

## 2022 QMS Management Review

### 2022 Quality Management System (QMS) Management Review Meeting Summary

Date:	March 16, 2023
Time:	10:00 a.m.
Location:	WTP Training Room
Attendees:	Jeanette Davidson, Director, Works & Engineering Brian Gilmer, Director, Corporate Services/Clerk Mike Stewart, Manager, Water BJ Coull, Supervisor, Water Christine Smith, W/WW Compliance Coordinator, QMS Rep Alex Doucette, Water Operator
Prepared By:	Christine Smith, Mike Stewart

#### Overview/Purpose

In accordance with the Ontario Drinking Water Quality Standard Version 2.0 (DWQMS V2.0) and the Port Hope Drinking Water System Operational Plan, a Management Review Meeting shall be conducted at least once per calendar year. The meeting provides Top Management with the information required to review and evaluate the continuing suitability, adequacy, and effectiveness of the Quality Management System (QMS) with the requirements outlined in DWQMS V2.0, which includes consideration of the sixteen (16) items listed below.

1. Incidents of regulatory non-compliance.
2. Incidents of adverse drinking water tests.
3. Deviations from critical control point limits and response actions.
4. The effectiveness of the risk assessment process.
5. Internal and third-party Audit results.
6. Results of emergency response testing.
7. Operational performance of the drinking water system.
8. Trends in the quality of raw water supply and drinking water.
9. Follow-up on action items from previous management reviews.
10. Updates on action items identified between management review meetings.
11. Changes to services, activities, or regulations that could affect the QMS.
12. Consumer feedback.
13. The resources needed to maintain the QMS.
14. Results of the infrastructure review.
15. The QMS Operational Plan currency, content, and updates.
16. Comments and suggestions made by personnel.

#### Important Terms/Definitions

**CCP** is a critical control point. A point in a process where a control measure with clear critical control limit(s) is essential to control a significant hazard.

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**CCL** is a critical control limit. They are measurable or observable pre-set values or criteria that separate what is acceptable from what is not acceptable to achieve safe drinking water.

**DWQMS** is the Drinking Water Quality Management Standard.

**MECP** is the Ministry of the Environment, Conservation and Parks.

**MPH** is the Corporation of the Municipality of Port Hope.

**Non-compliance** is a non-fulfillment of a regulatory requirement.

**Non-conformance** is a non-fulfillment of a DWQMS/QMS requirement.

**OFI - Opportunity for Improvement** is an idea, suggestion, or program that serves to improve a process that has had a history of stability with few or no identified non-conformances.

**OP** is the QMS Operational Plan.

**QMS** is the Quality Management System.

**QMS Representative (QMS Rep)** is responsible for the upkeep of the QMS as well as ensuring that staff are aware of all applicable legislative and regulatory requirements relevant to their duties regarding the provision of safe drinking water. The QMS Rep for the MPH is the Water/Wastewater Compliance Coordinator.

**SOP** is a Standard Operation Procedure.

### 1. Incidents of regulatory non-compliance

- 1.1 In 2022, there was one incident of non-compliance observed by Water Operations staff. On June 17<sup>th</sup>, 2022, Operators noticed that the membrane filter #2 turbidity meter was left in 'Hold' by an external contractor that was in on June 16<sup>th</sup>, 2022, performing an annual calibration on the unit. The event lasted from 11:42 a.m. on June 16<sup>th</sup>, 2022, to 2:00 p.m. on June 17<sup>th</sup>, 2022. The filter was in production (water directed to users) for approximately 20 hours during this time. Turbidity readings were not monitored at the required minimum testing and recording frequency of every 15 minutes, as the output on the turbidity meter was in hold. The MECP requested treated water turbidity data when membrane filter #2 was in production and the development of an Oversight of External Contractors standard operating procedure. There was no indication of an adverse water quality issue during the event. Calibration mode status buttons were added to the SCADA system on July 11<sup>th</sup>, 2022, for all membrane filter turbidity meters, as a future preventative measure.

### 2. Incidents of adverse drinking water tests

- 2.1 In 2022, there were no incidents of adverse water quality test results.

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### 3. Deviations from critical control point limits and corresponding actions

- 3.1 In 2022, there were no major deviations from critical control point (CCP) limits reported. There were six (6) minor deviations. See Table 1 - Critical Control Limit Deviations Summary below for a list of the minor deviations and actions taken.
- 3.2 24-hour SCADA trending/report review is completed daily by the Operator-in-Charge (OIC). Any deviations to critical control limits are noted on the Supervisory Control and Data Acquisition software (SCADA) daily report, with an explanation of why the deviation occurred. The report is then submitted to the Overall Responsible Operator (ORO) for review and sign-off.

