



## **APPENDIX 2**

### **Water Commissioning**

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

**APPENDIX 2 – WATER COMMISSIONING**

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<b><u>Form No.</u></b>	<b><u>Title</u></b>
<b><i>Township of King Forms</i></b>	
F-02	Commissioning Checklist
F-09	DWWP Alterations Checklist
F-16	Commissioning - Chlorine Residual Report
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
121-201*	Drinking Water Works Permit – Schomberg
121-202*	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.


<http://www.king.ca/Government/Departments/Engineering%20%20Public%20Works/Water%20Pemits%20and%20Licences/Pages/default.aspx>

	<b>Engineering and Public Works Department</b> <b>Water Distribution</b>	Form #: F-02
	<b>WATER – STANDARD OPERATING PROCEDURES</b>	Revision No: 6
	<b>Commissioning Check-List</b>	Date: Sep 26/2011

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

Item	Work Description	Date Work Performed By Consultant/Qualified Contractor/Town/Town's Consultant	Comments	Witnessed By Town/Representative (initial)
1.	Watermain constructed to Municipality's specifications			
2.	Sample Request and Drawings			
3.	Loading of Watermain (Metered and Backflow)			
4.	Swabbing		#In:   #Out:	
5.	Hydrostatic Testing and Summary Report (calculation to be shown)			
6.	Turbidity			
7.	Disinfecting Watermain (residual 50-100 mg/L)			
8.	24-hour Check (residual 50%)			
9.	Removal and Disposal of Super Chlorinated Water (residual 0.5 mg/L max.)			
10.	Bacteriological Sampling	Sample #1		
		Sample #2		
11.	Preliminary Results Checked * **	Sample #1		
		Sample #2		
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			

**NOTE:** \* if sample fails then repeat sample  
 \*\* if re-sample fails then repeat appropriate steps

	<b>Engineering and Public Works Department</b> <b>Water Distribution</b>	Form #: F-02
	<b>WATER – STANDARD OPERATING PROCEDURES</b>	Revision No: 6
	<b>Commissioning Check-List</b>	Date: Sep 26/2011

16.	Plan attached showing limits of watermain to be activated			
17.	Final Signed Bacteriological Lab Test Results			
18.	King Township CRM Form (attached)			
19.	Contractor Certificates/Licences			

**Total Water Volumes (M<sup>3</sup>)** \_\_\_\_\_

**Project Engineer's Certification:** Firm: \_\_\_\_\_

We hereby certify that the workforce carrying out the above-mentioned work is licensed, by the MOE 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 Development needs-added steps 12 - 17	J.V.
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	J.V.

**NOTE:** \* if sample fails then repeat sample

\*\* if re-sample fails then repeat appropriate steps


	Engineering and Public Works Department Water Distribution	Form #: F-02
	WATER – STANDARD OPERATING PROCEDURES	Revision No: 6
	Commissioning Check-List	Date: Sep 26/2011

		receipt of certificates/licences	
6	February 24, 2015	Moved to “paperless” protocol	J.V.

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NOTE: \* if sample fails then repeat sample  
 \*\* if re-sample fails then repeat appropriate steps

	Engineering and Public Works Department Water Distribution	Form #: F-09
	WATER – STANDARD OPERATING PROCEDURES	Revision No: 3
	DWWP Alterations Checklist	Date: March 25, 2013

**Subdivision Name (If Applicable):** \_\_\_\_\_

**Project/Contract/Planning Application Number:** \_\_\_\_\_

**Drinking Water System (check applicable):**


- ☐ King City – DWWP 121-203
- ☐ Schomberg – DWWP 121-201
- ☐ Nobleton – DWWP 121-202
- ☐ Ansnorveldt – DWWP 121-204

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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 of the Environment publication "Watermain Design Criteria for Future Alterations Authorized under a Drinking Water Works Permit – March 2009", as amended from time to time;
- ☐ Is consistent with or otherwise addresses the design objectives contained within the Ministry of the Environment 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.

	Engineering and Public Works Department Water Distribution	Form #: F-09
	WATER – STANDARD OPERATING PROCEDURES	Revision No: 3
	DWWP Alterations Checklist	Date: March 25, 2013

\_\_\_\_\_  
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 Manager of Engineering and Development 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 painted 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 Manager of Engineering and Development 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 MOE approval:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

	Engineering and Public Works Department Water Distribution	Form #: F-09
	WATER – STANDARD OPERATING PROCEDURES	Revision No: 3
	DWWP Alterations Checklist	Date: March 25, 2013

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\_\_\_\_\_  
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.

