

**Ministry of the Environment
and Climate Change**

Safe Drinking Water Branch
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**Ministère de l'Environnement et de
l'Action en matière de changement
climatique**

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October 28, 2015

File no. EL-SO-FI-540

The Township of Southwold
35663 Fingal Line
Fingal, ON
N0L 1K0

Attention: Mr. Ken Loveland, Chief Administrative Officer

Re: Southwold Distribution System Inspection Report (WW# 210001362)
Inspection conducted on October 07, 2015

Dear Mr. Loveland,

The enclosed Drinking Water Inspection Report outlines non-compliance, if any, with Ministry legislation, and policies for the above noted water system. Violations noted in this report, if any, have been evaluated based on community risk. These violations will be monitored for compliance with the minimum standards for drinking water in Ontario as set forth under the *Safe Drinking Water Act* and associated regulations. Where risk is deemed to be high and/or compliance is an ongoing concern, violations will be forwarded to this Ministry's Investigation and Enforcement Branch.

In order to measure individual inspection results, the Ministry has established an inspection compliance risk framework based on the principles of the Inspection, Investigation & Enforcement (II&E) Secretariat and advice of internal/external risk experts. The Inspection Summary Rating Record (IRR) provides the Ministry, the system owner and the local Public Health Units with a summarized quantitative measure of the drinking water system's annual inspection and regulated water quality testing performance.

Section 19 of the *Safe Drinking Water Act* (Standard of Care) creates a number of obligations for individuals who exercise decision-making authority over municipal drinking water systems. Please be aware that the Ministry has encouraged such individuals, particularly municipal councillors, to take steps to be better informed about the drinking water systems over which they have decision-making authority. These steps could include asking for a copy of this inspection report and a review of its findings. Further information about Section 19 can be found in *"Taking Care of Your Drinking Water: A guide for members of municipal council"* found under "Resources" on the Drinking Water Ontario website at www.ontario.ca/drinkingwater.

Please note the attached IRR methodology memo describing how the risk rating model has improved to better reflect the health related and administrative non-compliance found in an inspection report. IRR ratings are published (for the previous inspection year) in the Ministry's Chief Drinking Water Inspector's Annual Report. If you have any questions or concerns regarding the rating, please contact Tom Clubb, Drinking Water Program Supervisor, at (519) 873-5122.

If you have any questions regarding the report, please feel free to call me at (519) 873-5022.

Yours truly,

A handwritten signature in black ink that reads "Roland Plante". The signature is written in a cursive style with a large initial 'R'.

Roland Plante
Provincial Officer
London District Office
roland.plante@ontario.ca

cc. Laurie Spence Bannerman, Municipality of Dutton / Dunwich
Tim Hansen, Municipality of Dutton / Dunwich
Elgin-St. Thomas Health Unit
Lower Thames Valley Conservation Authority



Ministry of the Environment and Climate Change

SOUTHWOLD DISTRIBUTION SYSTEM

Inspection Report

Site Number:	210001362
Inspection Number:	1-BZARK
Date of Inspection:	Oct 07, 2015
Inspected By:	Roland Plante

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Appendix A: Key Reference and Guidance Material for Drinking Water Systems

Appendix B: Inspection Rating Record

OWNER INFORMATION:

Company Name: SOUTHWOLD, THE CORPORATION OF THE TOWNSHIP OF
Street Number: 35663 **Unit Identifier:**
Street Name: FINGAL Line
City: FINGAL
Province: ON **Postal Code:** N0L 1K0

CONTACT INFORMATION

Type: CAO/Clerk **Name:** Ken Loveland
Phone: (519) 769-2010 **Fax:** (519) 769-2837
Email: cao@southwold.ca
Title: CAO/Clerk/Deputy Treasurer

Type: Main Contact **Name:** Tim Hansen
Phone: (519) 933-6483 **Fax:**
Email: timhansen@duttondunwich.on.ca
Title: Operations Manager

INSPECTION DETAILS:

Site Name: SOUTHWOLD DISTRIBUTION SYSTEM
Site Address: 35663 FINGAL LINE FINGAL ON N0L 1K0
County/District: Southwold
MOECC District/Area Office: London District
Health Unit: ELGIN-ST. THOMAS HEALTH UNIT
Conservation Authority: N/A
MNR Office: Aylmer District Office
Category: Large Municipal Residential
Site Number: 210001362
Inspection Type: Unannounced
Inspection Number: 1-BZARK
Date of Inspection: Oct 07, 2015
Date of Previous Inspection: Nov 27, 2014

COMPONENTS DESCRIPTION

Site (Name): Distribution System
Type: **Sub Type:**

Comments:

The Southwold Water Distribution System is owned by the Township of Southwold and operated by the Municipality of Dutton-Dunwich with the exception of the Lynhurst Area which is operated and maintained by the City of St. Thomas. The Township of Southwold portion of the distribution system consists of:

1. Associated watermain appurtenances such as valves, blow-offs, air release chambers, drain chambers and flow meter chambers.
2. There are 1050 connections with approximately 4000 customers and 167 fire hydrants.
3. Connection to the Elgin Area Water Supply System via the St. Thomas Secondary Distribution System at the Talbotville Interconnect Control Chamber and the Ford Chamber on Clinton Line.
4. For emergency water supply, connections to the Dutton-Dunwich Distribution System via the Iona Interconnect.

The Middlesex Centre Water System includes a 100 mm (4 inch) watermain which has been looped commencing and ending along Southdel Drive. The approximate length of main which services Middlesex Centre is 8.5 kilometres. The Township of Southwold is currently responsible for operation and maintenance of the loop as it is supplied by the Southwold Distribution System.

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

Site (Name): Southwold Re-Chlorination Facility
Type: Other **Sub Type:** Other
Comments:

The potable water rechlorination system consists of a magnetic flow meter installed in the 350mm diameter watermain on the south side of Talbot Line. There is a 6.4 m by 4.0 m concrete block structure that houses two (2) chlorine residual analyzers, two (2) sodium hypochlorite metering pumps (one duty, one standby) rated at 1.5 L/hr, one storage tank having a capacity of 45 litres with a containment basin, flow transmitter and auto dialer.

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.**

This drinking water system is subject to the legislative requirements of the Safe Drinking Water Act, 2002 (SDWA) and regulations made therein, including Ontario Regulation 170/03, "Drinking Water Systems" (O. Reg.170/03). This inspection has been conducted pursuant to Section 81 of the SDWA.

This report is based on an inspection of a "stand alone connected distribution system". This type of system receives treated water from a separately owned "donor" system. This report contains the elements required to assess key compliance and conformance issues associated with a "receiver" system. This report does not contain items associated with the inspection of the donor system, such as source waters, intakes/wells and treatment facilities.

This report is based on a "focused" inspection of the system. Although the inspection involved fewer activities than those normally undertaken in a detailed inspection, it contained critical elements required to assess key compliance issues. This system was chosen for a focused inspection because the system's performance met the ministry's criteria, most importantly that there were no deficiencies as identified in O.Reg. 172/03 over the past 3 years. The undertaking of a focused inspection at this drinking water system does not ensure that a similar type of inspection will be conducted at any point in the future.

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.

Documentation reviewed in association with this report included, but were not limited to:

1. Ministry of the Environment, the Corporation of the Township of Southwold, Municipal Drinking Water Licence # 055-101, dated August 23, 2011; and
2. Ministry of the Environment, the Corporation of the Township of Southwold, Municipal Drinking Water Works Permit # 055-201, dated September 20, 2011.

Other operational documents maintained by the Owner for the period November 01, 2014 until September 30, 2015 were also reviewed in conjunction with this compliance evaluation.

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.**

During the physical inspection of the water system, it appeared that all equipment listed in Schedule A of the current Drinking Water Works Permit had been installed.

TREATMENT PROCESSES

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

The Southwold Water Distribution System receives treated water from the St Thomas Area Secondary Water Supply System which in turn is supplied with water from the Elgin Area Primary Water Supply System. There is a re-chlorination facility in Shedden. There are two chlorine analyzers and these analyzers record the chlorine residual levels in the water before and after the addition of sodium hypochlorite. Documentation reviewed for the inspection period which includes log records and SCADA records indicate that secondary disinfection was maintained within the distribution system and that the chlorine residual was within acceptable limits (>0.05 mg/L).