Table 1 – Critical Control Limit Deviation Summary

CCP #	CCP Description	CCL(s) deviated	Value	Comments/Actions Taken	Response Procedure Implemented (Y/N)
4	Primary Chlorination Log Removal Value	<1 log	0.00 log	January 18, 2022 - Operator error – Both chlorine contact chambers accidentally set to 'out of service', instead of both chambers 'in service'. Alarm callout. Production shut down. At 14:32H, log value was 1.12 log. Issue with log removal program. SCADA programmer notified. Production started once log value 1.5 log at 14:50H.	Y
7	Post Chlorination	<1.00 mg/L	0.81 mg/L	April 19, 2022 - Alarm callout. Proportional integral derivative controller (PID) catching up after a previous incident (chlorinator not engaging). Analyzer verified and adjusted.	Y
6	Membrane Filtration	>0.30 NTU	>0.30 NTU	May 24-31, 2022 - Production shut down. Alarm callout. Post membrane integrity test spikes resulted in issue from air in analyzer on start up of membrane filter train.	Y
6	Membrane Filtration	>0.30 NTU	0.374 NTU	June 11, 2022 - Production shut down. Alarm callout. On going air issue on start-up of membrane filter train.	Y
6	Membrane Filtration	>0.30 NTU	0.727 NTU	June 20, 2022 - Post membrane integrity test. Production shut down.	Y

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				Alarm callout. On going air issue on start-up of membrane filter train. Operators continuing to troubleshoot events.	
7	Post Chlorination	>2.50 mg/L	2.69 mg/L	November 28, 2022 - High lift pump switchover. Alarm callout. Residual dropped gradually. All okay.	Y

#### 4. The effectiveness of the risk assessment process

- 4.1 A risk assessment review was completed on October 27, 2022, by the risk assessment team, which included: the Manager and Supervisor of Water, two (2) Water Operators, and the QMS Rep. Verification of the validity of the Risk Assessment Tables and Critical Control Points (CCPs) Table was completed. Any changes to the water source, any modifications to the water treatment processes or water distribution infrastructure, and any changes to existing regulations were all taken into consideration when evaluating whether any new hazards exist or whether revisions to risk assessment outcomes and scoring was required. Only minor revisions were made to the Water Treatment and Distribution Risk Assessment Tables. No new hazards were identified, and none were removed from the tables. Some risk assessment scoring was updated on both risk assessment tables.

Under Item 46 of the Treatment Risk Assessment Table; Hazardous Event: Software Failure due to Cyber Terrorism, the addition of two-factor authentication and mobile device manager applied to Municipal cell phones, laptops and tablets was added under Preventative Control Measures.

A few minor revisions were made to the CCP Table, including adding alarm setpoint delays under Procedure for Deviations from Critical Control Points. Delays are in place to eliminate nuisance alarms. If a CCL value is exceeded, alarm callout and response action by Operators only takes place if the CCL is exceeded for a period of time longer than the delay set for the alarm.

No new CCPs were added. No CCPs were removed.

CCP#7 – Post Chlorination CCLs were discussed. Several CCL exceedances occurred with no known action taken by Operators. It was found that no action was required as the CCL values exceeded did not last long longer than the alarm delay set and did not alarm out. They have since been removed from the Critical Control Limit Deviation Summary spreadsheet, as they are not considered deviations.

- 4.2 Four (4) action items were identified during the discussions with the following actions taken:

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Table 2 – Risk Assessment Review Action Items

Origin of Action Item	Action Item	Action Taken	Status/Date Completed
Water Treatment Risk Assessment Table Review	Confirm SCADA turbidity setpoints and delays with Suez.	Confirmed SCADA turbidity setpoints and delays with Suez.	Completed October 31, 2022
Water Distribution Risk Assessment Table Review	Look into whether a PRV failure will cause localized pressure reduction.	To be completed by next Risk Assessment Review in 2023	In Progress
Critical Control Points Table Review	Add all SCADA alarm setpoint delays to CCP Table under Procedures for Deviations for Critical Control Points.	Added all SCADA Alarm setpoint delays to CCP Table.	Completed November 4, 2022
Reviewing Cyber Security and Hazards on Risk Assessment Tables	WTP Item 46 - Add 'Two-factor authentication and mobile device manager applied to Municipal cell phones, laptops and tablets.' under Preventative Control Measures.	Added wording to Water Treatment Risk Assessment Table under Item 46.	Completed November 4, 2022

\*Action Item – M. Stewart to reach out to SCADA integrator and assess vulnerability of SCADA network from cyber attacks and determine if any necessary preventative control measures are required to mitigate such attacks.

