



**The Corporation of the Municipality of Port Hope**

**Port Hope**

**Water Treatment Plant**

**New Water Treatment Plant**

**2007**

**Summary Report**



The Corporation of the Municipality of Port Hope  
Department of Public Works,  
Water Treatment Division  
35 Marsh St.  
Port Hope, ON  
L1A 4K3

March 15, 2008

Municipality of Port Hope  
P.O. Box 117  
56 Queen Street  
Port Hope, ON  
L1A 3V9

**Attention: Mr. Peter Angelo, P. Eng., Director of Municipal Engineering Services**

Dear Peter:

**RE: 2007 Summary Report – Port Hope Water Treatment Plant**

We are pleased to provide the *2007 Summary Report for the Port Hope Water Treatment Plant* as outlined in Schedule 22 of Ontario Regulation 170/03.

Sincerely,

Rick Trumper  
Water Treatment Supervisor  
Municipality of Port Hope  
Water Department

Letter of Transmittal

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## 1. **INTRODUCTION**

### 1.1 **BACKGROUND**

The Municipality of Port Hope is located within Northumberland County, approximately 90 km east of Toronto. The Community of Port Hope has a population of 12,500 with combined residential, commercial, industrial and institutional use.

Given the First Engineers' Report in February 2001, extensive upgrades were required for the old WTP, resulting in the construction of a new membrane filtration plant, which was commissioned on August 23, 2005.

On June 1, 2003, the Province introduced Regulation 170/03 under the Ontario Safe Drinking Water Act. This new regulation requires all municipal water systems to complete an Annual Report (submitted to the Ministry of the Environment) and a Summary Report (submitted to Council) for their water treatment plants.

This report is an independent 2007 Summary Report for the new plant. The original WTP was decommissioned in 2006 and rendered inoperative for the supply of potable water to the Municipalities distribution system.

### 1.2 **TERMS AND CONDITIONS OF THE CERTIFICATE OF APPROVAL**

Table 1-1 lists the headings of the Terms and Conditions of the latest CofA.

**Table 1-1 Terms and Conditions of the CofA**

<b>Part No.</b>	<b>Heading</b>
1	Drinking Water System Description
2	Definitions and Information
3	General
4	Performance
5	Monitoring and Recording
6	Operations and Maintenance
7	Future Alterations
8	Studies and Upgrades Required
9	Relief from Regulatory Requirements



**2. CERTIFICATIONS**

This section covers all certifications related to Port Hope WTP and distribution system, including:

- ◆ Certificates of approval;
- ◆ Permits to take water;
- ◆ Facility/distribution system classification; and,
- ◆ Operator classification.

**2.1 CERTIFICATES OF APPROVAL**

Table 2-1 summarizes the Certificates of Approval (CofA), which can be found in **Appendix A**.

**Table 2-1 Certificates of Approval**

Certificate Type	Certificate Number	Date Issued	Brief Description of Works Approved
Water Treatment Plant	3586-5T6QJL (Air)	Nov. 17/03	Installation and operation of a diesel generator
Water Treatment Plant	5488-6DNHC4	Aug. 25/05	Construction of a new 20,000 Cubic Metre per Day Ultrafiltration Water Treatment Plant.

**2.2 PERMIT TO TAKE WATER**

The Permit to Take Water (PTTW) for the Port Hope WTP is summarised in Table 2-2 and attached in **Appendix B**.

**Table 2-2 Permit To Take Water (PTTW)**

Permit Number	Source	Issued Date	Renewal Date	Permitted Amount of Taking
2240-6QQJ98	Lake Ontario	June 19, 2002	July 12, 2012	20,000 m <sup>3</sup> /d

**2.3 FACILITY CLASSIFICATION**

Details of Port Hope facility certifications are presented in Table 2-3.

**Table 2-3 Facility Classifications**

Facility Type	Facility Name	Class	Certificate No.	Date of Issue
Plant	Port Hope Water Treatment Plant	II	WT #3552	July 26, 2005
Distribution	Port Hope Water Distribution System	III	WD #4713	January 24, 2007



**2.4 OPERATOR CERTIFICATION**

The Corporation of the Municipality of Port Hope currently operates the Port Hope Water Supply System (WSS). Staff members responsible for the water supply and distribution systems are licensed operators with their certifications presented in Table 2-4.

**Table 2-4 Operator Certifications**

Name	Position	Certificate Level			Certification Number			Expiry Date		
		T	D	WQA	T	D	WQA	T	D	WQA
Rick Trumper	Supervisor Water Treatment	III	III	I	421	422	11995	06/30/08	03/31/08	05/31/07
Mike Stewart	Treatment Operator	III	II	I	13137	15294	11998	03/31/11	03/31/10	05/31/10
Geoff Morgan	Treatment Operator	II	II	-	9907	14148	-	06/30/09	06/30/09	-
Jerry Lord	Treatment Operator	II	II	-	11529	15321	-	11/30/09	04/30/10	-
Ed Symons	Superintendent Water Distribution	II	III	-	5081	5082	-	08/31/09	03/31/09	-
Rick Held	Distribution Operator	II	II	-	4871	4872	-	04/30/09	02/28/10	-
Larry Green	Distribution Operator	II	II	-	9290	9291	-	02/28/09	02/28/09	-
BJ Coull	Distribution Operator	-	I	-	-	50656	-	-	08/31/10	-
<b>T = Treatment License</b> <b>D = Distribution License</b> <b>WQA = Water Quality Analyst License</b>										



### 3. WATER FLOWS

#### 3.1 OVERVIEW

This section gives a summary of records made relating to flow rate exceedances.

