Ministry of the Environment, Conservation and Parks

Drinking Water and Environmental Compliance Division

Owen Sound District Office
101 17th St. E., 3rd Floor
Owen Sound ON N4K 0A5

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Division de la conformité en matière d'eau potable et d'environnement

Bureau du district de Owen Sound
101, 17e rue Est, 3e étage
Owen Sound ON N4K 0A5

Ontario

February 19, 2020

Sent by Email: swatson@brockton.ca

Municipality of Brockton
100 Scott Street, Box 68
Walkerton, Ontario
N0G 2V0

Attention: Ms. Watson
CAO/Clerk

Re: 2019/2020 Inspection Report 1-KVN1I
Chepstow Drinking Water System
Drinking Water Licence 081-101 Issue 2
Drinking Water Works Permit 081-201, Issue 2

The enclosed report documents findings of the inspection that was performed on January 23, 2020.

Two sections of the report, namely "Actions Required" and "Recommended Actions", specify due dates for the submission of information or plans to my attention. Please note that "Actions Required" are linked to incidents of non-compliance with regulatory requirements contained within an Act, a Regulation, or site-specific approvals, orders or instructions; "Recommended Actions" convey information that the owner or operating authority should consider implementing in order to conform with existing and emerging industry standards.

The report includes an Inspection Summary Rating Record as an appendix. This record forms part of the ministry's comprehensive, risk-based inspection process. The rating provides a quantitative measure of the inspection results for this specific drinking water system for the reporting year. An inspection rating that is less than 100 per cent does not mean that the drinking water from the system is unsafe. The primary goals of this assessment are to encourage ongoing improvement of drinking water systems and to measure this progress from year to year.

I would like to remind you that Section 19 of the Safe Drinking Water Act, 2002 (Standard of Care) creates a number of obligations for individuals who exercise decision-making authority over municipal drinking water systems, including members of municipal councils. "Taking Care of Your Drinking Water: A guide for members of municipal council", a publication found on the Drinking Water Ontario website (http://www.ontario.ca/environment-and-energy/municipal-drinking-water-systems-licencing-registration-and-permits), provides further information about these obligations.

Should you have any questions regarding the content of the enclosed report, please do not hesitate to contact me.

Yours truly,

Rhonda Shannon
Water Compliance Inspector
Phone: 226-668-5873
e-mail: Rhonda.shannon@ontario.ca

Enclosure

ec: Dr. Ian Arra, Medical Officer of Health, Grey-Bruce Health Unit
Gregg Furtney, Director of Operations, Municipality of Brockton
Nancy Guest, Administrative Assistant, Source Protection Program Branch
Scott Gowan, Project Manager/ORO, Veolia
Mark Smith, Water Compliance Supervisor, Ministry of Environment, Conservation and Parks

c: File SI-BR-BR-JO-540 (2019)

Ontario

Ministry of the Environment, Conservation and Parks

CHEPSTOW DRINKING WATER SYSTEM

Inspection Report

Site Number:	220008765
Inspection Number:	1-KVN1I
Date of Inspection:	Jan 23, 2020
Inspected By:	Rhonda Shannon

OWNER INFORMATION:

Company Name:	BROCKTON, THE CORPORATION OF THE MUNICIPALITY OF		
Street Number:	100	**Unit Identifier:**	
Street Name:	SCOTT St		
City:	WALKERTON		
Province:	ON	**Postal Code:**	N0G 2V0

CONTACT INFORMATION

Type:	Owner	**Name:**	Gregory Furtney
Phone:	(519) 881-2223	**Fax:**	(519) 881-2991
Email:	gfurtney@brockton.ca		
Title:	Director of Operations		

Type:	Operating Authority	**Name:**	SCOTT GOWAN
Phone:	(519) 881-1474	**Fax:**	(519) 881-3666
Email:	scott.gowan@veolia.com		
Title:	ORO/Project Manager		

Type:	Operator	**Name:**	STEVE ROWE
Phone:	(519) 881-1474	**Fax:**	(519) 881-3666
Email:			
Title:	Operator		

INSPECTION DETAILS:

Site Name:	CHEPSTOW DRINKING WATER SYSTEM
Site Address:	
County/District:	BROCKTON
MECP District/Area Office:	Owen Sound Area Office
Health Unit:	GREY BRUCE HEALTH UNIT
Conservation Authority:	Saugeen Conservation
MNR Office:	Owen Sound Field Office
Category:	Small Municipal Residential
Site Number:	220008765
Inspection Type:	Unannounced
Inspection Number:	1-KVN1I
Date of Inspection:	Jan 23, 2020
Date of Previous Inspection:	Jul 06, 2018

COMPONENTS DESCRIPTION

Site (Name):	MOE DWS Mapping		
Type:	DWS Mapping Point	**Sub Type:**	

Site (Name):	PUMPHOUSE RAW

Type: Source **Sub Type:** Ground
Comments:
The well is a 150 mm diameter bedrock well drilled to a depth of 57.6 m with approximately 15.8 m of till overburden. The well is equipped with a 1.1 kW submersible pump rated at 2.21 L/s at a total dynamic head (TDH) of 414 kPa (60 psi).

Site (Name): PUMPHOUSE TREATED
Type: Treated Water POE **Sub Type:** Pumphouse
Comments:
The well is located inside the pumphouse and the treatment consists of the following:
* A cartridge filtration system consisting of 2 treatment trains (duty and standby), each consists of 2 multi-cartridge housings in series, each capable of removing particles down to 5 micron and 1 micron absolute respectively, rated at 284 L/min., equipped with pressure gauges.
* An ultraviolet disinfection system consisting of 2 UV reactors (duty and standby), each rated at 244 L/min. to provide a minimum of 40 mJ/cm2 at capacity, complete with UV sensor, alarms and shut-off controls.
* One 50 mm magnetic flow meter
* Three (one old and two new) hydro-pneumatic tanks
* Two metering chemical pumps (duty and standby) rated at 1.4 L/hr., complete with automatic switchover control and one sodium hypochlorite tank with secondary containment

External from the pumphouse there is a 12 m length of 450 mm diameter chlorine contact pipe complete with swab launch and retrieval facilities, a 13 mm diameter treated water sampling/service line complete with backflow preventer connected from the pumphouse to existing watermain immediately downstream of the chlorine contact pipe and a 4 m X 1 m X 0.5 m soak away pit for disposal of pumphouse floor drain discharge and sampled water from monitoring equipment.