### 5. Internal and external Audit results

- 5.1 SAI Global conducted an offsite surveillance system audit on the Municipality of Port Hope's Drinking Water Quality Management System (QMS) on August 4<sup>th</sup>, 2022. The audit determined that the QMS is effectively implemented, maintained, and meets the requirements of the Drinking Water Quality Management Standard Version 2.0 – 2017.

Zero (0) non-conformances and zero (0) opportunities for improvement were identified during the audits.

- 5.2 To evaluate the conformance of the QMS to the requirements of the DWQMS, all 21 Elements of the DWQMS must be internally audited once per calendar year, or at least within 36 months of the date of issuance of the current certificate of

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accreditation. In 2022, all 21 Elements were internally audited within the calendar year.

One (1) internal audit was conducted on August 11<sup>th</sup>, 2022. Two (2) Water Operators were interviewed on questions related to Valve Inspection and Maintenance.

During the audits, several documents and records were reviewed for conformance.

No non-conformances (NC) were identified during the internal audit.

Two (2) Opportunities for Improvement were noted. The OFIs were considered for continual improvement of the Port Hope Drinking Water System QMS. Internal audit results were communicated to all staff via email on August 17<sup>th</sup>, 2022.

Table 3 – List of Internal Audit Opportunity for Improvements and Action Taken

Element	OFI Identified	Action Taken	Status/Date Completed
5	To aid in retrieving the most current forms quickly, one auditee recommended that it would be helpful if the file path was located on all forms.	File pathway was added to the bottom of all forms.	Implemented August 16, 2022
20	It was recommended that Water Operators be given the chance to sit-in on a Management Review Meeting to acquire a better understanding of the process and how their input to the Supervisor and/or Manager throughout the year can influence different departmental discussions.	An Operator will be invited to attend the Management Review Meetings each year.	Implemented March 02, 2023

### 6. Results of water emergency response testing

6.1 On November 9, 2022, emergency preparedness testing took place at the Water Treatment Plant. The testing included the following:

- Real-time Emergency Mock Scenario: **Complete Programmable Logic Controller (PLC) Failure at the Water Treatment Plant.**
- Debriefing/discussion of key points learned from the mock emergency exercise scenario.
- Review of 6-5 SCADA System and Programmable Logic Computer (PLC) Failure Procedure in the Water System Emergency Response Plan (ERP).
- Review of 8-2 Water Shortage Procedure in the ERP.

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- Review of the Water Communication Protocol and measure of effectiveness for the mock scenario.

6.2 Eight (8) action items were identified during the discussions with the following actions taken.

Table 4 – Emergency Response Preparedness Testing Action Items

Origin of Action Item	Action Item	Action Taken	Status/Date Completed
Mock Scenario/Event	Revise WTP Phone Number-Extensions list to include correct Fire contact numbers. Also revise Emergency Contact List in ERP.	Revised phone list and Emergency Contact List to include correct contact numbers and names.	Completed November 16, 2022
Mock Scenario/Event	Re-label High lift well piping in chlorine room from High lift Well S and N to High Lift Well 1 and 2.	Re-labelled.	Completed December 5, 2022
Debriefing	Colour code binders for quicker retrieval.	Colour coded binders at WTP and JOC Water Garage - ERP-Red, Operation and Maintenance Manual (OM)-Black, Health and Safety Manual-Yellow.	Completed November 16, 2022
Debriefing	Review section F20 High Lift Pumping in the OM and include sticking notes for any missing information. Give to Manager once complete.	Reviewed revisions made by Manager.	Completed December 19, 2022
Debriefing	Review and update section F20 High Lift Pumping in OM to include a procedure for manual operation of high lift pumps. May need to have separate procedures for certain pumps.	Reviewed and revised.	Completed March 2, 2023
Debriefing	Add manual operation procedure of high lift pumps to be posted on the VFD(s).	Posted for HLP #2-5 during emergency event. Confirmed that HLP 1 procedure is slightly different (older VFD). Procedure was updated and posted on March 2, 2023.	Completed March 2, 2023



