



Ministry of the Environment and Climate Change

**CASSELMAN DRINKING WATER SYSTEM
Inspection Report**

Site Number:	210001219
Inspection Number:	1-BZKUB
Date of Inspection:	Jan 13, 2016
Inspected By:	Christina DesRochers

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OWNER INFORMATION:

Company Name: CASSELMAN, THE CORPORATION OF THE VILLAGE OF
Street Number: 751 **Unit Identifier:**
Street Name: ST. JEAN St
City: CASSELMAN
Province: ON **Postal Code:** K0A 1M0

CONTACT INFORMATION

Type: Operator **Name:** Alain Castonguay
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Title: Program Coordinator, Safe Water - Eastern Ontario Health Unit

INSPECTION DETAILS:

Site Name: CASSELMAN DRINKING WATER SYSTEM
Site Address: 832 LAVAL ST CASSELMAN K0A 1M0
County/District: Casselman
MOECC District/Area Office: Cornwall Area Office
Health Unit: EASTERN ONTARIO HEALTH UNIT
Conservation Authority: N/A
MNR Office: N/A
Category: Large Municipal Residential

Site Number: 210001219
Inspection Type: Unannounced
Inspection Number: 1-BZKUB
Date of Inspection: Jan 13, 2016
Date of Previous Inspection: Dec 03, 2014

COMPONENTS DESCRIPTION

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

Site (Name): RAW WATER
Type: Source **Sub Type:** Surface
Comments:

The Casselman Water Treatment Plant draws water from the South Nation River. The intake crib is located in the middle of the river at a depth of 7 m below mean river level. Raw water is drawn through a wire mesh screen at the intake and flows into a raw water well (equipped with three low lift pumps, an inlet gate and removable screens) situated below the water treatment plant located at 832 Laval Street on the South Bank of the South Nation River in the Village of Casselman.

Site (Name): TREATED WATER
Type: Treated Water POE **Sub Type:** Treatment Facility
Comments:

The Casselman Water Treatment Plant is located at 832 Laval Street, Casselman, Ontario. At the treatment plant raw water from the South Nation River flows into a raw water well where it receives potassium permanganate. Water is fed through the raw water header where it may receive sodium hydroxide (no longer in use), an injection of aqueous chlorine solution (mix of chlorine gas and treated water), and receives coagulant upstream of the in-line static mixer. Water is then pumped into one of two Actiflo® process units that provide coagulation, flocculation, clarification, and filtration. Effluent from the Actiflo® units is then directed to the filtered water holding tank from which it is pumped through a header pipe that receives an injection of aqueous chlorine solution (mix of chlorine gas and treated water). The chlorinated water is then directed through one of two parallel UV reactors. Water then flows to a 415 m3 baffled clearwell located beneath the treatment plant, and a 440 m3 clearwell located adjacent to the main building where it is pumped alternately by three high lift vertical turbine high lift pumps into the distribution system. Chemical Feed Systems include: i) Coagulant Feed System consisting of four 5000 L capacity polyethylene coagulant storage tanks; 2 variable speed metering pumps to feed alum into the raw water header upstream of the in-line static mixer; ii) Polymer Feed System consisting of one 2270 L polyethylene solution storage tank and mixer with 3 variable speed metering pumps to feed polymer into the injection tank, coagulation tank and hydrocyclone on the treatment units; iii) Chlorination System consisting of 2 wall mounted vacuum chlorinators with automatic switchover regulators to draw chlorine gas from cylinders and blend with treated water to create an aqueous chlorine solution for feeding into the raw water header and the filtered water header.

GPS coordinates: NAD 83, Zone 18, 0492370 E / 5017559 N.

Site (Name): DISTRIBUTION SYSTEM**Type:** Other**Sub Type:** Other**Comments:**

The distribution system consists of approximately 20 km of PVC watermains that were installed in 1976 and 1977. The system supplies water to approximately 1000 service connections that serve a population of approximately 2,835. The operating authority stated that there were 128 hydrants installed on the system.

Site (Name): WATER TOWER**Type:** Other**Sub Type:** Reservoir**Comments:**

A 1,575 cubic meter capacity elevated storage tank is located at 758 Breboeuf Street. It is a steel tank that sits atop a concrete pedestal.

GPS coordinates: NAD 83, Zone 18, 0493526 E / 5017933 N.

INSPECTION SUMMARY

INTRODUCTION

- * **The primary focus of this inspection is to confirm compliance with Ministry of the Environment and Climate Change (MOECC) legislation as well as evaluating conformance with ministry drinking water policies and guidelines during the inspection period. The ministry utilizes a comprehensive, multi-barrier approach in the inspection of water systems that focuses on the source, treatment, and distribution components as well as management practices.**

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 inspection report does not suggest that all applicable legislation and regulations were evaluated. It remains the responsibility of the owner to ensure compliance with all applicable legislative and regulatory requirements.

This inspection covers the period from December 1, 2014 to January 1, 2016. Specifically this inspection examines compliance with Municipal Drinking Water Licence #173-101, Drinking Water Works Permit #173-201, and Permit to Take Water #6067-9EGMS2, in addition to relevant Ministry of the Environment and Climate Change (MOECC) legislation as addressed in specific inspection questions.

The inspection began January 13, 2016 when the unannounced physical inspection of Casselman Drinking Water System (DWS) was conducted consisting of a visual inspection of the treatment facility, including instrumentation and controls, physical inspection of the elevated storage tank, inspection interviews and review of operational information and log books also took place at that time.

Operational responsibility for the Casselman DWS is held by the owner, The Corporation of the Village of Casselman (Village).

Additional review of documentation and information relevant to the inspection were conducted at Ministry offices.

SOURCE

- * **The drinking water system management was aware of the potential sources of pollution or activities that could impair source water quality as contained in the approved Assessment Report.**

South Nation Source Protection Area Assessment Report, Table 5.19.9: Significant Drinking Water Threat Activities, Casselman, identifies both threat activities and counts of each type of activity located within the Village of Casselman Source Protection Area.

The application of pesticides to land, storage of agricultural source material, handling and storage of fuel, and private septic systems are identified in the Report as the most numerous threat activities.

PERMIT TO TAKE WATER

- * **The owner had a valid PTTW for all of the production sources.**

PTTW #6067-9EGMS2 was issued to the Village of Casselman on December 17, 2013.

PERMIT TO TAKE WATER

- * **The maximum water takings were in accordance with those allowed under the PTTW.**

PTTW #6067-9EGMS2 authorizes the Village of Casselman to take a maximum of 3,182,200 L/day (3,182 m³/day,) from the South Nation River for the purposes of municipal water supply.

The maximum daily raw water flow into the Casselman water treatment plant (WTP) during the inspection review period was 1,862 m³/day.

- * **The PTTW imposed additional monitoring or recording requirements and the owner had complied with the conditions of the PTTW.**

PTTW #6067-9EGMS2, 4. Monitoring requires:

4.1 The Permit Holder shall maintain a record of all water takings. This record shall include the dates and times of water takings, and the total measured amounts of water pumped per day for each day that water is taken under the authorization of this Permit. A separate record shall be maintained for each source. The Permit Holder shall keep all required records up to date and available at or near the site of the taking and shall produce the records immediately for inspection by a Provincial Officer upon his or her request.

4.2 The total amounts of water pumped shall be measured using a properly calibrated flow meter and totalizer.

Records were maintained as required during the inspection review period.

CAPACITY ASSESSMENT

- * **There was sufficient monitoring of flow as required by the Permit and Licence or Approval issued under Part V of the SDWA**

MDWL #173-101 Schedule C, 2.0 Flow Measurement and Recording Requirements states:

2.1 For each treatment subsystem identified in column 1 of Table 1 and in addition to any other flow measurement and recording that may be required, continuous flow measurement and recording shall be undertaken for:

2.1.1 The flow rate and daily volume of treated water that flows from the treatment subsystem to the distribution system.

2.1.2 The flow rate and daily volume of water that flows into the treatment subsystem.

Casselman DWS is equipped with two raw water flow meters, one located on each inlet line to the two treatment trains, one flow meter located post-filter measuring the flow volume of filtered water entering the filtered water holding tank, and one treated water flow meter located past the highlift pumps.