Site (Name): PUMPHOUSE TREATED
Type: Method of Disinfection **Sub Type:** Primary Treatment
Comments:
Primary disinfection at this facility is achieved through UV disinfection and chlorine contact time. The minimum log removal necessary to meet a 2-log inactivation of Viruses at this facility, as outlined in Schedule E of Licence #081-101, Issue No. 2 remains 4.0 mg/L*min. This has a site specific equivalent minimum chlorine residual (CT) of 0.28 mg/L necessary to achieve primary disinfection.

Site (Name): PUMPHOUSE TREATED
Type: Method of Disinfection **Sub Type:** Primary Treatment
Comments:
As well, UV disinfection equipment must provide a minimum dosage of 40 mJ/cm2 at 244 L/min to meet the remaining 2-log inactivation of Viruses, 3-log inactivation of Giardia and 2-log inactivation of Cryptosporidium.

Site (Name): DISTRIBUTION (WATER INSPECTION)
Type: Other **Sub Type:** Other
Comments:
The Chepstow distribution system has approximately 18 residential service connections. There may be an additional future phase of the subdivision that would provide for a total of 41 lots. Mains are constructed from 4 inch diameter plastic pipe with installation dates ranging from the early 1970's to present. Service pipes are 3/4 inch plastic from the main to the curb stop and 3/4 inch copper from the curb stop to the house. Pipes are located at a depth of approximately 14 feet.
There are two (2) blow-offs, one located at each end of the distribution system. There are no fire hydrants or valving in the system.

INSPECTION SUMMARY:

Introduction

- **The primary focus of this inspection is to confirm compliance with Ministry of the Environment, Conservation and Parks (MECP) legislation as well as evaluating conformance with ministry drinking water related 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 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.

  A drinking water inspection was conducted on January 23, 2020 at the Chepstow drinking water facility to assess compliance with the systems Licence and Permit as well as Ministry legislation and guidelines.

  The Municipality of Brockton owns the drinking water system and Veolia Water Canada currently operates the facility, located at 51 John Crescent, Chepstow. This inspection covers the time period of August 1, 2018 to January 15, 2020 and includes a review of Ministry files, plant operating data and a detailed assessment of compliance with the terms and conditions of all MECP authorizing documents.

  The physical inspection included a tour of the facility and was conducted with Scott Rowe, OIC.

Source

- **The owner was maintaining the production well(s) in a manner sufficient to prevent entry into the well of surface water and other foreign materials.**

  A review of the raw water test results during the past five (5) years continues to show no instances of total coliforms or E. coli detected. This indicates that there is little to no influence of surface water on the source water being used.

- **Measures were in place to protect the groundwater and/or GUDI source in accordance with any the Municipal Drinking Water Licence and Drinking Water Works Permit issued under Part V of the SDWA.**

  UV upgrades have been done since the previous inspection. However the most current process diagram, dated October 2015, still adequately reflects the process and is available on-site. As well, the Operations Manual and Contingency Plans still includes the following procedures:
  • Customer Complaints [OMB-CWS-J-05]
  • Well Inspection Maintenance [OMB-CWS-J-08 and OMB-CWS-J-08a]
  • Chemical Spills or Fuel Leaks [OMB-CWS-L-07]

Source

- Vandalism [OMB-CWS-L-08]
- Well Casing Failure, Well Head Damage and Well Pump Failure [OMB-CWS-L-12]
- Agricultural run-off [OMB-CWS-L-14]

Capacity Assessment

- **There was sufficient monitoring of flow as required by the Municipal Drinking Water Licence or Drinking Water Works Permit issued under Part V of the SDWA.**

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

  The rated capacity for this system is 228 m3/day, as authorized under the DWS Licence No. 081-101, Issue No. 2.

  There were neither flow exceedences nor flow monitoring anomalies found in the data reviewed. The maximum daily flow rate during the time period reviewed occurred on July 2019 with 34.5m3 of water used, which represents approximately 15% of the rated capacity allowed in the Licence.

  The Owner and Operating Authority is reminded that the Permit To Take Water for this system expires on September 30, 2022.

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.**

- **The owner/operating authority was in compliance with the requirement to prepare Form 2 documents as required by their Drinking Water Works Permit during the inspection period.**

  One (1) Form 2 was required during this inspection period for the replacement of the existing UV disinfection system.

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

  Primary disinfection at this facility is achieved through UV disinfection and chlorine contact time. The minimum log removal necessary to meet a 2-log inactivation of Viruses at this facility, as outlined in Schedule E of Licence #081-101, Issue No. 2 remains 4.0 mg/L*min. This has a site specific equivalent minimum chlorine residual (CT) of 0.28 mg/L necessary to achieve primary disinfection. (Calculations to support this are available in the Operations Manual)

  As well, UV disinfection equipment must provide a minimum dosage of 40 mJ/cm2 at 244 L/min to meet the remaining 2-log inactivation of Viruses, 3-log inactivation of Giardia and 2-log inactivation of Cryptosporidium.

  Based on the records reviewed, this facility met current primary treatment requirements at all times during this inspection period.

- **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.**

Treatment Processes

- **Where an activity has occurred that could introduce contamination, all parts of the drinking water system were disinfected in accordance with Schedule B, Condition 2.3 of the Drinking Water Works Permit.**

- **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.**

  Both new UV units are equipped with a solenoid valve that allows for a system lock-out below 40 mJ/cm2. It is reported that the solenoid valves are checked periodically to ensure integrity.

Treatment Process Monitoring

- **Primary disinfection chlorine monitoring was conducted at a location approved by Municipal Drinking Water Licence and/or Drinking Water Works Permit issued under Part V of the SDWA, or at/near a location where the intended CT has just been achieved.**

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

  Turbidity continues to be monitored after the 1-micron cartridge filter. Calibration of the turbidimeter occurs in-house on a monthly basis. Cartridge filtration at this facility is not, however, used towards inactivation credits for primary disinfection purposes.

