



APPENDIX 2

Water Commissioning

**Township of King
Design Criteria and Standard Detail Drawings**

APPENDIX 2 – WATER COMMISSIONING

Form No.**Title*****Township of King Forms***


F-02	Commissioning Checklist
F-09	DWWP Alterations Checklist
F-17	New Watermains, Confirmation of Adequate Flow and Pressure and Continuity of Tracer Wire
SOP-2.1	Commissioning New Watermain Isolated from Existing Watermain
SOP-2.4	Chlorination of Watermains
SOP-2.5	Dechlorination of Watermains
SOP-2.6	Pressure Testing/Leakage
SOP-2.7	Foam Swabbing Watermains – New Watermain (By Contractor)
SOP-6.0	DWWP Alterations Procedure

Note – the above forms are included here for convenience only. It is the responsibility of the developer's consultant to obtain the latest versions of the documents from the Township for use in the development and commissioning of the water system.

MOE Forms


Form 1	Record of Watermains Authorized as a Future Alteration
--	Pipe Data Form
--	Watermain Design Criteria for Future Alterations Authorized under a Drinking Water Works Permit
121-101*	Municipal Drinking Water Licence – Schomberg
121-102*	Municipal Drinking Water Licence – Nobleton
121-103*	Municipal Drinking Water Licence – King City
121-104*	Municipal Drinking Water Licence – Ansnorveldt
121-101*	Drinking Water Works Permit – Schomberg
121-102*	Drinking Water Works Permit – Nobleton
121-203*	Drinking Water Works Permit – King City
121-204*	Drinking Water Works Permit – Ansnorveldt

* These forms are available on the Township Web Site. <https://www.king.ca/township-services/water/water-permits-licences>

	Public Works Department Water Distribution	Form #: F-02
	WATER – STANDARD OPERATING PROCEDURES	Revision No: 10 – Apr. 20, 2021
	Form Title: Commissioning Check-List	Page 1 of H

Date: _____ Subdivision/Town Contract No.: _____
 Project: _____
 Contractor: _____ Consulting Engineer: _____

Item	Work Description	Date Work Performed By Consultant/Qualified Contractor/Town	Comments		Witnessed By Town/Representative (initial)
1.	Watermain constructed to Municipality's specifications				
2.	Approved Commissioning Plan and Drawings				
3.	Loading of Watermain (Metered and Backflow)				
4.	Swabbing		#In:	#Out:	
5.	Turbidity		Source Turbidity: Results:		
6.	Hydrostatic Testing and Summary Report (calculation to be shown)		Readings at 15min Intervals:		
7.	Disinfecting Watermain - Continuous Feed (Initial residual ≥ 25 mg/L)		Initial Residual:		
8.	24-hour Check (residual 40%)		24 Hr Residual:		
9.	Removal and Disposal of Super Chlorinated Water.		Residual:		
10.	Microbiological Sampling (first set)		Microbiological results: Chlorine Residual results:		
11.	Microbiological Sampling (second set)		Microbiological results: Chlorine Residual results:		

	Public Works Department Water Distribution	Form #: F-02
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12.	Valves, waterboxes, hydrants at grade			
13.	Bulk metering chambers installed with 25mm mainstop (where required)			
14.	Subdivision Plan Registered			
15.	Water Quality Monitoring Plan Approved			
16.	Plan attached showing limits of watermain to be activated			
17.	Final Signed Microbiological Lab Test Results			
18.	Contractor Certificates/Licences			

Total Water Volumes (M³) _____

Project Engineer's Certification: Firm: _____


We hereby certify that the workforce carrying out the above-mentioned work is licensed, by the Ministry as an operator, and that the watermain has been charged, pressured tested and disinfected in accordance with the Municipality's procedures as set out herein.

Signature

Date


DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
1	June 24, 2013	New Township Logo & inclusion of this table	J.V.
2	October 21, 2013	Include space to document total water usage during commissioning activities	J.V.
3	October 22, 2013	Improved alignment with Burnside input and	J.V.

	Public Works Department Water Distribution	Form #: F-02
	WATER – STANDARD OPERATING PROCEDURES	Revision No: 10 – Apr. 20, 2021
	Form Title: Commissioning Check-List	Page 3 of H

		Development needs-added steps 12 - 17	
4	March 18, 2014	Revised to reflect review of preliminary results to initiate CRM request and mobilize for final connection	J.V.
5	June 24, 2014	Added confirmation of receipt of certificates/licences	J.V.
6	February 24, 2015	Moved to “paperless” protocol	J.V.
7	September 24, 2015	Indicated CRM confirmation instead of attached form	J.V.
8	August 22, 2016	Removed CRM confirmation requirement and Plan registered requirement within this document.	J.V.
9	June 08, 2018	Administrative revision- Creation Date	J.V.
10	April 20, 2021	Reformatting	M.W.

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	Public Works Department Water Distribution	Form #: F-09
	WATER – STANDARD OPERATING PROCEDURES	Revision No: 7 – Apr. 20, 2021
	Form Title: DWWP Alterations Checklist	Page 1 of 3

Subdivision Name (If Applicable): _____

Project/Contract/Planning Application Number: _____


Drinking Water System (check applicable):

- ☐ King City – DWWP 121-203
- ☐ Schomberg – DWWP 121-101
- ☐ Nobleton – DWWP 121-202
- ☐ Ansnorveldt – DWWP 121-204

I have reviewed the information provided in support of the attached Form 1 and this application meets the following conditions of the Town's DWWPs:

The design of the watermain additions, modification, replacement, or extension:

- ☐ Does not connect to another drinking water system;
- ☐ Does not result in the fragmentation of the drinking water system;
- ☐ Does not pass under or through a body of surface water, unless trenchless construction methods are used and proper permits submitted to the Town;
- ☐ Does not have a nominal diameter greater than 900 mm.
- ☐ Has been prepared and verified in writing by a Professional Engineer;
- ☐ Has been designed only to transmit water and has not been designed to treat water;
- ☐ Satisfies the design criteria set out in the Ministry publication "Watermain Design Criteria for Future Alterations Authorized under a Drinking Water Works Permit –June 2012", as amended from time to time;
- ☐ Is consistent with or otherwise addresses the design objectives contained within the Ministry publication "Design Guidelines for Drinking Water Systems, 2008", as amended from time to time;
- ☐ Is wholly located within the municipal boundary over which the owner has jurisdiction;
- ☐ Is in compliance with the criteria approved by the Region of York to ensure the project does not adversely affect the water supply or treatment for the subject system.

