\_regs\\_070188\\_e.htm](http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_070188_e.htm)
- <sup>7</sup> [http://www.ene.gov.on.ca/envision/env\\_reg/er/documents/2006/Licensing-%20Backgrounder%20-%20October%202006.pdf](http://www.ene.gov.on.ca/envision/env_reg/er/documents/2006/Licensing-%20Backgrounder%20-%20October%202006.pdf)