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

The logbook and logsheet records indicate that an operator visits and records details of operational checks, work or sampling undertaken at the re-chlorination facility on a regular basis. The Operating Authority indicated that there are a number of operators that can act as OIC.

TREATMENT PROCESS MONITORING

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

Secondary disinfection is measured in the distribution system by a continuous chlorine analyzer and operators take grab samples on a regular basis. The operators perform at least 4 chlorine residual tests during bacteriological sampling each week and take 3 additional chlorine residual tests at least 48 hours later. The SCADA system monitors the chlorine residual in the distribution system continuously. SCADA records are reviewed by an operator and details are printed on a logsheet.

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

The Southwold Weekly Procedures indicates that SCADA readings are checked daily during the week and information is recorded on a logsheet.

- * **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.**

The chlorine analyzers at the re-chlorination facility are linked to the SCADA system which is capable of calling out alarms to operators when a set point is reached for low and high chlorine. The operator either acknowledges the alarm remotely or may visit the site to investigate the cause of the alarm. Details of the responses are written in the alarm logbook or the facility logbook.

- * **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 provided records related to secondary disinfection in the distribution system. These records consisted of continuous chlorine residual data and alarms from the analyzers in the distribution system. The SCADA data provided was in a "pdf" format.

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

Operators calibrate the chlorine analyzers as required during their daily checks and records are maintained of these calibrations.

DISTRIBUTION SYSTEM

DISTRIBUTION SYSTEM

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

During the review of logbook records, it was identified that there was a watermain break repair undertaken on August 17, 2015. The logsheet record indicates that the watermain split horizontally and the operator decided to cut a piece out of the watermain for the repair. The piece of pipe that was replaced was disinfected with chlorine and the operator ensured that no contamination entered the watermain during the repair. A bacteriological sample was taken after the repair was completed to confirm the effectiveness of the disinfection procedure.

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

SCADA records and logbook entries show that pressure was maintained in the distribution system.

- * The receiving system was claiming exemptions to O. Reg. 170/03 available under subsection 5(4), and the agreement with the donor satisfied the requirements prescribed by subsection 5(4).

There is a section of watermain that crosses in and out of the Township of Middlesex Centre. The Operating Authority maintains this section of watermain by monitoring the chlorine residual and taking bacteriological samples. There is a by-law #2002-39 that states the terms of the agreement between the Township of Southwold and the Township of Middlesex Centre for the extension of water services. This agreement took effect on October 22, 2002.

OPERATIONS MANUALS

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

The Southwold Distribution System Operations Manual has a "List of Revisions" page and it was last updated on July 30, 2015. The last updates in the manual include updated watermain break information, laboratory information, sampling schedule and bacteriological sample locations. A copy of this manual can be found at the Southwold office, the re-chlorination facility and the waterworks shop.

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

The Southwold Distribution System Operations Manual meets the requirements stipulated in the current Municipal Drinking Water Licence, section 16.0.

LOGBOOKS

- * Records or other record keeping mechanisms confirmed that operational testing not performed by continuous monitoring equipment was being done by a certified operator, water quality analyst, or person who suffices the requirements of O. Reg. 170/03 7-5.

Only certified operators perform drinking water tests in the drinking water system.

SECURITY

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

The re-chlorination facility remains locked at all times. This building has a door alarm and the facility is visited regularly by system operators.

CERTIFICATION AND TRAINING

CERTIFICATION AND TRAINING

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

The Southwold Distribution System is classed as a Water Distribution Subsystem Class 2. At the time of inspection, the designated (and back-up) ORO possessed an operator certificate that was equal or greater than the classification level of the distribution system.

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

The Owner must ensure that one operator is designated as operator-in-charge (OIC) for each day that the facility is in operation. An OIC can be any operator with an applicable certificate to the type of operated subsystem. An operator-in-training (OIT) cannot be designated as an OIC; any log entries made by the OIT must be approved by the OIC and clearly documented in the log at the time of entry. The Owner indicated that there are a number of operators that can act as OIC.