Additionally, each of the three filters are equipped with a filtered water flow meter

- * **Flow measuring devices were calibrated or verified in accordance with the requirements of a Permit and Licence or Approval issued under Part V of the SDWA.**

Flow measuring devices are calibrated annually. The most recent calibrations of raw, treated, filtered, and backwash water flow meters was conducted on June 22, 2015 by Franklin Empire Inc.

- * **The owner was in compliance with the conditions associated with maximum flow rate or the rated capacity conditions in the Permit and Licence or Approval issued under Part V of the SDWA.**

MDWL #173-101 Schedule C, 1.0 Performance Limits, 1.1 Rated Capacity states that the maximum daily volume of treated water that flows from the treatment subsystem to the distribution system shall not exceed 3,182 m³/day.

At no time during the inspection review period did the flow into the treatment system exceed the rated capacity. The maximum daily treated flow into the distribution system during the inspection review period was 1,784 m³/day.

CAPACITY ASSESSMENT

- * **Records of flows and any capacity exceedances were made in accordance with the Permit and Licence or Approval issued under Part V of the SDWA.**

Records are maintained daily of raw water flows into the treatment system, filtered water flow, and treated water flow into the distribution system.

There were no capacity exceedances during the inspection period.

TREATMENT PROCESSES

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

- * **Records indicated that the treatment equipment was operated in a manner that achieved the design capabilities required under Ontario Regulation 170/03 or a Permit, Licence or Approval issued under Part V of the SDWA at all times that water was being supplied to consumers.**

Filter effluent turbidity is monitored continuously at all filters and coagulant dosing is trended continuously via SCADA.

The filter effluent turbidity met the performance criterion of less than or equal to 0.3 NTU in 95% of the measurements each month.

The Ultraviolet (UV) light reactor system used for primary disinfection provided a minimum dose of 40 mJ/cm² at all times water was distributed to users.

- * **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.**

- * **The primary disinfection equipment was equipped with alarms or shut-off mechanisms that satisfied the standards described in Section 1-6 (1) of Schedule 1 of Ontario Regulation 170/03.**

The UV reactors in the Casselman DWS are equipped with alarms and lockouts which initiate a plant shutdown in the event that the UV dose drops below the required 40 mJ/cm².

- * **The owner had evidence indicating that all chemicals and materials that come in contact with water within the drinking water system met the AWWA and ANSI standards in accordance with the Permit and Licence issued under Part V of the SDWA.**

A review of purchase invoices provided by chemical suppliers indicated that gaseous chlorine, soda ash, potassium permanganate, and PAS-8 used at the Casselman WTP met NSF/ANSI standards.

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

Plans for the treatment and distribution systems are maintained and housed at the Casselman WTP offices.

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

TREATMENT PROCESSES

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

The Operator-in-Charge (OIC) performs daily rounds of the treatment system and monitoring equipment. Any abnormal operational situations/results, as well as maintenance/follow-up, are recorded in the system logbook.

Operators can review current treatment conditions and process values, recent trends, and set points and alarms through the SCADA system.

- * **Where a potential bypass of primary or secondary treatment equipment existed, measures were taken to ensure that raw or partially treated water was not directed to the distribution system.**

Piping to bypass the UV disinfection units, directing partially treated water from the filtered water holding tank to the clearwell, was constructed as part of the original system design. This pipe is blocked with a bolted steel flange.

- * **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.**

All material entering the floor drains is directed to the sanitary sewer system.

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

While there is no bylaw in place restricting the use of pesticides on properties adjacent to the WTP, there is no storage or application of pesticides on-site.

TREATMENT PROCESS MONITORING

- * **Operators were aware of the operational criteria necessary to achieve primary disinfection within the drinking water system.**

Operators are aware of the required filter effluent criteria of less than 0.3 NTU in 95% of measurements taken per month and the minimum required UV dosage (40 mJ/cm²) required to meet the requirements of primary disinfection.

- * **Continuous monitoring of each filter effluent line was being performed for turbidity.**

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

Secondary disinfectant residual in the distribution system is monitored continuously via online analyzer located at the Casselman Sewage Pumping Station.

- * **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.**

Casselman DWS utilizes free chlorine for secondary disinfection; all distribution residual samples were below 4.0 mg/L.

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

Review of system logbooks confirms that continuous monitoring data are reviewed daily (every 24 hours), including weekends and statutory holidays.

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

HACH handheld colourimeters, calibrated annually, are used for analysis of chlorine residual in conjunction with microbiological testing.

TREATMENT PROCESS MONITORING

- * **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.**

Turbidity, on each of three filter effluent lines, and UV dose are continuously monitored. If turbidity exceeds 0.80 NTU or UV dose drops below 40 mJ/cm² an alarm is triggered and the interlock systems shut down the plant immediately.

- * **Continuous monitoring equipment that was being utilized to fulfill O. Reg. 170/03 requirements was performing tests for the parameters with at least the minimum frequency specified in the Table in Schedule 6 of O. Reg. 170/03 and recording data with the prescribed format.**
 - * **The owner and operating authority ensured that the primary disinfection equipment had a recording device that continuously recorded the performance of the disinfection equipment.**
- UV dose, transmittance, lamp cycle, and system run time are monitored continuously via SCADA system.
- * **All continuous analysers were calibrated, maintained, and operated, in accordance with the manufacturer's instructions or the regulation.**

Online chlorine and turbidity analyzers, and raw, filtered, and backwash flowmeters were most recently calibrated by Franklin Empire on June 22, 2015. Handheld turbidimeters, colourimeters, spectrophotometers, and pH meters were most recently calibrated by HACH Service Plus on March 16, 2015.

PROCESS WASTEWATER

- * **The process wastewater and residual solids/sludges were being treated, handled and disposed of in accordance with the design requirements approved under the Permit and Licence or Approval issued under Part V of the SDWA.**

DWWP #173-201 Schedule A, Drinking Water System Description, Plant Residuals Management outlines two systems:

1. Filter backwash residuals treatment, consisting of one settling tank with settled sludge being pumped to the sanitary sewer and supernatant liquid discharged to the South Nation River; and
2. Clarification process residuals treatment, consisting of one settling tank with settled sludge pumped to the sanitary sewer and supernatant liquid discharged to the South Nation River.

- * **The process wastewater discharge quality and discharge monitoring program complied requirements established in the Permit and Licence or Approval issued under Part V of the SDWA.**

MDWL #173-101 Schedule C: System Specific Conditions, 1.0 Performance Limits, 1.5 Residue Management, identifies that the annual average of suspended solids in the effluent discharged from the waste residual management works shall not exceed 25 mg/L.

Further, 4.0 Additional Sampling, Testing and Monitoring, Environmental Discharge Parameters requires that manual composite samples (meaning at least three grab samples taken during a discharge event) be collected monthly for analysis of suspended solids from the point of discharge of the works.

Samples are collected as required for both filter backwash and Actiflo clarifier supernatant.

The annual averages of suspended solids discharged from filter backwash and clarifier residuals management systems in 2015 were 4.25 mg/L and 4.53 mg/L respectively.

DISTRIBUTION SYSTEM

DISTRIBUTION SYSTEM

- * **The owner had up-to-date documents describing the distribution components as required.**

- * **There is a backflow prevention program, policy and/or bylaw in place.**

Municipal policy, informed by the Ontario Building Code, dictates that backflow prevention devices be installed at all commercial and industrial service connections.

- * **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.**

As part of Quality Management System accreditation, a formalized maintenance schedule for the two reservoirs was enacted. One reservoir, alternating each year, is removed from service, inspected, and any required maintenance is performed.

The interior of the water tower was inspected and recoated approximately five years ago; Village of Casselman staff report that maintenance of the tower takes place on an as needed basis.

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

DWWP #173-201, Schedule B, Condition 2.3 requires disinfection in accordance with AWWA standards. All relevant AWWA standards are available at the Casselman WTP for operator use.

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

Village of Casselman Standard Operating Procedures (SOP) describe the requirements for full distribution system flushing to take place 3 to 4 times annually.

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

Microbiological and associated distribution chlorine residual samples are routinely collected from far points in the distribution system.

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

The Village of Casselman purchased a valve turning device in 2015. Staff estimate that roughly 75% of valves were exercised in 2015. Staff report that all valves will be exercised in 2016 and in each year going forward.

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

Hydrants are inspected and operated 3-4 times annually in conjunction with the distribution flushing program.