This section also gives a summary and discussion of the quantity of treated water supplied in 2007 compared to the rated capacity specified in the CofA, including monthly average and maximum daily flows.

Section 4.1 of the CofA states the following:

*“The drinking water system shall not be operated to exceed the rated capacity for the maximum flow rates into the treatment system, trains, or stages set out below:*

- o *Maximum flow rate = 20,000 m<sup>3</sup>/d (Phase II)”*

Currently, there is sufficient membrane modules installed to produce Phase 1 flows of 14,000 m<sup>3</sup>/d. Note that this flow rate is a total net daily production of treated water.

Given the downtime for cleaning and pressure decay tests; and, on-site water usage for cleaning (backwashing, chemical enhanced backwashing and clean-in-place the membranes), the instantaneous flow rate into the membranes is higher than the plant rated capacity as defined above. Given the current recovery rate of 90%, the membrane instantaneous factor has been defined as 1.26, thus requiring an instantaneous flow rate into the membranes of 15,120 m<sup>3</sup>/d.

Note however, that the plant was designed for an ultimate rated capacity of 31,700 m<sup>3</sup>/d and a recovery rate of 85%, which requires an instantaneous factor of 1.42 and thus instantaneous flow rate of 45,000 m<sup>3</sup>/d.

Given the current recovery rate of 90%, the daily net raw water volume currently required is 13,333 m<sup>3</sup>/d. Given the ultimate recovery rate of 85%, the daily net raw water volume ultimately required 37,294 m<sup>3</sup>/d.

A summary of the above is provided below:

- o Current plant rated capacity (net treated water production)= 12,000 m<sup>3</sup>/d
- o Current instantaneous flow rate from membranes = 175 L/s (15,120 m<sup>3</sup>/d)
- o Current daily net raw water volume = 13,333 L/m (relevant to PTTW)
- o Ultimate plant rated capacity (net treated water production)= 31,700 m<sup>3</sup>/d
- o Ultimate instantaneous flow rate from membranes = 521 L/s (45,000 m<sup>3</sup>/d)
- o Ultimate daily net raw water volume = 20,002,400 L (relevant to PTTW)

This section also accounts for the wastewater production from the water treatment process.

Table 3-1 shows that the highest net daily raw water volume of 12,652 m<sup>3</sup>/d has not exceeded the flow allowed in the PTTW of 20,002,400 L/d.



**Table 3-1 Net Daily Raw Water Volumes**

Item	Avg. Day (m <sup>3</sup> /d)	Max. Day (m <sup>3</sup> /d)
January	7,093	9,535
February	6,923	8,694
March	7,010	8,565
April	7,534	10,186
May	8,161	9,681
June	10,099	12,652
July	8,839	11,319
August	9,209	10,948
September	8,187	9,823
October	8,057	10,591
November	7,366	9,912
December	6,722	9,429
<b>Avg.</b>	<b>7,933</b>	<b>10,111</b>
<b>Max.</b>	<b>10,099</b>	<b>12,652</b>
Notes:		

### 3.2 RAW WATER FLOWS

A summary of the daily quantities of water being taken from Lake Ontario (i.e., net daily raw water volumes) are shown in Table 3-1.

### 3.3 MEMBRANE INSTANTANEOUS FLOWRATE

A summary of the combined instantaneous flow rate from the membranes is shown in Table 3-2.

Table 3-2 shows that the maximum combined instantaneous flow rate from the membranes of (11,369 m<sup>3</sup>/d) has not exceeded the anticipated maximum flow rate of 175 L/s (15,120 m<sup>3</sup>/d) per Section 3.1.



**Table 3-2 Combined Instantaneous Flow rate from Membranes**

Item	Average	Maximum	
	m <sup>3</sup> /d	L/s	m <sup>3</sup> /d
January	5,904	293	8,234
February	6,082	365	7,631
March	5,985	295	7,537
April	6,509	252	8,684
May	7,125	294	8,320
June	8,664	338	10,793
July	7,794	351	9,273
August	7,738	357	9,095
September	6,944	306	8,243
October	6,290	308	7,374
November	5,732	285	6,708
December	5,304	352	6,881
<b>Avg.</b>	<b>6,672.6</b>	<b>316.3</b>	<b>8,231</b>
<b>Max.</b>	<b>8,664</b>	<b>365</b>	<b>10,793</b>
Notes:			

### 3.4 TREATED WATER FLOWS

The treated water flows are shown in Table 3-3.

Table 3-3 shows that the plant rated capacity of 20,000 m<sup>3</sup>/d was not exceeded. The maximum daily water demand has reached 54.3% of the plant rated capacity.