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

A review of operator licences indicates that all operators had valid certificates during the inspection period.

WATER QUALITY MONITORING

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

Distribution water samples are being taken from pre-determined sites and analyzed on a weekly basis. On average, there are 5 bacteriological samples taken each week. During the review of documents, it was identified that several bacteriological samples that were delivered to the laboratory were above the recommended temperature range of 4.0 to 10.0 degrees Celsius. It is recommended that the Operating Authority review its shipping procedures for bacteriological samples.

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

Trihalomethane (THM) sampling is required to be undertaken on distribution water on a quarterly basis. The Owner is taking THM samples from 2 sites in the distribution system. All sample results for this inspection period show that the treated water is within acceptable limits.

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

Information related to bacteriological sampling is included on the Chain of Custody form and the Certificate of Analysis form.

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).**

The Operating Authority took bacteriological and chemical samples during the report period and all sample results met the Ontario Drinking Water Quality Standards.

REPORTING & CORRECTIVE ACTIONS

REPORTING & CORRECTIVE ACTIONS

- **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.**

There are chlorine residual analyzers at the re-chlorination facility. The chlorine analyzers are linked to a dialer system to notify operators when alarm set points are reached. The Operating Authority indicated that operators acknowledge alarms but the type of response will depend on the alarm situation. The Operating Authority provided an alarm summary for the inspection period and also provided a logbook which detailed a summary of alarm responses.

- * **All changes to the system registration information were provided within ten (10) days of the change.**

Information contained in the DWIS profile appears to be up-to-date.

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:

Roland Plante

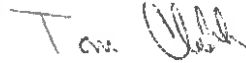
Signature: (Provincial Officer):



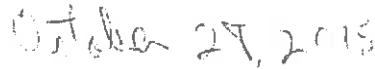
Reviewed & Approved By:

Tom Clubb

Signature: (Supervisor):



Review & Approval Date:



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



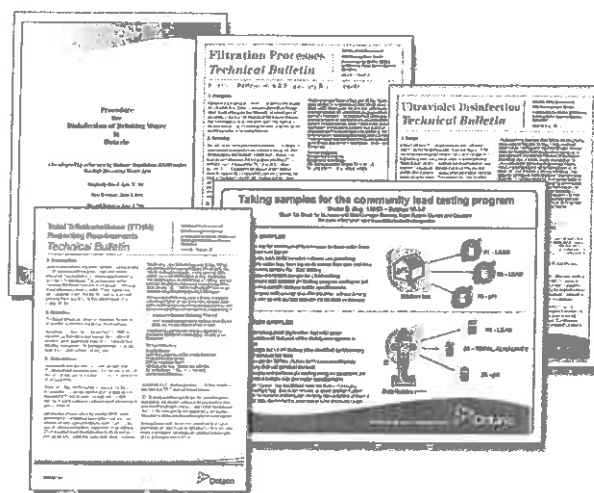
Drinking Water System Components Description

Key Reference and Guidance Material for Municipal Residential Drinking Water Systems

Many useful materials are available to help you operate your drinking water system. Below is a list of key materials owners and operators of municipal residential drinking water systems frequently use.

To access these materials online click on their titles in the table below or use your web browser to search for their titles. Contact the Public Information Centre if you need assistance or have questions at 1-800-565-4923/416-325-4000 or picemail.moe@ontario.ca.

For more information on Ontario's drinking water visit www.ontario.ca/drinkingwater and email drinking.water@ontario.ca to subscribe to drinking water news.



