Ontario

Ministry of the Environment

ALVINSTON DISTRIBUTION SYSTEM

Drinking Water System Inspection Report

DWS Number:	260040170
Inspection Number:	1-983FD
Date of Inspection:	Dec 12, 2011
Inspected By:	Paul Tersteege

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OWNER INFORMATION:

Company Name:	BROOKE-ALVINSTON, THE CORPORATION OF THE TOWNSHIP OF		
Street Number:	3236	**Unit Identifier:**	PO Box 28
Street Name:	RIVER St		
City:	ALVINSTON		
Province:	ON	**Postal Code:**	N0N 1A0

INSPECTION DETAILS:

DWS Name:	ALVINSTON DISTRIBUTION SYSTEM
DWS Address:	3188 CHURCH ST ALVINSTON ON N0N 1A0
County/District:	Brooke-Alvinston
MOE District/Area Office:	Sarnia District
Health Unit:	LAMBTON HEALTH UNIT
Conservation Authority	St. Clair Region Conservation Authority
MNR Office:	Aylmer District Office
DWS Category:	Large Municipal Residential
DWS Number:	260040170
Inspection Type:	Announced
Inspection Number:	1-983FD
Date of Inspection:	Dec 12, 2011
Date of Previous Inspection:	Feb 03, 2010

DRINKING WATER SYSTEM COMPONENTS DESCRIPTION

Site (Name): Alvinston Distribution System

Type: **Sub Type:**

Comments:

The Municipality of Brooke-Alvinston, with a population of approximately 3,000, is located in eastern Lambton County. (The Enniskillen Distribution System, which receives water from the Petrolia Water Treatment Plant, supplies water to the northern and western portions of the Municipality, including the community of Inwood.)

The Alvinston Distribution System, the subject of this inspection, primarily supplies the community of Alvinston - home to about a third of the Municipality's residents. The system also supplies several residences and a school north of Alvinston.

The Alvinston Distribution System receives water directly from the Lambton Area Water Supply System ("LAWSS") via a meter chamber located on the southeast corner of Churchill Line and Old Walnut Road. The LAWSS water treatment plant, located at the junction of Lake Huron and the St. Clair River, uses chemically assisted filtration and chorine disinfection to treat its surface water supply. Further, it fluoridates water it supplies to consumers.

A joint board made up of six members from the municipalities of Lambton Shores, Plympton-Wyoming, Point Edward, Sarnia, St. Clair and Warwick manages LAWSS. They have contracted the Ontario Clean Water Agency (OCWA) to operate and maintain the system's infrastructure that

includes the water treatment plant, kilometres of arterial mains, and several tertiary treatment, storage and pumping facilities.

LAWSS' meter chamber is equipped with a continuous online free chlorine analyzer and flow meter. A 250mm diameter PVC watermain connects the chamber to the Alvinston Water Pumping Station ("the Station").

The Station is equipped with,

- one 60kW diesel generator
- one 150 cubic meter capacity clearwell
- two vertical turbine high lift pumps, each rated at 8.7 L/s (one duty and one standby)
- one water meter on the pumping station discharge
- one sodium hypochlorite disinfection system consisting of,
    - three chemical feed pumps (two duty and one standby),
    - chemical feed lines to points upstream and downstream of the clearwell
    - continuous free chlorine analyzers upstream and downstream of the clearwell

The distribution system includes a 1,544m3 standpipe equipped with a continuous online free chlorine analyzer. Further, the distribution system includes 11 air valve chambers, two water meter chambers, approximately 70 hydrants, and mains of various sizes.

Each of the three chlorine analysers is alarmed. There is also an alarm on the sensor measuring the water level in the standpipe.

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.**

The Ministry is implementing a rigorous and comprehensive approach in the inspection of drinking water systems that focuses on the source, treatment and distribution components of the system as well as management practices.

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.

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.

The Officer met with OCWA's local senior operator and regional compliance representative to inspect the drinking water system.

Note: Contact information for the drinking water system and others who have an interest in this system is included in Appendix 1. The Inspection Rating Record, a numeric summary based on the Officer's observations, is attached in Appendix 2. The Risk Rating Methodology used to generate the Inspection Rating Record is discussed in Appendix 3.

TREATMENT PROCESSES

* **A valid Permit and Licence or Approval issued under Part V of the SDWA, other than those issued for watermain construction, existed for the system.**

Per Section 31 of the Safe Drinking Water Act, the establishment, use and operation of municipal drinking water systems must comply with the applicable approval, permit or licence. The Ministry has approved the Municipality's treatment facilities/equipment per the Permit and Licence included in Appendix 4 of this report.

* **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.**

Per Section 31 of the Safe Drinking Water Act, the establishment, use and operation of municipal drinking water systems must comply with the applicable approval, permit or licence. Per the system description in the attached Permit, treatment equipment includes,

- three sodium hypochlorite metering pumps (two duty, one standby) with feed lines to points upstream and downstream of the clearwell,

- two chemical storage tanks with spill containment, and

- various chlorine residual analyzers and an alarm system.

TREATMENT PROCESSES

* **Records confirmed that the water treatment equipment which provides chlorination or chloramination for secondary disinfection purposes was operated so that at all times and all locations in the distribution system the chlorine residual was never less than 0.05 mg/l free or 0.25 mg/l combined.**

  Section 1-5 in Schedule 1 of O. Reg. 170/03 requires the Municipality's treatment facilities/equipment to be capable of providing a free chlorine residual of 0.2mg/L at all locations within the distribution system. Further, Section 1-2 requires the equipment to be operated so that the free chlorine residual is never less than 0.05mg/L.

  A continuous analyser monitors the chlorine residual at the Municipality's standpipe. Further, operators test the chlorine residual at points in the distribution system when collecting microbiological samples. The Officer did not note any readings that suggested concerns with inadequate secondary disinfection.

* **The owner had evidence indicating that all chemicals and materials used in the treatment process met the AWWA and ANSI standards in accordance with the Permit and Licence or Approval issued under Part V of the SDWA.**

  Per Section 31 of the Safe Drinking Water Act, the use and operation of municipal drinking water systems must comply with the applicable approval or licence. Per Section 14 in Schedule B of the Licence, all water treatment chemicals shall meet all applicable AWWA and ANSI standards.

  The Operating Authority advised sodium hypochlorite is the only water treatment chemical they use in this facility. Further, they produced documentation confirming their supplier, D.H. Jutzi Limited of Stratford, is certified under NSF/ANSI Standard 60 to provide this chemical.

* **Up-to-date plans for the drinking-water system were available in accordance with the Permit, Licence or Approval issued under Part V of the SDWA.**

  Per Section 31 of the Safe Drinking Water Act, the alteration and operation of municipal drinking water systems must comply with the applicable approval, permit or licence which includes, where applicable, updating drawing and diagrams of the treatment system within one year of the substantial completion of any alteration.

  The Operating Authority advised their have been no alterations since the facility was converted from a water treatment plant to a booster station. Beside copies of the applicable drawings they keep at the booster station, they report the Municipality retains copies at their office.

* **The facility and equipment appeared to be maintained and in a fit state of repair.**

  Per Section 11(1) of the Safe Drinking Water Act, owners and operating authorities are required to maintain municipal drinking water systems, including their treatment facilities/equipment, in a fit state of repair. Besides a visual scan during the inspection, the Officer reviewed applicable records and logs. The Officer noted the system appeared to be adequately maintained.

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

  To ensure that all critical treatment equipment and processes are performing appropriately, Section 26 of O. Reg. 128/04 requires operators-in-charge to ensure the,

  - inspection of all the treatment equipment

  - preparation of records noting the equipment's operating status.

  Operators use logbooks and worksheets to record their observations. Besides reviews of trends captured on their SCADA system, the Operating Authority uses its "Hansen Work Maintenance System" to ensure operators maintain the treatment and monitoring equipment.

TREATMENT PROCESSES

* **Based on information provided by the owner/operator, it was not likely that contaminants entering the floor drains would have come in contact with the source water or treated water.**

  The Ministry recommends operators remain aware of where all the drains in their facilities discharge to such that they can be assured routine (e.g., cleaning) and abnormal (e.g., spills) events pose a negligible hazard. The Operating Authority advised any water or spills entering their drains is directed out of the booster station.

* **Measures were taken to ensure that pesticides were not applied, stored, or mixed in the immediate vicinity of source(s), treatment, and storage facilities.**

  The Ministry recommends not mixing, storing or applying pesticides at or near water supplies or the treatment and storage components associated with drinking water systems. Besides their own activities, the Ministry recommends operators remain mindful of practices on adjacent lands that might pose a concern.

  The Operating Authority advised it does not apply, handle or store any pesticides in or around their facilities. Further, the Operating Authority advised it is not aware of any concerns stemming from activities on neighbouring properties.

DISTRIBUTION SYSTEM

* **There was no cross-connection control/backflow prevention program, policy and/or by-law in place.**

  The Ministry recommends municipalities consider cross-connection and backflow prevention programs, policies and/or bylaws. Backflow can cause serious contamination problems in water systems, as was evident in Stratford during the spring of 2005 when an unauthorized cross-connection at a car wash allowed wash water to flow into the city's distribution system.

  The Officer understands the Municipality's policy is to not allow contractors or individuals to hook drawn water from hydrants without municipal approval. Further, Municipality By-law 3-1976 prohibits consumers from having connections to private water services. Cross-connections with non-potable water sources are one possible source of concern. The Officer recognizes,

  - some municipalities associate high-risk facilities with manufacturing

  - Alvinston's businesses are largely in the service and retail sectors

  - plumbing installations are subject to inspection and approval by the County Plumbing Inspector

  - some municipalities would prefer not to address this subject until such time as the Ministry offers a more prescriptive response to this subject

  As the Municipality is considering approaching the County regarding this subject, the Officer would recommend the Municipality,

  - consider the sample backflow prevention information in Appendix 5

  - consult with the County's Building and Planning Departments regarding risk surveys and how best to initiate a standardized response (i.e., one that addresses the subjects of installation of backflow prevention devices at new and existing facilities, and ensures appropriate levels of testing and maintenance).

  For further information on risk surveys and other strategies, please consider consulting,

  - the OWWA for additional guidance,

  - the CAN/CSA standards associated with backflow (B64.10.01 / B64.10.1-01 Manual for the Selection and Installation of Backflow Prevention Devices / Manual for the Maintenance and Field Testing of Backflow Prevention Devices), and

  - the InfraGuide - Innovations and Best Practices Potable Water - Methodology for Setting a Cross-Connection Control Program available at www.infraguide.ca.

DISTRIBUTION SYSTEM

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

  The Ministry recommends municipalities adopt programs, policies and/or bylaws to ensure the use of backflow devices at each new and existing service connection supplying an industrial, commercial, institutional and/or agricultural facility that could pose an elevated risk to the drinking water system.

