



Department/Division:	Public Works / Pelham Distribution System
Report:	Municipal Summary Report
Covering:	January 1, 2020 to December 31, 2020

1. Purpose

This report was prepared by the Director of Public Works and Manager of Public Works for the Owner of the Pelham Distribution System, the Corporation of the Town of Pelham, to be presented to Council.

Two annual water reports are required by the Ministry of the Environment, Conservation and Parks (MECP) to be prepared: (1) the 'MECP Annual Report' (O.Reg. 170/03 section 11), and (2) the municipal 'Summary Report' (O. Reg. 170/03 schedule 22).

As required by QMS-PROC-021 in the Town of Pelham's Quality Management System, results of the annual management and infrastructure review shall be presented to the Owner through the Annual Municipal Summary Report.

As legislated, Council is responsible as the Owner of the water system for ensuring these reports are prepared and available to the public each year.

The MECP Annual Report has been prepared and submitted as an attachment to the Public Works Report #2021-0013, 2020 Pelham Distribution System Summary Report.

This is the Municipal Summary Report.

To enhance the communication and understanding of these reports, this Municipal Summary Report contains additional non-legislated information on the drinking water system operations and water quality.

2. Definitions

"*DWQMS*" means Drinking Water Quality Management Standard.

"*MECP*" means Ontario Ministry of the Environment, Conservation, and Parks.

"*WTP*" means Water Treatment Plant.

"*QMS*" means Quality Management System.

"*OIC*" means Operator in Charge of the distribution system, as per O.Reg 128/04

"*ORO*" means Overall Responsible Operator of the distribution system, as per O.Reg 128/04

"*HAA*" means Haloacetic Acid. Haloacetic Acids in drinking water are a by-product of Chlorine disinfection.

"*THM*" means Trihalomethanes. Trihalomethanes in drinking water are a by-product of Chlorine disinfection.

"*CFU*" means Colony Forming Units. It is a unit of measure for bacteriological contaminants in drinking water.

"*HPC*" means Heterotrophic Plate Count. It is a method that measures colony formation on culture media of heterotrophic bacteria in drinking water.

3. System Overview

The provision of drinking water for residents in the Niagara Region is a responsibility shared between two tiers of municipal government. The Niagara Region is responsible for treatment and supply of the water to the Town of Pelham via transmission mains. The Town of Pelham is responsible for distributing water to local consumers via its own network of distribution pipes.

The Pelham Distribution System is a Class 2 water distribution subsystem. The system consists of approximately 86 km of watermains varying in size from 50mm to 400mm diameter providing water to approximately 13,300 residents through 5228 accounts within the general urban area.

The service area is approximately 14 km² and includes the Villages of Fonthill, Ridgeville and Fenwick. The system receives treated drinking water from the Welland Water Treatment Plant located on Cross Street in the City of Welland. The treatment plant is owned and operated by the Regional Municipality of Niagara. The plant receives its raw water from the Welland Recreational Canal. Treated water is transmitted to the Town by way of a 750mm diameter watermain to the Shoalts Drive Reservoir. The reservoir, which includes chlorination, is also Regionally-owned and operated. Water enters the Pelham Distribution System at the reservoir outlet.

The Town of Pelham owns and operates a water filling station with side-fill and a backflow prevention device to serve consumers outside of the urban boundary who do not have direct access to the distribution system. Water haulers must obtain approval from the Niagara Region before being permitted to use the station.

The Town of Pelham owns a small pressure booster pump station which is located on the Niagara Region's Elevated Tank Property. This pump is used to improve water pressure in the Chestnut Ridge development area. The normal operating pressure in the area is low due to its geographic location in relation to the elevated tank that supplies distribution supply and pressure by way of gravity.

The Town of Pelham Distribution System consists of 5 pressure zones separated by Pressure Reducing Valves (PRV). In Pelham, because of our unique topography, maintaining safe operating pressure within the system is a delicate balance. Increasing pressure in one area can cause damage to municipal infrastructure and private plumbing downstream.

4. Water Quality Testing

Ontario Regulation 170/03 prescribes water quality testing requirements for municipal drinking water systems.

The requirements prescribed by the MECP include: test parameters, number of test samples, frequency of testing, location of testing, reporting of test results, and reporting and corrective action of adverse test results, amongst other items. Operational guidelines are parameters used to monitor the general quality of water and the performance of the system.

The Town carried out testing in 2020 as prescribed by legislation.

In 2012, the Town of Pelham qualified for an exemption from collecting lead samples from residential or non-residential plumbing under the community lead testing program; however, reduced sampling must still take place in four locations within the distribution system. As such, the Town has continued with its lead testing program in the distribution system, with no concerns.

In addition to the prescribed sampling, the Town tested for water quality in response to complaints from consumers. Complaints generally refer to colour, odour, pressure, particulate, supply and/or taste.

The Town responded to thirteen water quality/supply complaints in 2020. Nine were related to low pressure concerns and four to water colour/odour. All were resolved promptly.

Taste and odour episodes are often related to a natural phenomenon caused by seasonal biological changes in the source water. These changes may produce odour-causing chemical compounds that can be detected by humans at very low levels. Most municipalities in Ontario which obtain their water supply from surface water sources experience this problem periodically in the summer or early fall. Also, private plumbing fixtures including small water filtration systems and drain traps can also contribute to concerns regarding taste and odour of municipally supplied water. Once identified, most of these can be resolved quickly and easily through regular maintenance completed by the property owner.

Water Treatment Plants are equipped with various filtration systems designed to reduce the effects of taste and odour, but may not eliminate it entirely.

Table 1- Testing requirements and results.

Table 1 – 2019 Testing Summary					
Parameter	# Samples Required	# of Samples Taken	Legislated Requirement	Guideline	# of Samples Exceeding Limit
Esherichia Coli (bacteriological)	22 per month	~ 36 per month	0 CFU/100mL Not detected	--	0
Total Coliform (bacteriological)	22 per month	~ 36 per month	0 CFU/100ml Not detected	--	2

HPC (heterotrophic plate count)	6 per month	~ 36 per month	--	< 500 CFU/100mL (AWWA c651-05)	0
Trihalomethanes	1 per quarter	3 per quarter	100 ug/L (annual running average)	--	0
Haloacetic Acids	1 per quarter	3 per quarter	80 ug/L (annual running average)	--	0
Free Chlorine	7 per week	13 per week	>=0.05 mg/L <=4.0 mg/L	--	0
pH	8 per year	8 per year	--	6.5 – 8.5 Operational guideline	0
Alkalinity	8 per year	8 per year	--	30 – 500 Operational guideline	0
Lead	8 per year	8 per year	0.01 mg/L	--	0
Pressure	None	5 per month (taken from each pressure zone)	--	>=28psi	0

5. Adverse Water Quality Incidents

An “adverse water quality incident” refers to a water quality test result exceeding the legislated requirements shown in **Table 1**.