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

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

  SCADA reports are printed with trending information and reviewed daily.
  Continuous monitoring results for both flows and UV dosages are reviewed on-site daily by the operator and verification of review is recorded in a dedicated logbook at the Veolia Walkerton office.

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

  The low alarm set-point on the continuous chlorine monitor is currently 0.50 mg/L and the UV is locked out at 19.3 W/m2. The units are validated by Trojan to meet a 40 mJ/cm2 dosage rate. See attached spec sheets.

- **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.**

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

  Verification of the online chlorine analyzer continues to be completed daily with a hand-held colorimeter. Tolerance ranges greater than 5% were found to be re-calibrated in all instances. The turbidimeter is also still verified at least once per week with a hand held turbidimeter to a tolerance range of 10%.

- **All UV sensors were checked and calibrated as required.**

  Two new UV units were installed between August and October 2018. Monthly reference checks occurred for sensors on both unit and the calibration ration consistently maintained. Sensors will be replaced, instead of being

Treatment Process Monitoring

checked against a Master Reference Assembly, once every three years as per the manufacturer.

The Operating Authority is reminded that the sensor assembly will need to be replaced in the fall of 2021.

Operations Manuals

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

  It is recommended that the policies and procedures in this manual continue to be reviewed on a regular basis to ensure continued accuracy.

- **The operations and maintenance manuals met the requirements of the Drinking Water Works Permit and Municipal Drinking Water Licence issued under Part V of the SDWA.**

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.**

Security

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

  The pump house is a concrete structure with a security keyed steel entry door with access restricted to Veolia and municipal staff, with a 'No Trespassing' sign and an exterior motion sensor light. The generator fencing is still locked at all times operators are not on-site.

Certification and Training

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

  The ORO for this facility is designated Scott Gowan and backup ORO is Steve Rowe.

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

  The OIC remains designated and recorded daily in the logbook.

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

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

Water Quality Monitoring

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

  Distribution sampling was found to be conducted on week days and consistently taken from one of two (2) residential locations. This meets and exceeds the requirements outlined in O.Reg. 170/03.

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

  Inorganic sampling for parameters of Schedule 23, O.Reg. 170 is required every sixty (60) months. The most

Water Quality Monitoring

current sample event occurred on February 20, 2018. All sample results were within the prescribed limits.

The Operating Authority is reminded that the next sample event will be required in February of 2023.

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

  Organic sampling for parameters of Schedule 24, O.Reg. 170 is required every sixty (60) months. The most current sample event occurred on February 20, 2018. All sample results were within the prescribed limits.

  The Operating Authority is reminded that the next sample event will be required in February of 2023.

- **All haloacetic acid water quality monitoring requirements prescribed by legislation are being conducted within the required frequency and at the required location.**

  Haloacetic acid (HAA) monitoring is conducted in conjunction with THM sampling; the following were the sample dates during the time period reviewed.
  - October 16th, 2018 (4.3 ug/L)
  - January 15th, April 16th, July 16th and October 15th, 2019 (2.2 – 3.7 ug/L), and
  - January 14th, 2020 (2.8 ug/L).

  The Ontario Drinking Water Quality Standard (ODWQS) for haloacetic acids came into force on January 1, 2020 and is expressed as a running annual average of quarterly results. The current rolling average is 7.4 ug/L, which is below the ODWQS of 80 ug/L.

- **All trihalomethane water quality monitoring requirements prescribed by legislation were conducted within the required frequency and at the required location.**

  All trihalomethane samples (THM's) continue to be collected from two (2) different locations in the distribution system which are likely to have an elevated potential for THM formation. They were sampled on the following dates within the time period reviewed:
  - October 16th, 2018 (5.5 ug/L)
  - January 15th, April 16th, July 16th and October 15th, 2019 (4.0 – 4.7 ug/L), and
  - January 14th, 2020 (4.0 ug/L).

  The current rolling average is 4.3 ug/L, which is consistent with previous inspection periods and below the Ontario Drinking Water Quality Standard (ODWQS) of 100 ug/L.

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

  Nitrate and nitrite samples were found to be taken every three (3) months from this drinking water system. The sample dates were:
  - October 16th, 2018,
  - January 15th, April 16th, July 16th and October 15th, 2019 and
  - January 14th, 2020.

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

  Sodium sampling is required every sixty (60) months. The most current sodium sample date was October 16, 2018 with a result of 5.49 mg/L which is well below the O. Reg. 170/03 reporting limit.

  The Operating Authority is reminded that the next sample event will be required in January of 2023.

Water Quality Monitoring

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

  Fluoride sampling is required every sixty (60) months. The ODWQS fluoride limit is 1.5 mg/L. Fluoride has been deemed to be naturally occurring in this area and was last measured on October 22nd and 23rd, 2018 with results of 1.70 and 1.74 mg/L respectively. This was reported under AWQI #143681 and all system residents were provided with a letter from the Grey Bruce Health Unit outlining effects of higher fluoride in drinking water.

  The Operating Authority is reminded that the next sample event will be required in January of 2023.

- **All water quality monitoring requirements imposed by the MDWL or DWWP issued under Part V of the SDWA were being met.**

- **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 Assessment

- **Records did not show that all water sample results taken during the inspection review period did not exceed the values of tables 1, 2 and 3 of the Ontario Drinking Water Quality Standards (O.Reg. 169/03).**

  All sample results taken within this inspection period met the ODWQS with the exception of fluoride, which is deemed to be naturally occurring. The ODWQS fluoride limit is 1.5 mg/L and the October 22nd and 23rd, 2018 samples showed results of 1.70 and 1.74 mg/L respectively.

  The results and corrective actions were reported under AWQI #143681 and no further actions are required until the next sample period in January of 2023.

Reporting & Corrective Actions

- **Corrective actions (as per Schedule 18) had been taken to address adverse conditions, including any other steps that were directed by the Medical Officer of Health.**

  One (1) AWQI for fluoride was reported during this inspection review time period, as noted above. All appropriate corrective actions were taken and timelines followed for AWQI #143681.