  The Officer understands the Municipality has a device installed at their fill station. Further, he understands that the Operating Authority has not identified any additional facilities that could pose an elevated risk.

  The Operating Authority advised operators use a backflow device on all hydrants before flushing. Further, they advised the Municipality oversees the use of hydrants by third parties. (Note: The Operating Authority advised they do not oversee any activities by the local fire department.)

* **There were no known cross connections between the distribution system and other water sources.**

  The Operating Authority is not aware of any cross-connections. Further, Municipality By-law 3-1976 prohibits consumers from having connections to private water services.

* **The owner had a program or maintained a schedule for routine cleanout, inspection and maintenance of reservoirs and elevated storage tanks within the distribution system.**

  The Municipality advised that they had their standpipe inspected in 2011 and that they were working on a 5-year inspection cycle. The Officer understands future inspections will also include the reservoir at the booster station.

* **There was a program for rehabilitation or replacement of watermains.**

  Various factors may determine whether an active watermain rehabilitation or replacement program is warranted, i.e., system age, water quality or capacity concerns, and leaks or breaks. The Officer understands the Operating Authority recently prepared a 10-year capital plan for the Municipality's consideration. The Officer understands this document is still under review.

* **The owner followed industry recognized standards or procedures in the material selection and design associated with distribution system construction and maintenance.**

  The Ministry recommends municipalities use recognized industry standards for material selection (e.g., NSF/ANSI Standard 61) and design (e.g., the Ontario Provincial Standards for Roads and Municipal Services). The Operating Authority advised that with respect to material selection, the Municipality makes use of Corix Water Products of London who supplies products conforming to ANSI/NSF standards.

* **The owner had implemented a program for the flushing of watermains as per industry standards.**

  The Ministry recommends municipalities ensure their watermains are flushed regularly to remove sediment build-up which can affect disinfectant residuals and the flow, color, odour and taste of the water. Industry standards speak to a preventative approach that involves adopting written procedures that address routine flushing as well as flushing aimed at addressing localized problems.

  The Operating Authority advised they usually perform a complete flushing of the system in the fall, and they usually flush dead ends in the system twice a year.

DISTRIBUTION SYSTEM

* **A program was in place for inspecting and exercising valves.**

  To ensure all stop valves will function when required, the Ministry recommends municipalities adopt a program for inspecting/exercising valves. The Operating Authority reports that initially they had proposed a valve-exercising program. However, owing to the condition of the valves, they encountered an incident on Morrell Street that resulted in having to replace three valves. Consequently, they opted to defer valve exercising until they and the Municipality agree on an alternate strategy, i.e., one involving repairs and/or replacements.

* **There was a program in place for inspecting and operating hydrants.**

  As noted in the Operating Authority's records, they exercise the hydrants as part of their flushing program. While flushing, they inspect the hydrant, note any maintenance that may be required, and forward their concerns to the Municipality.

* **There was a by-law or policy in place limiting access to hydrants.**

  The Ministry recommends municipalities implement measures to protect their water system by limiting access to their hydrants. The Operating Authority advised Section 42 of By-Law No. 3-1976 restricts the usage of fire hydrants to those authorized in writing by the Municipality's Public Works Manager.

* **Consumer water usage, including industrial and commercial water users, was fully metered.**

  The Ministry recommends municipalities meter water consumption to help them better manage their water resources and infrastructure. The Municipality meters all consumers with a service connection.

* **The owner had conducted an assessment of production volumes versus authorized consumption to determine the percentage of water loss in the distribution system.**

  The Operating Authority forwards the Municipality flow data regarding the volume of water consumed by the drinking water system as a whole. The Municipality's most recent water loss estimate of 14.3% was based upon the total volume the system consumed minus the total amount the Municipality billed to consumers. I.e., the figure does not include unmetered consumption related to system flushing, and fire protection and training exercises.

  Note: The Municipality reported they were planning to replace an old cast line that they believe is the primary source of actual water loss within their distribution system. As such, future estimates should be much lower, especially if they include estimates of the unmetered consumption.

* **The owner had undertaken efforts to identify, quantify and reduce sources of apparent water loss and/or established a leak detection/minimization program.**

  The Ministry recommends leak detection with respect to both "apparent losses" (e.g., un-metered consumers, inaccurate meters) and "real losses" (e.g., leaks from mains or storage facilities), especially where water losses exceed 10 to 15 percent.

  The Operating Authority advised the Municipality is currently considering a capital plan that includes infrastructure replacement – which should reduce future losses.

DISTRIBUTION SYSTEM

* **The distribution system pressure was monitored to alert the operator of conditions which may have lead to loss of pressure below the value under which the system is designed to operate.**

  The Ministry recommends monitoring to alert operators of conditions that could lead to a significant loss of pressure. This is particularly true of drinking water systems that include their own treatment and storage facilities.

  The Municipality has a gauge on its high lift header. Further, a pressure transmitter at the standpipe is converted into water level readings that are captured by the Municipality's SCADA system. The water level in the standpipe prompts the start and stop of the high-lift pump used to fill it.

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

  The Ministry strongly recommends the industry standard calling for the maintenance of a minimum residual pressure in the distribution system of 140kPa (20psi) during peak flow. Further, the Ministry's Drinking Water Works Permit prohibits additions or alterations that would "adversely affect a distribution system's ability to maintain a minimum pressure of 140kPa at ground level at all points in the distribution system under maximum day demand plus fire flow conditions."

  The Operator-in-Charge advised that the Municipality's standpipe normally maintains pressure within the distribution system between 50 and 55psi, i.e., providing the water level within it is maintained above the low-level set point. Their monitoring system captures data regarding water level in the standpipe. Further, operators can examine the pressure gauge on the high lift header that fills their standpipe.

  The Officer did not note any systemic concerns. The Operating Authority recorded an incident in May 2011 where they had to conduct a hydrant repair and had to isolate sections of the system and placed both high lift pumps on to maintain pressure in the distribution system. They also noted a planned event whereby they turned off the high lift pumps in order to "refresh" the standpipe.

* **The donor had provided an Annual Report to the receiver drinking water system.**

  Where systems supply all of the water for other drinking water systems, Section 11 of O. Reg. 170/03 requires donors to provide a copy of their Annual Reports to the owner of the receiving systems. The Municipality has a copy of the 2010 Annual Report for LAWSS posted on their website.

OPERATIONS MANUALS

* **Operators and maintenance personnel had ready access to operations and maintenance manuals.**

  Section 28 of O. Reg. 128/04 requires owners and operating authorities to ensure operators have ready access to the comprehensive operations and maintenance manuals.

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

* **The operations and maintenance manual contained a sampling plan.**

  The Operating Authority creates and posts a sampling calendar in the facility.

* **The operations and maintenance manual did identify the minimum required chlorine residual in water leaving the treatment process to maintain adequate secondary disinfection.**

  The manual identifies alarm set points for each of its analysers.

OPERATIONS MANUALS

* **The operations and maintenance manuals contained instructions pertaining to the identification of adverse drinking water conditions, as well as prescribed notification and corrective actions.**

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

  The Officer received notice from the Process and Compliance Technician that was recently assigned to the area that OCWA was establishing a document and record control centre for the satellite facilities. In this case, this information will be housed at the Wyoming Water Pollution Control Plant. Further, OCWA advised that as part of this exercise, documentation was being updated, e.g., to include the current Licence and Permit.

* **The operation and maintenance manuals and the emergency/contingency plans were reviewed on a periodic basis.**

  To ensure guidance provided to operators remains current and applicable, the Ministry recommends annual reviews (and where applicable updates) to operations and maintenance manuals, including any emergency/contingency plans contained within them, or documented separately.

  The Operating Authority advised they review this and other topics as part of their routine staff meetings.

LOGBOOKS

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

  Section 27(5) of O. Reg. 128/04 requires logs or other record-keeping mechanisms in which operators-in-charge or their designates include,

  - the date and time,

  - the names of ALL operators on duty, and

  - details regarding equipment problems, unusual events or departures from normal operating procedures.

  The Operating Authority maintains daily logs at the Municipality's booster station, standpipe and water meter chamber at Churchill Line and Old Walnut Road (the latter is part of the LAWSS).

  To ensure this exercise was limited to a reasonable timeframe, the scope of the Officer's inspection was limited to confirming whether the Operating Authority recorded these various items, and determining whether examples of these items could be found. Records screened by the Officer appeared to be satisfactory.

* **Logbook entries were made in chronological order.**

  Pursuant to Section 27(2) of O. Reg. 128/04, operators appear to be entering their records chronologically.

* **The record system allowed the reader to unambiguously identify the person who made the logbook entry.**

  Pursuant to Section 27(4) of O. Reg. 128/04, operators appear to be using methods that allow for the identification of the operators making entries. (The Operating Authority places a table of names and initials into their main logbooks in order to ensure the author of any entry can be readily identified.)

LOGBOOKS

* **Entries in the logbook were made only by appropriate and authorized personnel.**

  Pursuant to Section 27(3) of O. Reg. 128/04, only authorized personnel appear to be making entries.

* **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.**

  Pursuant to Section 7-5 in Schedule 7 of O. Reg. 170/03, only qualified personnel (e.g., certified operators or water quality analysts) appear to be performing operational tests.

* **For every required operational test and every required sample, a record was made of the date, time, location, name of the person conducting the test and result of the test.**

  Pursuant to Section 6-10 O. Reg. 170/03, operational tests and samples are accompanied by a record of the date, time, location, and the name of the person conducting the testing/sampling.

* **The operator-in-charge ensured that records were maintained of all adjustments made to the processes within his or her responsibility.**

  Section 26 of O. Reg. 128/04 requires operators-in-charge to record all adjustments made to the treatment and monitoring processes within their responsibility (e.g., chemical dosages, equipment calibrations, alarm set points, etc.). Records screened by the Officer appeared to be satisfactory.

* **Logs or other record keeping mechanisms were available for at least five (5) years.**

  Pursuant to Section 27(6) of O. Reg. 128/04, the Municipality / Operating Authority has committed to ensuring that their logs and related records are retained for a minimum of five years. The Operating Authority advised that they currently store their earlier records at the booster station.

CONTINGENCY/EMERGENCY PLANNING

* **The owner had developed a written contingency/emergency plan as required by the Permit and Licence or Approval issued under Part V of the SDWA.**

  Per Section 31 of the Safe Drinking Water Act, the use and operation of municipal drinking water systems must comply with the applicable approval or licence. The Ministry has required the development of operations and maintenance manuals, which are to include contingency plans and procedures, to promote quick and effective responses to incidents.