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Origin of Action Item	Action Item	Action Taken	Status/Date Completed
Procedure Review	Review and update 6-5 SCADA System and Programmable Logic Computer (PLC) Failure Procedure in ERP.	Reviewed and revised.	Completed February 22, 2023
Procedure Review	Review and update 8-2 Water Shortage Procedure in ERP.	Reviewed and revised.	Completed February 22, 2023

### 7 Operational performance of the Drinking Water System

- 7.1 Detailed information on the operational performance of the Port Hope Drinking Water System is available in the 2022 Drinking Water System Summary and Annual Reports. (See 2022 DWS Annual and Summary Report located on Municipal website.)
- 7.2 The Port Hope Drinking Water System is performing well and is an adequately funded system. There were no significant changes in the system performance in 2022. New building developments in Port Hope have had little to no impact on the drinking water system performance. 2022 revealed an average 9% decrease in treated water daily average flows compared to the last couple years.

Table 5 - 5 Year Treated Water Flow Trending

Year	Daily Average Flow (m <sup>3</sup> /day)	% Rated Capacity (20,300m <sup>3</sup> /day)	Maximum % Rated Capacity @ Peak Flows
2018	4814	24%	32%
2019	5117	25%	36%
2020	5743	28%	39%
2021	5968	29%	39%
2022	5311	26%	37%
<b>Average</b>	<b>5391</b>	<b>26.6%</b>	<b>37.3%</b>

- 7.3 The water distribution subsystem performed well in 2022. During this time frame there were nine (9) watermain breaks. Capitol works construction included Phase 1 of the Walton Street Reconstruction – Church Street to Pine Street, which was completed by Dekeyser Excavating Ltd. Semi-annual hydrant flushing was completed, on schedule, in the spring and fall. All other activities related to the operation and infrastructure maintenance of the distribution system was performed as scheduled. Additional information is presented on the 10 Year DWS Performance Trending Summary. (See Figure 1 – 10 Year DWS Performance Trending Summary at the end of this summary.)



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### 8 Trends in the quality of raw water supply and drinking water

- 8.1 Typical seasonal trends were observed for raw water quality (temperature, turbidity etc.). There were no new or concerning trends of raw water quality. Due to the PHAI remediation work, staff continue to test raw water on a weekly basis for uranium and arsenic. No concerns with the levels found in the raw water have been noted.
- 8.2 Information for raw and treated water quality is available in the Drinking Water System Summary and Annual Reports for 2022. (See 2022 DWS Annual and Summary Report located on Municipal website.)
- 8.3 As of January 1, 2020, *Schedules 13-6 and 13-6.1 of O. Reg. 170/03* requires owners and operating authorities of Municipal Residential Drinking Water Systems that provide chlorination, to take samples from a location in their system that is likely to have an elevated potential for the formation of Haloacetic Acids (HAAs). Samples are tested for HAA's on a quarterly basis, as per *O. Reg. 170/03*. Trihalomethanes (THMs) continue to be tested as per *O. Reg. 170/03*. For some Municipalities, disinfection by-products such as THMs and HAAs are a cause for concern. These disinfection by-products are formed when dissolved naturally occurring organic and inorganic matter react with chlorine that is added for the purpose of disinfection. In the MPH, levels of these disinfection by-products are well below regulatory limits and do not currently pose a threat.

Table 6 – THM and HAA Summary of Annual Results

Year	THM (ug/L) Limit: 100 ug/L	HAA (ug/L) Limit: 80ug/L
2018	43	23
2019	41	24
2020	45	19
2021	47	20
2022	43	28
<b>Average</b>	<b>43.8</b>	<b>22.8</b>

### 9 Follow-up on action items from previous management reviews

- 9.1 No action items were identified during the 2022 QMS Management Review meeting.

### 10. Updates on action items identified between management review meetings

- 10.1 During the 2022 internal audit two (2) action items were issued; one to aid Water Operators in finding forms quickly (Element 5-Document and Records Control) and the other to include all on-the-job training activities, including document review and power point training, to the Training Summary Spreadsheet (Element 10 – Competencies).

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10.2 During the 2022 Risk Assessment Review Meeting, there were four (4) action items identified. (See Table 2 in section 4.2 above.)