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

- **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.**

  A review of logbook entries for this inspection time period indicates that appropriate actions and timelines were followed.

- **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 logbook entries for this inspection time period indicates that appropriate actions and timelines were followed.

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:

Rhonda Shannon

Signature: (Provincial Officer)

Reviewed & Approved By:

Mark Smith

Signature: (Supervisor)

Review & Approval Date:

February 19, 2020

Mark Smith

Digitally signed by Mark Smith
DN: cn=Mark Smith, o=MECP, ou=Water Compliance Unit, email=mark.smith@ontario.ca, c=CA
Date: 2020.02.19 15:46:18 -05'00'

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.

Ontario

Ministry of the Environment, Conservation and Parks
Drinking Water Inspection Report

APPENDIX A

INSPECTION SUMMARY RATING RECORD

Ministry of the Environment - Inspection Summary Rating Record (Reporting Year - 2019-2020)

DWS Name:	CHEPSTOW DRINKING WATER SYSTEM
DWS Number:	220008765
DWS Owner:	Brockton, The Corporation Of The Municipality Of
Municipal Location:	Brockton
Regulation:	O.REG 170/03
Category:	Small Municipal Residential System
Type Of Inspection:	Focused
Inspection Date:	January 23, 2020
Ministry Office:	Owen Sound District Office

Maximum Question Rating: 555

Inspection Module	Non-Compliance Rating
Source	0 / 14
Capacity Assessment	0 / 30
Treatment Processes	0 / 98
Operations Manuals	0 / 28
Logbooks	0 / 14
Certification and Training	0 / 42
Water Quality Monitoring	0 / 91
Reporting & Corrective Actions	0 / 87
Treatment Process Monitoring	0 / 151
TOTAL	**0 / 555**

Inspection Risk Rating	**0.00%**

FINAL INSPECTION RATING:	**100.00%**

Inspection Rating Record Generated On 13-FEB-20 (Inspection ID: 1-KVN1I).

Ministry of the Environment - Detailed Inspection Rating Record (Reporting Year - 2019-2020)

DWS Name:	CHEPSTOW DRINKING WATER SYSTEM
DWS Number:	220008765
DWS Owner:	Brockton, The Corporation Of The Municipality Of
Municipal Location:	Brockton
Regulation:	O.REG 170/03
Category:	Small Municipal Residential System
Type Of Inspection:	Focused
Inspection Date:	January 23, 2020
Ministry Office:	Owen Sound District Office

Maximum Question Rating: 555

Inspection Risk Rating	**0.00%**

FINAL INSPECTION RATING:	**100.00%**

Inspection Rating Record Generated On 13-FEB-20 (Inspection ID: 1-KVN1I).

Ontario

Ministry of the Environment, Conservation and Parks
Drinking Water Inspection Report

APPENDIX B

UV SPECS

UVSwift™SC P40 Config Settings

Project Name: Chepstow
System Type: B03

B03 - "TrojanUVSwiftSC B03 DVGW Sizing", Basic Dose

P40 Configuration Settings

Wiper Timer Adjust	8	Master Digital Outputs		Flow Setup		Multiple Lamp Alarm STP	1
Operation Mode	Remote	MDO1	Common Alarm Major	Units	L/s	D/I #1 Master P40	Enable
Run at 100% Power	Off	MDO2	Low UVInten 1 Major	Source	**Entered**	D/I #2 Master P40	Enable
Alarm Delay (seconds)	10	MDO3	Reactor HiTemp Crt	Logic DP Rated Flow	- - -	D/I #1 Slave P40	Disable
Minor Low UVI Alarm STP	**21.2**	MDO4	System In Operation	Value	2.3	D/I #2 Slave P40	Disable
Major Low UVI Alarm STP	19.3	MDO5	- - -	Major Alarm STP	2.5	Comm. Protocol	Not Required
UVI Alarm Delay (leave 0)	0	MDO6	- - -	Full Scale Set	2.5	Comm. Baud Rate	19200
Reset Lamp Hours	No	MDO7	- - -	UVT Setup		Challenge Organism	Default
CCB Node Address	1	Master Digital Inputs		Source	**Entered**	Log Reduction	Default
Master or Slave	N = Master Only	MDI1	Remote On/Off	Value	90	D10 Value	Default
Reset Factor Config	- - -	MDI2	End Cap Limit Switch	Minor Alarm STP	**90**	LogicDP Rated Dose	- - -
Wipe With	Lamps On	MDI3	Reactor High Temp	Major Alarm STP	90	LogicDP NewLamp Intensity	- - -
Date (mm/dd/yy hh:mm)	Current	MDI4	- - -	Minimum Full Scale	70.0	Set P40 Lamp Hours	0
Change Tech Password	12345	Master Analog Outputs		Reactor Temp Setup		Wiper System	Yes
Trend Time Range	12 minute	MAO1	UV Intensity	Units	Celsius	Capture Factory Config	- - -
High Temp Off Delay (m)	0	MAO2		Source	**Off**	SCADA RED Target	Off
Firmware Revision	Current	MAO3		Value	0	Wiper Park Offset	10
Clear Alarm History	No	MAO4		Minor Alarm STP	0	Wiper Alarm Delay	1
Alarm Hold 100%BPL (m)	0	Master Analog Inputs		Major Alarm STP	0	Wiper Style	Spring
Alarm Relay Fail	Open	MAI1	UV Intensity	Full Scale	0	Wiper Limit SW Type	NO
		MAI2		Valve Position Setup		System Type	B03 DVGW Basic Dose
		MAI3		Source	**Off**	On/Off Power Cycles	0
		MAI4		Value	0	On/Off Lamp Cycles	0
		MAI5		Minor Open Alarm STP	0	On/Off Wiper Cycles	0
				Major Open Alarm STP	0	On/Off 4C/Day Cycles	0
				Full Scale Open	0	UVTransmittance	Enable
						Flow Rate	Enable
						Reactor Temperature	Disable
						Valve Position	Disable
						End Of Life Lamps Hours	11750
						Lamp Warm-up Time (min)	3
						Service Override	Off
						Full Scale UVI Setpoint	100
						Lamp Life Factor	0.88
						UV Fit & EPA RED Target	Default
						Logic DP Target	Default
						DVGW Target	40
						Analog Filter Factor	- - -

Drinking Water Treatment

TROJANUV™

Water Confidence™

Water Confidence for Communities Large & Small

Our UV solutions provide validated, cost-effective disinfection

UV's environmental and water quality benefits for disinfection of drinking water are proven and embraced by communities large and small. Offering broad-spectrum protection against a wide range of pathogens, including bacteria, viruses and chlorine-resistant protozoa (such as *Cryptosporidium* and *Giardia)*, UV is a reliable, cost-effective part of a multi-barrier treatment strategy.