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	Engineering and Public Works Department Water Distribution	Form #: F-16
	WATER – STANDARD OPERATING PROCEDURES	Revision No: 0
	Commissioning-Chlorine Residual Report	Date: Mar. 11, 2015


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Signature of Consulting Engineer/Township or Township Representative

#### DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
0	March 11, 2015	Document creation	J.V.

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	Engineering and Public Works Department Water Distribution	Form #: F-17
	<b>WATER – STANDARD OPERATING PROCEDURES</b>	Revision No: 0
	New Watermain, Confirmation of Adequate Flow and Pressure and Continuity of Tracer Wire	Date: Mar.12, 2015

***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

	Engineering and Public Works Department Water Distribution	Form #: F-17
	WATER – STANDARD OPERATING PROCEDURES	Revision No: 0
	New Watermain, Confirmatoin of Adequate Flow and Pressure and Continuity of Tracer Wire	Date: Mar.12, 2015

## DOCUMENT CHANGE HISTORY

Revision Level	Date	Change	Developed By
0	March 12, 2015	Creation of the document	J.V.

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	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: SOP – 2.1
	<b>WATER -STANDARD OPERATING PROCEDURE</b>	Approval Date: September 26, 2011
	Procedure Title: Commissioning New Watermain Isolated from Existing Watermain	Revision No: 7
	Approved by: Director, Engineering and Public Works	Page 1 of 4

## 1 PURPOSE


Commissioning new watermain isolated 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 have to verify the test results in compliance with the Procedure prior to final connection to the existing watermain.

## 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 EPW approval).
3. “Hydrostatic Pressure Test” shall be according to the following: OPSS701, AWWA C605 or AWWA C600. 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.
4. A “Turbidity Test” will be conducted. The watermain will be flushed for 5 to 10 minutes at each hydrant until a Turbidity reading of less than 1 NTU or values consistent with the ware provision system. The results of this test shall meet or beat the turbidity value present in the source water accessed for commissioning purposes.
5. “Chlorination” and “Bacteriological Test” should be completed in accordance with AWWA C651, as amended, and the Township SOP 2.4 – Chlorination of Watermain. The Township policy is bacteriological samples at 24 and 48 hours and Continuous Feed Method only. Heterotrophic Plate Counts (HPC) must meet at a minimum the values contained in the source water accessed for commissioning purposes. If HPC counts are greater than those identified in the source water the main is to be flushed and re-sampled. Method of chlorination must be approved by the Township prior to implementation and will include all calculations, product details and proof of “non-expiry” as well as peripheral equipment clearances where applicable.
6. “Chlorine Residual” should adhere to the targets in the latest AWWA Standard “Disinfecting Water Mains” (C651 as amended).
7. For de-chlorination of watermain, follow the method described in SOP 2.5 “De-chlorination of Watermain”.
8. After commissioning, the contractor fills out the “Commissioning Check-list” and provides it and all supporting documentation to the Township for record keeping.
9. 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.

	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: SOP – 2.1
	<b>WATER -STANDARD OPERATING PROCEDURE</b>	Approval Date: September 26, 2011
	Procedure Title: Commissioning New Watermain Isolated from Existing Watermain	Revision No: 7
	Approved by: Director, Engineering and Public Works	Page 2 of 4


**NOTE: Where watermain is physically separated from the distribution system the “Hydrostatic Pressure Test” may take place before chlorination with the approval of the Township.**

#### 4 REFERENCES / FORMS

Form F-02 - Commissioning Checklist  
SOP 2.7 - Foam Swabbing Watermains-New Watermains  
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	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 better alignment with referenced standards	J.V.

