

**CORPORATION OF THE TOWN OF MARATHON  
GUIDELINE**

<b>SECTION: WORKS &amp; OPERATIONS DEPT.</b>	<b>PAGE 1 OF 4</b>
<b>GUIDELINE: CONTINGENCY PLAN FOR WATER MAIN BREAK</b>	<b>POLICY NO. <u>WO 0010</u></b>

**PURPOSE:**

To establish a contingency plan in the event of a water main break.

**SCOPE:**

For all employees involved in the repair of a water main break

**GUIDELINE:**

- 1) Once the Works & Operations Manager or his designate is notified that there is a possibility of a water main break, he/she will notify the Water Distribution Operator in-charge of the possible break.
- 2) The Water Distribution Operator will then isolate the affected area of the distribution system by turning the main line isolation valves to the "off" position above and below the break. This will be done in accordance with the contingency plan for main line water valve operations.
- 3) An inspection of the break site will occur with the Works & Operation Manager & the Water Distribution System Operator to assess the situation and develop a work plan to address the break. Such items to be discussed are the size of work crew, equipment requirements, notification requirements, necessary materials, etc...
- 4) Once the work plan has been finalized, the work crew will provide immediate notification to the affected customers. This will be accomplished by delivering the standardized notification form; the Works and Operations secretary will have a digital copy of this form on file.
- 5) The Water Distribution Operator will notify OCWA, the Water Treatment Plant Operating Authority of the break situation. The contact numbers are as follows; regular business hours – 229-1186, after hour cellular number 229-6324.

<b>NEW</b> <input type="checkbox"/> <b>REVISED</b> <input checked="" type="checkbox"/>	<b>APPROVAL:</b> <i>J. L. Macio</i>
<b>SUPERSEDES GUIDELINE DATED:</b> <i>June 27, 2003</i>	<b>DATE:</b> <i>Mar 23, 2004</i>

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- 6) Either the Works & Operations Manager or the Water Distribution Operator will contact the public utilities for locates prior to excavating the break. The contact numbers are as follows;
- 1) Bell Canada – 1-800-465-6924
  - 2) Hydro 1-800-465-3960
  - 3) Cable (TV) – 807-229-0731
- 7) Prior to excavating, the Works & Operations Manager will personally notify the Ministry of Labour by telephone (1-800-461-7268) or by fax (1-705-949-9796) of the excavation and obtain an excavation authorization number.
- 8) Once all notifications, locates and approvals are in place, the necessary equipment and labour will be assembled at the break site. All staff involved in the excavation and repair process will be required to thoroughly review this plan and any other applicable plans and guidelines, prior to commencing work. They will provide their signature in the water distribution logbook to verify this.
- 9) Begin excavating the break.
- 10) Expose the break in the distribution system to determine what repairs, parts or materials are required.
- 11) Liberal quantities of hypochlorite will be placed in the open trench prior to opening the main to avoid potential contamination.
- 12) Prior to cutting or disconnecting any parts on the existing water distribution system, the exposed piping will be thoroughly cleaned to ensure that it is free of soil, foreign materials or any contaminants. If for some reason the existing piping has been exposed to wastewater (raw sewage) the piping will be completely disinfected using straight Javex (6% sodium hypochlorite) prior to disassembling the piping.
- 13) If possible, repair the break without depressurizing the main by use of clamps, sleeves, or other devices. If the main must be shut down and depressurized during repair, excavated areas should be dewatered to the extent practical to prevent dirty water from contacting the pipe. If the pipe is cut and a section is removed, examine the remaining pipe ends and remove pieces of pipe, scale, or other debris. Provide temporary plugs for the open ends of pipes.

NEW <input type="checkbox"/>	REVISED <input checked="" type="checkbox"/>	APPROVAL: <i>S L Hacio</i>
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- 14) Once all the repair parts have been determined they will be disinfected using Javex (6 % sodium hypochlorite). Once disinfected, the parts will be stored in sealed plastic bags to ensure no contamination occurs. The parts will be removed from the sealed bags in the bottom of the excavation once they are ready to be installed.
- 15) Workers will prevent contamination of the existing piping and repair parts by using rubber or latex gloves. Also, the workers will wear non-contaminated clothing.
- 16) Immediately proceeding repair activities the isolated water main will be flushed by discharging water from the nearest fire hydrant. Water will be discharged from both sides of the break. Each side will be flushed independent of the other to ensure no isolated water is allowed to be contained in the system prior to putting the water main back into service. Flushing should be accomplished at a rate of at least 0.762m/s (2.5ft/s). Table 1 of Schedule 'A' provides the flow rates required to obtain the required velocity in various pipe sizes. Flushing shall continue until discolored water is eliminated.
- 17) If the main has been depressurized and opened, the section of the main in which the break is located shall be isolated, all service connections shut off, and the section will be flushed and chlorinated:
- Completely fill the main to eliminate any air pockets. When this is achieved commence preliminary flushing of the main, in accordance with the guideline for flushing water mains, to remove any dirt or debris. Preliminary flushing should be accomplished at a rate of at least 0.762m/s (2.5ft/s). Table 1 of Schedule 'A' provides the flow rates required to obtain the required velocity in various pipe sizes.
  - Disinfect the repaired main with a dosage of 300mg/L FAC (free available chlorine) for a 15-minute contact period. The 300mg/L chlorine residual will be verified by measuring the chlorine residual in the flushed water through an outlet in the end of the section. Table 2 of Schedule 'A' provides the minimum volumes of hypochlorite necessary to achieve an initial chlorine residual of 300mg/L in 100ft of main. The calculation to determine the minimum amount of hypochlorite solution required to treat one pipe volume with a FAC of 300mg/L is also provided in Schedule 'A'.