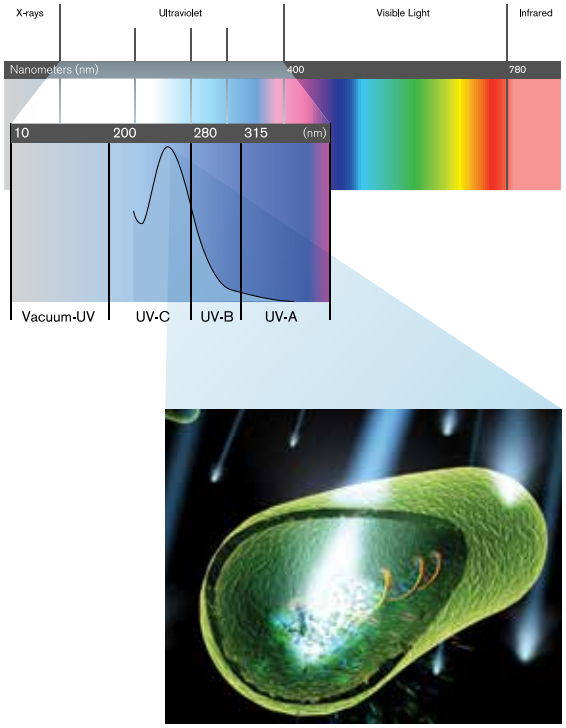
The TrojanUVSwift™SC is designed to treat flow rates of 20 gallons per minute (GPM) to 16 million gallons per day (MGD) or 4.5 to 2,525 m^3/hr. These compact UV systems offer communities an economical solution for drinking water disinfection. The TrojanUVSwiftSC is bioassay validated, having undergone rigorous DVGW and USEPA certification to ensure verified dose delivery, maximum public safety and peace of mind.

It's engineered and built to provide reliable performance, simplified maintenance, and reduced operating costs with innovative features like an optimized, "L-shaped" chamber, high-intensity amalgam lamps and optional automatic or manual sleeve wiping.

The Benefits of UV

Broad-spectrum, cost-effective protection that offers unparalleled safety

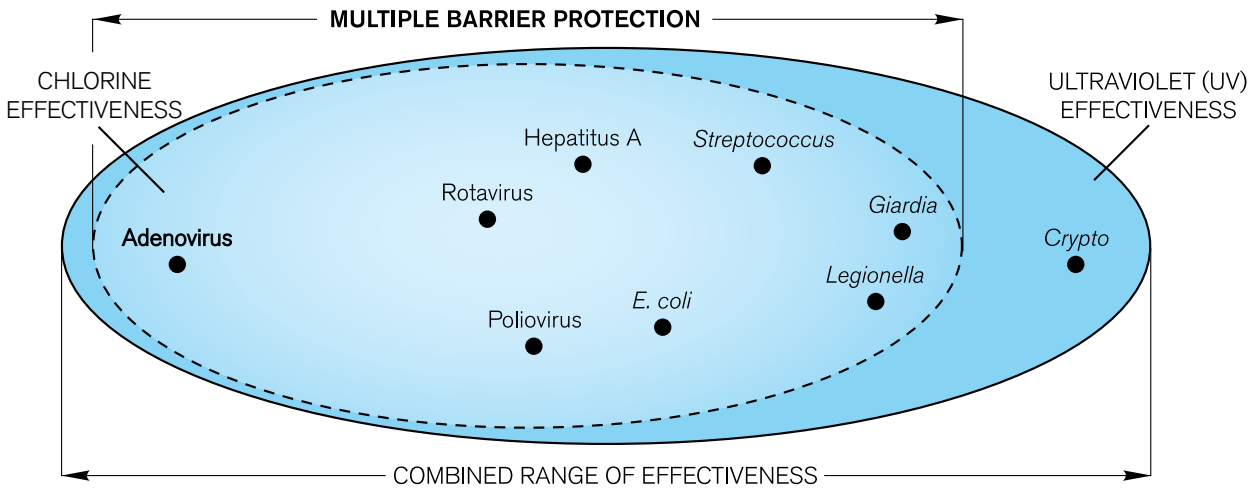
- Chemical-free way to safeguard water against harmful pathogens
- Widely accepted and endorsed worldwide for disinfection of drinking water
- Offers broad-spectrum protection against a wide range of pathogens, including bacteria, viruses, and chlorine-resistant protozoa
- Provides *Cryptosporidium*, *Giardia* and virus inactivation of up to 4-log (99.99%)
- Does not create disinfection by-products (DBPs) and does not affect taste
- At approximately 1/5th the cost of ozone disinfection and 1/10th the cost of membrane filtration, UV is the most cost-effective approach for multi-barrier treatment strategies



UV light is invisible to the human eye, but a highly effective, chemical-free way of inactivating microorganisms in water. UV light penetrates the cell wall of the microorganism and alters its DNA so it can no longer reproduce or cause infection.

Our New Virus Validation Redefines Multi-barrier

UV offers a cost-effective barrier of protection to safeguard drinking water against virtually all microorganisms treated by chlorine – including adenovirus – as well as proven inactivation of chlorine-resistant protozoa, including *Cryptosporidium* and *Giardia*. Treatment using UV provides significantly greater community safety and reduced liability risk for municipalities.



TROJAN UVSWIFT™ SC

Designed for efficient performance

Amalgam Lamps

Utilizes high-output amalgam lamps. Each is located within its own protective quartz sleeve and supported by a removable, sleeve holder assembly. Designed for easy lamp replacement.