	Public Works Department Water Distribution	Form #: F-09
	WATER – STANDARD OPERATING PROCEDURES	Revision No: 7 – Apr. 20, 2021
	Form Title: DWWP Alterations Checklist	Page 2 of 3

Name. P. Eng.


Date

Company

The Town Representative Recommends (check only one):

- ☐ I acknowledge the information provided meets the criteria of the DWWP and recommend the Director of Public Works approve the proposed works subject to the following:
1. THAT, the water system design pressures and fire flow volumes be verified at **all hydrant** locations within the Plan of Subdivision subsequent to site servicing and prior to the issuance of building permits and,
 3. THAT all hydrants shall be marked in accordance with NFPA 291 (as amended) and Township Specifications and,
 2. THAT no building permits will be issued until site verification of water system design pressures, flows and volumes have been verified to the satisfaction of the Township of King.
- ☐ I acknowledge the information provided does not meet the criteria of the DWWP and recommend the Director of Public Works forwards the submission to the Ministry of the Environment for approval of the proposed works (MOE Form Applications Respecting: Drinking Water Works Permits and Municipal Drinking Water Licenses included with submission).

State reason of Ministry approval:

	Public Works Department Water Distribution	Form #: F-09
	WATER – STANDARD OPERATING PROCEDURES	Revision No: 7 – Apr. 20, 2021
	Form Title: DWWP Alterations Checklist	Page 3 of 3

Signature


Name of Township Representative (Please Print)

Date

Document Change History

Revision Level	Date	Change	Developed By
0	March 25, 2013	Document Creation	J.V.
1	June 24, 2013	New Township Logo & inclusion of this table	J.V.
2	November 05, 2014	Substituted Mike Cole's position for Rob Flindall's	J.V.
3	December 01, 2014	Revised to reflect administrative changes, format changes and flow testing requirements changes	J.V.
4	March 02, 2015	Moved to "paperless" protocol	J.V.
5	October 02, 2015	Revised to reflect hydrant markers as per Township and NFPA 291 standards.	J.V.
6	June 08, 2018	Administrative revision-Creation Date	J.V.
7	April 20, 2021	Reformatting	M.W.

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	Public Works Department Water Distribution	Form #: F-17
	WATER – STANDARD OPERATING PROCEDURES	Revision No: 1 – June 08, 2018
	Form Title: New Watermain, Confirmation of Adequate Flow and Pressure and Continuity of Tracer Wire	Page 1 of 2

To be completed by Consulting Engineer and submitted to Township prior to issuance of Building Permits by Township

Date: _____

Project Name: _____ Town File No.: _____

Contractor/Workforce: _____

Consulting Engineer: _____


Standard		Procedure	Action By	Completion Date	Witnessed or Received By (Initial)*
Connection to Valve Sequence	Total Isolation Sequence				
14	11	Hydrant Flow Testing	Workforce Consulting Engineer Township or Township Rep		
15	12	Engineers Report to Confirm Distribution System will Perform Satisfactorily in Accordance with the Design when the Subdivision is Fully Developed	Workforce Consulting Engineer Township or Township Rep	N/A	
16	13	Confirm Continuity of Tracer Wire by Electrical Current Test	Workforce Consulting Engineer Township or Township Rep		

Please Note: This form is to be accompanied by the hydrant flow testing results, Engineers Report confirming that the system will perform satisfactorily and Tracer Wire Continuity testing notes.

Consulting Engineer's Certification:

We hereby confirm that the Workforce carrying out the above noted works is licensed, by the MOE as an Operator, and that these works have been completed in accordance with the Township of King Procedures for New Watermains.


Consulting Engineer and/or Representative's Signature

	Public Works Department Water Distribution	Form #: F-17
	WATER – STANDARD OPERATING PROCEDURES	Revision No: 1 – June 08, 2018
	Form Title: New Watermain, Confirmation of Adequate Flow and Pressure and Continuity of Tracer Wire	Page 2 of 2

DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
0	March 12, 2015	Creation of the document	J.V.
1	June 08, 2018	Administrative revision-Creation Date	J.V.

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	Public Works Department Water Distribution	Procedure No: SOP – 2.1
	WATER -STANDARD OPERATING PROCEDURE	Revision No: 10 – July 05, 2021
	Procedure Title: Commissioning New Watermain Isolated from Existing Watermain	Page 1 of 4

1 PURPOSE

Commissioning new watermain physically isolated from existing watermain.


2 DESCRIPTION

All new constructed watermain shall be commissioned and pass all tests indicated in this procedure diagram by the contractor and Township staff or their designated representative and shall verify the test results are in compliance with the Procedure prior to final connection to the existing watermain. This procedure is to be used in conjunction with the requirements set out in the Ministry Watermain Disinfection Procedure (as amended) and AWWA C651-14 (as amended).

The requirements in this procedure apply to all watermain of any size, including temporary watermain. Service Pipes of 100 mm diameter and greater shall be considered as watermain for the purposes of this procedure.