The Town experienced two incidents of adverse water quality conditions that were detected in the system in 2020. Both incidents have been resolved.

6. MECP Drinking Water System Inspection Report

In December 2020, the Town’s distribution system underwent a “focused” inspection by a MECP Drinking Water Inspector. The inspection included a review of operational records from December 16, 2019 to December 14, 2020.

The Town of Pelham received a Final Inspection Rating of 100%.

The Pelham Distribution System Inspection Report is included in the 2020 Pelham Distribution System Summary Report.

7. Regulatory Updates

An updated Watermain Disinfection Procedure was issued by the MECP in August 2020. As per the Town’s Drinking Water Works Permit, changes in the procedure were to come into effect on February 1, 2021. To remain in compliance, staff have updated a number of internal procedures and forms to conform to the new procedure. This will not have a major impact on water operations.

8. Competency, Licensing and Training

Operator training is required by law to maintain drinking water licenses and ensure competency. Operators and key water staff participate in a number of diverse course offerings aimed at broadening their knowledge.

The Town of Pelham owns and operates a Class 2 Water Distribution System and a Class 2 Wastewater Collection System. The Town of Pelham Water Division currently has a compliment of a Manager of Public Works, Supervisor of Water and Wastewater, and three Water Operators. All water and wastewater operators must maintain a Water Distribution License and Waste Water Collection Facility License to operate the Town's systems.

9. Flow Data

Water consumed by the Town of Pelham is measured by the Niagara Region, and provided monthly to the Town. In 2020, a total of 1,473,630 cubic meters (m³) of water flowed to the Town of Pelham in total. (1 cubic meter of water = 1,000 litres).

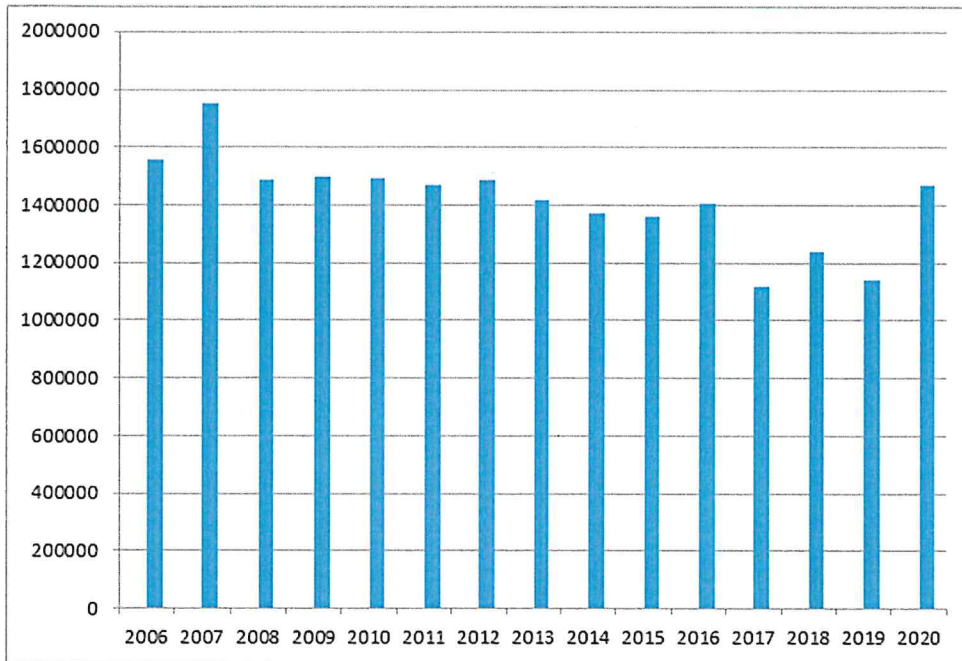
The Town of Pelham's accounted water use which includes revenue, and accounted non-revenue water use totaled 1,349,179m³. The total volume of unaccounted for water in 2020 was 124,451m³. Water loss is the difference between the total flow input and the accounted for water volume shown as a percentage. In 2020 the Town of Pelham's water loss was 8.4%.

Table 2 – Annual Totals

Year	Supply (m ³)
2006	1,559,490
2007	1,752,470
2008	1,488,891
2009	1,499,700
2010	1,497,110
2011	1,469,470
2012	1,491,850
2013	1,420,220
2014	1,374,130
2015	1,364,450
2016	1,410,410
2017	1,122,740
2018	1,243,900
2019	1,150,570
2020	1,473,630

The totals in this table are also reflected in the graph below, **Figure 1**

Figure 1 – 2020 Total Water Supplied by the Region of Niagara



All water demands were met in the system, thus the Town was not required to implement the additional use restrictions under section 4(p) of the Water Supply By-law No. 3198-2011.

The Town’s Drinking Water License does not limit demand of flows to the Town, so a comparison to license limits is not required. The 2020 average daily consumptions are shown in **Table 3**, along with the maximum daily flows for each month.

Table 3 – 2020 Daily Water Usage

Month	Average Daily Flow (m³)	Maximum Flow in One Day (m³)
January	2756	3290
February	2698	3270
March	2763	3290
April	2964	4000
May	4184	7010
June	5989	8870
July	6448	9460
August	5808	8200
September	5038	7320
October	3289	4410
November	2963	4500
December	3356	3920

The 2020 highest demand day occurred in July, which aligns with the typical high monthly demands in the summer.

No servicing concerns are noted. The Niagara Regional Master Servicing Plan (MSP) lists the firm capacity of the Shoalts Drive Reservoir to be 19,400 m³ / day. The MSP has identified future projects including the replacement of the Pelham Elevated Water Tank and increased pumping capacity at the Shoalts Drive Reservoir to accommodate projected 2041 servicing needs.