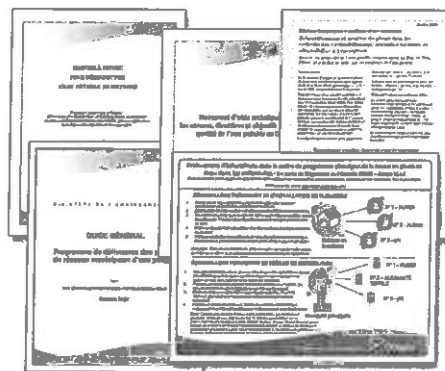
PUBLICATION TITLE	PUBLICATION NUMBER
Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils	7889e01
FORMS: Drinking Water System Profile Information, Laboratory Services Notification, Adverse Test Result Notification Form	7419e, 5387e, 4444e
Procedure for Disinfection of Drinking Water in Ontario	4448e01
Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids	7152e
Total Trihalomethane (TTHM) Reporting Requirements Technical Bulletin (February 2011)	8215e
Filtration Processes Technical Bulletin	7467
Ultraviolet Disinfection Technical Bulletin	7685
Guide for Applying for Drinking Water Works Permit Amendments, Licence Amendments, Licence Renewals and New System Applications	7014e01
Certification Guide for Operators and Water Quality Analysts	
Guide to Drinking Water Operator Training Requirements	9802e
Taking Samples for the Community Lead Testing Program	6560e01
Community Sampling and Testing for Lead: Standard and Reduced Sampling and Eligibility for Exemption	7423e
Guide: Requesting Regulatory Relief from Lead Sampling Requirements	6610
Drinking Water System Contact List	7128e
Technical Support Document for Ontario Drinking Water Quality Standards	4449e01

ontario.ca/drinkingwater

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

De nombreux documents utiles peuvent vous aider à exploiter votre réseau d'eau potable. Vous trouverez ci-après une liste de documents que les propriétaires et exploitants de réseaux résidentiels municipaux d'eau potable utilisent fréquemment.

Pour accéder à ces documents en ligne, cliquez sur leur titre dans le tableau ci-dessous ou faites une recherche à l'aide de votre navigateur Web. Communiquez avec le Centre d'information au public au 1 800 565-4923 ou au 416 325-4000, ou encore à picemail.moe@ontario.ca si vous avez des questions ou besoin d'aide.



Pour plus de renseignements sur l'eau potable en Ontario, consultez le site www.ontario.ca/eaupotable ou envoyez un courriel à drinking.water@ontario.ca pour suivre l'information sur l'eau potable.