* **The contingency/emergency plan was available for reference by all staff as required by the Permit and Licence or Approval issued under Part V of the SDWA.**

* **The contingency/emergency plan did provide for key equipment to be made available in the event of an emergency or upset condition.**

* **The contingency/emergency plan addressed spill scenarios.**

* **Spill containment was provided for process chemicals.**

* **Spill containment was provided for standby power generator fuel.**

CONTINGENCY/EMERGENCY PLANNING

* **Clean-up equipment and materials were in place for the clean up of spills.**

* **Standby equipment was available for critical treatment processes as required by a Permit and Licence or Approval issued under Part V of the SDWA.**

* **Back-up power was available as required by Permit and Licence or Approval issued under Part V of the SDWA.**

* **Standby power generators were tested under normal load conditions.**

  Generators must not only start; when required, generators must deliver the power necessary to operate the drinking water system. Consequently, the Ministry recommends testing generators under load.

  The Operating Authority advised they check the equipment monthly, and have Albert's Generator Services perform an annual service. Further, the Operatating Authority's logbook states Albert's Generator Services performed a load test on September 7, 2011.

SECURITY

* **All storage facilities were completely covered and secure.**

  Ministry Guideline B-12 (Potable Water Storage Structures), states the Ministry expects owners to cover water storage structures serving municipal and communal systems to prevent contamination of the stored water. The Officer noted the facilities appeared to be secure.

* **Air vents and overflows associated with reservoirs and elevated storage structures were equipped with screens.**

  To reduce the likelihood of contamination, the Ministry recommends the use of screens on air vents and overflows associated with reservoirs and elevated storage structures. The standpipe was last inspected in 2011.

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

  The Ministry recommends owners adopt measures to reduce the potential for access to their facilities by intruders. The pumping station, standpipe and metering station on Walnut Road are fenced and gated. The fill station adjacent to the standpipe is locked when not in use. Authorized users have keyed access to the facility. Further, the plant and standpipe have signage indicating access to these facilities is restricted. Lastly, operators visit these facilities several times throughout the week.

CONSUMER RELATIONS

* **Water conservation was being practiced by the owner or operating authority.**

  The Municipality has metered consumers which can promote conservation; however, it does not have an extensive water conservation strategy.

CONSUMER RELATIONS

* **Required documents were available free-of-charge during normal business hours at a location accessible to the public.**

  Pursuant to Sections 12 of O. Reg. 170/03, municipalities are required to have copies of their test results; annual / summary reports; engineering evaluation reports; the applicable licences, permits or approvals; and O. Reg. 170/03 available to the public. In the absence of public demand, copies of all these materials are not stored at the public counter. However, any member of the public is free to contact the Municipality during their normal business hours to arrange to view this material.

* **The owner did take effective steps to advise users of the water system of the availability of Annual Reports.**

  To satisfy Section 11 (9.1) of O. Reg. 170/03, the Municipality posted a copy of the report on its website. The Officer understands a copy is also posted at the municipal office.

CERTIFICATION AND TRAINING

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

  O. Reg. 128/04 prescribes a system for classifying municipal residential systems. The Regulation includes a corresponding system for certifying operators. Further, Section 23(1) requires the appointment of an "overall responsible operator" for each subsystem. The Operating Authority's Operations Manager has been appointed for this purpose, and other management personnel are available to serve as backups.

* **Operators in charge had been designated for all subsystems which comprised the drinking-water system.**

  Section 25(1) of O. Reg. 128/04 requires the appointment of one or more "operator-in-charge" for each subsystem. The senior operator usually acts as "operator-in-charge".

* **All activities that were undertaken by uncertified persons in the DW subsystems were overseen by persons having the prescribed qualifications.**

  The Operating Authority has satisfied Section 11(1) (5) of the Safe Drinking Water Act, by placing their own personnel (and if applicable, personnel contracted to work for them) under the supervision of persons having the prescribed qualifications. Where required, the Operating Authority supervises work undertaken by uncertified persons.

  Note: Section 4.1.1 of Ministry publication PIBS 4723e, "Certification Guide for Operators and Water Quality Analysts of Drinking Water Systems," speaks to functions that certified operators must perform and to functions not requiring certification.

* **All operators possessed the required certification.**

* **Only certified operators made adjustments to the treatment equipment.**

  The Operating Authority advised that pursuant to Schedule 1 of O. Reg. 170/03, subsection 1-2(2)5, only individuals who are certified as Drinking-Water System Operators under O. Reg. 128/04, are permitted to make adjustments to the treatment equipment.

* **Operator certificates or water quality analyst certificates were displayed in a conspicuous location at the workplace or at the premises from which the subsystem was managed.**

  Sections 15 and 21 of O. Reg. 128/04 requires a copy of every operator and analyst's certificate to be displayed at either their workplace or at the premises from which the system is managed.

* **The classification certificates of the subsystems were conspicuously displayed at the workplace or at premises from which the subsystem was managed.**

  To satisfy Section 3 (5) of O. Reg. 128/04, a copy of the system's certificate of classification is posted in the office at the booster station.

CERTIFICATION AND TRAINING

* **An adequately licenced operator was designated to act in place of the overall responsible operator when the overall responsible operator was unable to act.**

  Section 23 of O. Reg. 128/04, speaks to addressing occasions when the overall responsible operator is absent or unable to act (e.g., due to vacations or illness). The Operating Authority posts memos on their bulletin board on occasions where other operators are acting in the capacity of overall responsible operator.

* **The owner/operating authority was aware of the operator training and record keeping requirements, and they were taking reasonable steps to ensure that all operators receive the required training.**

  Owners and operating authorities should be aware of their operators' training requirements, to ensure they do not experience a personnel shortage should an operator fail to renew their certification. Should an operator fail to renew their certification because they had failed to maintain their training requirements, the Ministry's local office cannot intervene. To find out more, visit the Ontario Water Wastewater Certification Office's website (www.owwco.ca). The Operating Authority advised they were aware of the ongoing training and record keeping requirements imposed by O. Reg. 128/04.

* **Operators were regularly trained with respect to the contents of the operations and maintenance manual and Contingency/Emergency Plan.**

  The Ministry recommends regular training of operators with respect to the contents of operations, maintenance and contingency documentation. Besides serving as a refresher, this practice provides an opportunity to ensure this material is accurate and current. The Operating Authority advised they address various training requirements during routine staff meetings.

WATER QUALITY MONITORING

* **Relief from water quality monitoring requirements had not been granted.**

  At the time of the field visit, the Municipality had not requested, or received, relief from monitoring required under O. Reg. 170/03. (On February 13, 2012, the Ministry's Approvals Section granted some relief from lead sampling requirements in O. Reg. 170/03.)

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

  Results reported by the Municipality's laboratory indicate operators have been collecting distribution samples for testing microbiological parameters as required in Section 10-2 of Schedule 10 in O. Reg. 170/03.

  Operators routinely collect microbiological samples from 3310 Walnut Street (the Community Centre) and 3084 River Road (the sewage treatment plant).

  Note: Operators also collect samples from 3188 Church Street (the pumping station). Per the attached summary, the laboratory identifies the latter samples as distribution samples. However, because the Municipality provides tertiary treatment at the pumping station, these samples do not satisfy the definition of a distribution sample per O. Reg. 170/03.

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

  Results reported by the Municipality's laboratory indicate operators have been collecting quarterly distribution samples for testing trihalomethanes as prescribed in Section 13-6 of Schedule 13 and Section 6-1.1(4) of Schedule 6 of O. Reg. 170/03.

WATER QUALITY MONITORING

* **Trihalomethane samples were being collected from a point in the distribution system or connected plumbing system that was likely to have an elevated potential for the formation of trihalomethanes.**

  Sampling records indicate the Municipality's laboratory normally tests for trihalomethanes, from a point likely to have an elevated potential for disinfectant by-product formation, as prescribed in Schedule 13 of O. Reg. 170/03. Alvinston is an eastern extremity of the network of water systems supplied by the LAWSS. The attached records indicate operators have routinely collected samples from the Community Centre at 3310 Walnut Street, which is in the northern extremity of the community of Alvinston.

* **The owner ensured that water samples were taken at the prescribed location.**

* **The owner had not established water quality goals over and above regulatory requirements.**

  Other than their commitment to providing safe drinking water, the Municipality has not committed to any water quality goals over and above the applicable regulatory requirements.

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

  For most owners, Schedule 15.1 in O. Reg. 170/03 requires the collection of samples for lead testing based up the population a system services, and their past results / eligibility for reduced sampling. Owners must apply for, and receive approval, if they want relief from these requirements.

  On February 13, 2012, the Ministry's Approvals Section granted some relief from the lead sampling requirements in O. Reg. 170/03, i.e., for the current sampling period (December 15, 2011 to April 15, 2012) until the sampling period ending June 15, 2016 to October 15, 2016, the Municipality only needs to collect two distribution samples. I.e., plumbing samples are not required.

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

  In conjunction with prescribed lead testing, Schedule 15.1 of O. Reg. 170/03 also requires pH testing, and the collection of distribution samples for alkalinity testing. The Operating Authority confirmed operators test the pH when collecting samples for lead testing. Further, they collect samples for alkalinity testing (when sampling from the distribution system).

* **The owner was not conducting sampling beyond the minimum legislative requirements.**

* **Samples for chlorine residual analysis were tested using an acceptable portable device.**

  Operators use Hach Pocket Colorimeters for field measurements of the chlorine residuals. These units satisfy Section 6-7(1) in Schedule 6 of O. Reg. 170/03. (The Operating Authority advised they perform monthly checks to ensure the accuracy of these units.)

* **All continuous monitoring equipment utilized for sampling and testing required by O.Reg.170/03, or approval or order, were equipped with alarms or shut-off mechanisms that satisfied the standards described in Schedule 6.**

  Where continuous monitoring equipment for monitoring the chlorine residual or turbidity level is required, Schedule 6 of O. Reg. 170/03 requires alarms and/or automated shutoffs. The Operator-in-Charge reported an alarm will also sound if any of the following occur:

  - the chlorine residual exceeds or falls below established set points

  - the water level in the clearwell exceeds or falls below established set points

WATER QUALITY MONITORING

- the water level in the standpipe exceeds or falls below established set points
- a fault occurs with the transmitter
- the generator fails to start when required
- a fault occurs with the Uninterruptible Power Supply at the standpipe

* **All continuous analysers were calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation.**

Schedule 6 of O. Reg. 170/03 requires owners to ensure the accuracy of their continuous monitoring equipment (e.g., chlorine residual, turbidity) through checks and, where necessary, calibrations. (Besides the equipment referenced in Schedule 6 as requiring routine calibration, the Ministry recommends owners check and calibrate all continuous monitoring equipment in accordance with the manufacturer's instructions.)