10.3 During the 2022 Emergency Response testing, there were eight (8) action items identified. (See Table 4 in section 6.2 above.)

### 11. Changes to services, activities or regulations that could affect the QMS

11.1 A proposed Water Use, Cross Connection and Backflow Prevention By-law is currently being developed by the Manager of Water. This will allow staff access to water infrastructure (i.e., meters) within private dwellings, create repercussions for failing to adhere to bylaw requirements, and protect the drinking water system. The By-law is expected to be completed and ready for review by the end of May 2023.

Three (3) MPH Water Operators have attained their as Cross Connection Control Specialist certification through Durham College. These staff are qualified to test, inspect, and repair backflow prevention devices.

### 12. Consumer feedback

12.1 There were no public inquiries related to the Water Treatment Plant operation and performance.

12.2 In 2022, there were twelve (12) drinking water quality complaints in the distribution system and seven (7) drinking water quantity complaints. In all cases, the homeowners were contacted immediately or on the next business day by Water Operations staff. See Table below for a list of complaints.

Table 7 – List of 2022 Drinking Water Quality and Quantity Complaints

Complaint Description	# of Complaints	Cause
Water Quality - Coloured/Milky	6	Hydrant Flushing Program (1), Disturbance of sediment (2), Internal plumbing issue (3)
Water Quality – Foreign Particles	1	No issue found (1)
Water Quality - Odour	3	Seasonal taste and odour episode (1), No issue found (2)
Water Quality - Taste	2	Seasonal taste and odour episode (2)
Water Quantity – No Water	3	Walton St. construction (1), Internal plumbing issue (2)
Water Quantity – Low Pressure	4	Faulty water meter (1), Curb stop not open all the way after repair (1), Internal plumbing issue (2)

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- 12.3 Water Operations staff worked with Communication staff to provide education to the public via, the Municipal website, social media, and through water bill inserts in hopes to help mitigate future customer concerns.

In March of 2022, an insert was mailed out with quarterly water bills to educate customers on water consumption and conservation, including information on how to check for water leaks and on why watering lawns can lead to higher water bills.

During spring and fall hydrant flushing, the Municipalities website and social media platforms were utilized to educate customers on when the maintenance activity would take place, how the activity could affect them, and how they can mitigate any inconveniences the activity may cause them. This seemed to mitigate public concerns, as only one (1) consumer complaint was received during the hydrant flushing events.

To reduce taste and odour complaints in the hot summer months, customers were educated on typical seasonal taste and odour changes to Municipal drinking water due to seasonal biological and temperature changes in Lake Ontario, via the Municipalities website and social media platforms.

In 2021, Water Operations staff received 24 drinking water quality and quantity complaints. In 2022, we received 19 complaints: a 20.8% reduction.

### 13. The resources needed to maintain the QMS

- 13.1 The Port Hope Drinking Water System QMS was effectively managed in 2022 as confirmed by successful internal and external audits. No additional resources are needed at this time.
- 13.2 The QMS Representative is attending a DWQMS Provincial Workshop in April. The Workshop provides an opportunity to network with other QMS professionals and participate in interactive breakout sessions, on various topics, over the two-day workshop.

### 14. The results of the infrastructure review

- 14.1 Infrastructure review was conducted during the preparation stages of updating the Water and Wastewater Rate Study. The 2020 Water Rates Study, conducted by CIMA+ and Watson and Associates, projects the 10-year forecasts for Water Operations infrastructure maintenance and rehabilitation needs. The 2020 Water and Wastewater Rate Study was finalized and approved by Council on December 1, 2020. During the annual budget preparation process, the Director of Works and Engineering and the Manager of Water review and adjust the 10-year capital forecast, then prepare annual budget recommendations. The 2022 Water Operations Capital and Operating Budgets was approved December 21, 2021.
- 14.2 In 2022, the Water Division experienced a higher volume of linear infrastructure breaks/leaks when compared to 2021. This was primary caused by aging pipes and

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fittings that are beyond their useful life. The Municipality is working towards developing a fully functional asset management program to help address aging infrastructure. (See Figure 1 – 10 Year DWS Performance Trending Summary at the end of this summary.)