3 PROCEDURE

1. Carry out the steps and sequences shown in the Procedure Diagram which forms part of this procedure.
2. “Load/Swab main” procedure can follow the method established in the Township’s SOP 2.7 – Foam Swabbing Watermain-New Watermain or adopt the contractor’s own approach (with prior PW approval).
3. A “Turbidity Test” shall be conducted. The watermain will be flushed for 5 to 10 minutes at each hydrant if needed until a Turbidity reading of less than 1 NTU or values consistent with the water provision system. The results of this test shall meet or beat the turbidity value present in the source water accessed for commissioning purposes.
4. “Hydrostatic Pressure Test” shall be according to the following: OPSS.MUNI 441, AWWA C605 or AWWA C600 and SOP 2.6 Pressure Testing/Leakage. The contractor shall confirm the applicable methodology with the Township prior to commencing with commissioning works. Pressure testing shall not take place prior to swabbing and shall take place before chlorination.
5. “Chlorination” should be completed in accordance with the Ministry Watermain Disinfection Procedure (as amended) and AWWA C651-14 (as amended) and the Township of King SOP 2.4 – Chlorination of Watermain. The proponent shall submit all calculations, product details and proof of “non-expiry” as well as peripheral equipment clearances where applicable. For de-chlorination of watermain, follow the method described in SOP 2.5 “De-chlorination of Watermain”.
6. Microbiological Samples are to be taken in accordance with the Ministry Watermain Disinfection Procedure (as amended), AWWA C651-14 (as amended), King SOP 2.4 – Chlorination of Watermain and include as a minimum Escherichia coli and Total Coliforms and are tested by a licensed and accredited laboratory.
7. After commissioning, the contractor is to fill out Form F-02 “Commissioning Check-list” and provide it and all supporting documentation to the Township for record keeping.

	Public Works Department Water Distribution	Procedure No: SOP – 2.1
	WATER -STANDARD OPERATING PROCEDURE	Revision No: 10 – July 05, 2021
	Procedure Title: Commissioning New Watermain Isolated from Existing Watermain	Page 2 of 4


8. Final connection must take place within 10 days of final lab reports. If not connected within 10 days then it must be flushed and re-tested for micro-biological parameters.

4 REFERENCES / FORMS

Ministry Watermain Disinfection Procedure (as amended)
 AWWA C 651-14 (as amended)
 Form F-02 - Commissioning Checklist
 SOP 2.4 – Chlorination of Watermains
 SOP 2.5 - Dechlorination of Watermains
 SOP 2.6 – Pressure Testing/Leakage
 SOP 2.7 - Foam Swabbing Watermains-New Watermains


5 DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
1	June 24, 2013	New Township Logo & inclusion of this table	J.V.
2	September 13, 2013	Revised to reflect 24 and 48 hours and to indicate a 24 hour wait time for pressure testing only where applicable.	J.V.
3	February 24, 2014	Revised to indicate 10 day timeline for final connection	J.V.
4	March 25, 2014	Numerous revisions reflecting references to standards, diagram reductions and general administrative housekeeping	J.V.
5	December 04, 2014	Specified supporting document submission, swabbing before static pressure testing, specifics for pressure testing such as notification and documentation/support.	J.V.
6	March 02, 2015	Moved to “paperless” protocol	J.V.
7	March 11, 2015	Revisions to reflect	J.V.

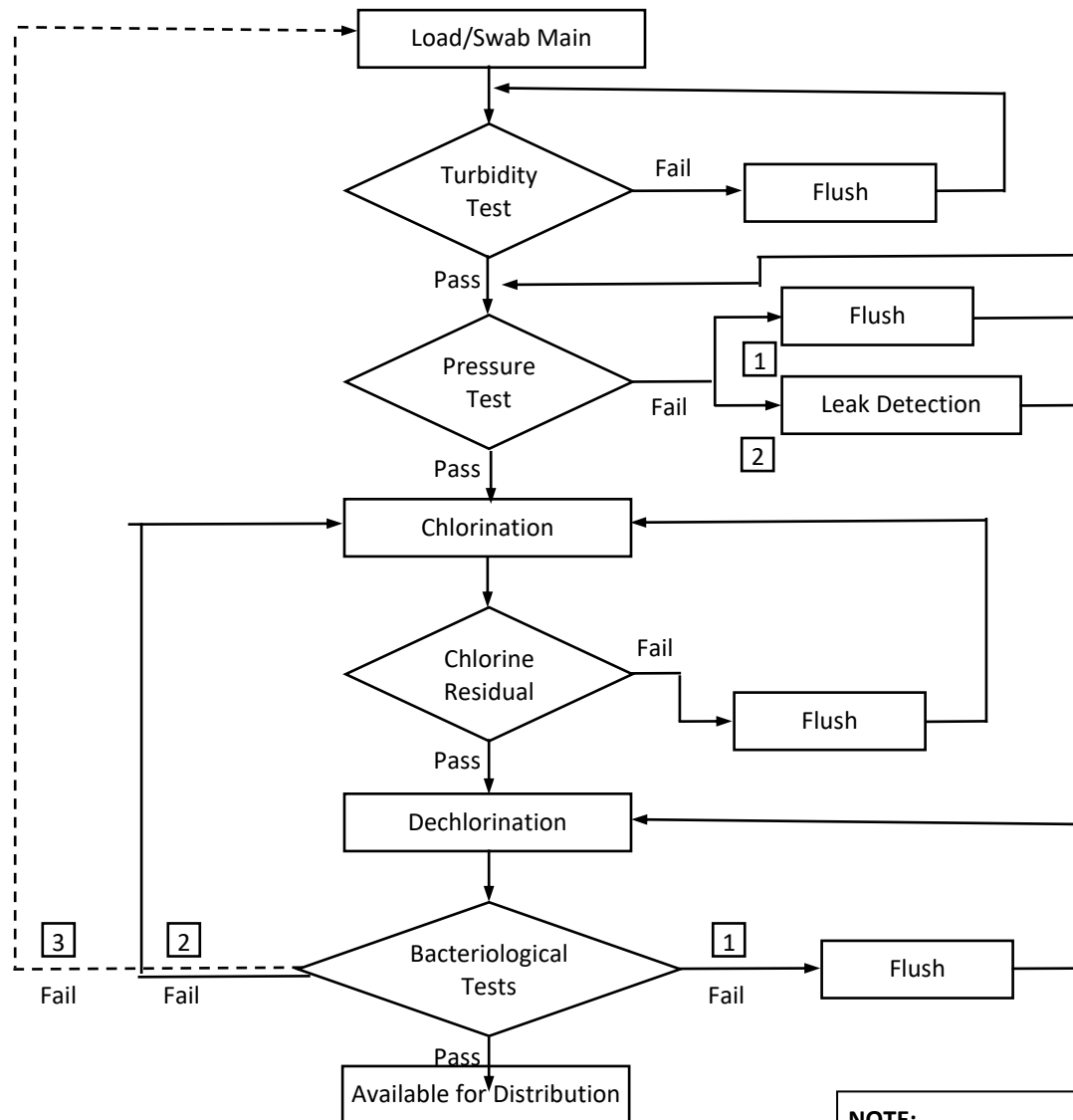
	Public Works Department Water Distribution	Procedure No: SOP – 2.1
	WATER -STANDARD OPERATING PROCEDURE	Revision No: 10 – July 05, 2021
	Procedure Title: Commissioning New Watermain Isolated from Existing Watermain	Page 3 of 4