Ongoing preventative maintenance initiatives result in 5-10 hydrants per year undergoing upgrades or maintenance.

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

The municipality restricts hydrant use to Village of Casselman utilities staff and firefighting activities.

DISTRIBUTION SYSTEM

- * **The owner has undertaken efforts to identify, quantify and reduce sources of apparent water loss.**

All service connections within the distribution system are metered. Village of Casselman staff are able to perform comparisons of volumes of water purchased to volumes of water supplied to the distribution system.

Pressure losses reported by users or identified by pressure monitoring at the WTP and tower, as well as upwelling/sinkholes, will be used to identify potential sources of water loss in the system as they arise.

- * **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.**

A pressure monitor is located on the distribution system header and pressure readings are displayed at the Casselman WTP main office via analogue gage. The SCADA system continuously monitors level and associated pressure at the water tower.

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

Distribution system pressure, constant at 52 psi under normal operating conditions, is recorded on daily log sheets and tower pressure is trended via SCADA system.

OPERATIONS MANUALS

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

Operations and maintenance manuals for the WTP and distribution infrastructure are available to operators at the WTP offices.

Further, a "maintenance board", identifying various maintenance tasks and associated cycles is located in the office for operator use.

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

MDWL #173-101, Schedule B 16.0 Operation and Maintenance Manual requires,

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;

LOGBOOKS

LOGBOOKS

- * **Logs for the drinking water subsystem(s) contained the required information.**
- * **Logbook entries were made in chronological order.**
- * **The record system allowed the reader to unambiguously identify the person who made the logbook entry.**
- * **Entries in the logbook were made only by appropriate and authorized personnel.**
- * **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.**
- * **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.**

A review of log books and Chain of Custody documents confirms that all required information was recorded.

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

Any adjustments to treatment equipment were clearly recorded in log books.

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

Historical log books are kept onsite at the WTP offices.

CONTINGENCY/EMERGENCY PLANNING

- * **Spill containment was provided for process chemicals and/or standby power generator fuel.**

All process chemicals are stored within lipped secondary containment.

The emergency generator fuel container is double walled.

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

Chemical neutralizers are stored on-site to respond to spills localized in and around the WTP.

The Village of Casselman owns and maintains a dedicated mobile emergency response spill containment trailer for use at larger spill scenarios (i.e. to the South Nation River). The trailer contents include but are not limited to river booms, clean up materials, and personal protective equipment.

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

The emergency generator is exercised monthly under partial load and full load test runs are scheduled every two years.

A recent power outage resulted in the generator running without difficulty under full load.

SECURITY

SECURITY

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

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

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

The Casselman WTP and water tower are equipped with contact alarms and mechanical locks. In addition, the treatment facility is fenced and monitored by Ranguard Security from Cornwall, Ontario.

CONSUMER RELATIONS

- * **Required documents were available free-of-charge during normal business hours at a location accessible to the public.**
- All required documents are available at the WTP.
- * **The owner did take effective steps to advise users of the water system of the availability of Annual Reports, including posting a copy on a web site, if applicable.**

The Annual Report is posted to the Village of Casselman website and hard copies are available at the WTP.

CERTIFICATION AND TRAINING

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

Subsection 23(1) of O.Reg. 128/04 states that a municipal residential drinking water system must have a designated overall responsible operator (ORO). The ORO shall be an operator who holds a certificate for that type of subsystem and that is of the same class or higher than the class of that subsystem.

The Casselman WTP was classified as a Class II Water Treatment Subsystem on November 26, 2015.

The current overall responsible operator (ORO) holds Water Treatment IV and Water Distribution II licences.

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

Operator in charge (OIC) duties are assigned rotationally, based on scheduling needs, to all operators meeting the required levels of certification.

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

An appropriately certified operator from the Village of Casselman staff is onsite for all activities undertaken by uncertified persons.

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

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

CERTIFICATION AND TRAINING

- * **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.**

Operator licence certificates are displayed at the Village of Casselman WTP.

- * **The subsystem had been replaced or altered, since the issuance of the existing subsystem certificate of classification and the owner applied for the re-determination of the type and class of the subsystem or had determined that the alteration(s) was not sufficient to trigger an application.**

An application for reclassification was submitted in advance of the installation of a chloramination system. The Village of Casselman intends to implement the use of chloramine for secondary disinfection purposes in Spring 2016.

The Casselman WTP, previously classified as Class III, was reclassified as a Class II system on November 26, 2015.

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

The certificates are posted in the WTP offices.

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

The current ORO is considered to be on call at all times. The ORO travels with a telephone to remain in contact with operators and laptop computer capable of securely accessing SCADA information remotely.

A back-up ORO has been appointed by resolution of Municipal Council in the event of the ORO being unable to act.

- * **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.**

WATER QUALITY MONITORING

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

O. Reg. 170/03 10-4 states:

10-4(1) The owner of a drinking-water system and the operating authority for the system shall ensure that a water sample is taken at least once every week from the drinking-water system's raw water, before any treatment is applied to the water.

and

(3) The owner of the drinking-water system and the operating authority for the system shall ensure that each of the samples taken under subsection (1) is tested for, (a) *Escherichia coli*; and; and (b) total coliforms.

Samples were collected and analyzed as required during the inspection review period.

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

O. Reg. 170/03 10-2 states:

10-2. (1) The owner of a drinking water system and the operating authority for the system shall ensure that,

WATER QUALITY MONITORING

(a) if the system serves 100,000 people or less, at least eight distribution samples, plus one additional distribution sample for every 1,000 people served by the system, are taken every month, with at least one of the samples being taken in each week; and

(2) The owner of the drinking water system and the operating authority for the system shall ensure that each of the samples taken under subsection (1) is tested for,

(a) *Escherichia coli*; and

(b) total coliforms.

(3) The owner of the drinking water system and the operating authority for the system shall ensure that at least 25 per cent of the samples required to be taken under subsection (1) are tested for general bacteria population expressed as colony counts on a heterotrophic plate count.

Based on current population, Casselman DWS is required to collect a minimum of eleven samples per month, with at least one sample collected each week.

A minimum of twelve samples per month, habitually three samples per week, are collected from Casselman DWS distribution system and analyzed as required. One of every three weekly samples is also analyzed for heterotrophic plate count.

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

O. Reg. 170/03010-3 states:

10-3. The owner of a drinking water system and the operating authority for the system shall ensure that a water sample is taken at least once every week and tested for,

(a) *Escherichia coli*;

(b) total coliforms; and

(c) general bacteria population expressed as colony counts on a heterotrophic plate count.

Samples were collected and analyzed as required during the inspection review period.

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

Per O. Reg. 170/03, sampling frequency for any parameter of Schedule 23, provided previous sample results have not exceeded one-half MAC, is one sample every 12 months for a surface water system.

The most recent samples for analysis of Schedule 23 parameters were collected April 14, 2015 and the previous sample was collected on April 22, 2014.

These dates satisfy the requirements of the regulation.

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

Per O. Reg. 170/03, sampling frequency for any parameter of Schedule 24, provided previous sample results have not exceeded one-half MAC, is one sample every 12 months for a groundwater system.

The most recent samples for analysis of Schedule 24 parameters were collected April 14, 2015 and the previous sample was collected on April 22, 2014.

These dates satisfy the requirements of the regulation.

WATER QUALITY MONITORING

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

O. Reg. 170/03 13-6 states:

(1) The owner of a drinking water system that provides chlorination or chloramination and the operating authority for the system shall ensure that at least one distribution sample is taken in each calendar quarter, from a point in the drinking water system's distribution system, or plumbing that is connected to the drinking water system, that is likely to have an elevated potential for the formation of trihalomethanes.

(2) The owner of the drinking water system and the operating authority for the system shall ensure that each of the samples taken under subsection (1) is tested for trihalomethanes.

Further, O. Reg. 170/03 6-1.1 states:

(4) If this Regulation or an approval, municipal drinking water licence or order, including an OWRA approval or OWRA order, requires at least one water sample to be taken every three months or in each calendar quarter and tested for a parameter, the owner of the drinking water system and the operating authority for the system shall ensure that at least one sample that is taken during a three-month period or calendar quarter for the purpose of being tested for that parameter is taken at least 60 days, and not more than 120 days, after a sample was taken for that purpose in the previous three-month period or calendar quarter.