The Operator-in-Charge noted maintenance is dictated and recorded by the Operating Authority's preventative maintenance software program (Hansen). Besides Hansen, OCWA personnel make use of the log at the pumping station to records maintenance activities. The Operator-in-Charge reported an OCWA technician based at LAWSS is largely responsible for routine maintenance, e.g., tubing changes. The continuous analysers are cleaned monthly and compared against handheld units to verify their continued accuracy.

* **Operators were examining continuous monitoring test results and they were examining the results within 72 hours of the test.**

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

The Municipality uses continuous monitoring equipment to assess the secondary disinfectant residual at their standpipe.

* **Records confirmed that the maximum free chlorine residual in the distribution system was less than 4.0 mg/L or that the combined chlorine residual was less than 3.0 mg/L.**

Results of readings collected at the standpipe indicated the free chlorine residual in the distribution system was less than 4.0mg/L.

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

Sampling records indicate operators test the chlorine residual at the same time and location they are collecting microbiological samples as required by Section 6-3(1) in Schedule 6 of O. Reg. 170/03.

* **Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03.**

Section 6-5 in Schedule 6 of O. Reg. 170/03 prescribes a minimum time interval for testing of chlorine and turbidity by continuous monitoring equipment (e.g., 5 minutes, 15 minutes, 1 hour). Alternatively, where monitoring equipment tests more frequently, the monitoring equipment may record the minimum, maximum, and the mean results for periods equal to the prescribed intervals. Records available for inspection indicate the continuous monitoring equipment records at a satisfactory interval.

WATER QUALITY MONITORING

* **All continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was recording data with the prescribed format.**

  Section 6-5 in Schedule 6 of O. Reg. 170/03 requires a record of the date, time, sampling location and the result.

  Records available for inspection indicate the continuous monitoring equipment records sufficient detail.

* **Records confirmed that disinfectant residuals were routinely checked at the extremities and "dead ends" of the distribution system.**

  The Ministry recommends routine testing of the chlorine residual at the extremities of, and "dead ends" in, the distribution system. Operators routinely test the chlorine residual at the community's arena and sewage treatment plant. These points reflect the northern and southern extremities of Alvinston.

* **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.**

  Section 72 of the Safe Drinking Water Act requires laboratories wishing to perform tests for regulated parameters in drinking water to obtain a licence from the Ministry of the Environment. Further, Section 6-9 in Schedule 6 of O. Reg. 170/03 requires owners to provide written notice to the Ministry identifying any laboratory they wish to conduct testing on their behalf.

  Sample results recorded on the Ministry's Drinking Water Information System indicate the use of licensed laboratories. Further, as indicated in the Drinking Water System Dossier appended to this report, the Ministry has received 3 Laboratory Services Notification forms, i.e., the initial notification and 2 that reflected subsequent changes.

* **The drinking water system owner had submitted written notices to the Director that identified the laboratories that were conducting tests for parameters required by legislation, Order Certificate of Approval (OWRA) or a Permit, Licence or Approval issued under Part V of the SDWA.**

  The Drinking Water System Dossier and Reported Sample Results appended to this report indicate that the Municipality has submitted Laboratory Services Notification forms pursuant to Section 6-9(4) in Schedule 6 of O. Reg. 170/03.

* **Based on information provided by the owner/operator, samples were being taken and handled in accordance with instructions provided by the drinking-water system's laboratories.**

  The Operating Authority advised the sampling instructions provided by their laboratories are accessible to their operators. The Officer did not note any unusual sample results indicating samples were handled inappropriately.

* **The owner indicated that the required records are kept and will be kept for the required time period.**

  Section 13 of O. Reg. 170/03 prescribes retention schedules (e.g., 2, 6 and 15 years) for the various types of water monitoring records. The Operating Authority advised they retain results at their offices in the LAWSS.

WATER QUALITY ASSESSMENT

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

WATER QUALITY ASSESSMENT

* **Results of Ministry audit sampling met the standards included in the Ontario Drinking Water Quality Standards (O. Reg. 169/03) and O.Reg. 170/03.**

* **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

* **All reporting requirements for lead sampling were complied with as per schedule 15.1-9 of O.Reg. 170/03.**

  Section 15.1-9 in Schedule 15.1 of O. Reg. 170/03 requires owners and operators to report the results of lead tests on samples of water collected from private plumbing to the occupants.

  Besides the results, the Regulation requires the provision of,

  - a statement advising whether the result exceeds the applicable standard,
  - any advice provided by the local Medical Officer of Health (or their representative), and
  - the telephone number of a person whom can answer questions about the report.

  The Operating Authority retains their records at LAWSS.

* **Where required continuous monitoring equipment used for the monitoring of chlorine residual and/or turbidity triggered an alarm or an automatic shut-off, a qualified person responded in a timely manner and took appropriate actions.**

  The Operating Authority provided daily summary data for review that limited the Officer's ability to determine the start and duration of possible events. However, daily minimums frequently coincided with maintenance, e.g., servicing the analysers. As such, these events were not of concern. Further, a review of times reported in log entries suggested timely responses.

* **Annual Reports included the required information.**

* **The Annual Report was prepared by February 28th of the following year.**

  While municipalities are no longer required to submit their Annual Report to the Ministry, Section 11 of O. Reg. 170/03 continues to require them to prepare these reports by February 28th of the following year, and to have them available for inspection. The copy posted on the Municipality's website indicates it was created February 16, 2011.

* **Summary Reports for municipal council were completed on time, included the required content, and were distributed in accordance with the regulatory requirements.**

* **All written notices, warning notices and reports were issued by the owner in a form provided by or approved by the Director.**

* **The system was registered with the Ministry and provided the required notice containing information about the system.**

  Section 10.1 of O. Reg. 170/03 requires owners to register within the Ministry. Per page two of this inspection report, the Ministry has registered the name and category of this system, along with the system number.

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.

1. **There was no cross-connection control/backflow prevention program, policy and/or by-law in place.**

   Recommendation:
   We would recommend the Municipality,

   - consider the sample backflow prevention information in Appendix 5

   - consult with the County's Building and Planning Departments regarding risk surveys and how best to initiate a standardized response (i.e., one that addresses the subjects of installation of backflow prevention devices at new and existing facilities, and ensures appropriate levels of testing and maintenance).

   For further information on risk surveys and other strategies, please consider consulting,

   - the OWWA for additional guidance,

   - the CAN/CSA standards associated with backflow (B64.10.01 / B64.10.1-01 Manual for the Selection and Installation of Backflow Prevention Devices / Manual for the Maintenance and Field Testing of Backflow Prevention Devices), and

   - the InfraGuide - Innovations and Best Practices Potable Water - Methodology for Setting a Cross-Connection Control Program available at www.infraguide.ca.

SIGNATURES

Inspected By:	Signature: (Provincial Officer):
Paul Tersteege	

Reviewed & Approved By:	Signature: (Supervisor):
Marc Bechard	 2012.03.08 08:51:49 -05'00'

Review & Approval Date:

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

Appendix 1 - Contacts

Contacts

Name:	Richard Holland, Treasurer/Administrator	**Role:**	Owner
Company:	Brooke-Alvinston, The Municipality of	**Phone:**	519-898-2173
Address:	3236 River Street, P.O. Box 28 Alvinston, Ontario N0N 1A0	**Fax:**	519-898-5653
Email:	rholland@amtelecom.net		

Name:	Randy Hills, Public Works Manager	**Role:**	Owner
Company:	Brooke-Alvinston, The Municipality of	**Phone:**	519-898-2173
Address:	3236 River Street, P.O. Box 28 Alvinston, Ontario N0N 1A0	**Fax:**	519-898-5653
Email:	tbaroads@brktel.on.ca		

Name:	Dave Hunt, Cluster Manager	**Role:**	Operating Authority
Company:	Ontario Clean Water Agency	**Phone:**	519-312-4790
Address:	1215 Fort Street, P.O. Box 790 Sarnia, ON N7V 1M1	**Fax:**	519-344-4337
Email:	dhunt@ocwa.com		

Name:	Mike Weber, Senior Operator	**Role:**	Operating Authority
Company:	Ontario Clean Water Agency	**Phone:**	519-845-0098
Address:	--	**Fax:**	519-845-0982
Email:	mweber@ocwa.com		

Name:	Deborah Thomson, Process & Compliance Technician	**Role:**	Operating Authority
Company:	Ontario Clean Water Agency	**Phone:**	519-845-0098
Address:	482 Broadway Street Wyoming, ON N0N 1T0	**Fax:**	519-845-0982
Email:	dthomson@ocwa.com		

Name:	Dr. Christopher Greensmith, Medical Officer of Health	**Role:**	Public Health
Company:	Lambton Community Health Services Department	**Phone:**	519-383-8331 ext 3500
Address:	160 Exmouth Street Point Edward, ON N7T 7Z6	**Fax:**	519-383-7092
Email:	dr.greensmith@county-lambton.on.ca		

Name:	Chad Ikert, Public Health Manager	**Role:**	Public Health
Company:	Lambton Community Health Services Department	**Phone:**	519-383-8331 ext 3507
Address:	160 Exmouth Street Point Edward, ON N7T 7Z6	**Fax:**	519-383-7092
Email:	chad.ikert@county-lambton.on.ca		

Name:	Theresa Warren, Health Inspector	**Role:**	Public Health
Company:	Lambton Community Health Services Department	**Phone:**	519-383-8331 ext 3576
Address:	160 Exmouth Street Point Edward, ON N7T 7Z6	**Fax:**	519-383-7092
Email:	theresa.warren@county-lambton.on.ca		

Name:	Girish Sankar, Water Resources Engineer	**Role:**	Source Protection
Company:	St. Clair Region Conservation Authority	**Phone:**	519-245-3710
Address:	205 Mill Pond Crescent Strathroy, ON N7G 3P9	**Fax:**	519-245-3348
Email:	gsankar@scrca.on.ca		

Name:	Paul TerSteege, Drinking Water Inspector	**Role:**	Compliance - SDWA
Company:	Ministry of the Environment	**Phone:**	519-383-3797
Address:	1094 London Road Sarnia, ON N7S 1P1	**Fax:**	519-336-4280
Email:	paul.tersteege@ontario.ca		

Appendix 2 - Inspection Rating Record

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

DWS Name:	ALVINSTON DISTRIBUTION SYSTEM
DWS Number:	260040170
DWS Owner:	Brooke-Alvinston, The Corporation Of The Township Of
Municipal Location:	Brooke-Alvinston
Regulation:	O.REG 170/03
Category:	Large Municipal Residential System
Type Of Inspection:	Standalone
Inspection Date:	December 12, 2011
Ministry Office:	Sarnia District

Maximum Question Rating: 533

Inspection Module	Non-Compliance Rating
Treatment Processes	0 / 82
Operations Manuals	0 / 42
Logbooks	0 / 42
Contingency/Emergency Planning	0 / 31
Consumer Relations	0 / 8
Certification and Training	0 / 65
Water Quality Monitoring	0 / 214
Reporting & Corrective Actions	0 / 49
TOTAL	**0 / 533**

Inspection Risk Rating	**0.00%**

FINAL INSPECTION RATING:	**100.00%**

Inspection Rating Record Generated On 07-MAR-12 (Inspection ID: 1-983FD).