		better alignment with referenced standards and specify “physical separation”	
8	February 22, 2018	Revised to reflect new DWWP's and MOECC Watermain Disinfection Procedure implementation	J.V.
9	June 08, 2018	Administrative revision-Creation Date	J.V.
10	July 05, 2021	MECP procedure update.	M.W.

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	Public Works Department Water Distribution	Procedure No: SOP – 2.1
	WATER -STANDARD OPERATING PROCEDURE	Revision No: 10 – July 05, 2021
	Procedure Title: Commissioning New Watermain Isolated from Existing Watermain	Page 4 of 4

Procedure Diagram



NOTE:

- 1 One failure
- 2 More than one failure
- 3 Multiple failures

	Public Works Department Water Distribution	Procedure No: SOP – 2.4
	WATER -STANDARD OPERATING PROCEDURE	Revision No: 8 – April 5, 2021
	Procedure Title: Chlorination of New Watermains and Alterations	Page 1 of 3

1 PURPOSE


To ensure watermains are sufficiently disinfected prior to connecting into the existing water system.

2 DESCRIPTION

All new watermain installations or alterations are to be chlorinated according to the Ministry Watermain Disinfection Procedure (as amended) and AWWA C651-14 (as amended). Satisfactory test results must be received prior to putting the new or repaired watermain into service according to the applicable Procedures.

3 PROCEDURE

1. In the event of new watermain installations, the calculations and detailed methodology will be documented by the contractor with calculations, proof of “non-expiry” of product where applicable and supporting graphics indicating proposed flow rates, injection points and sampling points. This documentation is to be submitted to the Township prior to initiating the chlorination works and approval for watermain commissioning works to proceed. During chlorination Contractor to fill out Form F-02 Commissioning Checklist
2. Watermain to be swabbed (if required), completely charged, pressure tested and flushed prior to chlorinating.
3. Extreme caution must be exercised to ensure that no cross connection exists to the potable water system per the Ministry Watermain Disinfection Procedure (as amended).
4. Chlorination shall be connected to the main at the closest point to the potable water supply, no more than 3m downstream from the beginning of the new main.
5. Discharge shall be at the ends of all watermains being chlorinated.
6. The method for chlorination of watermains shall be continuous feed method unless otherwise approved by the Township and shall be carried out as per the Ministry Watermain Disinfection Procedure (as amended) and AWWA C651-14, (as amended).
7. For continuous feed method, use potable water that has been chlorinated to at least 25 mg/l. After 24-hr holding period in the main there shall be a free chlorine residual of not less than 10 mg/L or 40% of initial chlorine concentration.
8. For de-chlorination of watermains, follow the method described in SOP 2.5 “De-chlorination of Watermains”.
9. Microbiological Samples are to be taken in accordance with the Ministry Watermain Disinfection Procedure (as amended) and AWWA C651-14 (as amended) and include as a minimum Escherichia coli and Total Coliforms and are tested by a licensed and accredited laboratory.
 - a. Before approving a main for release, take an initial set of samples and then resample again after a minimum of 16 hr. Both sets of samples must pass for the main to be approved for release.

	Public Works Department Water Distribution	Procedure No: SOP – 2.4
	WATER -STANDARD OPERATING PROCEDURE	Revision No: 8 – April 5, 2021
	Procedure Title: Chlorination of New Watermains and Alterations	Page 2 of 3


- b. When Microbiological Samples are taken from new watermains that have not been placed into service, Operating Authorities shall ensure that additional samples are taken at the same time from the same location and are tested immediately for chlorine residuals.
10. Acceptable Disinfectant Concentration must be maintained until the new watermain is placed into service. If a concentration of 0.05 mg/L of free chlorine residual in a chlorinated system or 0.25 mg/L of combined chlorine residual in a chloraminated system is not maintained prior to placing into service, the microbiological sampling shall be repeated.
11. Final connection must take place within 10 days of final lab reports. If not connected within 10 days then it must be flushed and re-tested for micro-biological parameters.
12. Sanitary construction practices must be followed during installation of the final connection so that there is no contamination of the new or existing watermain and shall follow requirements set out in the Ministry Watermain Disinfection Procedure (as amended) and AWWA C651-14 (as amended).
13. Contractors provide records of watermain chlorination to the Township Representative on Form F-02 – Commissioning Checklist.

4 REFERENCES / FORMS

Ministry Watermain Disinfection Procedure (as amended)
 AWWA C651-14 (as amended)
 Form F-02 – Commissioning Checklist
 SOP 2.1 – New Watermain Commissioning Isolated from Existing Watermain
 SOP 2.2 – Commissioning Existing Watermain after Break
 SOP 2.5 - Dechlorination of Watermains


5 DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
1	June 24, 2013	New Township Logo & inclusion of this table	J.V.
2	December 04, 2014	Specifics regarding documentation of proposed activities and verification of material suitability	J.V.
3	March 02, 2015	Moved to “paperless” protocol	J.V.
4	March 11, 2015	Indicated OPSS 701.07.25 as opposed to AWWA C651 as chlorination/disinfection guideline.	J.V.