Samples were collected for analysis of trihalomethanes on December 8, 2014, January 5, April 8, July 13 and December 21, 2015 and January 5, 2016. While these dates were intended to meet the requirement of sampling "quarterly", they do not satisfy the requirement to collect samples a least 60 days and not more than 120 days after the previous sample.

Going forward from the most recent sampling date, January 5, 2016, Village of Casselman staff shall insure that sampling for trihalomethanes is conducted within required timeframes.

- * **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.**

Samples are collected from extremities of the distribution system, at points representing higher than average residence times.

- * **All nitrate/nitrite water quality monitoring requirements prescribed by legislation were conducted within the required frequency for the DWS.**

O. Reg. 170/03 13-7 states:

The owner of a drinking water system and the operating authority for the system shall ensure that at least one water sample is taken every three months and tested for nitrate and nitrite.

Further, O. Reg. 170/03 6-1.1 states:

(4) If this Regulation or an approval, municipal drinking water licence or order, including an OWRA approval or OWRA order, requires at least one water sample to be taken every three months or in each calendar quarter and tested for a parameter, the owner of the drinking water system and the operating authority for the system shall ensure that at least one sample that is taken during a three-month period or calendar quarter for the purpose of being tested for that parameter is taken at least 60 days, and not more than 120 days, after a sample was taken for that purpose in the previous three-month period or calendar quarter.

Samples were collected for analysis of nitrate and nitrite on December 8, 2014, January 5, April 8, July 20 and December 21, 2015 and January 5, 2016. While these dates were intended to meet the requirement of sampling "quarterly", they do not satisfy the requirement to collect samples a least 60 days and not more than 120 days after the previous sample.

Going forward from the most recent sampling date, January 5, 2016, Village of Casselman staff shall insure that sampling for nitrate and nitrite is conducted within required timeframes.

WATER QUALITY MONITORING

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

O. Reg. 170/03 Schedule 13-8 requires sampling and analysis of sodium every 60 months.

Further, O. Reg. 170/03 6-1.1 states:

(7) If this Regulation or an approval, municipal drinking water licence or order, including an OWRA approval or OWRA order, requires at least one water sample to be taken every 60 months and tested for a parameter, the owner of the drinking water system and the operating authority for the system shall ensure that at least one sample that is taken during a 60-month period for the purpose of being tested for that parameter is taken not more than 90 days before or after the fifth anniversary of the day a sample was taken for that purpose in the previous 60-month period.

A sample was collected for sodium analysis on January 5, 2015 and as results exceeded the reportable limit of 20 mg/L, a resample was collected on January 13, 2015. The previous sample was collected on May 3, 2015.

These dates do not satisfy the requirement to collect samples not more than 90 days before after the fifth anniversary of the previous sample.

Going forward from the most recent sampling date, January 5, 2016, Village of Casselman staff shall insure that sampling for sodium is conducted within required timeframes.

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

O. Reg. 170/03 Schedule 13-9 requires sampling and analysis of fluoride every 60 months.

A sample for analysis of fluoride was collected on April 14, 2015. The previous sample was collected on April 5, 2013.

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

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

Casselman DWS is currently eligible to conduct lead sampling according to the reduced sampling schedule outlined in Schedule 15.1-5 Reduced Sampling. Further, Casselman DWS qualifies for exemption from the requirements to collect samples from plumbing.

Sampling may therefore to be conducted according to the following requirements:

-samples collected for analysis of pH and alkalinity during every sampling period (December 15-April 15 and June 15-October 15)

-samples collected from a number of points in the distribution system identified in the Reduced Sampling table for analysis of lead must be collected during both sampling periods every third 12-month period (every three years).

Samples were collected from two points in the distribution system on April 14 and October 13, 2015. Samples were collected as required for analysis of pH and alkalinity.

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

WATER QUALITY MONITORING

- * **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.**

All samples collected in the Casselman DWS are analyzed by Caduceon Environmental Laboratories.

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

Historical operational data, log books, daily/monthly summary sheets, and other required documents are stored at the Casselman WTP offices.

WATER QUALITY ASSESSMENT

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

REPORTING & CORRECTIVE ACTIONS

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

In response to AWQI #122190, sodium in exceedance of the reportable limit (20 mg/L) at 36.4 mg/L on January 5, 2015, a resample was collected on January 13, 2015. The resample was also in exceedance of the limit at 54.3 mg/L.

A public notice was issued on January 21, 2015 by the Eastern Ontario Health Unit advising users of the exceedance and encouraging individuals requiring reduced sodium diets to contact their physicians for personalized guidance on the consumption of municipal water.

- * **All required notifications of adverse water quality incidents were immediately provided as per O. Reg. 170/03 16-6.**

- * **All required written notices of adverse water quality incidents were provided as per O. Reg. 170/03 16-7.**

- * **In instances where written notice of issue resolution was required by regulation, the notice was provided as per O. Reg. 170/03 16-9.**

- * **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.**

REPORTING & CORRECTIVE ACTIONS

- * **When the primary disinfection equipment, other than that used for chlorination or chloramination, has failed causing an alarm to sound or an automatic shut-off to occur, a certified operator responded in a timely manner and took appropriate actions.**

A review of logbooks clearly demonstrate that Village of Casselman certified operators responded as required to all instances when the UV disinfection system was in alarm.

- * **The Annual Report containing the required information was prepared by February 28th of the following year.**

The 2014 Annual Report was prepared as required and was accepted by resolution of the Village of Casselman municipal council in March 2015.

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

The 2014 Summary Report was prepared as required and was accepted by resolution of the Village of Casselman municipal council in March 2015.

- * **The owner had evidence that all required notifications to all legal owners associated with the Drinking Water System had been made during the inspection period.**

When originally issued, the MDWL and DWWP were accepted by resolution of the Village of Casselman municipal council.

Village of Casselman operational policy dictates that all issued/renewed reports and control documents be presented to municipal council for acceptance through resolution. A binder containing copies of all resolutions is available for review in the Casselman WTP office.

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 RECOMMENDATIONS AND BEST PRACTICE ISSUES

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

Not Applicable

SIGNATURES

Inspected By:

Christina DesRochers

Signature: (Provincial Officer):



Reviewed & Approved By:

James Mahoney

Signature: (Supervisor):



Review & Approval Date: 16/02/2016 (dd/mm/yyyy)

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



APPENDIX A
MUNICIPAL DRINKING WATER LICENCE
DRINKING WATER WORKS PERMIT



MUNICIPAL DRINKING WATER LICENCE

Licence Number: 173-101

Issue Number: 1

Pursuant to the *Safe Drinking Water Act, 2002*, S.O. 2002, c. 32, and the regulations made thereunder and subject to the limitations thereof, this 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 Village of Casselman

**751 St.-Jean St. Box 710
Casselman
ON K0A 1M0**

For the following municipal residential drinking water system:

Casselman Drinking Water 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 15th day of April, 2011

Signature

A handwritten signature in black ink, appearing to read "I. Prashad".

Indra R. Prashad, P.Eng.
Director
Part V, *Safe Drinking Water Act, 2002*

Schedule A: Drinking Water System Information

System Owner	The Corporation of the Village of Casselman
Licence Number	173-101
Drinking Water System Name	Casselman Drinking Water System
Schedule A Issue Date	April 15th, 2011

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

Licence

Licence Issue Date	April 15, 2011
Licence Expiry Date	April 13, 2016
Application for Licence Renewal Date	October 13, 2015

Drinking Water Works Permit

Drinking Water System Name	Permit Number	Issue Date
Casselman Drinking Water System	173-201	April 15, 2011

Permits to Take Water

Water Taking Location	Permit Number	Issue Date
South Nation River	88-P-4041	August 26, 2003

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:	173-301
Alternately, if one Financial Plan is developed for all drinking water systems owned by the owner, the Financial Plan Number shall be:	173-301A

Accredited Operating Authority

Drinking Water System or Operational Subsystems	Accredited Operating Authority	Operational Plan Number
Casselman Drinking Water System	The Corporation of the Village of Casselman	173-401

Schedule B: General Conditions

System Owner	The Corporation of the Village of Casselman
Licence Number	173-101
Drinking Water System Name	Casselman Drinking Water System
Schedule B Issue Date	April 15th, 2011

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 Permits to Take Water

- 7.1** A permit to take water identified in Schedule A of this licence is associated with the taking of water for purposes of the operation of the drinking water system and is the applicable permit on the date identified as the Schedule A Issue Date.