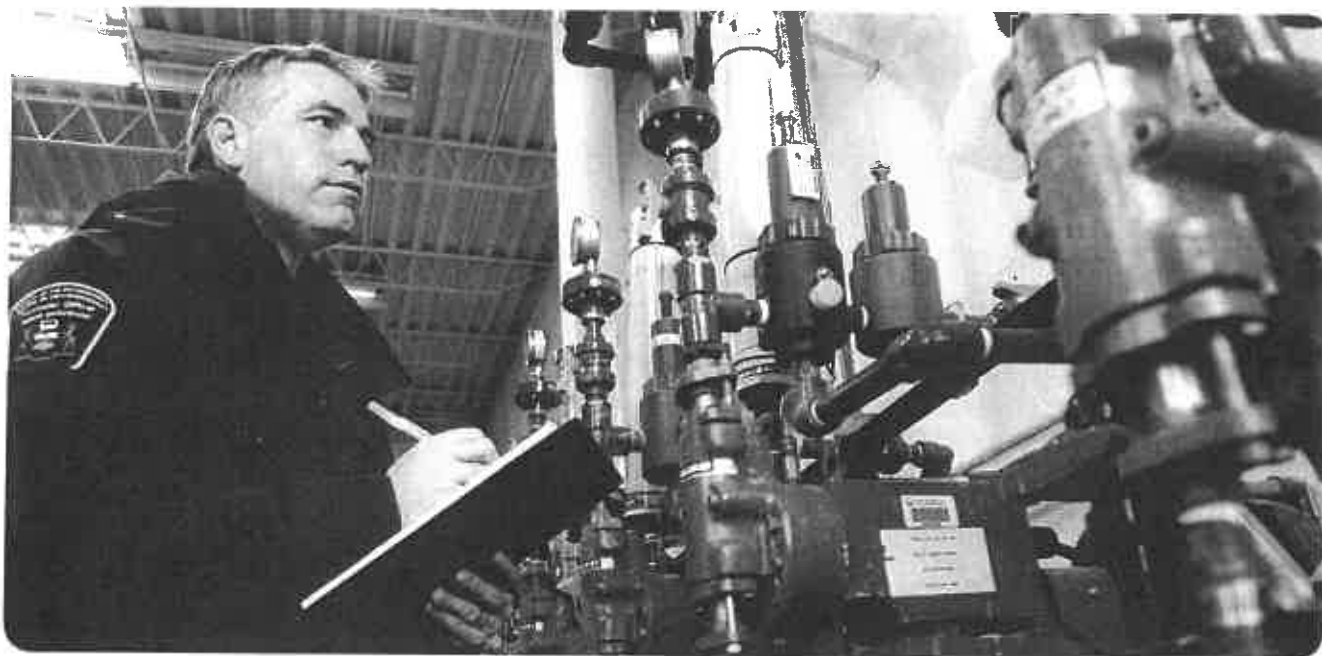
TITRE DE LA PUBLICATION	NUMÉRO DE PUBLICATION
Prendre soin de votre eau potable – Un guide destiné aux membres des conseils municipaux	7889f01
Renseignements sur le profil du réseau d'eau potable, Avis de demande de services de laboratoire, Formulaire de communication de résultats d'analyse insatisfaisants et du règlement des problèmes	7419f, 5387f, 4444f
Marche à suivre pour désinfecter l'eau potable en Ontario	4448f01
Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids (en anglais seulement)	7152e
Total Trihalomethane (TTHM) Reporting Requirements: Technical Bulletin (février 2011) (en anglais seulement)	8215e
Filtration Processes Technical Bulletin (en anglais seulement)	7467
Ultraviolet Disinfection Technical Bulletin (en anglais seulement)	7685
Guide de présentation d'une demande de modification du permis d'aménagement de station de production d'eau potable, de modification du permis de réseau municipal d'eau potable, de renouvellement du permis de réseau municipal d'eau potable et de permis pour un nouveau réseau	7014f01
Guide sur l'accréditation des exploitants de réseaux d'eau potable et des analystes de la qualité de l'eau de réseaux d'eau potable	
Guide sur les exigences relatives à la formation des exploitants de réseaux d'eau potable	9802f
Prélèvement d'échantillons dans le cadre du programme d'analyse de la teneur en plomb de l'eau dans les collectivités	6560f01
Échantillonnage et analyse du plomb dans les collectivités : échantillonnage normalisé ou réduit et admissibilité à l'exemption	7423f
Guide: Requesting Regulatory Relief from Lead Sampling Requirements (en anglais seulement)	6610
Liste des personnes-ressources du réseau d'eau potable	7128f
Document d'aide technique pour les normes, directives et objectifs associés à la qualité de l'eau potable en Ontario	4449f01

ontario.ca/eaupotable



Inspection Rating Record

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



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

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

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

MOE reviews the risk rating methodology every three years.

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

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 (4x8) and the lowest would be 0 (0x1).

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 x 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).