10. Capital Projects and Purchases

The Town updated the 20-year capital plan. Although efforts to ensure it represents the most current water distribution system improvement needs were made, many allowances were necessary based on competing capital infrastructure needs.

The replacement of watermain on Pelham Street from Burton Avenue to 1634 Pelham Street has been completed. The replacement of watermain on Station Street between Hwy 20 and Port Robinson Road has also been completed.

Developments involving the construction of new watermain by developers included the Summersides Mews, 100 Welland Road, Saffron Meadows Phase 2 and River Estates Phase 2.

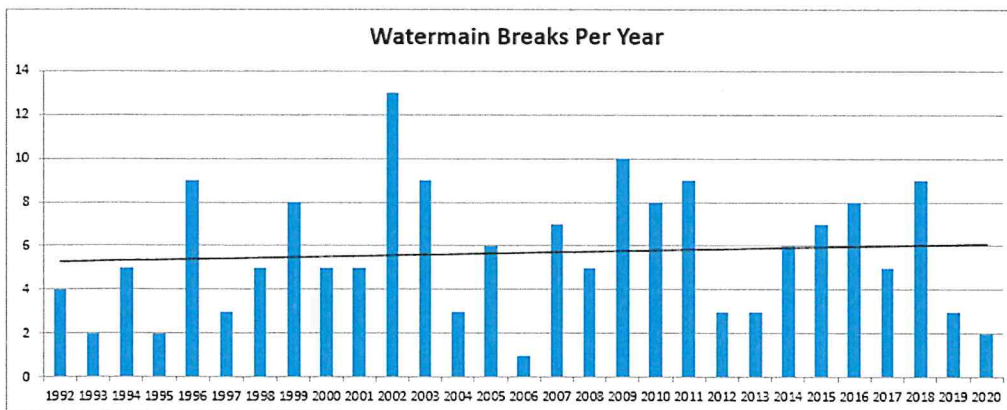
11. Rehabilitation and Repairs

A Total of 2 watermain breaks occurred in 2020, summarized in **Table 4**. **Figure 2** shows the overall trend for the total number of watermain breaks caused by pipe material and age.

Table 4 – Watermain Break Summary

Date	Location	Pipe Material	Suspected Cause	Planned Replacement
1-12-2020	Terrace Heights	Cast	Bedding, Age	
9-23-2020	Intersection Quaker/Line/Clare	Cast	Bedding, Age, High water table	

Figure 2 – Town of Pelham – Watermain Breaks per Year



In addition to watermain repairs, in 2020 Town of Pelham Staff replaced 4 leaking water services.

Regular maintenance and repairs are required at our Chestnut Ridge Booster Pump Station. Since installation these have been completed by the Niagara Regional Staff through a Maintenance Agreement. The Town continues to work closely with the Region of Niagara to maintain close communication about pressure or supply interruptions related to this pumping station.

The Town of Pelham owns and operates a Water Loading Station at 294 Canboro Road. Minor maintenance tasks are performed throughout the year including backflow prevention device testing and sampling programs.

12. Backflow Prevention

The Ontario Building Code requires backflow prevention devices are to be installed at each connection to new buildings where a potentially severe health hazard may be caused by backflow. The Town relies on the Building Code to ensure that backflow preventers are installed in new buildings.

The creation of a backflow prevention policy, associated by-law and program is ongoing and in the final stages of completion and will be presented to Council for consideration in 2021. The MECP has been strongly encouraging the Town of Pelham to develop such a program for a number of years.

13. Leak Detection

The Town of Pelham did not complete a leak detection program for 2020.

14. Municipal Drinking Water Licensing Program

The Municipal Drinking Water Licensing Program is a five-stage initiative by the MECP under the Safe Drinking Water Act, 2002. The Town of Pelham maintains its Certificate of Accreditation as an Operating Authority for its water distribution system, and the system license and permit(s) are in place. **Table 6** lists the status of the key elements for water licensing.

Table 6 – Municipal Drinking Water Licensing Program Status

Stage	Status
License #072-101	Renewed July 23, 2019 – Expires July 22, 2024
Permit #072-201	Active and current – No expiry
Operational Plan	Updated to version 2.0 and endorsed by Council March 4, 2019
Accreditation	Maintains full accreditation. Expires May 24, 2021
Financial Plan	Updated in 2018, covering 2019 – 2024 inclusive

15. Quality Management System

The Quality Management System (QMS) is fully integrated into Water operations, and maturing and improving with time. Council should remain aware of its commitments in the QMS Policy, which is the framework upon which to set the QMS.

Several minor changes to internal procedures were completed in 2020 to be implemented in 2021. An updated QMS policy S801-01 will be brought to Council for approval in 2021.

The current Operational Plan is available through the network or in printed copies at select locations.

16. Infrastructure Review

The Infrastructure Review is a required component of the DWQMS, where infrastructure includes piping and related infrastructure, but also buildings, workspace, process equipment, hardware, software, and supporting services such as transport or communication. The purpose of the review was to assess the adequacy of the infrastructure necessary to operate and maintain the water system.

Recommendations from the annual 2020 review were translated accordingly into the 2021 water operational and capital budget requests, and into the 20-year Capital Plan updates, and are communicated in this report below.

The Infrastructure Review has been included in **Appendix A** of this report

17. Management Review

Management review is a required component of the DWQMS. In December 2020, the Director of Public Works and Manager of Public Works completed a management review of the QMS in alignment with the budget and capital planning process, in accordance with the Town's Operational Plan. Recommendations will be translated accordingly into future water operational and capital budget requests, and into the 20-year Capital Plan updates, and are communicated in this report below.

The Management Review has been included in **Appendix B** of this report

18. Internal Audit Results

Results from the QMS internal audit performed in November 2019 are summarized. The internal audit must be performed once per year.

The Internal Audit found one (1) minor non-conformance and three (3) opportunities for improvement. All non-conformances and opportunities for improvement were discussed during management review as action items.

The Internal Audit Results have been included in **Appendix C** of this report

19. External Audit Results

In April 2020, the Town engaged NSF as a third party auditor to the QMS, in accordance with the Town's drinking water license requirements.

No non-conformances or corrective action requests were identified. Three opportunities for improvement were identified.