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 Village of Casselman
Licence Number	173-101
Drinking Water System Name	Casselman Drinking Water System
Schedule C Issue Date	April 15th, 2011

1.0 Performance Limits

Rated Capacity

- 1.1 For each treatment subsystem listed in column 1 of Table 1, the maximum daily volume of treated water that flows from the treatment subsystem to the distribution system shall not exceed the value identified as the rated capacity in column 2 of the same row.

Table 1: Rated Capacity	
Column 1 Treatment Subsystem Name	Column 2 Rated Capacity (m ³ /day)
Casselman Village Water treatment Plant	3,182

- 1.2 Despite condition 1.1, a treatment subsystem may be operated temporarily at a daily volume above the value set out in column 2 of Table 1 for the purposes of fighting a large fire or for the maintenance of the drinking water system.
- 1.3 Condition 1.2 does not authorize the discharge into the distribution system of any water that does not otherwise meet all of the requirements of this licence and all other regulatory requirements, including compliance with the Ontario Drinking Water Quality Standards.

Maximum Flow Rates

- 1.4 For each treatment subsystem listed in column 1 of Table 2, the maximum flow rate of water that flows into a treatment subsystem component listed in column 2 shall not exceed the value listed in column 3 of the same row.

Table 2: Maximum Flow Rates		
Column 1 Treatment Subsystem Name	Column 2 Treatment Subsystem Component	Column 3 Maximum Flow Rate (L/s)
Not Applicable	Not Applicable	Not Applicable

Residue Management

- 1.5 In respect of an effluent discharged into the natural environment from a treatment subsystem or treatment subsystem component listed in column 1 of Table 3:

- 1.5.1 The annual average concentration of a test parameter identified in column 2 shall not exceed the value in column 3 of the same row; and
- 1.5.2 The maximum concentration of a test parameter identified in column 2 shall not exceed the value in column 4 of the same row.

Table 3: Residue Management			
Column 1 Treatment Subsystem or Treatment Subsystem Component Name	Column 2 Test Parameter	Column 3 Annual Average Concentration (mg/L)	Column 4 Maximum Concentration (mg/L)
Waste Residual Management	Suspended Solids (composite)	25 mg/L	Not Applicable

UV Disinfection Equipment Performance

- 1.6 For each treatment subsystem or treatment subsystem component listed in column 1 of Table 4, the UV disinfection equipment shall be operated such that a continuous pass-through UV dose is maintained throughout the life time of the UV lamp(s) that is at least the minimum continuous pass-through UV dose set out in column 2 of the same row.

Table 4: UV Disinfection Equipment Performance	
Column 1 Treatment Subsystem or Treatment Subsystem Component Name	Column 2 Minimum Continuous Pass-Through UV Dose (mJ/cm²)
Casselman Drinking Water System	40

2.0 Flow Measurement and Recording Requirements

- 2.1 For each treatment subsystem identified in column 1 of Table 1 and in addition to any other flow measurement and recording that may be required, continuous flow measurement and recording shall be undertaken for:
- 2.1.1 The flow rate and daily volume of treated water that flows from the treatment subsystem to the distribution system.
- 2.1.2 The flow rate and daily volume of water that flows into the treatment subsystem.
- 2.2 For each treatment subsystem component identified in column 2 of Table 2 and in addition to any other flow measurement and recording that may be required, continuous flow measurement and recording shall be undertaken for the flow rate and daily volume of water that flows into the treatment subsystem component.
- 2.3 Where a rated capacity from Table 1 or a maximum flow rate from Table 2 is exceeded, the following shall be recorded:

- 2.3.1 The difference between the measured amount and the applicable rated capacity or maximum flow rate specified in Table 1 or Table 2;
- 2.3.2 The time and date of the measurement;
- 2.3.3 The reason for the exceedance; and
- 2.3.4 The duration of time that lapses between the applicable rated capacity or maximum flow rate first being exceeded and the next measurement where the applicable rated capacity or maximum flow rate is no longer exceeded.

3.0 Calibration of Flow Measuring Devices

- 3.1 All flow measuring devices must be checked and calibrated in accordance with the manufacturer's instructions.
- 3.2 If the manufacturer's instructions do not indicate how often to check and calibrate a flow measuring device, the equipment must be checked and calibrated at least once every year during which the drinking water system is in operation.

4.0 Additional Sampling, Testing and Monitoring

Drinking Water Health and Non-Health Related Parameters

- 4.1 For each treatment subsystem or treatment subsystem component identified in column 1 of Tables 5 and 6 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 5: Drinking Water Health Related Parameters			
Column 1 Treatment Subsystem or Treatment Subsystem Component Name	Column 2 Test Parameter	Column 3 Sampling Frequency	Column 4 Monitoring Location
Not Applicable	Not Applicable	Not Applicable	Not Applicable

Table 6: Drinking Water Non-Health Related Parameters			
Column 1 Treatment Subsystem or Treatment Subsystem Component Name	Column 2 Test Parameter	Column 3 Sampling Frequency	Column 4 Monitoring Location
Not Applicable	Not Applicable	Not Applicable	Not Applicable

Environmental Discharge Parameters

- 4.2** For each treatment subsystem or treatment subsystem component identified in column 1 of Table 7 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 using the sample type identified in column 3 at the sampling frequency listed in column 4 and at the monitoring location listed in column 5 of the same row.
- 4.3** For the purposes of Table 7:
- 4.3.1** Manual Composite means the mean of at least three grab samples taken during a discharge event, with one sample being taken immediately following the commencement of the discharge event, one sample being taken approximately at the mid-point of the discharge event and one sample being taken immediately before the end of the discharge event; and
- 4.3.2** Automated Composite means samples must be taken during a discharge event by an automated sampler at a minimum sampling frequency of once per hour.
- 4.4** Any sampling, testing and monitoring for the test parameter Total Suspended Solids shall be performed in accordance with the requirements set out in the publication "Standard Methods for the Examination of Water and Wastewater", 21st Edition, 2005, or as amended from time to time by more recently published editions.

Table 7: Environmental Discharge Parameters				
Column 1 Treatment Subsystem or Treatment Subsystem Component Name	Column 2 Test Parameter	Column 3 Sample Type	Column 4 Sampling Frequency	Column 5 Monitoring Location
Plant Residuals Management	Total Suspended Solids	Manual	Monthly	Point of Discharge

UV Disinfection Equipment

- 4.5** For each treatment subsystem or treatment subsystem component listed in column 1 of Table 8 and in addition to any other sampling, analysis and recording that may be required, continuous monitoring and recording with a minimum testing/reading and recording frequency of every four (4) hours shall be carried out for the test parameters set out in column 3 of the same row.

Table 8: UV Disinfection Equipment		
Column 1 Treatment Subsystem or Treatment Subsystem Component Name	Column 2 Control Strategy	Column 3 Test Parameter
Casselman Village Water Treatment Plant	Calculated Dose	Calculated UV Dose
		Flow Rate
		UV Transmittance
		UV Lamp Status

5.0 Studies Required

5.1 Not applicable

Schedule D: Conditions for Relief from Regulatory Requirements

System Owner	The Corporation of the Village of Casselman
Licence Number	173-101
Drinking Water System Name	Casselman Drinking Water System
Schedule D Issue Date	April 15th, 2011

1.0 Lead Regulatory Relief

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

2.0 Other Regulatory Relief

- 2.1** Not applicable



DRINKING WATER WORKS PERMIT

Permit Number: 173-201

Issue Number: 1

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

The Corporation of the Village of Casselman

**751 St.-Jean St. Box 710
Casselman
ON K0A 1M0**

For the following municipal residential drinking water system:

Casselman Drinking Water 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 15th day of April, 2011

Signature

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

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

Schedule A: Drinking Water System Description

System Owner	The Corporation of the Village of Casselman
Permit Number	173-201
Drinking Water System Name	Casselman Drinking Water System
Schedule A Issue Date	April 15th, 2011

1.0 System Description

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

Overview

The Casselman Drinking Water System consists of one drinking water treatment plant, one elevated storage tank and approximately 10 km of watermain, ranging in size from 150mm to 250mm diameter pipe.