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

DWS Name:	ALVINSTON DISTRIBUTION SYSTEM
DWS Number:	260040170
DWS Owner:	Brooke-Alvinston, The Corporation Of The Township Of
Municipal Location:	Brooke-Alvinston
Regulation:	O.REG 170/03
Category:	Large Municipal Residential System
Type Of Inspection:	Standalone
Inspection Date:	December 12, 2011
Ministry Office:	Sarnia District

Maximum Question Rating: 533

Inspection Risk Rating	**0.00%**

FINAL INSPECTION RATING:	**100.00%**

Inspection Rating Record Generated On 07-MAR-12 (Inspection ID: 1-983FD).

Appendix 3 - Risk Rating Methodology

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APPLICATION OF THE RISK METHODOLOGY USED FOR MEASURING MUNICIPAL RESIDENTIAL DRINKING WATER SYSTEM INSPECTION RESULTS

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

This document describes the risk rating methodology, which has been applied to the findings of the Ministry's MRDWS inspection results since fiscal year 2008-09. The primary goals of this assessment are to encourage ongoing improvement of these systems and to establish a way to measure this progress.

MOE reviews the risk rating methodology every three years to account for legislative and societal changes that affect acceptable risk levels. As a result of the most recent review, the methodology has been modified to present an improved metric for the evaluation of the risk/safety of MRDWS operations.

The Ministry's Municipal Residential Drinking Water Inspection Protocol contains up to 14 inspection modules and consists of approximately 120 regulatory questions. Those protocol questions are also linked to definitive guidance that

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ministry inspectors use when conducting MRDWS inspections. The questions address a wide range of regulatory issues, from administrative procedures to drinking water quality monitoring. Additionally, the inspection protocol contains a number of non-regulatory questions.

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

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

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

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

Determining Potential to Compromise the Delivery of Safe Water

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

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

RISK = LIKELIHOOD × CONSEQUENCE
(of the consequence)

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

TABLE 1:

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

TABLE 2:

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

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

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

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

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

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

TABLE 3:

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

Application of the Methodology to Inspection Results

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

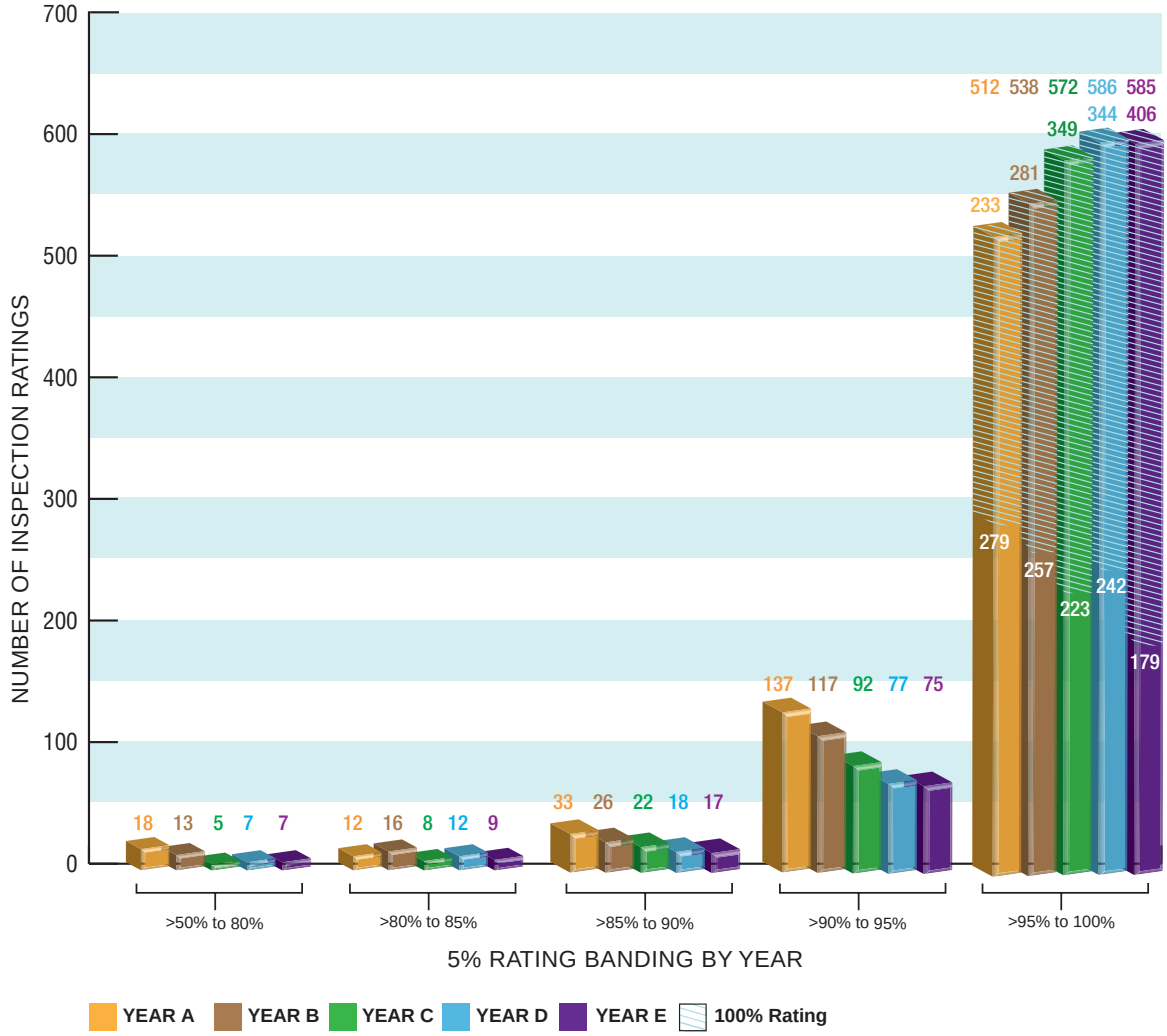
The risk ratings of all non-compliant answers are summed and divided by the sum of the risk ratings of all questions asked (maximum question rating). The resulting inspection risk rating (as a percentage) is subtracted from 100 per cent to arrive at the final inspection rating.

Application of the Methodology for Public Reporting

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

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

Figure 1: Year Over Year Distribution of MRDWS Ratings



Reporting Results to MRDWS Owners/Operators

A summary of inspection findings for each system is generated in the form of an Inspection Rating Record (IRR). The findings are grouped into the 14 possible modules of the inspection protocol, which would provide the system owner/operator with information on the areas where they need to improve. The 14 modules are:

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

For further information, please visit **www.ontario.ca/drinkingwater**

Appendix 4 - Municipal Licence and Works Permit

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MUNICIPAL DRINKING WATER LICENCE

Licence Number: 240-101
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 Township of Brooke-Alvinston

3236 River Street
Alvinston ON, N0N 1A0

For the following municipal residential drinking water system:

Alvinston Distribution System

This municipal drinking water licence includes the following:

Schedule	Description
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 13th day of February, 2012

A. Ahmed

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

Schedule A: Drinking Water System Information

System Owner	**The Corporation of the Township of Brooke-Alvinston**
Licence Number	**240-101**
Drinking Water System Name	**Alvinston Distribution System**
Schedule A Issue Date	**February 13th, 2012**

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

Licence

First Licence Issue Date	February 22, 2011
Licence Expiry Date	February 21, 2016
Application for Licence Renewal Date	August 22, 2015

Drinking Water Works Permit

Drinking Water System Name	Permit Number	Issue Date
Alvinston Distribution System	240-201	February 14, 2011

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:	240-301
Alternately, if one Financial Plan is developed for all drinking water systems owned by the owner, the Financial Plan Number shall be:	240-301A

Accredited Operating Authority

Drinking Water System or Operational Subsystems	Accredited Operating Authority	Operational Plan Number
Alvinston Distribution System	Ontario Clean Water Agency	240-401

Schedule B: General Conditions

System Owner	**The Corporation of the Township of Brooke-Alvinston**
Licence Number	**240-101**
Drinking Water System Name	**Alvinston Distribution System**
Schedule B Issue Date	**February 13th, 2012**

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 Township of Brooke-Alvinston**
Licence Number	**240-101**
Drinking Water System Name	**Alvinston Distribution System**
Schedule C Issue Date	**February 13th, 2012**

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

2.1 Not applicable

Schedule D: Conditions for Relief from Regulatory Requirements

System Owner	**The Corporation of the Township of Brooke-Alvinston**
Licence Number	**240-101**
Drinking Water System Name	**Alvinston Distribution System**
Schedule D Issue Date	**February 13th, 2012**

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.

1.2 In addition to condition 1.1, for a drinking water system or drinking water subsystem identified by columns 1 and 2 of Table 1 and notwithstanding the provisions of Schedule 15.1 of O. Reg. 170/03, the owner is not required to comply with the sampling requirements of columns 3, 4 and 5 of the same row.

Table 1: Number of Sampling Points Required for Compliance with Schedule 15.1 of O. Reg. 170/03

Column 1 Drinking Water System or Drinking Water Subsystem Name	Column 2 DWS Number	Column 3 Number of Sampling Points in Plumbing that Serves Private Residences	Column 4 Number of Sampling Points in Plumbing that Does Not Serve Private Residences	Column 5 Number of Sampling Points in Distribution System
Alvinston Distribution System	260040170	20	2	4

1.3 For a drinking water system or drinking water subsystem identified by columns 1 and 2 of Table 2 and in exchange for any relief from regulatory requirements granted in condition 1.2 and subject to any other applicable conditions of this licence and drinking water works permit, the owner is required to comply with the sampling requirements of columns 3, 4 and 5 of the same row.

Table 2: Number of Sampling Points Required for Relief from Regulatory Requirements

Column 1 Drinking Water System or Drinking Water Subsystem Name	Column 2 DWS Number	Column 3 Number of Sampling Points in Plumbing that Serves Private Residences	Column 4 Number of Sampling Points in Plumbing that Does Not Serve Private Residences	Column 5 Number of Sampling Points in Distribution System
Alvinston Distribution System	260040170	0	0	2

1.4 For a drinking water system or drinking water subsystem identified by columns 1 and 2 of Table 3, the relief from regulatory requirements granted in condition 1.2 is in effect for the sampling periods identified in column 3 of the same row.