	Public Works Department Water Distribution	Procedure No: SOP – 2.4
	WATER -STANDARD OPERATING PROCEDURE	Revision No: 8 – April 5, 2021
	Procedure Title: Chlorination of New Watermains and Alterations	Page 3 of 3

5	November 09, 2015	Reverted back to AWWA C651 chlorination/disinfection guideline and specified Continuous Feed Method only for chlorination.	J.V.
6	February 22, 2018	Revised to incorporate the MOECC Watermain Disinfection Procedure	J.V.
7	June 08, 2018	Administrative revision-Creation Date	J.V.
8	April 5, 2021	Updated MECP procedure	M.W

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	Public Works Department Water Distribution	Procedure No: SOP – 2.5
	WATER -STANDARD OPERATING PROCEDURE	Revision No: 6 – Jan. 14, 2022
	Procedure Title: Dechlorination of Watermains	Page 1 of 2

1 PURPOSE

Procedure to control/mitigate chlorine levels in the discharged water from watermain as required by Ministry regulations, Township DWQMS/DWWP and latest AWWA 655 Field Dechlorination requirements.

2 DESCRIPTION


All discharged water from the routine flushing program, foam swabbing and watermain commissioning is dechlorinated prior to disposal or entering the natural environment per condition 10.0 of Schedule B of the Municipal Drinking Water License.

3 PROCEDURE

1. If there is any possibility that the chlorinated discharge will cause damage to the environment, a neutralizing chemical shall be applied to the water to be wasted to thoroughly neutralize the residual chlorine per AWWA C655. Where necessary, federal, state, local, or provincial regulatory agencies should be contacted to determine special provisions for the disposal of heavily chlorinated water.
 - i. Chlorinated water not exceeding AWWA standard of 0.2mg/l may be discharged into storm sewer.
 - ii. Where there may be detrimental effects to the natural environment the Total Residual Chlorine shall be less than 0.002 mg/L before disposal,
2. During routine flushing program, foam swabbing and new watermain commissioning de-chlorination works must meet AWWA C655 (as amended) requirements.
3. For repaired watermain commissioning activity, the following procedures to implement dechlorination may be used where meeting AWWA C655 is not practical:
 - i. Prepare equipment (use the diffuser with chlorine/chloramine removal tablet) and chemicals (sulfates and sulfites) prior to neutralizing the discharged water.
 - ii. Measure the Total Residual Chlorine in discharge water flow.
 - iii. Open the cap at the diffuser and place the table bags into the diffuser.
 - iv. Connect the discharged water flow to the diffuser inlet port.
 - v. Connect the diffuser outlet port to the releasing piping.
 - vi. Monitor the Total Residual Chlorine after treatment and ensure the Total Residual Chlorine is less than 0.002 mg/L before disposal, where there may be detrimental effects to the natural environment
4. The contractor during their new watermain commissioning activity can adopt their own approach to carrying out de-chlorination with documented approval of the PW Department and meeting requirements of AWWA C655, as amended.

4 REFERENCES / FORMS


AWWA C655 (as amended)
King Township Drinking Water Licenses

	Public Works Department Water Distribution	Procedure No: SOP – 2.5
	WATER -STANDARD OPERATING PROCEDURE	Revision No: 6 – Jan. 14, 2022
	Procedure Title: Dechlorination of Watermains	Page 2 of 2

5 DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
1	June 24, 2013	New Township Logo & inclusion of this table	J.V.
2	March 02, 2015	Moved to “paperless” protocol	J.V.
3	November 05, 2015	Indicated alignment with AWWA C655 and allowable discharge of “compliant” water into storm sewer	J.V.
4	March 11, 2018	Administrative changes to better reference applicable guidance documents	J.V.
5	June 08, 2018	Administrative revision-Creation Date	J.V.
6	January 14, 2022	Update residuals and references	M.W.

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	Public Works Department Water Distribution	Procedure No: SOP – 2.6
	WATER -STANDARD OPERATING PROCEDURE	Revision No: 5 – May 07, 2021
	Procedure Title: Pressure Testing/Leakage	Page 1 of 2

1 PURPOSE

To ensure allowable leakage in pipe system at design pressures and to ensure that piping is able to withstand design pressures.

2 DESCRIPTION

Undertake steps to perform testing on the distribution system to ensure leakage at design pressures and the ability of the system to withstand design pressures. This will require the coordination in the operation of valves and reviewing the test results with the AWWA standards prior to final acceptance. If swabbing is required, swabbing must be completed prior to pressure testing.

3 PROCEDURE


Pressure testing of all watermains must meet the requirements of AWWA 600 or AWWA 605 at a minimum. This procedure is to be used in conjunction with the requirements set out in AWWA Standards.

1. All watermains, valves, drains, hydrants, blow-offs, services to the streetline and other appurtenances should be accounted for in the leakage test. In the instance of watermain replacement, services may be omitted from the pressure test at the discretion of the Operator.
2. Operate all isolation valves and verify that all internal valves can be fully opened and closed.
3. Each test section of pipe shall be filled with water, air expelled and pressurized to 1035 KPa (150 psi) and all visible leaks shall be stopped.
4. Leakage is measured by a calibrated meter with readings taken at fifteen minute intervals for a period of two (2) hours. The average rate of leakage should not exceed 1.00 litres per millimeter of pipe diameter per kilometer of pipe per day.

The allowable leakage for P.V.C. mains shall be calculated in accordance with the following:

Pipe Diameter	Approximate Allowable Leakage in Litres/ 1000 meters/ 2 Hours
150 mm	12.50 L
200 mm	17.00 L
250 mm	21.00 L
300 mm	25.00 L

5. Preconditioning of specific pipe materials shall be in conformance with pipe manufacturer specifications and AWWA requirements.
6. If pressure test fails, system shall be re-tested and leaks shall be isolated using industry standard leak detecting techniques.
7. All detected leaks above the allowable leakage shall be repaired.