	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: SOP – 2.1
	<b>WATER -STANDARD OPERATING PROCEDURE</b>	Approval Date: September 26, 2011
	Procedure Title: Commissioning New Watermain Isolated from Existing Watermain	Revision No: 7
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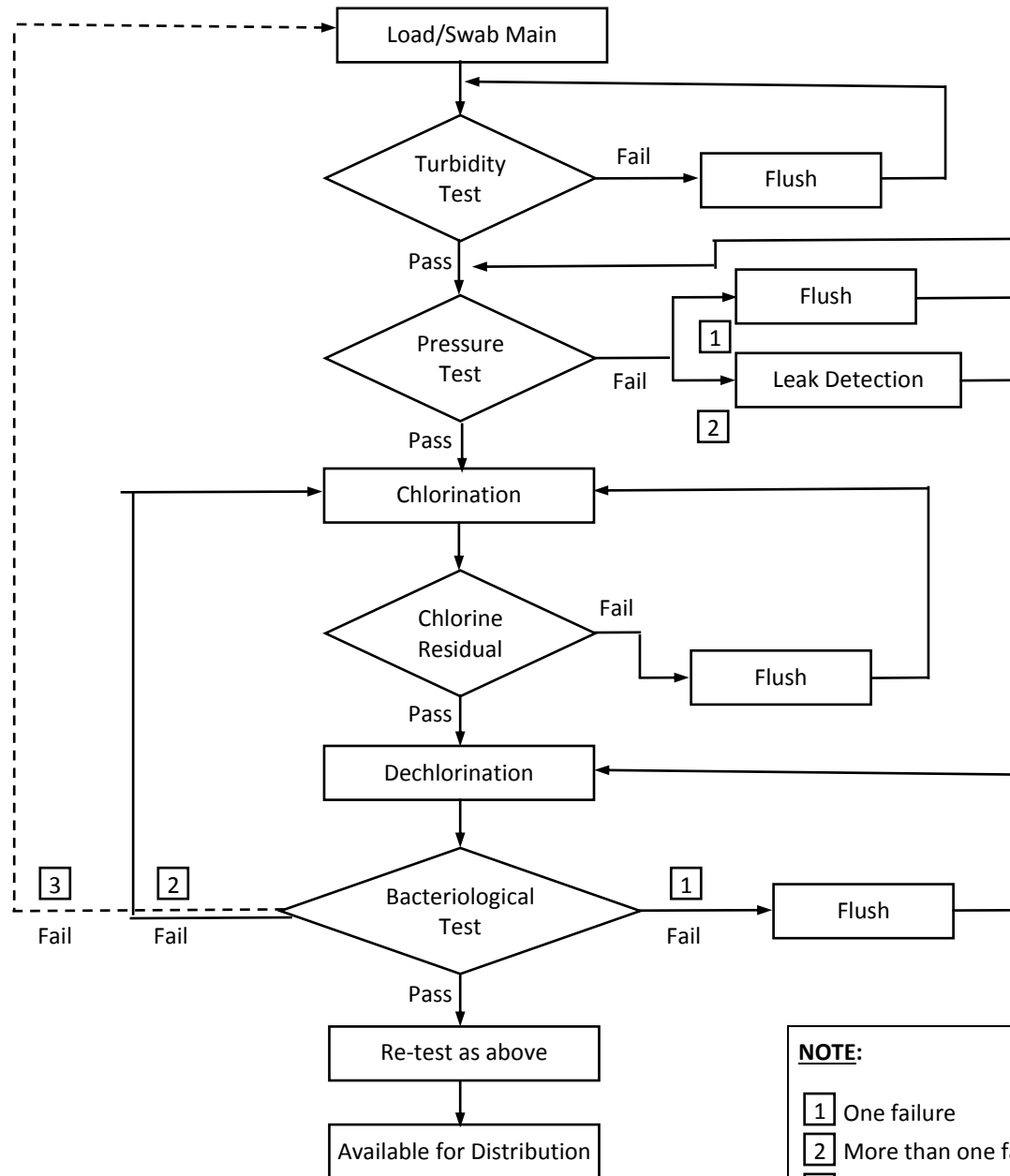
		and specify “physical separation”	
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	<b>Engineering and Public Works Department</b> <b>Water Distribution</b>	Procedure No: SOP – 2.1
	<b>WATER -STANDARD OPERATING PROCEDURE</b>	Approval Date: September 26, 2011
	Procedure Title: Commissioning New Watermain Isolated from Existing Watermain	Revision No: 7
	Approved by: Director, Engineering and Public Works	Page 4 of 4

### Procedure Diagram





	Engineering and Public Works Department Water Distribution	Procedure No: SOP – 2.4
	<b>WATER -STANDARD OPERATING PROCEDURE</b>	Approval Date: September 26, 2011
	Procedure Title: Chlorination of Watermains	Revision No: 4
	Approved by: Director, Engineering and Public Works	Page 1 of 2

## 1 PURPOSE

Chlorinate to disinfect watermains to meet all current MOE Regulations and the latest AWWA Standards.