The External Audit Results have been included in **Appendix D** of this report

Appendix A – Infrastructure Review



Infrastructure Review Summary

Revision #02 Document #QMS FORM 026

The Corporation of the Town of Pelham Drinking Water Distribution System	
Meeting Location:	Tice Road Operations Centre
Date / Time:	July 14, 2020 3:10 – 4:00pm
Attendees:	Jason Marr (DPW), Ryan Cook (MPW), Corey Sciarra (Engineering Tech)
Minutes Recorded by:	Sandra Tavares (Facilitator, Tavares Group Consulting Inc.)
Minutes to be distributed to:	DPW, MPW, Supervisor

Infrastructure Review Meeting Minutes	
Details / Discussion Points / Issues Identified	Recommendation (for budget ask) / Action Items (to be tracked via QMS LIST 006)
<p>Outcomes of the Risk Assessment</p> <ul style="list-style-type: none"> Reviewed the Town of Pelham's Critical Control Point (CCP), loss of chlorine residual, associated Critical Control Limit (CCL = 0.20 mg/L after routine flush) and processes in place to maintain (i.e., Spring/Fall and watermain flushing) and monitor (weekly distribution system Cl2 sampling). There have been no deviations from the CCL in 2019/2020 and there are no current implications to the capital request. No other risks / hazards to be addressed by budget aside from backflow which will need to be determined at a later date (e.g., responsibility of Council / Municipality vs. private) <p>Watermain – servicing, replacement, monitoring, operating & capital needs, other</p> <ul style="list-style-type: none"> Reviewed 2019 Infrastructure Review Summary and associated recommendations (current status is in bold text): <ul style="list-style-type: none"> Clare Avenue Watermain Replacement - development driven (development has been completed by Developer, but Town of Pelham portion is still not approved) Haist Street: Welland Rd to Beckett Cres, including Welland Rd Haist to Edward (completed Fall 2019) Station Street: Hwy 20 to Port Robinson, Watermain Replacement - trench 	<p>No additional recommendations or action items.</p> <p>No additional recommendations or action items.</p>

Infrastructure Review Summary

Revision #02

Document #QMS FORM 026

Infrastructure Review Meeting Minutes	Recommendation (for budget ask) / Action Items (to be tracked via QMS LIST 006)
<p>Details / Discussion Points / Issues Identified</p> <ul style="list-style-type: none"> - only (WTR 02-18 still in progress) - Water System Repair Equipment (annual) - Backflow Prevention Program (WTR 01-2018 repeated recommendation from MECP. Bylaw has been postponed from Spring 2020 due to COVID to Fall 2020 although backflow testing form in place; testing is estimated to take place Jan-2021 starting with surveys of properties for implementation in 2022 – linked to risk assessment outcome #11) • Reviewed 2018-2020YTD break histories to date: <ul style="list-style-type: none"> - 8 in total in 2018 (1 pulled by contractor on Hurricane [risk assessment outcome 8]) 2x Pelham St N, 2x Pelham St S, 1 Strathcona Drive, 165 Welland and 1441 Station St. (watermain to be replaced in these areas) - 7 in 2019 (5 contractor- and 2 ageing-related) - 6 in 2020 YTD (5 contractor-related) - Numbers continue to be in line with 5-10 / year with highest frequency in replacement process which is also dependent on funding/available reserves, wastewater and roads needs. • Reviewed the 2019/2020 projected 20-Year Capital and 2018 Pelham St S. (Welland St. to south limit) which is projected for 2024 with Pelham N. (originally recommended for 2016, watermain in service and complete). 2021 working 20-Year Capital to be approved Oct/Nov-2020 (includes annual request for inventory, Clare Ave (likely deferred to 2022); budget process to move to August / September 2020). 	
<p>Hydrants – monitoring, servicing, operating & capital needs, other</p> <p>No hydrant needs have been identified by the Fire Chief since Pelham St. Merrit to Quaker. Ties in with Water System Repair Equipment above if needed</p> <p>Main valves – monitoring, servicing, operating & capital needs, other</p>	<p>No additional recommendations or action items.</p>
	<p>No additional recommendations or action items.</p>

Infrastructure Review Summary

Revision #02

Document # QMS FORM 026

Infrastructure Review Meeting Minutes	Recommendation (for budget ask) / Action Items (to be tracked via QMS LIST 006)
Details / Discussion Points / Issues Identified	
<p>Existing Pressure Release Valves (PRVs) – March 2020 inspection took place as part of the operating budget with no short-terms concerns aside from 2022/2023 maintenance as per MPW; 2020 Final 20-Year Capital identified projected needs in 2034 and 2035 replacement</p>	
<p>Other appurtenances – operating & capital budget needs, other</p>	
<p>Bulk Station was discussed (identified 50-year life span) with no short-term concerns / implications to capital request.</p>	<p>No additional recommendations or action items.</p>
<p>Inventory and Tools – operating & capital needs, other</p>	
<p>2 Colorimeters (4 in total) were replaced in 2019</p>	
<p>Software / hardware – capital needs, other</p>	
<p>Work Order software (all Public Works Departments) was approved for 2018 and now waiting for assets to be uploaded.</p>	<p>Action (2020-OFI-11): DPW to include tablets for Operators as part of the 2021 Budget ask.</p>
<p>Pumping Station</p>	
<ul style="list-style-type: none"> Region attends the site once / month and contacts the Town in the event of an issue. A redundant pump is in place in the event of issues with the duty pump. The Region does intend on moving the Water Tower, at which point the pumping station will become obsolete. Study is ongoing and no timelines have yet been identified. Related to Risk Assessment Outcomes #s 1 and 2 and 2020-OFI-05 MECF Inspection Recommendation. 	<p>No additional recommendations or action items.</p>
<p>Staffing</p>	
<p>New staff member in 2018 is now applying for a Class I licensing and no additional staffing required as per DPW.</p>	<p>No additional recommendations or action items.</p>
<p>Water Quality Complaints</p>	
<p>Annual summary in 'Complaint Summary' tab of 'Current Combined Water Ops</p>	<p>No additional recommendations or action items.</p>