### 14.3 Completed Capital Works in 2022 –

- ✓ WTP 550 kW Generator Trailer Overhaul
- ✓ Replacement of Potable Water System PVC Pipe with Stainless Steel Pipe. Chemical Room to Chlorine Room, Generator Room to WW Centre
- ✓ Replacement of Truck (Distribution) – 4WD ½ TON Pick-Up Truck
- ✓ Zone 1 Floating Storage Feasibility Study
- ✓ Generator Fuel Systems, Exhaust and Air Intake Upgrades
- ✓ Membrane Replacement of Train 1
- ✓ Low Lift Pump Refurbishment
- ✓ Hirshman PLC Switch – Upgrades to Ring Cards
- ✓ WTP Paving Upgrades

14.3 The following locations were identified for watermain replacement/installation in 2023: Walton Street Reconstruction Project - Phase 2 – Mill Street to Pine Street.

14.4 To date, the Port Hope Area Initiative remediation process has presented manageable challenges affecting water services/infrastructure. Ongoing discussions are taking place, between the affected groups, to mitigate future challenges.

### 15. The QMS Operational Plan currency, content, and updates

15.1 The QMS Operational Plan has been maintained as per DWQMS requirements. Since the last Management Review, the QMS Operational Plan excluding System Level Documents (SLDs), were revised in April and June of 2022. The revisions were minor and did not require the re-endorsement of the Operational Plan by the Owner and Top Management.

15.2 The current version of the QMS Operational Plan is Revision.11.3, 2023.02.28. (A copy of the QMS Operational Plan is available upon request. Printed copies are available at the Water Treatment Plant and Town Hall.)

15.3 In 2022, the QMS Operational Plan, all SLDs, Standard Operating Procedures, Water System Emergency Response Plan and other QMS documents were reviewed (in total 35 document revisions/additions in 2022; twelve (12) documents were revised or added, so far in 2023). The QMS Rep endeavors to ensure that hardcopies and electronic copies of all current QMS documents are available to personnel at all designated locations.

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### 16. Comments and suggestions made by personnel

- 16.1 Opportunity for Improvements (OFIs) are an idea or suggestion that serves to improve a process. They could be identified during the internal/external audits, MECP inspections, management reviews, incident debriefing, etc., and shall be considered for continual improvement of the QMS when applicable. In 2022, two (2) opportunity for improvements (OFIs) were suggested; both during the internal audit.
- 16.2 All comments or suggestions received were considered by either the Manager of Water and/or the QMS Rep through a typical document review and process change, training and/or through the issuing of action items. All actions related to suggested OFIs are tracked in the Continual Improvement Logbook, along with actions taken due to non-conformances, potential non-conformances and reviewed best management practice information.

End of Meeting Summary

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Figure 1 - 2012-2022 DWS Performance Trending Summary

10 Year Drinking Water System Performance Summary

Task	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
<b>Distribution</b>											
Watermain breaks	8	6	0	1	4	4	4	4	2	7	9
Watermain pit-out	n/a	n/a	n/a	3	0	0	0	0	0	0	0
Watermain separation	n/a	n/a	n/a	1	0	0	0	0	0	0	0
Water service repairs/replacements	15	14	22	21	18	21	17	6	12	14	21
Frozen water services	n/a	n/a	n/a	21	0	0	0	0	0	0	0
Watermains commissioned	n/a	n/a	6	0	3	2	2	2	2	2	2
Water service transfer/New service installation	n/a	n/a	4	5	6	0	8	3	0	4	1
Zone by-pass leaks	2	1	2	0	0	1	0	1	0	1	0
Main valves repairs	0	3	11	17	7	1	4	1	1	2	5
Fire hydrants replacements/additions	0	2	4	0	0	0	1	2	7	1	10
Fire hydrants repairs	n/a	n/a	n/a	32	24	22	0	42	11	28	15
Street box deficiencies repaired	n/a	n/a	n/a	17	22	18	49	12	18	18	13
Anodes installation	49	33	n/a	25	27	24	32	30	25	35	33
Equipment failure affecting supply/quality	none	none	none	none	none	none	none	none	none	none	none
Adverse water quality incidents/water observations	0	0	0	1	0	0	0	0	0	0	1
Consumer water quality complaints	22	8	14	12	12	11	11	20	15	23	12
Consumer water quantity complaints									8	1	7
<b>WTP</b>											
Adverse water quality incidents/water observations	0	3	0	0	0	0	0	0	1	0	0
Equipment failure affecting supply/quality	none	none	none	Intake	none	none	none	none	none	none	none
<b>QMS</b>											
Non-conformances	8	3	1	2	2	7	4	2	8	2	0

n/a – data not available