## 2 DESCRIPTION


All new watermain installations and/or repaired watermain breaks are to be chlorinated, flushed and tested. Satisfactory test results must be received prior to putting the new or repaired watermain into service.

## 3 PROCEDURE

1. Watermain to be completely charged and flushed prior to chlorinating.
2. Extreme caution must be exercised to ensure that no cross connection exists to the potable water system.
3. Chlorination shall be connected to the main at the closest point to the potable water supply.
4. Discharge shall be at the ends of all watermains being chlorinated.
5. Prior to chlorination, establish the water flow at the velocity of not less than 0.75 m/s, measure this by using a pitot gauge.
6. All chlorination of watermains 300 mm diameter and smaller shall be carried out as per OPSS 701.07.25 as amended.
7. 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.
8. Contractors provide records of watermain chlorination to the Manager of Urban Services.

## 4 REFERENCES / FORMS


None

	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: SOP – 2.4
	<b>WATER -STANDARD OPERATING PROCEDURE</b>	Approval Date: September 26, 2011
	Procedure Title: Chlorination of Watermains	Revision No: 4
	Approved by: Director, Engineering and Public Works	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	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	Indicate OPSS 701.07.25 as opposed to AWWA C651 as chlorination/disinfection guideline	J.V.

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	Engineering and Public Works Department Water Distribution	Procedure No: SOP – 2.5
	<b>WATER -STANDARD OPERATING PROCEDURE</b>	Approval Date: September 26, 2011
	Procedure Title: Dechlorination of Watermains	Revision No: 3
	Approved by: Director, Engineering and Public Works	Page 1 of 2

## 1 PURPOSE

Using chemical to control chlorine in the discharged water from watermain as required by MOECC regulations.

## 2 DESCRIPTION

All discharged water from the routine flushing program is dechlorinated before disposal. All discharged water from foam swabbing, watermain commissioning or any chlorinated water is dechlorinated prior to disposal or entering habitat important to fish. Chlorinated water not exceeding AWWA standard of 3.0 mg/l may be discharged into storm sewer.

## 3 PROCEDURE


1. During routine flushing program new watermain commissioning de-chlorination works must meet AWWA C655 (as amended) requirements. 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 0.02 mg/L before disposal.
2. The contractor during their new watermain commissioning activity can adopt their own approach to carrying out de-chlorination with documented approval of the EPW Department and meeting requirements of AWWA C655 (as amended).

## 4 REFERENCES / FORMS

AWWA C655 (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	November 05, 2015	Indicated alignment with AWWA C655 and	J.V.

	Engineering and Public Works Department Water Distribution	Procedure No: SOP – 2.5
	<b>WATER -STANDARD OPERATING PROCEDURE</b>	Approval Date: September 26, 2011
	Procedure Title: Dechlorination of Watermains	Revision No: 3
	Approved by: Director, Engineering and Public Works	Page 2 of 2

		allowable discharge of “compliant” water into storm sewer	
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	<b>Engineering and Public Works Department</b> <b>Water Distribution</b>	Procedure No: SOP – 2.6
	<b>WATER -STANDARD OPERATING PROCEDURE</b>	Approval Date: September 26, 2011
	Procedure Title: Pressure Testing/Leakage	Revision No: 4
	Approved by: Director, Engineering and Public Works	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 American Waterworks Association standards prior to final acceptance. All watermains must be swabbed prior to pressure testing.

## 3 PROCEDURE


Pressure testing of all watermains must meet the requirements of AWWA 600 or AWWA 605 at a minimum. The following outlines general procedural requirements and shall not be construed to over-ride the AWWA requirements.

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.

	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: SOP – 2.6
	<b>WATER -STANDARD OPERATING PROCEDURE</b>	Approval Date: September 26, 2011
	Procedure Title: Pressure Testing/Leakage	Revision No: 4
	Approved by: Director, Engineering and Public Works	Page 2 of 2

7. All detected leaks above the allowable leakage shall be repaired.
8. Leakage test procedure shall be repeated until the leakage test is completed to the Municipality's satisfaction.
9. The 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.

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	<b>Engineering and Public Works Department</b> <b>Water Distribution</b>	Procedure No: SOP – 2.7
	<b>WATER -STANDARD OPERATING PROCEDURE</b>	Approval Date: September 26, 2011
	Procedure Title: Foam Swabbing Watermains-New Watermain (By Contractor)	Revision No: 4
	Approved by: Director, Engineering and Public Works	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.