Infrastructure Review Summary

Revision #02 Document # QMS FORM 026

Infrastructure Review Meeting Minutes		2015 onward spreadsheet ¹ was reviewed with MPW:							Recommendation (for budget ask) / Action Items (to be tracked via QMS LIST 006)
Details / Discussion Points / Issues Identified		2016	2017	2018	2019	2020 YTD	TOTAL		
Air Complaints / Year	– tied to watermain breaks (incl. approx. 75% contractor issues, natural watermain breaks dropped to 2-3 / year related to Haist, Welland and Pelham Sts.) and colour	3	1	1	2	0	7		
Colour Complaints / Year	– internal plumbing issues have led to an increase in 2019 (e.g., rusty water tanks)	4	7	3	12	1	27		
Leaky Service Complaints / Year	– replacement of water mains has reduced this number	5	22	3	2	0	32		
Low Pressure Complaints / Year	– moves from one area to another	9	13	5	6	2	35		
Odour Complaints / Year		1	2	1	2	0	6		
TOTAL		22	45	13	24	0	107		
Best Management Practices (BMPs)		<ul style="list-style-type: none"> QMS LIST 006 Corrective Action List <ul style="list-style-type: none"> 2018-OFI-13, 2019-OFI-01 and 2020-OFI-05 OPEN MECP Recommendations are not deemed BMPs Corrective Action List Element 14 actions were reviewed with no further updates No additional BMPs identified 							No additional recommendations or action items.

Appendix B – Management Review

Management Review Meeting Record

Revision #01 Document # QMS FORM 027

The Corporation of the Town of Pelham Drinking Water Distribution System	
Meeting Location:	Tice Road Operations Center
Date / Time:	December 3, 2020
Attendees:	Jason Marr (DPW), Ryan Cook (MPW), Dave Vaccaro (SWW), John Raso (Asset Management Analyst) & TGC Facilitator (Sandra Tavares)
Minutes Recorded by:	Sandra Tavares (TGC)
Minutes to be distributed to:	DPW, MPW and Council

2019 Management Review dated 19-Dec-2019 completed for the Nov-2018 to Dec-2019 period was communicated via <https://www.pelham.ca/en/living-here/resources/images/Appendix-B---2019-Municipal-Summary-Report.pdf> and approved 18-Feb-2020 via Committee of the Whole Minutes COW-02/2020 agenda number 4.4.1 (in OP binder).

Management Review Minutes are located at ops(M:\Public Works & UTILITIES DEPARTMENT\Water Distribution System\DWQMS\Management Review by year.

*Please refer to 2019 Management Review Data Summary Package dated 19-Dec-2019 for previous details reviewed for each of the inputs below.

Management Review Meeting Points / Issues Identified / Decisions	Action Item(s)	Responsibility	Proposed Due Date
<p>1) NO Incidents of regulatory non-compliance:</p> <ul style="list-style-type: none"> - Last MECP Inspection took place 17-Dec-2019 with report issued 22-Jan-2020 with 100% Inspection Rating - Associated 'Recommendations and Best Management Practices' are identified in QMS LIST 006 with updates on open items provided by the MPW and SWW; all MECP inspection recommendations have been addressed (e.g., 2018-OFI-14 / 2017-IA-03 pertaining to logbook certified Operator entries completed 9-Apr-2018 was verified 5-Nov-2020 as part of the Internal Audit) except for item dated 2016-09-01 (which is also addressed in subsequent MECP Inspection Reports and linked to 2019-OFI-01 [verification needed due to backflow testing form use April 2020 at next TGC onsite day]) and 2020-OFI-05 relating to: <ul style="list-style-type: none"> i) Town baffles/mixing systems/rechlorination stations 	QMS LIST 006 to be shared with MECP for updates on 2019 same issues raised	MPW	20-Dec-2019 COMPLETED when additional MECP requested information was provided by 1-May-2020 requested date but MPW unsure if reviewed

Management Review Meeting Record

Revision #01 Document #QMS FORM 027

Management Review Meeting Minutes (completion of Action Items to be tracked via QMS LIST 006)				
Input	Details / Discussion Points / Issues Identified / Decisions Made	Action Item(s)	Responsibility	Proposed Due Date
2)	<p>installations, impact of higher pressure on older watermains and adjusting Pressure-Reducing Valve (PRV) strategies accordingly, and</p> <p>ii) visiting the new Port Colborne Barrick and King St. Roads and Well and Bemis Elevated Tanks for issues during construction and decommissioning / demolition.</p> <p>Incidents of <u>adverse drinking-water tests</u>:</p> <ul style="list-style-type: none"> - 2-2020 Total Coliform (TC) and high chlorine Adverse Water Quality Incidents (AWQIs) on 9-Sep (151917, resolved 14-Sep) and June 25 (150397, resolved 29-Jun) - Previously, 4 incidents in 2015 as per 'Current Combined Water Ops 2015 onward spreadsheet' 'Maintenance Activities' tab. <p>Deviations from critical control point limits and response actions:</p> <p>Last deviation from the identified CCL took place 10-Nov-2017 as per logbook (Town of Pelham W D System #260001604 Water Distribution System Operation Record for 24-Aug to 17-Jan-2018) – refer to item 1 above relating to 2018-OFI-14 / 2017-IA-03 logbook entries which also document whether CCLs are reached.</p> <p>The effectiveness of the <u>risk assessment process</u>:</p> <p>A delayed Re-Assessment due to COVID was completed 2020-07-14 (previously 2-May-2017 and last reviewed 28-Oct-2019) as a precursor to review of infrastructure, conducted on the same day. There were no changes to ratings or the threshold with QMS SOP 020 SOP Frozen Service added as a control to #s 5 and 15 as a result of the same-day emergency exercise.</p> <p><u>Internal / third-party audit results</u>:</p> <ul style="list-style-type: none"> - Results of the internal audit 5-Nov-2020 were reviewed. The audit took place over a 2-day period, ½ of which was 	Not applicable (N/A)	N/A	N/A
3)		N/A	N/A	N/A
4)		Next proposed Mar-21 prior to NSF Re-Accreditation and to coincide with 2021 budget process (refer to 'DWQMS Timeline' tab of <u>QMS LIST 006</u>)	TGC	5-Mar-2020 COMPLETED 14-Jul-2020 due to COVID
5)		2019 findings to be addressed. Photos of colorimeters are to	TGC / MPW SWW	end of Q1 2020 - OPEN 31-Dec-2020