Casselman Village Water Treatment Plant

Treatment Plant

Name	Casselman Village Water Treatment Plant
Street Address	832 Drouin Street
UTM Coordinates	NAD83: UTM Zone 18: 492320 m E, 5017340 m N
System Type	Surface Water Treatment Plant
Notes	A main building housing the treatment units and control, testing and monitoring equipment

Surface Water Supply

Intake Facilities

Description	One (1) timber intake structure in the South Nation River
Notes	With upturned elbow and coarse screen; approximately 57 m of 450 mm diameter PVC intake pipe

Low Lift Works

Wet Well

Description	One (1) low lift concrete wet well with removable perforated plates with 6.35 mm openings
Dimensions	5.0 m long by 2.2 m wide by 7.0 m deep
Notes	

Low Lift Pumps

Description	Three (3) variable speed vertical turbine low lift pumps
Capacity	Each pump rated at 19.5 L/s at a TDH of 12.2 m
Notes	A in-line static mixer on the low lift pump discharge common header for mixing of coagulant in the raw water Approximately 12.5 m of 250 mm diameter pipe to convey raw water to the water treatment units or to the filter backwash process residuals settling tank during cleaning of the raw water well

Coagulation/Flocculation/Clarification

Coagulation/Flocculation/Clarification Facilities

Description	Two (2) ballasted flocculation water treatment units (Actiflo® process units) complete with coagulation, injection, maturation and settling tanks, each rated at a nominal capacity of 1,920 m ³ /day
Equipment (on each train)	One (1) coagulation tank having approximate dimensions of 1.2 m by 0.8 m by 2.1 m water depth, with a working volume of approximately 2.0 m ³ , equipped with a mechanical mixer One (1) injection tank having approximate dimensions of 1.2 m by 1.2 m by 2.1 m water depth, with a working volume of approximately 3.0 m ³ , equipped with a mechanical mixer One (1) maturation tank having approximate dimensions of 1.9 m by 2.0 m by 2.1 m water depth with a working volume of approximately 8.0 m ³ , equipped with a mechanical mixer One (1) settling tank having approximate dimensions of 1.5 m by 2.0 m complete with an inclined collection hopper, inclined tube settling module One (1) recirculation pump for recycling settled microsand and residuals to the hydrocyclone One (1) hydrocyclone chamber for separating microsand and residuals and returning microsand to the injection tank, and residuals to a residuals treatment tank
Notes	Coated steel tankage

Filtration

Filters

Description	Dual media filters consisting of 150 mm sand overlain by 600 mm activated carbon
Dimensions	Two (2) filters, each with a filtration area of 8.0 m ² , and a nominal filtration rate of 10 m/hr
Notes	Coated steel tankage

Backwash Pumps

Description	One vertical turbine filter backwash pump (used for both filters)
Capacity	Having a rated capacity of 88.9 L/s at a TDH of 13 m
Notes	A standby backwash system consisting of the high lift pumps described below, complete with a pressure reducing valve

Filter Backwash Blower

Description	One filter backwash blower (used for both filters)
Capacity	Having a rated capacity of 480 m ³ /hr at a discharge pressure of 4.8 m
Notes	For air scouring of the filter media as part of the backwash sequence

Filter Water Holding Tank

Description	One filtered water holding tank
Dimensions	Approximate dimensions of 2.25 m by 4.45 m by 1.83 m
Notes	Used to transfer filtered water from filters to the clearwell

Filter Water Holding Tank Transfer Pumps

Description	Three (3) variable speed vertical turbine transfer pumps
Capacity	Each pump rated at 18.5 L/s at a TDH of 4.5m
Notes	Pump operation and speed controlled by the water level in the holding tank

Primary Disinfection

Ultraviolet (UV) Disinfection System

Description	UV disinfection system
UV Dose	Two (2) ultraviolet disinfection units (one duty, one standby), providing a minimum ultraviolet dosage of 40mJ/cm ² at the end of lamp life
Capacity	Each unit rated at a flow rate of 44.4 L/s
Notes	

Chlorine Disinfection

Description	Chlorination
Injection Point	Feed into the raw water header and the filtered water header
Equipment	Two (2) wall mounted vacuum chlorinators, each capable of delivering 227 kg/d
Notes	Draw chlorine gas from 68 kg cylinders

Clear Well and High Lift Works

Clear Wells

Description	Two-celled reinforced concrete clearwell
Dimensions	Volume of clearwell 1 is 415 m ³
	Volume of clearwell 2 is 440 m ³
Notes	Complete with masonry baffling

High Lift Pump Station

Description	High lift pump system
Dimensions	High lift pump well 1.9 m by 7.6 m by 3.0 m
Pumps	Three (3) vertical turbine pumps (two duty and one standby), each rated at 19 L/s at a TDH of 61 m
Notes	High lift pump well partitioned from the existing clearwell

Plant Residuals Management

Filter Backwash Residuals Treatment

Description	One (1) reinforced concrete settling tank for residuals generated from the filter backwash process
Dimensions	Approximate dimensions 6.4 m by 6.4 m by 3.5 m
Equipment	One (1) progressive cavity pump with a rated capacity of 5.0 L/s at a TDH of 6 m, for pumping settled sludge from the bottom of the tank through a forcemain to a gravity sanitary sewer
Notes	Supernatant discharge to the South Nation River via 300 mm diameter supernatant decant piping
	Located under the filter room floor

Clarification Process Residuals Treatment

Description	One (1) reinforced concrete settling tank for residuals generated from the clarification process
Dimensions	Approximate dimensions 4.1 m by 2.3 m by 5.7 m
Equipment	One (1) progressive cavity pump with a rated capacity of 5.0 L/s at a TDH of 6 m, for pumping settled sludge from the bottom of the settling tank through a forcemain to a gravity sanitary sewer
Notes	Supernatant discharge to the South Nation River

Chemical Addition

Coagulant

Description	Coagulant feed system
Feed Point	Feed into the raw water header upstream of the in-line static mixer
Equipment	Two (2) metering pumps each is capable of delivering 22.7 L/hr
	Four (4) 5000 L capacity polyethylene coagulant storage tanks, complete with secondary containment
Notes	

Polymer

Description	Polymer feed system
Feed Point	Feed into the injection tank and maturation tank in the ballasted flocculation treatment units
Equipment	Three (3) metering pumps, each is capable of delivering 45.4 L/hr
	One (1) 2270 L polyethylene solution storage tank, complete with a 1.1 kW motor mixer, and secondary containment
	One (1) 270 L polymer tank for use during batch preparation in the solution storage tank, complete with secondary containment
Notes	

Potassium Permanganate

Description	Potassium permanganate feed system
Feed Point	Feed into the raw water header or into the raw water well
Equipment	Two (2) metering pumps (one duty, one standby), each is capable of delivering 6.3L/hr
	One (1) 340 L polyethylene solution tank, complete with a mixer and secondary containment
	One (1) 90 L day tank for use during batch preparation in the solution tank, complete with secondary containment
Notes	

Sodium Hydroxide

Description	Sodium hydroxide feed system
Feed Point	Prior to the clearwell
Equipment	Two (2) metering pumps, each is capable of delivering 6.7 L/hr
	One (1) 5,000 L heat traced, insulated reinforced fibreglass bulk storage tank, complete with secondary containment
Notes	

Emergency Power**Backup Power Supply**

Description	One (1) air-cooled 225 kVA diesel generator, complete with weatherproof enclosure, fuel storage tank, and secondary containment
Notes	

Storage Tanks

Village of Casselman Elevated Storage Tank

Location	756 Brebeuf Street
UTM Coordinates	NAD 83, Zone 18, 493256 E 5017917 N
Dimensions	16,000 m ³
Notes	Useable volume is 12,000 to 13,000 m ³

Instrumentation and Control

Regulatory Monitoring

Description	Process control and monitoring equipment for Casselman Drinking Water System
Notes	System control with data acquisition including various in-line analyzers and monitors

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
Village of Casselman Waterworks System	October, 2009

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

1.2.3 Watermains that have been added, modified, replaced or extended further to an authorization by the Director on or after the date identified in column 2 of Table 1 for each document or file identified in column 1.