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

## 2 DESCRIPTION

Pursuant to AWWA C651-14 (as amended) new watermains should 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 procedure is completed by contractors.

## 3 PROCEDURE

1. The proponent shall generate a CRM through the Township or it's designate to initiate the works and inform Township Operations staff 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.

	<b>Engineering and Public Works Department Water Distribution</b>	Procedure No: SOP – 2.7
	<b>WATER -STANDARD OPERATING PROCEDURE</b>	Approval Date: September 26, 2011
	Procedure Title: Foam Swabbing Watermains-New Watermain (By Contractor)	Revision No: 4
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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.
17. All hydrants must have at least one swab run.
18. After swabbing is completed proceed with subsequent commissioning steps (See SOP 2.1-Commissioning New Watermain Isolated from Existing Watermain)

#### 4 REFERENCES / FORMS


AWWA 651 (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.

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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 References**


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

### **4.0 Responsibilities**

Director of Engineering and Public Works  
Manager of Urban Services  
Project Manager - Development  
Water/Wastewater Compliance and Engineering Technologist  
Manager of Engineering & Development  
Director of Planning

### **5.0 Definitions**


**Director** – The Township of King Director of Engineering and 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 Urban Services Manager;  
**MOE** – 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;

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

## **6.0 Notes**

- 6.1** 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.
- 6.2** Not all alterations to the DWWPs are pre-approved. Pre-approved alterations include, but are not limited to:
- Works within municipal jurisdiction;
  - Consistent with MOE Design Guidelines contained in the publication ‘Design Guidelines for Drinking Water Systems, 2008’, as amended from time to time;
  - Satisfying the MOE Watermain Design Criteria contained in the publication ‘Watermain Design Criteria for Future Alterations Authorized under a Drinking Water Works Permit, March 2009’ , as amended from time to time;
  - Design & verification by a Professional Engineer
- 6.3** Alterations requiring MOE 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.
- 6.4** 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 an MOE Director.
- 6.5** Proponents can contact the local MOE district office (1-800-376-4547) or the MOE Safe Drinking Water Branch (416-212-7318) for clarification of the pre-authorized alterations listed in Schedule B of the Township’s DWWP.

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**6.6** In the event there is a discrepancy between the MOE Design Guidelines, the MOE Watermain Design Criteria and Township Standards, the most stringent criteria shall take precedence. MOE documents and forms referred to in this procedure can be found on the MOE Website: <http://www.portal.gov.on.ca/ONT/portal61/drinkingwater?lang=en>

**6.7** The Township's DWWP's and MDWL are available on the Township's website at: <http://www.king.ca/Government/Departments/Engineering%20%20Public%20Works/Water%20Pemits%20and%20Licences/Pages/default.aspx>

## **7.0 Form 1 – Records of Watermains Authorized as a Future Alteration**

**7.1** MOE 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.

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

**7.3** 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);
- Existing watermain to be connected to;
- Street names;
- Easements


**7.4** A Professional Engineer shall verify the criteria described in Part 2 and sign Part 3 of Form 1.

**7.5** 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
- MOE Pipe Data Form
- DWWP Alterations Checklist
- Applicable DWWP and MDWL
- The applicable application fees detailed in Part 10 of this procedure

**7.6** The Project Designer will submit the applicable application fees as detailed in Part 10 of this procedure along with the completed Developers Information Package.


**7.7** 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.

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- 7.8** 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 Engineering and Public Works for final review and execution of the Form 1.
- 7.9** If the submission is determined to be incomplete or unsatisfactory to the Township Representative or the Director of Engineering and Public Works, all materials shall be returned to the Project Designer with the Township's comments.
- 7.10** 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 9 of this procedure.
- 7.11** Submissions to the Director of Engineering and Public Works for 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.
- 7.12** The Director or Engineering and Public Works shall forward the signed original Form 1 to the Water/Wastewater Compliance and Engineering Technologist for filing. The Water/Wastewater Compliance and Engineering Technologist shall keep all Form 1 records and general watermain plans for future MOE inspections.
- 7.13** Documents are to be retained in accordance with the license, DWWP requirements and according to Procedure QMS-05-SYS "Documents and Record Control".