Management Review Meeting Record

Revision #01

Document # QMS FORM 027

Management Review Meeting Minutes (completion of Action Items to be tracked via QMS LIST 006)				
Input	Details / Discussion Points / Issues Identified / Decisions Made	Action Item(s)	Responsibility	Proposed Due Date
6)	<p>conducted offsite by a different TGC auditor to maintain independence with follow-up online interviews during the onsite portion. 5 OFIs were identified and added to added to <u>QMS LIST 006</u> (2019 led to 1 NonConformity + 4 OFIs) with elements 5 and 13 resurfacing in addition to elements 7, 15 and 21.</p> <ul style="list-style-type: none"> - 2019-OFI-05 (2019-IA-02) and 2019-OFI-07 (2019-IA-04) pertaining to correctly characterizing frozen [home] services within 'Current Combined Water Ops 2015 onward spreadsheet', currently identified as "scheduled" and confirmation of colorimeters remain open, the latter pending verification (<i>refer right for Action Item</i>). - The NSF external DWQMS audit took place 16-Apr-2020 by NSF with 2 OFIs, 2020-OFI-08 which remains open pending QMS PROC 021 supplier 12-hour response requirement update to ensure no reoccurrence as part of the 5-Nov-2020 Internal Audit verification and -09 pertaining to reliance on external resources which was closed during this meeting. <p>Results of emergency response testing:</p> <p>Conducted 14-Jul-2020 (previously <u>17-Nov-2017</u> relating to watermain break) closing 2018-OFI-10 from the external audit (weather-related relating to QMS SOP 020 Frozen Service) with 2020-OFI-10 IN PROGRESS to review the use of a Drinking Water Advisory Form / Checklist as per QMS SOP 026 and changes made to a number of procedures noted in revision histories.</p> <p>Operational Performance:</p> <p>As per SWW:</p> <ul style="list-style-type: none"> • Sampling results is still being inputted within an excel spreadsheet, Chlorine Residual Sampling Summary by year (reviewed by MPW and lead / THMs / HAAs) to enable easier annual reporting; no trends / incidents were identified. • Maintenance as per 'Current Combined Water Ops 2015 	<p>be provided for verification of 2019-OFI-07 (2019-IA-04).</p> <p>Next proposed for 2023 as per 'DWQMS Timeline' tab of <u>QMS LIST 006</u></p>	TGC	5-Mar-2020 COMPLETED 14-Jul-2020 due to COVID
7)				

Management Review Meeting Record

Revision #01 Document #QMS FORM 027

Management Review Meeting Minutes (completion of Action Items to be tracked via QMS LIST 006)			
Input	Details / Discussion Points / Issues Identified / Decisions Made	Action Item(s)	Proposed Due Date
	<p>onward spreadsheet¹ was reviewed:</p> <ul style="list-style-type: none"> - PRVs (completed 5-Sep-2019 for the Region with pressure zone readings still done monthly as per 'Pressure Test' tab; 'Scheduled' 28-Oct- and 2-Nov-2020 PRV Maintenance was discussed - 2018/2019 annual valve maintenance (Q1 started in 2018 and finished Jun-2019 utilizing QMS FORM 14; Q2 was done in 2019 as well, Q3 scheduled for Fall 2020 and Q4 (large section) in 2021) - 2020 annual hydrant maintenance (including flushing, greasing, repair if needed) is also completed in 4 quadrants in one year (Spring to Fall); completion of individual hydrants are tracked using QMS FORM 002 and in logbook - 2020 dead end blow off flushing was completed in the Spring (23-Mar to 20-Apr) and Fall (Oct 5-22) and is documented on QMS FORM 001. • Discussion ensued re: Operational Performance criteria with no additional inputs identified but actions listed right generated 	<p>MPW / SWW</p> <p>MPW / SWW</p> <p>TGC / MPW</p>	<p>April 2021</p> <p>1-Sep-2021</p> <p>1-Sep-2021</p>
8)	<p>Raw water supply <u>reports</u> & drinking water trends:</p> <p>Region of Niagara reports reviewed annually by MPW identified no issues</p>	<p>N/A</p> <p>N/A</p>	<p>N/A</p> <p>N/A</p>
9)	<p>Follow-up on actions from <u>previous Management Reviews</u>:</p> <p>2019-OFI-08 to obtain a copy of the draft Ontario Watermain Disinfection Procedure sparked discussion on requirements and changes (e.g., Operator approval and onsite from start to finish for disinfection and change to watermain break and categories).</p> <p>Status of management actions items identified between reviews:</p>	<p>SWW</p>	<p>1-Feb-2021</p>
10)			

Management Review Meeting Record

Revision #01 Document #QMS FORM 027

Management Review Meeting Minutes (completion of Action Items to be tracked via QMS LIST 006)																																													
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	Refer to Item 10 directly above and closed 2020-OFI-09 in Item 5 above.	2020-OFI-12 ii) Consider making the OP in its entirety available electronically, considering Town Hall is closed due to COVID to be reviewed during Management Review	1-Mar-2021 (following Annual Summary Report presentation to Council)																																										
11)	<p>Changes that could affect the Quality Management System:</p> <ul style="list-style-type: none"> - Refer to Item 9 above. - DPW had no follow up re: status of requirements under O.Reg. 588/17 Asset Management Planning for Municipal Infrastructure which is currently determined as not having an impact on the DWQMS - 2021 Annual Calibration proposed for Mar-21 prior to NSF on-site Re-Accreditation as per DWQMS Timeline 	<p>MPW</p> <p>i) Obtain a copy of the draft Ontario Watermain Disinfection Procedure.</p> <p>ii) Confirm dates of training for admin staff and annual calibration in 2020 as per meeting notice sent 27-Dec-2019 and DWQMS timeline.</p>	<p>i) 15-Jan-2020</p> <p>- RESCHEDULED to 1-FEB-2021</p> <p>ii) 5-Mar-2020 COMPLETED 14-Jul-2020 and included Operators + Engineering Technician</p> <p>N/A</p>																																										
12)	<p>Consumer feedback (incl. complaints):</p> <p>Annual summary in 'Complaint Summary' tab of 'Current Combined Water Ops 2015 onward spreadsheet' was reviewed:</p> <table border="1"> <thead> <tr> <th>COMPLAINT TYPE</th> <th>2016</th> <th>2017</th> <th>2018</th> <th>2019</th> <th>2020 YTD</th> </tr> </thead> <tbody> <tr> <td>Air</td> <td>3</td> <td>1</td> <td>1</td> <td>2</td> <td>0</td> </tr> <tr> <td>Colour Complaints</td> <td>4</td> <td>7</td> <td>3</td> <td>12</td> <td>3</td> </tr> <tr> <td>Leaky Service Complaints</td> <td>5</td> <td>22</td> <td>3</td> <td>2</td> <td>0</td> </tr> <tr> <td>Low Pressure Complaints</td> <td>9</td> <td>13</td> <td>5</td> <td>8</td> <td>4</td> </tr> <tr> <td>Odour Complaints</td> <td>1</td> <td>2</td> <td>1</td> <td>2</td> <td>1</td> </tr> <tr> <td>TOTAL</td> <td>22</td> <td>45</td> <td>13</td> <td>26</td> <td>8</td> </tr> </tbody> </table>	COMPLAINT TYPE	2016	2017	2018	2019	2020 YTD	Air	3	1	1	2	0	Colour Complaints	4	7	3	12	3	Leaky Service Complaints	5	22	3	2	0	Low Pressure Complaints	9	13	5	8	4	Odour Complaints	1	2	1	2	1	TOTAL	22	45	13	26	8	N/A	N/A
COMPLAINT TYPE	2016	2017	2018	2019	2020 YTD																																								
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Management Review Meeting Record