Schedule B: General

System Owner	The Corporation of the Village of Casselman
Permit Number	173-201
Drinking Water System Name	Casselman Drinking Water System
Schedule B Issue Date	April 15th, 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 AWWA C654 – Standard for Disinfection of Wells; or an equivalent procedure.
- 2.4 The owner shall notify the Director within thirty (30) days of the placing into service or the completion of any addition, modification, replacement or extension of the drinking water system which had been authorized through:
 - 2.4.1 Schedule B to this drinking water works permit which would require an alteration of the description of a drinking water system component described in Schedule A of this drinking water works permit;
 - 2.4.2 Any Schedule C to this drinking water works permit respecting works other than watermains; or

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

3.0 Watermain Additions, Modifications, Replacements and Extensions

- 3.1 The drinking water system may be altered by adding, modifying, replacing or extending a watermain within the distribution system subject to the following conditions:
- 3.1.1 The design of the watermain addition, modification, replacement or extension:
- a) Has been prepared by a Professional Engineer;
 - b) Has been designed only to transmit water and has not been designed to treat water;
 - c) Satisfies the design criteria set out in the Ministry of the Environment publication "Watermain Design Criteria for Future Alterations Authorized under a Drinking Water Works Permit – March 2009", as amended from time to time; and
 - d) Is consistent with or otherwise addresses, the design objectives contained within the Ministry of the Environment publication "Design Guidelines for Drinking Water Systems, 2008", as amended from time to time.
- 3.1.2 The maximum demand for water exerted by consumers who are serviced by the addition, modification, replacement or extension of the watermain will not result in an exceedance of the rated capacity of a treatment subsystem or the maximum

- flow rate for a treatment subsystem component as specified in the licence, or the creation of adverse conditions within the drinking water system.
- 3.1.3 The watermain addition, modification, replacement or extension will not adversely affect the distribution system's ability to maintain a minimum pressure of 140 kPa at ground level at all points in the distribution system under maximum day demand plus fire flow conditions.
 - 3.1.4 Secondary disinfection will be provided to water within the added, modified, replaced or extended watermain to meet the requirements of O. Reg. 170/03.
 - 3.1.5 The watermain addition, modification, replacement or extension is wholly located within the municipal boundary over which the owner has jurisdiction.
 - 3.1.6 The owner of the drinking water system consents to the watermain addition, modification, replacement or extension.
 - 3.1.7 A Professional Engineer has verified in writing that the watermain addition, modification, replacement or extension meets the requirements of condition 3.1.1.
 - 3.1.8 The owner of the drinking water system has verified in writing that the watermain addition, modification, replacement or extension meets the requirements of conditions 3.1.2 to 3.1.6.
- 3.2 The authorization for the addition, modification, replacement or extension of a watermain provided for in condition 3.1 does not include the addition, modification, replacement or extension of a watermain that:
- 3.2.1 Passes under or through a body of surface water, unless trenchless construction methods are used;
 - 3.2.2 Has a nominal diameter greater than 750 mm;
 - 3.2.3 Connects to another drinking water system; or
 - 3.2.4 Results in the fragmentation of the drinking water system.
- 3.3 The verifications required in conditions 3.1.7 and 3.1.8 shall be:
- 3.3.1 Recorded on "Form 1 – Record of Watermains Authorized as a Future Alteration" as published by the Ministry of the Environment; and
 - 3.3.2 Retained for a period of ten (10) years by the owner.
- 3.4 For greater certainty, the verification requirements set out in condition 3.3 do not apply to any addition, modification, replacement or extension in respect of the drinking water system which:
- 3.4.1 Is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03; or
 - 3.4.2 Constitutes maintenance or repair of the drinking water system.

- 3.5** The document or file referenced in Column 1 of Table 1 of Schedule A of this drinking water works permit that sets out watermains shall be retained by the owner and shall be updated to include watermain additions, modifications, replacements and extensions within 12 months of the addition, modification, replacement or extension.
- 3.6** The updates required by condition 3.5 shall include watermain location relative to named streets or easements and watermain diameter.

4.0 Minor Modifications to the Drinking Water System

- 4.1** The drinking water system may be altered by modifying or replacing the following components:
- 4.1.1 Raw water, 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 Raw water, 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/m³ 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 B
PERMIT TO TAKE WATER

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Ministry of the Environment
Ministère de l'Environnement

PERMIT TO TAKE WATER
Surface and Ground Water
NUMBER 6067-9EGMS2

Pursuant to Section 34 of the *Ontario Water Resources Act, R.S.O. 1990* this Permit To Take Water is hereby issued to:

The Corporation of the Village of Casselman
751 St. Jean Street
Casselman, Ontario
K0A 1M0
Canada

For the water
taking from:

South Nation River

Located at:

832 Drouin St
Casselman, United Counties of Prescott and Russell

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

- (a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34, OWRA.
- (b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.
- (c) "Ministry" means Ontario Ministry of the Environment.
- (d) "District Office" means the Cornwall District Office.
- (e) "Permit" means this Permit to Take Water No. 6067-9EGMS2 including its Schedules, if any, issued in accordance with Section 34 of the OWRA.
- (f) "Permit Holder" means The Corporation of the Village of Casselman.
- (g) "OWRA" means the *Ontario Water Resources Act, R.S.O. 1990, c. O. 40*, as amended.

You are hereby notified that this Permit is issued subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. Compliance with Permit

1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated September 23, 2013 and signed by Alain Castonguay, and all Schedules included in this Permit.

1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.

1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this

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Permit.

1.4 This Permit is not transferable to another person.

1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.

1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.

1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

2. General Conditions and Interpretation

2.1 Inspections

The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act*, R.S.O. 1990, the *Pesticides Act*, R.S.O. 1990, or the *Safe Drinking Water Act*, S. O. 2002.

2.2 Other Approvals

The issuance of, and compliance with this Permit, does not:

(a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act*, and the *Environmental Protection Act*, and any regulations made thereunder; or

(b) limit in any way any authority of the Ministry, a Director, or a Provincial Officer, including the authority to require certain steps be taken or to require the Permit Holder to furnish any further information related to this Permit.

2.3 Information

The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

(a) an approval, waiver or justification by the Ministry of any act or omission of any person that contravenes this Permit or other legal requirement; or

(b) acceptance by the Ministry of the information's completeness or accuracy.

2.4 Rights of Action

The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

2.5 Severability

The requirements of this Permit are severable. If any requirements of this Permit, or the application of any requirements of this Permit to any circumstance, is held invalid or unenforceable, the application of such requirements to other circumstances and the remainder of this Permit shall not be affected thereby.

2.6 Conflicts

Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

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3. Water Takings Authorized by This Permit

3.1 Expiry

This Permit expires on **December 31, 2023**. No water shall be taken under authority of this Permit after the expiry date.

3.2 Amounts of Taking Permitted

The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

Table A

	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1	South Naton River	River	Municipal	Water Supply	2,205	24	3,182,200	365	18 492327 5017547
Total Taking:							3,182,200		

4. Monitoring

4.1 The Permit Holder shall maintain a record of all water takings. This record shall include the dates and times of water takings, and the total measured amounts of water pumped per day for each day that water is taken under the authorization of this Permit. A separate record shall be maintained for each source. The Permit Holder shall keep all required records up to date and available at or near the site of the taking and shall produce the records immediately for inspection by a Provincial Officer upon his or her request.

4.2 The total amounts of water pumped shall be measured using a properly calibrated flow meter and totalizer.

5. Impacts of the Water Taking

5.1 Notification

The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

CONTENT COPY OF ORIGINAL

5.2 For Surface-Water Takings

The taking of water (including the taking of water into storage and the subsequent or simultaneous withdrawal from storage) shall be carried out in such a manner that streamflow is not stopped and is not reduced to a rate that will cause interference with downstream uses of water or with the natural functions of the stream.

For Groundwater Takings

If the taking of water is observed to cause any negative impact to other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit Holder shall take such action necessary to make available to those affected, a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking to prevent or alleviate the observed negative impact. Pending permanent restoration of the affected supplies, the Permit Holder shall provide, to those affected, temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of doing so.

If permanent interference is caused by the water taking, the Permit Holder shall restore the water supplies of those permanently affected.

6. Director May Amend Permit

The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act*, Section 100 (4).