Table 3: Sampling Periods

Column 1 Drinking Water System or Drinking Water Subsystem Name	Column 2 DWS Number	Column 3 Sampling Period
Alvinston Distribution System	260040170	December 15, 2011 to April 15, 2012 June 15, 2012 to October 15, 2012 December 15, 2012 to April 15, 2013 June 15, 2013 to October 15, 2013 December 15, 2013 to April 15, 2014 June 15, 2014 to October 15, 2014 December 15, 2014 to April 15, 2015 June 15, 2015 to October 15, 2015 December 15, 2015 to April 15, 2016 June 15, 2016 to October 15, 2016

1.5 In the event O. Reg. 170/03 is amended to require fewer sampling locations than specified under the relief granted in accordance with condition 1.2, then the regulation shall prevail

1.6 Subsection 15.1 – 5 (Reduced Sampling) of O. Reg. 170/03 does not apply to the drinking water system or drinking water subsystems identified in this licence as long as the relief from regulatory requirements granted in accordance with condition 1.2 remains in effect.

2.0 Other Regulatory Relief

2.1 Not applicable

Ontario

DRINKING WATER WORKS PERMIT

Permit Number: 240-201
Issue Number: 01

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 Township of Brooke-Alvinston

3236 River Street
Alvinston ON
N0N 1A0

For the following municipal residential drinking water system:

Alvinston Distribution System

This drinking water works permit includes the following:

Schedule	Description
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 February, 2011

Signature

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

Schedule A: Drinking Water System Description

System Owner	**The Corporation of the Township of Brooke-Alvinston**
Permit Number	**240-201**
Drinking Water System Name	**Alvinston Distribution System**
Schedule A Issue Date	**February 14th, 2011**

1.0 System Description

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

Overview

The **Alvinston Distribution System** consists of one (1) pumping station/rechlorination facility, one (1) elevated storage tank and approximately 22 kilometers of distribution watermains.

Pumping Stations

Alvinston Pumping Station/Rechlorination Facility

Location	3188 Church Street, Alvinston
UTM Coordinates	NAD 27, Zone 17, Easting 429750 m and Northing 4740730 m
Equipment	One (1) clearwell with total volume of 150 m^3
	Two (2) high lift pumps (duty and standby) each at 522 L/min. at 41.2 m TDH
	Three (3) sodium hypochlorite metering pumps (two duty, one standby) each capable of 3.31 L/hr. complete with feed lines to points upstream and downstream of the clearwell
	Two (2) chemical storage tanks with spill containment
	Various chlorine residual analyzers and alarm system
Standby Power	One (1) 60 kW standby diesel generator
Notes	

Elevated Storage Tanks

Alvinston Standpipe

Location	3294 Henry Street, Alvinston
UTM Coordinates	NAD 27, Zone 17, Easting 429133 m and Northing 4741381 m
Description	Storage standpipe
Dimensions	Total volume of 1,544 m^3
Notes	

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
Dist._schematic.bmp	Feb. 2010

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	**The Corporation of the Township of Brooke-Alvinston**
Permit Number	**240-201**
Drinking Water System Name	**Alvinston Distribution System**
Schedule B Issue Date	**February 14th, 2011**

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 900 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 A 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^3 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.

7.0 System-Specific Conditions

7.1 Not applicable

Appendix 5 - Sample Backflow Prevention Information

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Backflow Prevention Program (BFP)

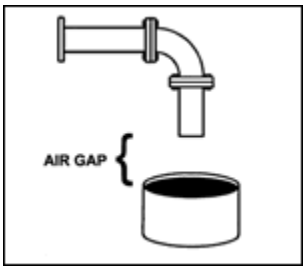
Frequently asked questions
Last updated on July 16, 2009

What is backflow?
Backflow is the undesired reversal of water flow against normal direction, which can cause contaminants to enter into the drinking water supply system. There are two causes for backflow: Back-pressure and Back-siphonage.

What is back pressure and back siphonage?
Back-pressure occurs when the pressure in a private water system is greater than the pressure in the City's water supply system. If this happens, water from a private water system can force its way into the water supply system. This can be caused by a pump, elevated tank, temperature increase in boiler systems, or other events causing an increase in local pressure.

Back-siphonage is the reversal of normal flow. This is caused by a reduction in the pressure in the local water supply system, which can be caused by nearby fire-fighting or a water-main break. Back-siphonage can cause contaminated water to be pulled into the water supply system.

What is an Air Gap?
An air gap is the unobstructed vertical distance through air between the lowest point of a water supply outlet and the flood level rim of the fixture (e.g. a bathtub faucet) or vessel into which the outlet discharges. The separation shall be at least twice the diameter of the water supply outlet and never less than one inch (1"). In theory, a well-designed and properly maintained air gap is considered the best means available for protection against backflow. However, it is not always practical and is vulnerable to easy bypass.



What is the Backflow Prevention Program? Why is it important?
Toronto Water delivers safe and clean drinking water through the distribution system. The Safe Drinking Water Act and Ontario Ministry of the Environment (MOE) regulations mandate water purveyors to protect the water supply to the point of delivery. In order to protect the public, the Water Supply Bylaw includes a program for backflow prevention to ensure the safety of drinking water. The program involves the isolation of private water systems from the public waterworks through the installation of a backflow prevention device immediately after the water meter. This is called *premise isolation*.

The Backflow Prevention Program focuses on Industrial, Commercial, and Institutional (ICI) properties, as well as multi-residential properties of five or more units, where there is a greater potential for backflow and contamination to the water supply.

When did the Backflow Prevention Program begin?
The City of Toronto's Water Supply Bylaw (Municipal Code, Chapter 851) was enacted on October 22, 2007 and came into effect on January 1, 2008. This bylaw is a consolidation of all similar bylaws enforced by the former municipalities. Section 8 of the bylaw addresses backflow prevention to ensure the safety of drinking water. The Backflow Prevention Program standardizes and enforces backflow prevention across the city.

What is a water supply cross connection?
A water supply cross connection is any connection or potential connection between the drinking water system and any contaminant that could enter the water distribution system as a result of backflow. This could include a bypass, jumper connection, removable section of pipe, swivel or changeover device, and any other temporary or permanent connecting arrangement.

How can contaminants enter into the water distribution system?
In order for contaminants to enter the drinking water system, a number of factors must be present: a cross connection must exist, a source of contamination must be present, and a backflow event would have to occur as a result of Back-pressure or Back-siphonage.

Who is affected by this bylaw with regard to backflow prevention?
Industrial, Commercial, Institutional (ICI) and Multi-residential Properties (five or more units) that have the potential to contaminate the City's water supply system, must install backflow prevention devices on all connections coming off the City's water supply line. Different industries have different hazard classifications, i.e. a car wash facility or a hospital would be rated as a severe risk, a restaurant or a school would be rated as a moderate risk.

Compliance dates for industries, based on their risk level, are listed in Schedule 5 of the bylaw.

Why are there various compliance dates?
The city would like to protect the water supply from the most severe hazard first, followed closely by those sites that pose a lower hazard.

The implementation of the program is spread out so that the work is manageable for the City, consultants, and the installation contractors.

Why are homes not covered by this bylaw?
Single family homes generally pose the least threat for contamination of the water supply. They are considered a low hazard and no protection is required in the bylaw. However, homeowners can help to protect our water supply and the water within their own homes by installing backflow prevention devices on their garden hoses. They are called hose bibs and they can be purchased from hardware stores. Using a hose bib is not a law, but it is good practice in protecting homeowners and their families from contaminated water. Everybody has a role to play in protecting the health and safety of our drinking water.

What is premise isolation?
Premise isolation is the isolation of a property's private water system from the City's drinking water supply system. This is done downstream of a property's' water service connection (the water meter). It is the isolation of water located within a building, structure or property from the City's water supply and is achieved by installing a backflow prevention device immediately after the water meter.

Is a building permit required to install a backflow prevention device?
Yes, the Water Supply Bylaw Chapter 851 requires a building permit for projects involving new or altered plumbing, including backflow prevention devices.

A permit can be obtained at one of the four Civic Centres, depending where the property is located. For the nearest location, go to:

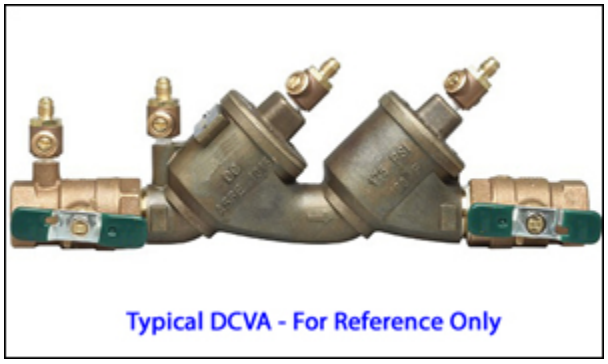
www.toronto.ca/building/customer_service.htm#contact

Does thermal expansion within the private plumbing system need to be addressed?
The building code requires that thermal expansion is addressed within the private plumbing system whenever there is an installation of a backflow prevention device. During the Building Permit process, thermal expansion will have to be dealt with by the applicant within their submission.

Who can apply for a building permit?
The property owner can apply for a building permit, however in many cases; the plumbing contractor will do it on the owner's behalf. For more information, please refer to Toronto Building's Website: www.toronto.ca/building/building_permits.htm

How do I know what type of backflow prevention device my facility requires?
The type of device required for your facility will depend on the hazard level your facility is classified as based on Schedule 5 of The Water Supply Bylaw (chapter 851). The hazard level is determined by the industry sector and the property usage at your facility. Facilities classified as a "moderate hazard" require the installation of a Double Check Valve Assembly (DCVA) device. Facilities classified as a "severe hazard" require the installation of a Reduce Pressure Principle (RP) device.

What is a Double Check Valve Assembly (DCVA) device?
A Double Check Valve Assembly (DCVA) is a mechanical backflow prevention device that consists of two internally loaded check valves. It includes two shut-off valves and four test cocks. With the two check valves in series, a DCVA prevents backflow even if one check valve fails to close tightly. It can be used to prevent backflow due to both Back-siphonage and Back-pressure where a minor or moderate hazard exists. Since no visible warning is given of a failure of check valves, a DCVA must be tested at least annually to ensure proper operation.


Typical DCVA - For Reference Only

What is a Reduced Pressure Principle Backflow Prevention Assembly (RP)?
A Reduced Pressure Principle (RP) is a mechanical backflow prevention device that consists of two independently acting, internally loaded check valves, separated by a reduced pressure zone. During normal operation, the pressure between the two check valves is maintained at a lower pressure than the supply pressure. If either check valve leaks, water will discharge from the relief port. When this happens, maintenance is required. Due to the discharge of water, an RP must be properly installed in an area that has adequate drainage.