UV Sensor

Highly accurate, DVGW-approved, photodiode sensor monitors UV output within the chamber. Mounted within the sensor port on the side wall for easy access.

Sleeve Wiping System

Optional manual or automatic systems available; both operate online, without interrupting disinfection. Fluorocarbon wipers are mounted in stainless steel yoke around the quartz sleeve of each lamp. The manual system is driven by hand using an external handle. The automatic system allows cleaning at preset intervals using a motor-driven wiper assembly.

UV Chamber

Type 316L stainless steel. Chamber configurations are available with multiple inlet/outlet diameters. Rated to 150 PSI (10 BAR) with an optional rating of 232 PSI (16 BAR). A drain port is located opposite the outlet flange.

Control Panel (CP)

Epoxy-painted, carbon steel cabinet is designed for indoor, wall-mount installation. Houses a microprocessor-based controller with input/output (I/O) connection points, and electronic power supplies. Distributes power to the UV chamber as well as the UV sensor and optional automatic wiping system. UV intensity, lamp elapsed time and lamp status are continuously monitored and displayed on the operator interface, located on the control panel door.

Remote Monitoring & Control

Robust microprocessor-based controller provides standard I/O signals for on/off control from a remote location. Programmable digital and analog I/O capabilities can generate unique alarms for individual applications, and send signals to operate valves and pumps. All units feature optional SCADA communication via Modbus, Modbus TCP/IP, EtherNet/IP and PROFINET. D-Series systems offer dose pacing to minimize energy use while maintaining required dose.

Key Benefits

TrojanUVSwiftSC

Proven performance – full bioassay validation. Meets the stringent, internationally-recognized DVGW and USEPA standards – having undergone comprehensive validation at a wide range of flow rates and UV transmittance levels.

Assurance of NSF 61 compliance. Meets the stringent standards of NSF International.

Compact footprint for installation flexibility. Can handle maximum flow capacity in minimal space. Its compact design allows it to be installed vertically or horizontally in restrictive spaces, thereby lowering installation costs. Where approved by local regulators, the system can even be installed immediately after a 90° elbow and other upstream piping configurations.

Fewer lamps required to treat a given flow. High-intensity amalgam lamps minimizes the lamps, seals, and maintenance to meet dose delivery requirements.

Sleeve wiping system reduces maintenance costs. Can be equipped with a highly-effective manual or fully automated sleeve wiping system to minimize the frequency and costs of cleaning. Both options work while the UV unit is online and disinfecting.

Designed for maximum operating efficiency. High-efficiency, electronic ballasts ensure cost-effective operation. Our high-capacity D-Series models can be equipped with optional dose pacing that adjusts lamp output to match dose to actual disinfection requirements – minimizing operating costs and extending lamp life.

Local service. Global support. Our comprehensive network of certified service providers offers ongoing maintenance programs and fast response for service and spare parts.

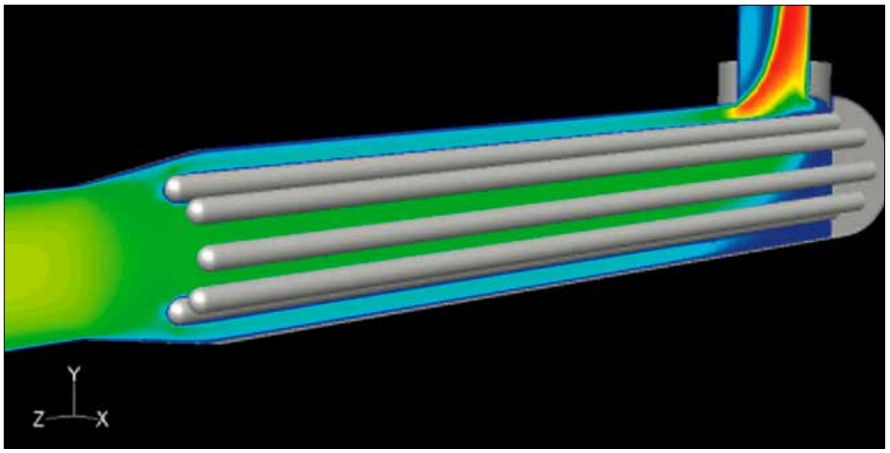
Guaranteed performance and comprehensive warranty. Our systems include a Performance Guarantee and comprehensive protection for your investment.

Compact Chamber for Installation Flexibility

Efficient, cost-saving design can be installed vertically or horizontally

Benefits:

- Compact footprint simplifies installation and minimizes related capital costs – making it ideal for retrofit applications into existing water treatment plants
- Engineered to fit into restrictive pipe galleries
- Lamps and sleeves are fully serviceable from one side – allowing the system to be installed tight to walls, other equipment or piping
- Validated with a 90° elbow installed immediately before the chamber to ensure consistent dose delivery – even under challenging hydraulic conditions created by upstream piping
- "L-shaped" design is 40% more efficient than "U-shaped" systems
- Low head loss design simplifies integration into existing processes, and minimizes the need for additional pumps and their associated capital and operating costs
- Wall-mounted control panel can be located up to 82' (25 m) from the chamber



The highly efficient "L-shaped" design and low-pressure, high-output (LPHO) amalgam lamps result in an extremely compact footprint.

Developed using advanced Computational Fluid Dynamic (CFD) modeling, and incorporating high-output amalgam lamps, the TrojanUVSwiftSC is extremely space-efficient. Its compact footprint allows the system to be integrated into restrictive pipe galleries of water treatment facilities.