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- After a minimum contact period of 15 minutes a chlorine residual of at least 100mg/L should be verified in the water being discharged. If this can not be verified additional chlorine shall be added to the system until the residual is a minimum of 100mg/L for a contact time of 15 minutes.
- Additional information in regard to determining the appropriate chlorine injection rate, discharge of heavily chlorinated water, etc. is provided in the contingency plan to disinfect a water main within the distribution system: Policy No. WO 0013.

18) All users downstream of the break will be officially notified using a standardized notification form that their property has been put on a boil water advisory until positive water results are received indicating the water is safe for consumption. The Works and Operations secretary will have a digital copy of this form on file.

19) Three (3) water distribution bacteriological samples will be taken immediately at the break area in the system;

- 1) upstream of the break section
- 2) downstream of the break section
- 3) one at the nearest service near the break.

The water samples will be sent to an accredited laboratory for analyzes. Presently, the accredited laboratory is Enviro-Test in Thunder Bay.

20) Once positive water samples are received indicating that the water is safe for consumption, the downstream customers will be officially notified by the standardized notification form that the water is safe for consumption. The Works and Operations secretary will have a digital copy of this form on file.

21) All pertinent information regarding the break will be logged by the Water Distribution Operator in the water distribution logbook. Also, information will be recorded on the water distribution plans attached to the walls in the Works & Operations Office.

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**CORPORATION OF THE TOWN OF MARATHON**  
**SCHEDULE 'A'**

**Table 1: Flow Required for Various Flushing Velocities**

Pipe Size		Pipe Area		Flow Required for a Given Velocity					
				1ft/s (0.305m/s)		2.5ft/s (0.762m/s)		5ft/s (1.524m/s)	
m	cm	ft <sup>2</sup>	m <sup>2</sup>	gpm	L/s	gpm	L/s	gpm	L/s
2	5.08	0.02	0.001	10	0.63	25	1.60	50	3.20
4	10.16	0.09	0.008	40	2.50	100	6.30	200	12.60
6	15.24	0.20	0.019	90	5.70	220	13.90	440	27.80
8	20.32	0.35	0.033	155	9.80	390	24.60	780	49.20
10	25.4	0.55	0.051	245	15.50	610	38.50	1220	77.00
12	30.48	0.79	0.073	350	22.10	880	55.50	1760	111.00
14	35.56	1.07	0.099	480	30.30	1200	75.70	2400	151.40
16	40.64	1.40	0.130	625	39.40	1570	99.10	3140	198.10

**Table 2: Hypochlorite Required per 100 FT of Main**

Pipe Size		Total Pipe Volume		Hypochlorite Solution				Hypochlorite Granules	
				Dose 100 mg/L	Dose 300mg/L	Dose 100 mg/L	Dose 300mg/L	Dose 100 mg/L	Dose 300mg/L
in	cm	gal	L	Gal of 5%		Gal of 12.5%		Ounces of 65%	
2	5.08	16.30	61.70	0.03	0.10	0.01	0.04	0.33	1.00
4	10.16	65.30	247.19	0.13	0.39	0.05	0.16	1.30	4.00
6	15.24	147.00	556.46	0.29	0.88	0.12	0.35	3.00	9.00
8	20.32	261.00	987.99	0.52	1.60	0.21	0.63	5.40	16.10
10	25.40	408.00	1544.45	0.82	2.40	0.33	0.98	8.40	25.10
12	30.48	587.00	2222.04	1.20	3.50	0.47	1.40	12.10	36.20
16	40.64	1044.00	3951.97	2.10	6.30	0.84	2.50	21.40	64.30

\*Note: 5% chlorine solution = 50 000ppm or mg/L free chlorine.

**Equation 1: Minimum Amount of Hypochlorite Solution to Treat One Pipe Volume with an Initial Chlorine Dose of 300mg/L**

$$V_{Cl-sol} = \frac{300mg/L \times V_{main}}{Conc_{Cl-sol}}$$

$V_{Cl-sol}$  = Volume of calcium hypochlorite solution (gal).

$Conc_{Cl-sol}$  = Concentration of chlorine in the calcium hypochlorite solution in mg/L.

$V_{main}$  = Volume of the main (gal).