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.
2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.
3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, as amended, provides that the Notice requiring the hearing shall state:

1. The portions of the Permit or each term or condition in the Permit in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

In addition to these legal requirements, the Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works are located;

This notice must be served upon:

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*The Secretary
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto ON
M5G 1E5
Fax: (416) 314-4506
Email: ERTTribunalsecretary@ontario.ca*

AND

*The Director, Section 34
Ministry of the Environment
1259 Gardiners Rd, PO Box 22032
Kingston, ON
K7P 3J6*

*Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:
by telephone at (416) 314-4600 by fax at (416) 314-4506 by e-mail at www.ert.gov.on.ca*

Dated at Kingston this 17th day of December, 2013.



Gillian Dagg-Foster
Director, Section 34
Ontario Water Resources Act, R.S.O. 1990

Schedule A

This Schedule "A" forms part of Permit To Take Water 6067-9EGMS2, dated December 17, 2013.



APPENDIX C
INSPECTION RATING RECORD

Ministry of the Environment - Inspection Summary Rating Record (Reporting Year - 2015-2016)

DWS Name: CASSELMAN DRINKING WATER SYSTEM
DWS Number: 210001219
DWS Owner: Casselman, The Corporation Of The Village Of
Municipal Location: Casselman

Regulation: O.REG 170/03
Category: Large Municipal Residential System
Type Of Inspection: Detailed
Inspection Date: January 13, 2016
Ministry Office: Cornwall Area Office

Maximum Question Rating: 787

Inspection Module	Non-Compliance Rating
Permit To Take Water	0 / 30
Capacity Assessment	0 / 42
Treatment Processes	0 / 124
Process Wastewater	0 / 20
Distribution System	0 / 25
Operations Manuals	0 / 42
Logbooks	0 / 42
Consumer Relations	0 / 8
Certification and Training	0 / 73
Water Quality Monitoring	0 / 148
Reporting & Corrective Actions	0 / 109
Treatment Process Monitoring	0 / 124
TOTAL	0 / 787

Inspection Risk Rating	0.00%
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FINAL INSPECTION RATING:	100.00%
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Ministry of the Environment - Detailed Inspection Rating Record (Reporting Year - 2015-2016)

DWS Name: CASSELMAN DRINKING WATER SYSTEM
DWS Number: 210001219
DWS Owner: Casselman, The Corporation Of The Village Of
Municipal Location: Casselman
Regulation: O.REG 170/03
Category: Large Municipal Residential System
Type Of Inspection: Detailed
Inspection Date: January 13, 2016
Ministry Office: Cornwall Area Office

Maximum Question Rating: 787

Inspection Risk Rating 0.00%

FINAL INSPECTION RATING: 100.00%



APPENDIX D

INSPECTION RATING RECORD METHODOLOGY

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



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

This document describes the risk rating methodology, which has been applied to the findings of the Ministry's MRDWS inspection

results since fiscal year 2008-09. The primary goals of this assessment are to encourage ongoing improvement of these systems and to establish a way to measure this progress.

MOE reviews the risk rating methodology every three years.

The Ministry's Municipal Residential Drinking Water Inspection Protocol contains 15 inspection modules consisting of approximately 100 regulatory questions. Those protocol questions are also linked to definitive guidance that ministry inspectors use when conducting MRDWS inspections.

ontario.ca/drinkingwater

The questions address a wide range of regulatory issues, from administrative procedures to drinking water quality monitoring. The inspection protocol also contains a number of non-regulatory questions.

A team of drinking water specialists in the ministry 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 less than 100 per cent does not mean the drinking water from the system is unsafe. It shows areas where a system's operation can improve. The ministry works with owners and operators of systems to make sure they know what they need to do to achieve full compliance.

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

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

Determining Potential to Compromise the Delivery of Safe Water

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

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

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

(of the consequence)

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

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

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 related to regulatory compliance and input their “yes”, “no” or “not applicable” responses 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).

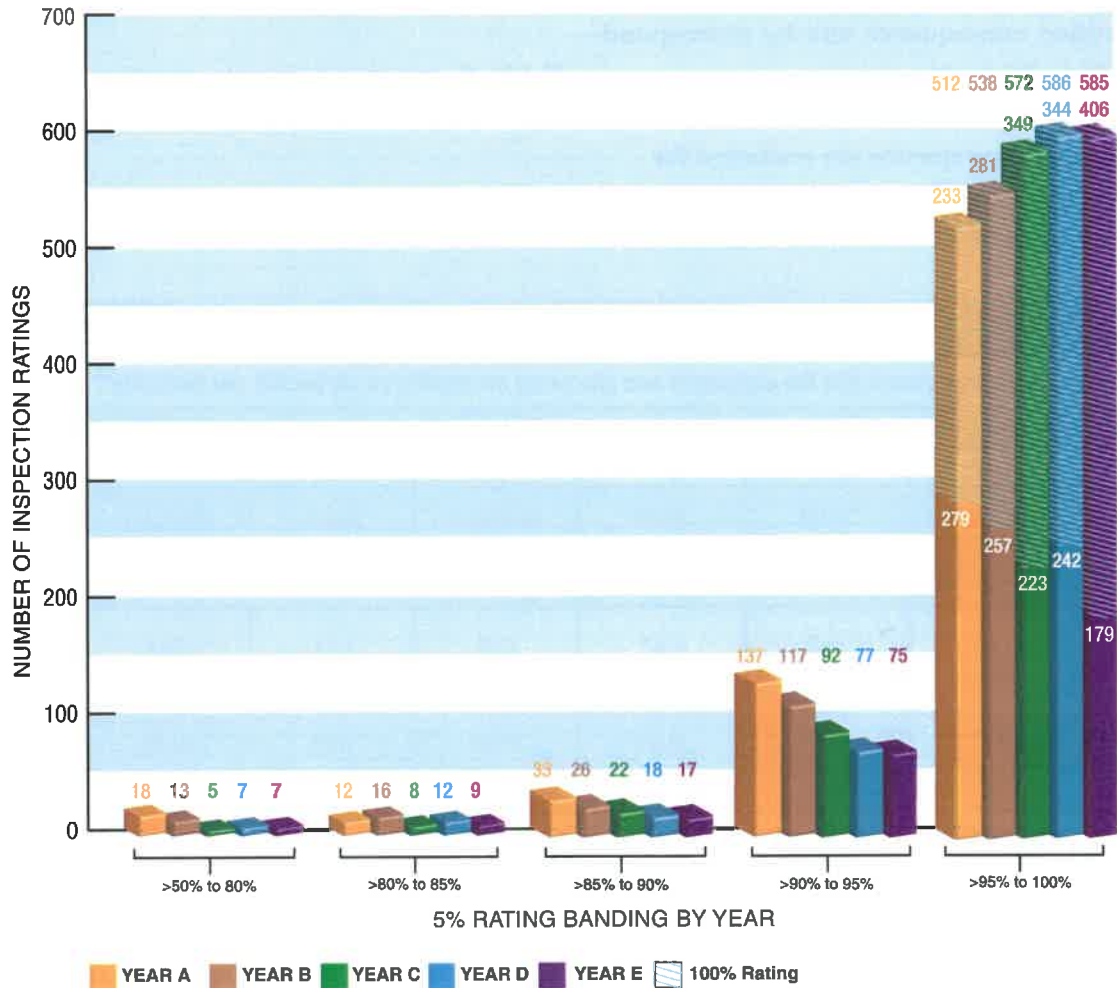
The risk ratings of all non-compliant answers are summed and divided by the sum of the risk ratings of all questions asked (maximum question rating). The resulting inspection risk rating (as a percentage) is subtracted from 100 per cent to arrive at the final inspection rating.

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 15 possible modules of the inspection protocol,

which would provide the system owner/operator with information on the areas where they need to improve. The 15 modules are:

- | | | | |
|-------------------------|---------------------------------|--|--|
| 1. Source | 5. Treatment Process Monitoring | 9. Logbooks | 13. Water Quality Monitoring |
| 2. Permit to Take Water | 6. Process Wastewater | 10. Contingency and Emergency Planning | 14. Reporting, Notification and Corrective Actions |
| 3. Capacity Assessment | 7. Distribution System | 11. Consumer Relations | 15. Other Inspection Findings |
| 4. Treatment Processes | 8. Operations Manuals | 12. Certification and Training | |

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