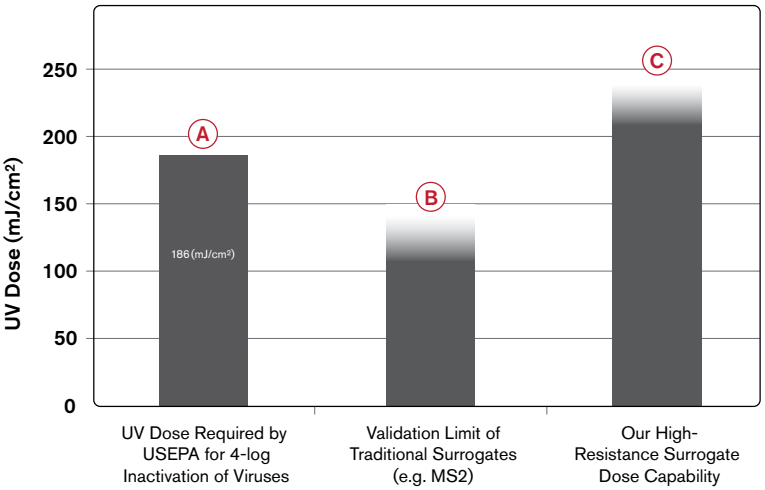
Industry-Leading Bioassay Validations

Validation testing to world standards ensures regulatory compliance regardless of location

Benefits:

- D-Series Units validated in accordance with USEPA 2006 Guidance Manual
  - Use of multiple surrogate organisms (T1, T7 and MS2) allows tailoring of UV dose to that of the target organism (e.g. *Cryptosporidium*)
  - Intensity Setpoint or Calculated Dose control options
  - Validations performed under worst-case hydraulics – with a 90° elbow at the inlet
- UV for Virus Treatment
  - Cutting-edge validation for TrojanUVSwiftSC D-Series chambers demonstrates doses sufficient for 4-log inactivation of viruses, including adenovirus, with a single unit
  - Fully EPA compliant, third-party witnessed
- All TrojanUVSwiftSC units are bioassay tested according to German DVGW standards
- Bioassay validations eliminate the use of theoretical calculations which can significantly overstate dose, potentially jeopardizing community safety (see Figure 2).

Figure 1. A UV dose of 186 mJ/cm² is required by the USEPA for 4-log treatment of viruses (column A). Traditional surrogates, such as MS2, aren't resistant enough for UV to demonstrate inactivation of 4-log virus (column B). To overcome this challenge, a high-resistance surrogate was used to validate to the doses required for 4-log virus inactivation (column C).



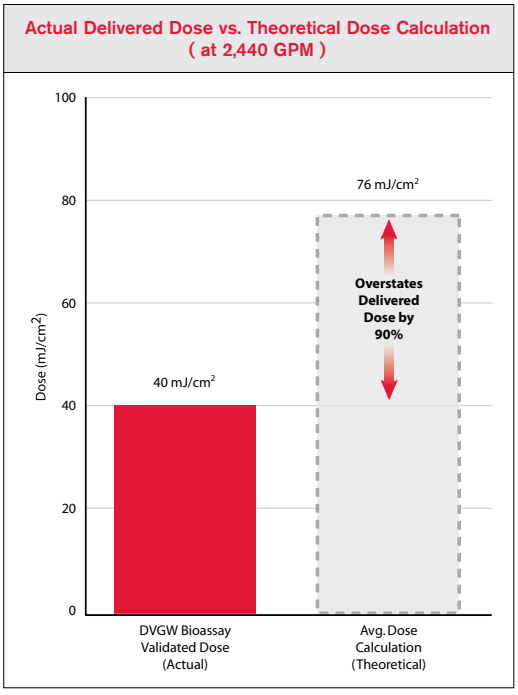


Figure 2. The graph to the left highlights an actual comparison of DVGW bioassay validation results with theoretical dose calculations for a TrojanUVSwiftSC at a flow rate of 2,440 GPM. The theoretical calculation overstates the delivered dose by 90%. Had a drinking water system been selected based on the results of the calculated dose, public safety could have been compromised.

Energy-Efficient, High-Output Amalgam Lamps

Fewer lamps reduces capital and O&M costs

Efficient, LPHO amalgam lamps allow TrojanUVSwiftSC systems to deliver the required UV dose with fewer lamps and lower operating costs.

Benefits:

- The TrojanUVSwiftSC requires 1/2 to 1/3 fewer lamps to deliver the required dose compared to traditional UV systems using low-pressure lamps
- With fewer lamps, the TrojanUVSwiftSC is very compact and can be installed in small spaces
- Fewer lamps means reduced annual maintenance costs for lamp change-outs

Robust Sleeve Wiping System

Optional manual or automatic wiping ensures consistent dose delivery

The optional wiping system reduces maintenance costs. Operators have a choice of the manual system that is operated by hand, or motorized system (shown above) which can be programmed to wipe automatically at preset intervals.

Benefits:

- Wiping system minimizes fouling of the quartz sleeves
- Ensures consistent UV dose delivery for maximum public safety
- Operates online while the lamps are disinfecting, reducing downtime
- Can be programmed to wipe lamp sleeves at preset intervals

User-Friendly Digital Controller

Intuitive system provides at-a-glance system status and allows remote operation

The TrojanUVSwiftSC controller and high-efficiency electronic ballasts have been proven in thousands of installations. The Control Panel features a user-friendly digital interface, and can be mounted up to 82 ft (25 m) from the chamber.

Benefits:

- Robust, microprocessor-based controller combines extensive functionality with an operator-friendly, digital interface
- Display provides at-a-glance, real-time system status information
- Programmable digital and analog I/O capabilities allow remote on/off control and alarm code differentiation for fast identification of changes in system status
- Optional dose pacing on high capacity D-Series systems minimizes energy use while maintaining required dose
- Optional Modbus, Modbus TCP/IP, EtherNet/IP and PROFINET protocols communicate with plant SCADA system for centralized monitoring of UV performance, lamp status, power levels and other parameters

Designed for Easy Maintenance

Operator-friendly design for easy routine maintenance

The TrojanUVSwiftSC design simplifies maintenance procedures. For example, lamp change-outs require no tools and take less than five minutes per lamp.