	Public Works Department Water Distribution	Procedure No: SOP – 2.6
	WATER -STANDARD OPERATING PROCEDURE	Revision No: 5 – May 07, 2021
	Procedure Title: Pressure Testing/Leakage	Page 2 of 2

8. Leakage test procedure shall be repeated until the leakage test is completed to the Township's satisfaction.
9. Form F-02 Commissioning Check-List is to be completed and signed by the authorized Engineer or Consultant.


4 REFERENCES / FORMS

Form F-02 – Watermain Commissioning Check-List
 AWWA C605 -05 (as amended)
 AWWA C600-05 (as amended)

5 DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
1	June 24, 2013	New Township Logo & inclusion of this table	J.V.
2	March 02, 2015	Moved to "paperless" protocol	J.V.
3	March 11, 2015	Identified reference standards and removed reference to Regional standardized SOP's	J.V.
4	November 05, 2015	Indicated necessary alignment with applicable AWWA standards.	J.V.
5	May 07, 2021	Reformatting	M.W.

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	Public Works Department Water Distribution	Procedure No: SOP – 2.7
	WATER -STANDARD OPERATING PROCEDURE	Revision No: 6 – April 07, 2021
	Procedure Title: Foam Swabbing Watermains-New Watermain	Page 1 of 2

1 PURPOSE

Foam swab watermains to remove foreign material, air pockets and perform overall watermain line scrubbing to facilitate final commissioning.


2 DESCRIPTION

Pursuant to AWWA C651-14 (as amended) new watermains shall be swabbed/flushed to remove foreign material and air pockets as part of the procedure for disinfection and final commissioning prior to connection to the existing watermain.

The proponent's contractor may implement their own procedure provided it meets the requirements outlined within this Procedure at a minimum and approved by the Township.

3 PROCEDURE

1. The proponent shall inform the Township's representative of the proposed works timelines.
2. The proponent shall submit a swabbing plan aligned with this Procedure including maps identifying, at a minimum, the following:
 - a. Launch hydrant
 - b. Retrieval hydrant
 - c. Directional control/valving
3. The proponent will provide proof of qualification of the workforce conducting the works (See Form F-02 - Commissioning Checklist).
4. The watermain shall be loaded via a by-pass with approved/certified backflow and meter prior to works beginning.
5. All swabs are to be a minimum of one size larger than the watermain being swabbed.
6. All stub ends shall be provided with a temporary flushing hydrant or approved equivalent to allow for the removal of the swabs.
7. Open risers will be permitted only when watermain sizing is such that the appropriate sized swab cannot be physically extracted through a hydrant branch line.
8. All swabs inserted into the watermain shall be marked with an identification number to ensure all swabs are retrieved.
9. Close secondary valve on discharge hydrant, disassemble discharge hydrant, and mount, if necessary, discharge tube complete with ground sheets.
10. Close secondary valve on launch hydrant, disassemble launch hydrant and mount launching apparatus and pumper.
11. Insert No. 1 swab in launcher and open secondary valves on launch and discharge hydrant.

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12. Launch No. 1 swab for trial run. Pass the swab through the main at a speed of 0.9 to 1.5 m/s. Swab to be retrieved, condition checked and run verified before No. 2 swab is launched.
13. Used swabs shall not be reused.
14. No more than 3 swabs may be placed in main at five minute intervals.
15. The watermain can be considered clean when clear water appears six seconds after the last foam swab has exited.
16. Swabbing shall take place from hydrant to hydrant or from hydrant to a discharge riser located at the end of the water main.
17. All hydrants must have at least one swab run.
18. After swabbing is complete proceed with subsequent commissioning steps per SOP 2.1- Commissioning New Watermain Isolated from Existing Watermain.


4 REFERENCES / FORMS

AWWA 651-14 (as amended)
 Form F-02 – Watermain Commissioning Checklist
 SOP 2.1 – Commissioning New Watermains Isolated from Existing Watermain

5 DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
1	June 24, 2013	New Town logo and insertion of this table	J.V.
2	October 03, 2013	Outputs from 2013 Schomberg swabbing AAR	J.V.
3	March 25, 2014	Minor administrative revisions	J.V.
4	December 01, 2014	Further detail in body of procedure	J.V.
5	June 13, 2018	Administrative change- Creation Date	J.V.
6	April 07, 2021	Reformatting	M.W.

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1.0 PURPOSE

The purpose of this procedure is to describe the process for altering the Town's Drinking Water Works Permits (DWWP). The Certificate of Approval (CofA) has been replaced by the Municipal Drinking Water Licensing Program (MDWL) giving the Township the authority to approve alterations and minor modifications to its three (3) Large Municipal Residential Drinking Water Systems and one (1) Small Municipal Residential Drinking Water System and to ensure pre-approved alterations or minor modifications to the Township's Drinking Water Systems (DWS) meet the criteria outlined in the DWWP's.

2.0 SCOPE

The DWWP Alterations Procedure is applicable to all Township of King employees who manage and perform work related to the Township's Drinking Water Systems.

3.0 DEFINITIONS

Director – The Township of King Director of Public Works

Drinking Water Works Permit (DWWP) – Permit issued to the Township by the Ontario Ministry of the Environment as part of the MDWL Program to establish, replace or alter a municipal Drinking Water System

DWS – Drinking Water Systems

Manager – The Township of King Environmental Services Manager

Ministry – Ontario Ministry of the Environment

MDWL – Municipal Drinking Water License

Operational Plan - The overall documentation of an operating authority's Quality Management System (QMS)

Project Designer – Township staff or the Engineering Consulting Firm working on behalf of the Township or a Developer and is responsible for completing Form 1 – "Record of Watermains Authorized as a Future Alteration" or Form 2 – "Record of Minor Modification or Replacements to the Drinking Water System" for submission


Town Representative – The person or persons designated by the Township's Public Works Department to review and approve development or capital project submissions

4.0 NOTES

4.1 Pre-approved alterations are subject to the conditions outlined in the Drinking Water Works Permits. Refer to Schedule B of the Township's DWWPs for a full listing of conditions.