Revision #01

Document # QMS FORM 027

Management Review Meeting Minutes (completion of Action Items to be tracked via QMS LIST 006)				
Input	Details / Discussion Points / Issues Identified / Decisions Made	Action Item(s)	Responsibility	Proposed Due Date
13)	<p>Construction work on Station St. and associated connections needed and cast iron may have contributed to the increase of colour complaints in 2012. No other trends observed.</p> <p>The resources needed to maintain the QMS:</p> <p>MPW and DPW identified assistance services an asset and to continue into 2021, in response to 2020-OFI-08. Number of Operators OK until 2025 when work is required on the system. DWQMS Timeline tracks significant annual activities.</p>	N/A	N/A	N/A
14)	<p>The result of the <u>infrastructure review</u>:</p> <p>Status of 20-Year Projected Capital Budget was communicated to the Senior Leadership Team. Projects were documented within the updated Infrastructure Review Meeting Minutes (QMS FORM 026) conducted 14-Jul-2020 which also included the Risk Outcomes Re-Assessment. Operating budget presented 30-Nov to Council and recommended for approval with Capital budget scheduled for 7-Dec with both to be approved Jan-2021.</p>	More detailed review of 20-year projects (e.g., cast iron, from developers) prior to review of infrastructure	DPW	1-Apr-2021
15)	<p><u>Operational plan currency, content and updates (incl. need for re-endorsement)</u>:</p> <p>Some Operational Plan updates have been identified as a result of audit findings, etc. (e.g., 2020-OFI-12 [2020-IA-01]) with no need for re-endorsement in early 2021 as per MPW at time Annual Summary Report goes to Council as these are not major revisions and do not involve a new Council.</p> <p>Personnel suggestions:</p> <p>No additional details reviewed; actions have been given consideration and are being effectively tracked via <u>QMS LIST 006 - 2018-OFI-13, 2019-OFI-01</u> (discussed above) and 2020-OFI-06 remain open related to backflow, calibration and Final Guideline for Canadian Drinking Water Quality for Chloramines, respectively.</p>	N/A	N/A	N/A
17)	<p>General assessment of suitability, adequacy, and effectiveness</p>	Spoke about continual	N/A	N/A

Management Review Meeting Record

Revision #01

Document # QMS FORM 027

Management Review Meeting Minutes (completion of Action Items to be tracked via QMS LIST 006)											
Input	Details / Discussion Points / Issues Identified / Decisions Made		Action Item(s)							Proposed Due Date	
	Audits identified the following positive trend:										
			2015	2016	2017	2018	2019	2020			
	Internal Audit		3 NCs, 5 OFIs	5 NCs, 13 OFIs	8 OFIs	6 OFIs	1 NC, 4 OFIs	5 OFIs			
	MECP Inspection		2 NCs	3 Recs	4 Recs	3 NCs, 5 Rec	2	TBD			
	External audit (OFIs)		4	2	2	3	2	2			
	TOTAL		3 NCs, 9 OFIs	5 NCs, 18 OFIs	16 OFIs	9 OFIs	1 NC, 6 OFIs	7 OFIs			
	Most findings are generated from internal audits and mostly OFIs. Corrective and preventive actions are being managed effectively. The QMS is deemed to be suitable, adequate, and effective.										
18)	Review and consideration of applicable Best Management Practices (BMPs)										
	MECP website identified no BMPs. MECP recommendations (see input 1) are included within QMS LIST 006 (i.e., 208-OFI-13 and 2019-OFI-01 discussed above and generated from Staff Observations) as well as BMPs / Preventive Actions (latter classification as a result of DWQMS v2).										
			improvement and through corrective action log. Less findings and associated risk. SWW / MPW / DPW actively involved and engaged in process.								
			N/A							N/A	N/A

Appendix C – Internal Audit



The Corporation of the Town of Pelham

Drinking Water Quality Management System (v2)
Internal Audit Report

*20 Pelham Town Square
P.O. Box 400
Fonthill ON, L0S 1E0*

Internal Audit Date: 5 November 2020

Report Distribution: Ryan Cook, *Manager of Public Works (MPW)*
Jason Marr, *Director of Public Works (DPW)*

A handwritten signature in black ink, appearing to read "S. Tavares", written over a horizontal line.

Sandra Tavares, *B.Sc., M.Sc., EP(EMSLA), EP-Sustainability*

Report Issued: 25 November 2020

Project Objectives

Tavares Group Consulting Inc. was engaged by The Town of Pelham to conduct an Internal Audit of the Town's Drinking Water Quality Management System (QMS) against the Drinking Water Quality Management Standard (DWQMS V2). This audit was conducted to satisfy the requirements of the DWQMS Element 19 requirement to complete a QMS internal audit at least once every calendar year. Please see [Annex A](#) for auditor qualifications.