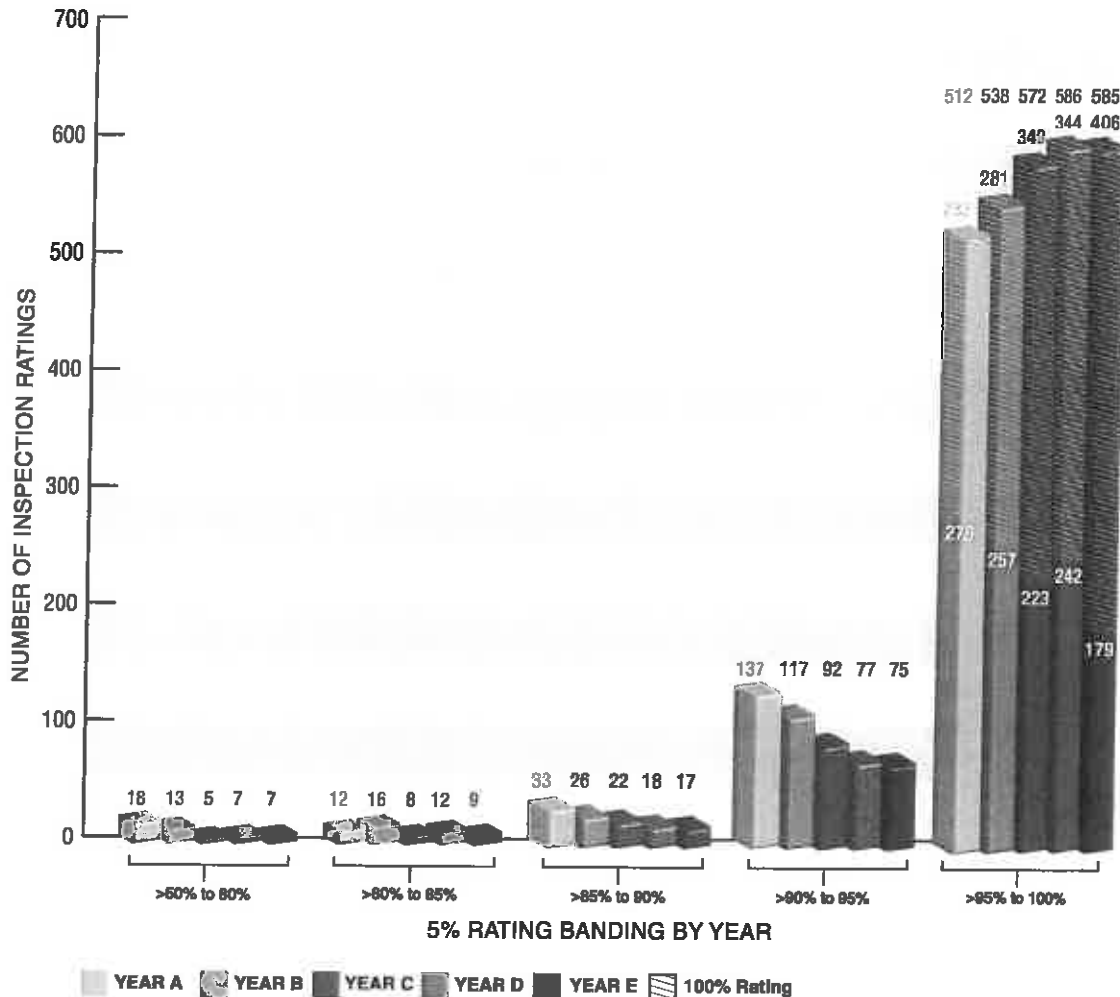
The risk ratings of all non-compliant answers are summed and divided by the sum of the risk ratings of all questions asked (maximum question rating). The resulting inspection risk rating (as a percentage) is subtracted from 100 per cent to arrive at the final inspection rating.

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 14 possible modules of the inspection protocol,

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

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

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

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

DWS Name: SOUTHWOLD DISTRIBUTION SYSTEM
DWS Number: 210001362
DWS Owner: Southwold, The Corporation Of The Township Of
Municipal Location: Southwold

Regulation: O.REG 170/03

Category: Large Municipal Residential System

Type Of Inspection: Adhoc

Inspection Date: October 7, 2015

Ministry Office: London District

Maximum Question Rating: 306

Inspection Module	Non-Compliance Rating
Treatment Processes	0 / 56
Distribution System	0 / 21
Operations Manuals	0 / 28
Logbooks	0 / 14
Certification and Training	0 / 28
Water Quality Monitoring	0 / 43
Reporting & Corrective Actions	0 / 25
Treatment Process Monitoring	0 / 91
TOTAL	0 / 306

Inspection Risk Rating 0.00%

FINAL INSPECTION RATING: 100.00%

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

DWS Name: SOUTHWOLD DISTRIBUTION SYSTEM
DWS Number: 210001362
DWS Owner: Southwold, The Corporation Of The Township Of
Municipal Location: Southwold

Regulation: O.REG 170/03
Category: Large Municipal Residential System
Type Of Inspection: Adhoc
Inspection Date: October 7, 2015
Ministry Office: London District

Maximum Question Rating: 306

Inspection Risk Rating 0.00%

FINAL INSPECTION RATING: 100.00%