4.2 Not all alterations to the DWWPs are pre-approved. Pre-approved alterations include, but are not limited to:

- Works within municipal jurisdiction;
- Consistent with Ministry Design Guidelines contained in the publication 'Design Guidelines for Drinking Water Systems, 2008', as amended;
- Satisfying the Ministry Watermain Design Criteria contained in the publication 'Watermain Design Criteria for Future Alterations Authorized under a Drinking Water Works Permit, March 2009', as amended;

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- Design & verification by a Professional Engineer

4.3 Alterations requiring Ministry approval include but are not limited to:

- Connection to another water system;
- Fragmentation of the system;
- Pipe diameter exceeds 900mm or greater than indicated in the applicable DWWP;
- Watermain passes through or under a water surface, unless trenchless methods are utilized.

4.4 Exemptions to Form 1 (Record of Watermains Authorized as a Future Alteration) and Form 2 (Record of Minor Modifications or Replacements to the Drinking Water System) criteria include, but are not limited to:

- The establishment or alteration of or a change to a service pipe;
- The establishment or alteration of or a change in an appurtenance of a watermain, if the appurtenance does not disrupt the operation of the drinking water system that the watermain is a part of;
- The relining of a watermain, if the new lining does not disrupt the operation of the drinking water system that the watermain is a part of;
- The replacement of an existing watermain with a new watermain that has similar dimensions and performance criteria and that is in the same or approximately the same location, if the existing watermain was established or altered in accordance with an approval granted by the Ministry Director.

4.5 Proponents can contact the local Ministry district office (1-800-376-4547) or the Ministry Safe Drinking Water Branch (416-212-7318) for clarification of the pre-authorized alterations listed in Schedule B of the Township's DWWP.

4.6 In the event there is a discrepancy between the Ministry Design Guidelines, the Ministry Watermain Design Criteria and Township Standards, the most stringent criteria shall take precedence. Ministry documents and forms referred to in this procedure can be found on the Ministry Website: <https://www.ontario.ca/page/drinking-water>

4.7 The Township's DWWP's and MDWL are available on the Township's website at: <https://www.king.ca/township-services/water/water-permits-licences>


5.0 FORM 1 – RECORDS OF WATERMAINS AUTHORIZED AS A FUTURE ALTERATION

5.1 Ministry Form 1 – “Record of Watermains Authorized as a Future Alteration” (Form 1) shall be used for additions, modifications, replacements or extensions (e.g. subdivisions or capital projects) to the Township's Municipal Drinking Water Systems.

5.2 Parts 1 and 2 of Form 1 are mandatory submissions by the Project Designer.

5.3 At a minimum, a general watermain plan shall be submitted with Form 1 and shall include but not be limited to the following:


- Location of Watermain(s);
- Diameter of watermain(s);

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- Existing watermain to be connected to;
- Street names;
- Easements

- 5.4** A Professional Engineer shall verify the criteria described in Part 2 and sign Part 3 of Form 1.
- 5.5** The Project Designer will submit a completed Developers Information Package to the Town Representative. This package consists of the following:
- Signed Form 1
 - General watermain plan
 - MINISTRY Pipe Data Form
 - DWWP Alterations Checklist
 - Applicable DWWP and MDWL
 - The applicable application fees detailed in Part 8 of this procedure
- 5.6** The Town Representative or their designate shall ensure the correctness of the submitted information and in particular that it meets the pre-authorization criteria outlined in Schedule B of the applicable system DWWP.
- 5.7** If the submission is determined to be complete and accurate by the Township Representative or their designate all documents shall be forwarded to the Director of Public Works for final review and execution of the Form 1. Final review shall be completed within 20 business days of receipt. If more time is required, the Director shall advise the Township Representative and Project Designer.
- 5.8** If the submission is determined to be incomplete or unsatisfactory to the Township Representative or the Director Public Works, all materials shall be returned to the Project Designer with the Township's comments.
- 5.9** If the submission does not meet the pre-authorization criteria outlined in Schedule B of the applicable DWWP, the Township Representative shall notify the Project Designer that an "Application Respecting: Drinking Water Works Permits and Municipal Drinking Water Licenses" must be submitted to the Township. For further details regarding this submission, please refer to Section 7 of this procedure.
- 5.10** After signature and approval from the Director of Public Works the Township Representative shall forward the signed Form back to the Project Designer. The Township Representative shall also forward the signed form to the QMS Representative. The QMS Representative shall keep all Form 1 records and general watermain plans for future Ministry inspections.
- 5.11** Documents are to be retained in accordance with the license, DWWP requirements and according to Procedure QMS-05-SYS "Documents and Record Control".

6.0 FORM 2 – RECORD OF MINOR MODIFICATIONS OR REPLACEMENTS TO THE DRINKING WATER SYSTEM

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- 6.1 Ministry Form 2 – “Record of Minor Modifications or Replacements to the Drinking Water System” (Form 2) shall be used for the minor modification or replacement to the Township’s Municipal Drinking Water Systems.
- 6.2 Form 2 is not required for any modification or replacement deemed maintenance or repair such as hydrant replacement, valve replacement or watermain break repairs.
- 6.3 The Parts 1 and 2 of Form 2 are mandatory submissions by the Project Designer.
- 6.4 A copy of the Township’s water system map(s) shall be attached to any Form 2 submission clearly indicating the location of the work(s).
- 6.5 The Project Designer shall submit the following to the Town Representative for review
 - Completed Form 2
 - The Township’s water system map(s)
- 6.6 The Township Representative confirms the accuracy of the information and its compliance with Schedule B of the applicable DWWP. The Town Representative shall inform the Project Designer if the Form 2 submission does not meet the criteria described in Schedule B of the applicable DWWP. The Town Representative shall further indicate the need for either a Form 1 submission or the submission of the Ministry Form “Applications Respecting: Drinking Water Works Permits and Municipal Drinking Water Licenses”. Refer to Sections 5 or 7 of this procedure.
- 6.7 If the submission is determined to be complete and accurate by the Township Representative or their designate all documents shall be forwarded to the Director of Public Works for final review and execution of the Form 2. Final review shall be completed within 20 business days of receipt. If more time is required then the Director shall advise the Township Representative and Project Designer.
- 6.8 If the submission meets the DWWP criteria but the Director of Public Works is not satisfied with the submission, all documents shall be returned to the Project Designer for review and re-submission.
- 6.9 After signature and approval from the Director of Public Works the Township Representative shall forward the signed Form back to the Project Designer. The Township Representative shall also forward the signed form to the QMS Representative. The QMS Representative shall keep all Form 2 records and general watermain plans for future Ministry inspections.
- 6.10 All documents are to be retained according to the license, DWWP and QMS-05-SYS – Procedure for Document and Records Control.
- 6.11 No application fees are required for Form 2 submissions.