Project Scope

An on-site audit was performed 5-Nov-2020 at the Tice Road Operations Centre following an off-site documentation review, according to ISO 19011:2018 Guidelines for auditing management systems, including the Internal Audit Plan issued 7-Oct-2020 to confirm:

- the management system conforms with the applicable elements of the Standard; and
- the organization conforms with its own policies and procedures.

Results of prior internal and external audits were also considered and reviewed through the course of the audit.

An Opening and Closing Meeting was held. Attendees included:

- *Manager of Public Works*, and
- *Director of Public Works*

with the Water / Wastewater Supervisor as an audit participant.

Conclusions

The Town of Pelham's QMS conforms with:

- the applicable elements of the DWQMS, and
- its own policies and procedures.

The Operating Authority's (OA) commitment to the improvement of its QMS is evident and has the appropriate elements in place for further improvement.

In total, there were five [5] Opportunities for Improvement (OFIs) identified. Refer throughout the audit report for 2019 audit finding follow-up (*details regarding closure and verification can be found in QMS LIST 006*). A [Summary of Findings](#) has been provided below

with details in the [Comments](#) portion of the report; identification numbers (e.g., 2020-IA-XX) have been assigned for new findings.

2015 – 3 NCs, 5 OFIs
 2016 – 5 NCs, 13 OFIs
 2017 – 8 OFIs
 2018 – 6 OFIs
 2019 – 1 NC, 4 OFIs
 2020 – 5 OFIs

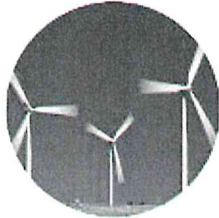
Confidentiality

This report was prepared exclusively for The Corporation of the Town of Pelham and is based on information collected during off- and on-site reviews. The scope of the project is described in this report and is subject to restrictions, assumptions, and limitations. As noted herein, the work was conducted in accordance with the scope of Tavares Group Consulting's proposal and Terms and Conditions.

Summary of Findings

Owner & Operating Authority:	The Corporation of the Town of Pelham (Public Works)
Auditors:	Sandra Tavares (<i>Lead</i>) and Francis Chua (<i>Team Member</i>)
Systems Reviewed:	The Pelham Distribution System
REQUIREMENT ↓	FINDING(S) ↓
1. Quality Management System	C
2. Quality Management System Policy	C
3. Commitment and Endorsement	C
4. Quality Management System Representative	C
5. Document and Records Control	OFI 2020-IA-01
6. Drinking Water System	C
7. Risk Assessment	OFI 2020-IA-02
8. Risk Assessment Outcomes	C
9. Organizational Structure, Roles, Responsibilities and Authorities	C
10. Competencies	C
11. Personnel Coverage	C
12. Communication	C
13. Essential Supplies and Services	OFI 2020-IA-03
14. Review and Provision of Infrastructure	C
15. Infrastructure Maintenance, Rehabilitation & Renewal	OFI 2020-IA-04
16. Sampling, Testing and Monitoring	C
17. Measurement & Recording Equipment Calibration and Maintenance	C
18. Emergency Management	C
19. Internal Audits	C
20. Management Review	C
21. Continual Improvement	OFI 2020-IA-05
C	Conforms to the requirement – See comments in body of report
Mj	Major Non-conformity
Mn	Minor Non-conformity
OFI	Opportunity for improvement – See Annex A
OFI *	Opportunity for improvement which may become a nonconformity if not addressed– See Annex A

Appendix D – External Audit



NSF International Strategic Registrations Audit Report

The Corporation of the Town of Pelham
20 Pelham Town Square Box 400
Fonthill, Ontario L0S 1E0 CAN

C0122277

Audit Type

Surveillance Audit

Auditor

James Pang

Standard

Ontario's Drinking Water Quality Management Standard Version 2
(Exp Date: 06-SEP-2021)

Audit Date(s):

04/16/2020 - 04/16/2020

Recommendation

Ontario's Drinking Water Quality Management Standard Version 2 :



Executive Summary	
Ontario's Drinking Water Quality Management Standard Version 2	The DWQMS appears to be very customised and right to the point, which should make it easy to implement.

Opportunities	
Ontario's Drinking Water Quality Management Standard Version 2	See the three OFI

Corrective Action Requests	
There is NO Corrective Action Request in this audit.	

Site Information
 The audit was based on a sampling of the company's management system.

Industry Codes
 NACE:E 41

Scope of Registration
 Ontario's Drinking Water Quality Management Standard Version 2 : Pelham Distribution System, 072-OA1, Entire Full Scope Accreditation



Opportunities for Improvements

Ontario's Drinking Water Quality Management Standard Version 2

Opportunity	Observations / Auditor Notes
Opportunities for Improvements (DWQMS)-01	<p>Location of OFI Quality Management System;</p> <p>Discussed With Ryan Cook;</p> <p>Description Although the 21 elements were incorporated in the Operational Plan, some of the documentation reference are still pointing to the previous version of the DWQMS Standard, eg. QMS PROC 021. Therefore, the management is to consider to review the a;l documents making up the DWQMS to be consistency referring to the correct version of the DWQMS. ;</p>
Opportunities for Improvements (DWQMS)-02	<p>Location of OFI Communications;</p> <p>Discussed With Ryan Cook;</p> <p>Description Although QMS PROC 021 described communication between the top management and the four different parties required by the Standard adequately, may I suggest to elaborate within QMS PROC 021 on the subject of communication with supplies of essential services and supplies. For example, elaborate on the need for their commitment to be available to render help within 12 hours or to supply certain products such as pipe repair fittings in conformance with AWWA and other acceptable and reputable Standards. ;</p>
Opportunities for Improvements (DWQMS)-03	<p>Location of OFI Management Review;</p> <p>Discussed With Ryan Cook;</p> <p>Description Reviewed records of management reviews held in December 2018 and December 2019, and found to be acceptable. It was noted that on both occasions, the meetings were facilitated and recorded by the consultant who also conducted their internal audit in both years. Although these were not non-conformances, the management should develop staff to conduct audits and process functions internally. ;</p>

Processes

Audit Summary Matrix



Verification of CARs For Ontario's Drinking Water Quality Management Standard Version 2

Have you verified the effectiveness of all previous CARs? (List all new CAR's that you initiated in this report because you did not verify effective implementation of a previous CAR)
N/A.

Discuss your evaluation in detail.
No CAR from previous audit.