A Reduced Pressure Principle includes two shut-off valves and four test cocks. It is designed to isolate severe hazards and must be tested at least once a year.


Typical RP - For Reference Only

How often do backflow prevention devices need to be tested?
In order to ensure the proper operation of a backflow prevention device, it must be tested upon installation, repair, relocation or replacement, and at least once a year thereafter. To ensure that backflow prevention devices are functioning properly, a certified tester must test them annually.

Test reports can be submitted to Toronto Water:

by fax: 416-394-5716
e-mail: backflow@toronto.ca, or
by mail: 30 Dee Avenue, Toronto, ON, M9N 1S9,
Attention: Backflow Prevention.

Will water pressure be reduced within the private plumbing system of a facility due to the installation of a premise isolation backflow device?
Yes, the installation of a backflow device will reduce the water pressure within the facility. Please consult with the plumbing contractor that you selected, to ensure that there will be adequate water pressure after backflow device is installed.

Why do backflow prevention devices need to be tested?
A backflow prevention device may not show visible signs of failure. Backflow prevention assembly devices contain internal seals, springs, and moving parts that are subject to fouling, wear, or fatigue. A backflow prevention assembly device, such as Double Check Valve Assembly (DCVA), or Reduced Pressure Principle Backflow Prevention Assembly (RP), must be tested by a certified individual as listed in Schedule 6 of the bylaw (chapter 681) with a properly calibrated test gauge.

Who is responsible for the installation and annual testing of premise isolation backflow prevention device?
The owner of the property or building that currently has a service connection to the City's water supply or has applied for a new service connection is responsible for the installation of the premise isolation backflow prevention devices, as well the annual testing of the device by a certified tester.

Who is qualified to install backflow prevention devices?
Before hiring an installer or maintenance contractor, ensure that he/she has proper certification.

Backflow prevention devices shall only be installed by an individual with the following accreditation:

- Ontario Water Works Association (OWWA) or equivalent certification as a Cross Connection Control/Backflow Prevention Specialist; and
- A Master Plumber with a City contractor licence; or
- A Journeyman plumber employed by a City-licensed plumbing contractor; or
- An Apprentice plumber who is employed by a City-licensed plumbing contractor and under the direct supervision of a Journeyman Plumber or Master Plumber;

Who is qualified to test backflow prevention devices?
Backflow prevention devices shall only be tested by a certified tester with the following qualifications:

1. Ontario Water Works Association (OWWA) or equivalent certification as a Cross Connection Control/Backflow Prevention Specialist; and
2. A Current calibration certificate for the test equipment (traceable to N.I.S.T.) for one year; and
3. Must be one of the following:
    - Licensed master plumber with a City contractor licence;
    - Journeyman plumber, employed by a licensed plumbing contractor;
    - Apprentice plumber employed by a licensed plumbing contractor and under the direct supervision of a journeyman plumber or master plumber;
    - Professional engineer;
    - Certified engineering technologist under the direction of a professional engineer;
    - Fire system sprinkler fitter;
    - Industrial millwright;

Do test reports need to be submitted on a specific form?
Yes, test reports for back flow prevention devices must be submitted on a City of Toronto Backflow Prevention Device Test Form. Backflow forms and tag templates can be downloaded from our Website:

www.toronto.ca/water/backflow.

I have an old Test Report template form from a previous year; can I continue to use that for annual tests and/or new installations?
No. The old test reports are missing important information that has been added to the newer test reports. Please check our website for the most recent test report version, and use it for any tests conducted.

Do the test tags have specifications?
Device tags may be any size, colour, and made of a moisture resistant material. Section 8, D, (9) of the bylaw only requires that:

"The owner shall cause to be displayed a legibly marked record card on the premise isolation backflow prevention device that indicates the address of the property, the location, type and date of installation of the device, manufacturer, serial number and size of the device, the test date, the tester's initials, the tester's printed name, the printed name of the tester's employer and the tester's certificate number."

Backflow forms and tag templates can be downloaded from our Website: www.toronto.ca/water/backflow. These tags are meant to be used as Templates only; a facility should have its device tags customized without losing the original information.

Do fire protection systems require a backflow prevention device?
In terms of fire protection systems, the Backflow Prevention Program only addresses existing facilities. Only fire systems that contain anti-freeze, foam injection, or other chemical additives or are connected with a private water supply require a Reduce Pressure Principle (RP) backflow prevention device to be installed.

Any changes to a fire protection system shall be done under the direction of a professional engineer who specializes in fire protection systems.
New construction is addressed by the Building Code and § 851-5-M of the Water Supply Bylaw (chapter 851).

What are the fines for non-compliance?
Pursuant to the Sections of Offences and Penalties specified in the Water Supply Bylaw, Toronto Municipal Code Chapter 851-8:

- A person who is convicted of contravention of Section 8 of the Bylaw (Schedule 3) can be fined up to not more than $100,000 for a first offence and any subsequent offence.
- In addition, a corporation that is convicted of contravention of Schedule 3 can be fined up to not more than $100,000 for both a first offence and any subsequent offence.

Are new buildings constructed with backflow prevention devices in place?
All new buildings must conform to current bylaw requirements.

If a business changes from a moderate risk to a high risk, what is the process for compliance?
It is the property owner's responsibility to notify Toronto Water if there is a change from moderate to high risk. Please send your information to:

e-mail: backflow@toronto.ca, fax: 416-394-5716, or

mail: 30 Dee Ave, Toronto, ON, M9N 1S9, attention: Backflow Prevention.

What is a backflow prevention survey?
If an existing facility has more than one water service connection, or has the potential to contaminate the City's water supply system, the General Manager of Toronto Water may require the owner, at the owner's expense, to conduct a backflow prevention devices survey to evaluate potential risks and cross connections that may allow backflow contamination to the public water supply. The survey shall be conducted and signed by an authorised person as well as the facility owner, and a copy must be submitted to the City by the date specified in the General Manager's notification, or within 30 days. A backflow prevention devices survey shall include:

- Number of water service connections with the waterworks;
- Level of hazard for each water service connection;
- Number, type and condition of any existing premise isolation backflow prevention devices;
- Recommended and planned corrective measure(s), if applicable;
- Schedule of work required for any corrective measures;
- Recommendations for appropriate premise isolation backflow prevention device or devices, if applicable, in accordance with the CSA-B64 Standard.

Who is qualified to prepare a backflow prevention device survey?
A backflow prevention devices survey can only be done by a certified individual with the following qualifications:

1. Ontario Water Works Association (OWWA) or equivalent certification as a Cross Connection Control/Backflow Prevention Specialist.
2. Be one of the following:
    - Licensed master plumber with a City contractor license;
    - Journeyman plumber, employed by a licensed plumbing contractor;
    - Professional engineer;
    - Certified engineering technologist under the direction of a professional engineer;

The owner of the property is required to sign the survey report before it is submitted. These documents can be submitted by e-mail: backflow@toronto.ca, fax: 416-394-5716, or mail: 30 Dee Ave, Toronto, ON, M9N 1S9, attention: Backflow Prevention.

Can businesses get a reclassification to low hazard that does not require them to install a backflow device?
Only small dry retail operations with one or two residential apartments above the retail space have been reclassified to a low hazard category. A low hazard category does not require a backflow preventer to be installed at this time. Currently, there are very few reclassifications being given out. If you are a small dry retail operation and do not fall into a category listed in schedule 5 of the bylaw, you could be considered for reclassification. Please contact the Backflow Prevention program at 416-394-8888 (Backflow Voicemail) or by E-mail: backflow@toronto.ca to discuss your facility with us.

For more information:
To learn more, or for inquiries about backflow prevention:

Call: 416-394-8888 (Backflow Voicemail)

E-mail: backflow@toronto.ca

To download a copy of the Water Supply Bylaw, visit:

www.toronto.ca/legdocs/municode/1184_851.pdf.

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Industry Sectors with Severe Hazard Level
Asphalt Paving Mixture & Block Manufacturing
Fire Protection Systems inter-connected with private water system
Fire Protection Systems with chemical additives
Single Residential Dwelling inter-connected with private water system
Waste/Garbage Transfer Station & Disposal Plant
Agricultural/Landscaping Applications
Aircraft Manufacturing
All Printing Industry (excluding dry digital printing)
Allied Services to Manufacturing
Analytical Laboratories
Autobody Refinishing
Automobile Manufacturing
Automotive Repairs & Maintenance
Beverage Manufacturing
Blood Clinic
Breweries
Car Washes
Carpet Cleaners
Chemical Manufacturing
Clinical Laboratories
Commercial Laundry (without dry cleaning)
Cosmetic Product Manufacturing
Death Care Services
Dental Surgery Facility
Distilleries
Dock & Marine Facility
Dry Cleaners
Dye & Pigment Manufacturing
Electroplating, Plating, Polishing, Anodizing, & Colouring
Exhibition Grounds
Food Processing
Gas Stations
Greenhouses
Hospitals
Industrial Laundries
Irrigation Systems (with chemical addition)
Lubricating Oil & Grease Manufacturing
Machine Tool Manufacturing
Machine Tool Operations
Meat Processing & Packaging
Medical Clinic (surgical)
Medical Laboratories

Industry Sectors with Severe Hazard Level
Metal Can Manufacturing
Metal Coating, Engraving
Metal Fabrication
Metal Window & Door Manufacturing
Milk/Dairy Product Processing
Mortuary or Morgue
Motorcycle Repairs & Maintenance
Nonferrous Metal Manufacturing
Other Metal Container Manufacturing
Paint & Coating Manufacturing
Paper & Pulp Processing Plants
Personal Care Products Manufacturing
Petrochemical Manufacturing
Petroleum Bulk Storage Facilities
Petroleum Refining
Pharmaceutical Manufacturing
Photo Finishing
Photographic Film Manufacturing
Photographic Plate / Paper Manufacturing
Plant Using Radioactive Materials
Plastic Manufacturing
Plastic Material & Resin Manufacturing
Power Generating Facility
Premises Where Access Is Prohibited
Printed Circuit Board Manufacturing
Radiator Shop
Recycling Facility
Rendering Facility
Research Buildings & Laboratories
Rubber Manufacturing
Slaughter House
Soap & Detergent Manufacturing
Textile Manufacturing/ Processing
Veterinary Hospital
Wastewater Pumping Stations
Wastewater Treatment Plants & Facilities
Water Filling Station
Water Pumping Stations
Water Treatment Plants
Wineries
Zoo