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7.0 MINISTRY APPLICATIONS RESPECTING: DRINKING WATER WORKS PERMITS AND MUNICIPAL DRINKING WATER LICENSES

- 7.1** The Ministry Form “Applications Respecting: Drinking Water Works Permits and Municipal Drinking Water Licenses” (the Form) shall be completed by the Project Designer if the project does not meet the criteria set out in Schedule B of the Town’s DWWP.
- 7.2** Section 4 of the Form shall be completed by the Project Designer and supporting information outlined in Section 11 of the Form shall accompany the submission.
- 7.3** The Form shall be submitted to the Town Representative who shall review for completeness, accuracy and applicable fees (See section 8 of this procedure for fees information) prior to submitting to the Director Public Works.
- 7.4** The Director shall sign-off on the Form.
- 7.5** The Form along with supporting documentation and fees shall be submitted by the Director of Public Works directly to the Ministry Director. A copy of the application and supporting documentation is forwarded to the applicable Ministry District Office. Details of the Ministry submission, review and approval process are outlined in the Ministry Document titled: “Guide for Applying for DWWP Amendments, License Amendments, License Renewals and New System Applications Municipal Residential Drinking Water Systems, November 2010” as amended.
- 7.6** The Director of Public Works shall provide written notification to the Project Designer and Town Representative upon receipt of any MINISTRY comments or approval.
- 7.7** The Township Representative shall forward all documents and correspondences to QMS Representative. The QMS Representative shall keep all records and general watermain plans for future Ministry inspections.
- 7.8** All documents are to be retained according to the license, DWWP and QMS-05-SYS – Procedure for Document and Records Control.

Upon Completion of Commissioning of a Watermain:

- 7.9** The Project Designer shall complete and submit the Ministry form “Director Notification Form Alterations to a Drinking Water System” to the Township Representative within fifteen (15) days of the commissioning of the water system addition, modification, replacement, removal or extension which:
 - Would require an alteration of the description of a component described in Schedule A of the DWWP.
 - Any document to be incorporated into Schedule C of the DWWP other than watermains
 - Approval issued prior to issue date of the first DWWP for works other than watermains which were not in service at the time of the first DWWP issuance.

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Notification is not required for works that are covered under Form 1; is exempt from subsection 31(1) of the SDWA by subsection 9.(2) of O. Reg. 170/03; 2.6.2; or Constitutes maintenance or repair of the drinking water system.

- 7.10** The Township Representative shall review for completeness and accuracy and then shall submit to the Director of Public Works for signature. After signature the Director of Public Works shall return signed form to the Township Representative,
- 7.11** The Township Representative shall submit the completed form to the Ministry within fifteen (15) business days of receiving the form from the Project Designer.
- 7.12** The Township Representative shall forward the Ministry correspondence and all supporting documentation to the QMS Representative for filing. The QMS Representative shall keep all records and plans for future Ministry inspections.
- 7.13** All documents are to be retained according to the license, DWWP and QMS 02 – Procedure for Control of Records requirements.
- 7.14** Refer to Section 8 of this document for information regarding application fees.

8.0 APPLICATION FEES


- 8.1** All application fees are payable to “The Corporation of the Township of King” for a Form 1 submissions and for an Minsitry Applications Respecting: Drinking Water Works Permits and Municipal Drinking Water Licenses submissions as outlined in **Schedule A** attached to this document.
- 8.2** Application fees payable to the Minister of Finance for Ministry Applications Respecting: Drinking Water Works Permits and Municipal Drinking Water Licenses are outlined in the “Guide for Applying for DWWP Amendments, Licence Amendments, Licence Renewals and New System Applications,” as amended.
- 8.3** Application fees are not applicable for a Form 2 submission.

9.0 REFERENCES/FORMS

Township’s DWWP’s and MDWL’s and amendments
QMS-05-SYS – Procedure for Document and Records Control

9.1

- Ministry Watermain Design Criteria for Future Alterations Authorized Under A Drinking Water Works Permit – March 2009 (as amended).
- Ministry Design Guidelines for Drinking Water Systems, 2008 (as amended).
- Ministry Guide for Applying for DWWP Amendments License Amendments License Renewals & New System Application Municipal Drinking Water Systems, November 2012 (as amended).

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- Ministry Form 1 – Record of Watermains Authorized as a Future Alteration
- Ministry Form 2 – Record of Minor Modifications or Replacements to the Drinking Water System
- Ministry Applications Respecting: Drinking Water Works Permits and Municipal Drinking Water Licenses.
- Ministry Director Notification Form – Alterations to a Drinking Water System.
- DWWP Form 09 – “DWWP Alteration Checklist”.

Revision Level	Date	Change	Developed By
0	March 25, 2013	Procedure Creation	J.V.
1	September 18, 2013	Procedure clean-up	J.V.
2	December 01, 2014	Further revisions reflecting positional changes and administrative corrections	J.V.
3	March 02, 2015	Moved to “paperless” protocol	J.V.
4	October 18, 2015	Revised fees in Schedule A	J.V.
5	June 13, 2018	Administrative change- Creation Date	J.V.
6	January 17, 2022	Reformatting	M.W.

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Schedule A – DWWP Applications Fees	
Form 1 - Record of Watermains Authorized as a Future Alteration	\$2,000.00
Form 2 - Record of Minor Modifications or Replacements to the DWS	\$ 0.00