## **8.0 Form 2 – Record of Minor Modifications or Replacements to the Drinking Water System**


- 8.1** MOE 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.
- 8.2** Form 2 is not required for any modification or replacement deemed maintenance or repair such as hydrant replacement, valve replacement or watermain break repairs.
- 8.3** The Parts 1 and 2 of Form 2 are mandatory submissions by the Project Designer.
- 8.4** 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).
- 8.5** The Project Designer shall submit the following to the Town Representative for review
- Completed Form 2
  - The Township's water system map(s) described in 8.4.

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- 8.6** The Director of Engineering and Public Works confirms the accuracy of the information and its compliance with Schedule B of the applicable DWWP.
- 8.7** 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 MOE Form “Applications Respecting: Drinking Water Works Permits and Municipal Drinking Water Licenses”. Refer to Sections 7 or 9 of this procedure.
- 8.8** If the submission meets the DWWP criteria but the Director of Engineering and Public Works is not satisfied with the submission, all documents shall be returned to the Project Designer for review and re-submission.
- 8.9** Submission to the Director of Engineering and Public Works for review shall be complete within 20 business days of receipt. If more time is required, the Director shall advise the Town Representative and Project Designer in writing.
- 8.10** The Director of Engineering and Public Works shall provide written approval of the Form 2 submission to the Project Designer along with a signed copy of the Form 2.
- 8.11** The Director of Engineering and Public Works shall provide the signed original Form 2 to the Water/Wastewater Compliance and Engineering Technologist for filing. The Water/Wastewater Compliance and Engineering Technologist shall retain all Form 2 submissions and accompanying Township water system maps for future MOE inspections.
- 8.12** All documents are to be retained according to the license, DWWP and QMS-05-SYS – Procedure for Document and Records Control.
- 8.13** No application fees are required for Form 2 submissions.

**9.0 MOE Applications Respecting: Drinking Water Works Permits and Municipal Drinking Water Licenses**

- 9.1** The MOE 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.
- 9.2** 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.


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- 9.3** The Form shall be submitted to the Town Representative who shall review for completeness, accuracy and applicable fees (See section 10 of this procedure for fees information) prior to submitting to the Director of Engineering and Public Works.
- 9.4** The Director shall sign-off on the Form.
- 9.5** The Form along with supporting documentation and fees shall be submitted by the Director of Engineering and Public Works directly to the MOE Director. A copy of the application and supporting documentation is forwarded to the applicable MOE District Office. Details of the MOE submission, review and approval process are outlined in the MOE 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.
- 9.6** The Director of Engineering and Public Works shall provide written notification to the Project Designer and Town Representative upon receipt of MOE comments. The Director of Engineering and Public Works shall provide written notification to the Project Designer upon receipt of MOE approval.

**Upon Completion of Commissioning of a Watermain:**

- 9.7** The Project Designer shall complete and submit the MOE form “Director Notification Form Alterations to a Drinking Water System” to the Director of Engineering and Environmental Services within fifteen (15) days of the commissioning of the water system addition, modification, replacement or extension.
- 9.8** The Director of Engineering and Public Works shall submit the completed form referenced in 9.7 to the MOE within fifteen (15) business days of receiving the form from the Project Designer.
- 9.9** The Director of Engineering and Public Works shall forward the MOE correspondence and all supporting documentation to the Water & Wastewater Compliance and Engineering Technologist for filing. The Water & Wastewater Compliance and Engineering Technologist shall keep all records and plans for future MOE inspections.
- 9.10** All documents are to be retained according to the license, DWWP and QMS 02 – Procedure for Control of Records requirements.
- 9.11** Refer to Section 10 of this document for information regarding application fees.
- 10.0** **Application Fees**
- 10.1** All application fees are payable to “The Corporation of the Township of King” for a Form 1 submissions and for an MOE Applications Respecting: Drinking Water Works Permits



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and Municipal Drinking Water Licenses submissions as outlined in **Schedule A** attached to this document.

**10.2** Application fees payable to the Minister of Finance for an MOE 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, November 2010,” as amended.

**10.3** Application fees are not applicable for a Form 2 submission.

**11.0** **Related Documents**

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


**12.0** **Related Forms**

- MOE Form 1 – Record of Watermains Authorized as a Future Alteration
- MOE Form 2 – Record of Minor Modifications or Replacements to the Drinking Water System
- MOE Applications Respecting: Drinking Water Works Permits and Municipal Drinking Water Licenses.
- MOE 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.

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<b>Schedule A – DWWP Applications Fees</b>	
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

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