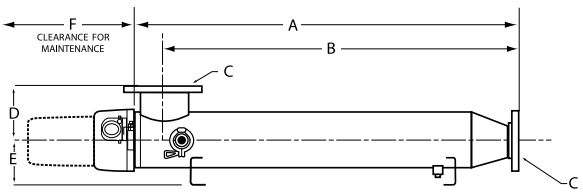
Benefits:

- Single-ended UV lamps simplify replacement
- Lamps require less than five minutes each to change – without tools
- Externally-mounted sensor allows easy access
- Optional automatic or manual sleeve wiping system reduces the frequency, inconvenience and cost of manual cleaning

TROJAN UVSWIFT™ SC

System Specifications

Model #		A02	B03	B04	B06	B08	D03	D06	D12	D18	D30
Validated Dose Range	DVGW (mJ/cm²)	40									
	EPA (mJ/cm²)	N/A					186				100
UVT Range		Nominal Range of 80% to 98%					70% to 98%				
Water Temperature		1°C to 40°C (34°F to 104°F)									
UV Chamber											
Number of Lamps		2	3	4	6	8	3	6	12	18	30
Chamber Material		Type 316L Stainless Steel									
Mounting Feet (Brackets)		Optional					Standard				
Max Operating Pressure PSI (BAR) *Additional Pressures Available		150 (10)									
Chamber Weight (Dry) lbs (kg)		34 (15)	72 (33)	75 (34)	81 (37)	85 (39)	115 (52)	275 (125)	430 (195)	665 (301)	1,200 (545)
Chamber Weight (Wet) lbs (kg)		65 (29)	149 (68)	150 (68)	160 (73)	162 (85)	230 (104)	530 (240)	860 (390)	1400 (635)	2250 (1,150)
Wiping System Available		Manual	Manual/Automatic				Automatic				
Control Panel											
Ballast Power Level		Electronic Constant Output (100%)					Electronic Variable Output (60% - 100%)				
Electrical - Voltages		120 V 230 V (Europe)	208 or 240 V, single phase , 2 wire + gnd, 50/60 Hz L-L								
Control Panel Rating		Type 12 (IP54), Type 3R (IP24)			Type 12 (IP54), Type 3R (IP24), Type 4X (IP66)						
Material		Painted Mild Steel (Type 12) SS304 (1.4301 in Europe) (Type 3R & Type 4X)									
Inputs/Outputs		5 Analog In, 2 Discrete In, 4 Analog Out, 7 Discrete Out									
Instrumentation											
UV Sensors Per Chamber (DVGW/EPA) 1 per 10 lamps as per DVGW 1 per chamber as per EPA		1					1	1	2/1	2/1	3/1
Other											
Languages		**Standard:** English, French, Dutch, German, Spanish, Norwegian, Swedish, Italian									
Dimensions – Inches (cm)											
	without auto wiper A:	33 (84)	47 (119)	47 (119)	47 (119)	47 (119)	68 (173)	66 (170)	68 (173)	68 (173)	70 (178)
	B:	30 (75)	43 (109)	43 (109)	43 (109)	43 (109)	62 (157)	60 (152)	59 (150)	56 (142)	56 (142)
	Flange Size C:	3 (80DN)	4 (100DN)	4 (100DN)	6 (150DN)	6 (150DN)	6 (150DN)	8 (200DN)	12 (300DN)	16 (400DN)	20 (500DN)
	D:	6 (15)	8 (20)	8 (20)	8 (20)	8 (20)	8 (20)	11 (27)	14 (35)	17 (42)	21 (53)
	E:	6 (15)	7 (18)	7 (18)	7 (18)	7 (18)	7 (18)	9 (23)	12 (30)	15 (38)	18 (45)
	F:	50 (127)	60 (152)	60 (152)	60 (152)	60 (152)	70 (178)	70 (178)	70 (178)	70 (178)	70 (178)



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TROJAN UV™
A TROJAN TECHNOLOGIES BUSINESS

Ontario

Ministry of the Environment, Conservation and Parks
Drinking Water Inspection Report

APPENDIX C

REFERENCE GUIDE FOR STAKEHOLDERS

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 Ministry if you need assistance or have questions at 1-866-793-2588 or waterforms@ontario.ca.

For more information on Ontario's drinking water visit www.ontario.ca/drinkingwater

PUBLICATION TITLE	PUBLICATION NUMBER
FORMS: Drinking Water System Profile Information Laboratory Services Notification Adverse Test Result Notification	 012-2149E 012-2148E 012-4444E
Taking Care of Your Drinking Water: A Guide for Members of Municipal Councils	Website
Procedure for Disinfection of Drinking Water in Ontario	Website
Strategies for Minimizing the Disinfection Products Trihalomethanes and Haloacetic Acids	Website
Filtration Processes Technical Bulletin	Website
Ultraviolet Disinfection Technical Bulletin	Website
Guide for Applying for Drinking Water Works Permit Amendments, & License Amendments	Website
Certification Guide for Operators and Water Quality Analysts	Website
Guide to Drinking Water Operator Training Requirements	9802E
Community Sampling and Testing for Lead: Standard and Reduced Sampling and Eligibility for Exemption	Website
Drinking Water System Contact List	7128E01
Ontario's Drinking Water Quality Management Standard - Pocket Guide	Website
Watermain Disinfection Procedure	Website
List of Licensed Laboratories	Website

Ontario

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 ministère au 1-866-793-2588, ou encore à waterforms@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

TITRE DE LA PUBLICATION	NUMÉRO DE PUBLICATION
Renseignements sur le profil du réseau d'eau potable Avis de demande de services de laboratoire Avis de résultats d'analyse insatisfaisants et de règlement des problèmes	012-2149F 012-2148F 012-4444F
Prendre soin de votre eau potable - Un guide destiné aux membres des conseils municipaux	Site Web
Marche à suivre pour désinfecter l'eau portable en Ontario	Site Web
Stratégies pour minimiser les trihalométhanes et les acides haloacétiques de sous-produits de désinfection	Site Web
Filtration Processes Technical Bulletin (en anglais seulement)	Site Web
Ultraviolet Disinfection Technical Bulletin (en anglais seulement)	Site Web
Guide de présentation d'une demande de modification du permis d'aménagement de station de production d'eau potable	Site Web
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	Site Web
Guide sur les exigences relatives à la formation des exploitants de réseaux d'eau potable	9802F
Échantillonnage et analyse du plomb dans les collectivités : échantillonnage normalisé ou réduit et admissibilité à l'exemption	Site Web
Liste des personnes-ressources du réseau d'eau potable	Site Web
L'eau potable en Ontario - Norme de gestion de la qualité - Guide de poche	Site Web
Procédure de désinfection des conduites principales	Site Web
Laboratoires autorisés	Site Web

Ontario