Industry Sectors with Moderate to Severe Hazard Level
Fire Stations
Funeral Homes/Cemetery
Golf Courses

Industry Sectors with Moderate Hazard Level
Apartment Buildings (five units or more, with shared single-service connection)
Commercial Premises (excluding dry retail operations)
Restaurant (including bar, coffee shop, food courts, lounge, etc.)
Swimming Pools (private with direct connection)
Airports
Animal Shelter
Auto Dealership
Campsite
Commercial Coin Operated Laundry
Dental Office (non-surgical)
Grocery Store
Hair Salon
Hotel & Motel
Irrigation System (without chemical addition)
Kennel
Marina & Yacht Club (pleasure-boat)
Medical Clinic (non-surgical)
Mobile Home Park
Nursing Home
Penitentiary
Sauna & Massage Centre
Schools (elementary, junior high, senior high)
Swimming Pools (public)
Technical Institutes
Townhouse (five units or more, with shared single-service connection)
Universities & Colleges
Veterinary Clinic
Water Park

Appendix 6 - Reported Drinking Sample Results

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Summary of Reported Results

DW System:	260040170, Alvinston Distribution System	**Category:**	LMRS
MOE Area:	Southwestern Region, Sarnia District	**Source:**	Distribution
Health Unit:	Lambton Health Unit	**Regulation:**	O.REG 170/03

Microbiological - Sampling Summary

Location: Distribution:Alvinston Distribution System
Type: Distributed Drinking Water
Filter: >= Jan 1, 2011

Month	EC	TC	HPC	HPC/EC
2011 Dec	12	12	4	33%
2011 Nov	12	12	4	33%
2011 Oct	15	15	5	33%
2011 Sep	12	12	4	33%
2011 Aug	15	15	5	33%
2011 Jul	12	12	4	33%
2011 Jun	12	12	4	33%
2011 May	15	15	5	33%
2011 Apr	12	12	4	33%
2011 Mar	12	12	4	33%
2011 Feb	15	15	5	33%
2011 Jan	15	15	5	33%

Trihalomethanes Samples

Filter: >= Jan 1, 2011

Sampled	Sample ID	Days Elapsed	Results
2011-Nov-02	DW 3210 WALNUT ST ALVINSTON	85	42.0 UG/L
2011-Aug-09	DW 3210 WALNUT ST ALVINSTON	97	72.0 UG/L
2011-May-04	DW 3210 WALNUT ST ALVINSTON	62	29.0 UG/L
2011-Mar-03	DW 3210 WALNUT ST		25.0 UG/L

Lead - Distribution Samples

Sample Period	Avg	Max	Count
2011-Jun-15 **to** 2011-Oct-15	0.12	0.18	2
2010-Dec-15 **to** 2011-Apr-15	1.64	1.66	2
2008-Jun-15 **to** 2008-Oct-15	0.35	1.13	5
2000-Jan-01 **to** 2007-Dec-14	0.50	0.50	2
Summary:	0.57	1.66	11

Lead - Non-Residential Plumbing Samples

Sample Period	Avg	Max	Count
2011-Jun-15 **to** 2011-Oct-15	0.20	0.24	2
2010-Dec-15 **to** 2011-Apr-15	0.44	0.49	2
2008-Jun-15 **to** 2008-Oct-15	0.39	0.84	6
Summary:	0.36	0.84	10

Lead - Private Residential Samples

Sample Period	Avg	Max	Count
2011-Jun-15 **to** 2011-Oct-15	0.39	1.20	20
2010-Dec-15 **to** 2011-Apr-15	0.43	1.35	20
2008-Jun-15 **to** 2008-Oct-15	0.39	1.15	40
Summary:	0.40	1.35	80

Laboratories testing Routine Parameters

Laboratory	Parameter Group	Testing Period
Maxxam Analytics [2292] - Mississauga	Organic Chemical	2008-Oct-27 and 2010-Mar-04

Laboratory	Parameter Group	Testing Period
Maxxam Analytics Inc. - Mississauga	Inorganic Chemical	2006-Jan-16 and 2007-Jan-22
Maxxam Analytics Inc. - Mississauga	Organic Chemical	2006-Jan-16 and 2008-Jul-22

Laboratory	Parameter Group	Testing Period
Sgs Environmental Services - Lakefield	Inorganic Chemical	2008-Aug-29 and 2011-Sep-29
Sgs Environmental Services - Lakefield	Organic Chemical	2010-Mar-15 and 2011-Nov-02

Laboratory	Parameter Group	Testing Period
Sgs Environmental Services - London	Microbiological	2005-Jan-04 and 2011-Dec-28

Appendix 7 - Audit Sample Results

Microbiological Sample Results (Booster Station)

Microbiological Parameter	Result	Units	Qualifier
Total Coliforms	Absent	c/100mL	NDAT
Escherichia coli	Absent	c/100mL	NDAE
Deterioration Indicators	Not Detected	c/100mL	NDDN

Microbiological Sample Results (Sewage Treatment Plant)

Microbiological Parameter	Result	Units	Qualifier
Total Coliforms	Absent	c/100mL	NDAT
Escherichia coli	Absent	c/100mL	NDAE
Deterioration Indicators	Not Detected	c/100mL	NDDN

Microbiological Sample Results (Arena)

Microbiological Parameter	Result	Units	Qualifier
Total Coliforms	Absent	c/100mL	NDAT
Escherichia coli	Absent	c/100mL	NDAE
Deterioration Indicators	Not Detected	c/100mL	NDDN

Chemical Sample Results (Arena)

Parameter	Result		Qualifier		Parameter	Result		Qualifier
1,1,1-trichloroethane	.05	ug/L	<=W		Tert-butyl methyl ether	.05	ug/L	<=W
1,1-dichloroethane	.05	ug/L	<=W		Tetrachloroethene	.05	ug/L	<=W
1,1-dichloroethene	.05	ug/L	<=W		Toluene	.05	ug/L	<=W
1,2-dichlorobenzene	.05	ug/L	<=W		trans-1,2-dichloroethene	.05	ug/L	<=W
1,2-dichloroethane	.05	ug/L	<=W		Trichloroethene	.05	ug/L	<=W
1,2-dichloropropane	.05	ug/L	<=W		1,1,2-trichloroethane	.1	ug/L	<=W
1,3-dichlorobenzene	.05	ug/L	<=W		1,2-dibromoethane	.1	ug/L	<=W
1,4-dichlorobenzene	.05	ug/L	<=W		1,1,2,2-tetrachloroethane	.2	ug/L	<=W
Benzene	.05	ug/L	<=W		Carbon tetrachloride	.2	ug/L	<=W
Chlorobenzene	.05	ug/L	<=W		Dichloromethane	.2	ug/L	<=W
Chloroethene	.05	ug/L	<=W		Lead	.3	ug/L	+/-0.16
cis-1,2-dichloroethene	.05	ug/L	<=W		Bromoform	.5	ug/L	<=W
Diisopropylether	.05	ug/L	<=W		Dichloroacetonitrile	.5	ug/L	<=W
Ethylbenzene	.05	ug/L	<=W		Dibromochloromethane	3.0	ug/L	
m- and p-xylene	.05	ug/L	<=W		Bromodichloromethane	7.0	ug/L	
o-xylene	.05	ug/L	<=W		Chloroform	22.1	ug/L	
Styrene	.05	ug/L	<=W		Trihalomethanes; total	32.0	ug/L	

Explanatory Notes

Qualifier	Explanation
<=W	No Measurable Response (Zero): <Reported Value
<T	A Measurable Trace Amount: Interpret With Caution
NDAT	No Data: Absent
NDAE	No Data: Absent
NDDN	No Data: Not Detected

Appendix 8 - Drinking Water System Dossier (excerpts)

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021 - Drinking Water System Dossier for 260040170

Drinking Water System Profile Information

DWS #	260040170
Registration Date (yyyy/mm/dd)	2004/06/29
MOE Assigned Name	Alvinston Distribution System
Category	LMRS
Regulation Short Name	O.REG 170/03
DWS Type	Distribution System
Source Type	Distribution
Address	3188 Church Street, Alvinston, Ontario, Canada, N0N 1A0
Region	Southwestern Region
District	Sarnia District
Municipality	Brooke-Alvinston
Public Health Unit	Lambton Health Unit

DWS OPERATIONAL INFORMATION

Population:	1,000
LSN Compliance Status:	*Complete LSN*
24/7 Contact	Mike Weber, Senior Operator
24/7 Contact Info	p: (519)8982047, f: (519)8985684, e: mweber@ocwa.com, c: (519)3843029, pg: (519)3333150

DWS OWNER INFORMATION

Owner Legal Name	Brooke-Alvinston, The Corporation Of The Township Of
Owner Address	3236 River St,Post Office Box Delivery ,28,Alvinston,Ontario,N0N 1A0
Owner Contact	Richard Holland, Treasurer/Administrator
Owner Contact Info	p: (519)8982173, f: (519)8985653, e: rholland@amtelecom.net
Owner Alternate Contact	Randy Hills, Public Works Manager
Owner Alternate Contact Info	p: (519)8982173, f: (519)8985653, e: tbaroads@brktel.on.ca

DWS OPERATING AUTHORITY INFORMATION

Op. Authority Legal Name	Ontario Clean Water Agency
Op. Authority Contact	Terry Bender, Operations Manager
Op. Authority Contact Info	p: (519)3447429 x252, f: (519)3444337, e: tbender@ocwa.com
Op. Authority Alternate Contact	Mike Weber, Senior Operator
Op. Authority Alternate Contact Info	p: (519)8450098, f: (519)8450982, e: mweber@ocwa.com

021 - Drinking Water System Dossier for 260040170

Laboratory Service Notification (LSN) Information

Inorganic Chemical

O. Reg. 170 Parameter Name	LSN Effective Date	Lab Name
Lead	2004-11-17	Maxxam Analytics Inc. - Mississauga
	2008-02-13	Sgs Environmental Services - Lakefield
	2008-09-26	Maxxam Analytics [2292] - Mississauga

Microbiological

O. Reg. 170 Parameter Name	LSN Effective Date	Lab Name
Escherichia Coli	2004-11-17	Sgs Environmental Services - London
Heterotrophic Plate Count (Hpc)	2004-11-17	Sgs Environmental Services - London
Total Coliform	2004-11-17	Sgs Environmental Services - London
Total Coliform Background	2004-11-17	Sgs Environmental Services - London

Organic Chemical

O. Reg. 170 Parameter Name	LSN Effective Date	Lab Name
Trihalomethanes (Total)	2004-11-17	Maxxam Analytics Inc. - Mississauga
	2008-02-13	Sgs Environmental Services - Lakefield
	2008-09-26	Maxxam Analytics [2292] - Mississauga