The maximum day factor (ratio of maximum day demand to average day demand) was approximately 1.72, while the peak hour factor (ratio of maximum peak hour demand to average day demand) was approximately 34.47.

**Table 3-3 Treated Water Flows<sup>1</sup>**

Item	Avg. Day (m <sup>3</sup> /d)	Max. Day (m <sup>3</sup> /d)	% Max/ Rated Capacity	Max. Peak Hour (m <sup>3</sup> /h)
January	6,085	8,010	40.1	240.24
February	5,608	6,997	35.0	174.09
March	6,006	7,964	39.8	185.08
April	6,459	7,917	39.6	227.50
May	7,065	8,324	41.6	229.18
June	8,522	10,858	54.3	215.83
July	7,792	10,190	51.0	219.65



Item	Avg. Day (m <sup>3</sup> /d)	Max. Day (m <sup>3</sup> /d)	% Max/ Rated Capacity	Max. Peak Hour (m <sup>3</sup> /h)
August	7,688	9,142	45.7	229.46
September	6,883	8,816	44.1	213.65
October	6,299	7,290	36.5	213.71
November	5,698	8,069	40.3	203.48
December	5,235	6,224	31.1	190.82
<b>Avg.</b>	<b>6,611.7</b>	<b>8,316.8</b>	<b>41.6</b>	<b>211.89</b>
<b>Max.</b>	<b>8,522</b>	<b>11,387</b>	<b>54.3</b>	<b>240.24</b>
Notes:				

### 3.5 WASTEWATER FLOWS

Wastewater is generated on-site from cleaning the membranes by the following processes: backwashing, chemical enhanced backwashing and clean-in-place cycles. It has been anticipated that 10% of the raw water volume is used for these processes, resulting in the plant recovery rate of 90%.

Table 3-4 shows that wastewater production in any given month has averaged 26.0% of the raw water flows, which is 16% more than the anticipated 10% wastewater production.

**Table 3-4 Wastewater Flows**

Item	Total Monthly Raw Water Volume (m <sup>3</sup> )	Total Monthly Wastewater Volume (m <sup>3</sup> )	% Wastewater/ Raw
January	222,264	52,602	23.70
February	196,030	35,671	18.20
March	223,292	69,489	31.12
April	227,697	59,008	25.91
May	259,239	56,342	21.73
June	300,764	67,300	22.38
July	287,055	67,214	23.42
August	289,949	70,471	24.30
September	247,477	57,562	23.26
October	254,089	77,798	30.62
November	220,202	72,575	32.96
December	210,394	65,819	31.28
<b>Avg.</b>	<b>244,871</b>	<b>62,654</b>	<b>25.74</b>
<b>Max.</b>	<b>300,764</b>	<b>77,798</b>	<b>32.96</b>
Notes:			



**4. CHEMICALS**

This section gives a summary of listing treatment chemicals used, including average dosage rates with special reference to any abnormal usage.

**4.1 PROPERTIES**

Table 4-1 shows the properties of the chemicals used at Port Hope WTP.

**Table 4-1 Properties of Chemical Feed Systems**

Chemical	Purpose	Concentration (%)	Specific Gravity (g/mL)	Target Dosage (mg/L)
Chlorine gas	◆ Zebra mussel control	100	-	◆ 1.2
	◆ Primary disinfection			◆ 1.0
	◆ Touch-up chlorination			◆ 0.3
Sodium Bisulphite	◆ Dechlorinate the supernatant from the wastewater treatment process before it flows to the Lake	38	1.29	◆ 0.73

**4.2 USAGE**

Table 4-2 summarizes the annual chemical usage and monthly average dosages.

**Table 4-2 Annual Chemical Usage at Port Hope WTP**

Chemical	Volume (L) or Weight (kg)	Range of Monthly Avg. Dosages (mg/L)	Month with Highest Avg. Dosage	Comments of Any Abnormal Usage
Primary Disinfection Chlorine gas	kg	0.75 – 1.99	September	-
Secondary Disinfection Chlorine Gas	kg	0.30 – 0.77	June	-
Sodium Bisulphite	L	4.56 – 9.11	July	-



## 5. SAMPLING ANALYTICAL RESULTS

### 5.1 OVERVIEW

This section consists of a summary of analytical results of sampling required by Ontario Drinking Water Quality Standards (ODWQS) and Conditions 5.5 and 5.6 of the CofA in Appendix A.

**Appendix B** contains the sampling results, which are summarized in tables, which are identical to Schedules 23 and 24 in *Regulation 170/03, Drinking Water Systems Regulation*.

### 5.2 MICROBIOLOGICAL

The bacteriological data in the raw, treated and distribution water supply are shown in Tables D-5 to D-7.

Ontario Reg. 170/03, Schedule 10 states that samples of raw water do not need to be analysed for heterotrophic plate count (HPC) or background colonies (BKG).

If either the treated or distribution water contain *any* total coliform (TC) or fecal coliform (FC), then the sample is considered adverse. The corrective action in all cases is to report, resample, analyze and follow the instructions as directed by the Medical Officer of Health.

There were zero (0) adverse samples for 2007.

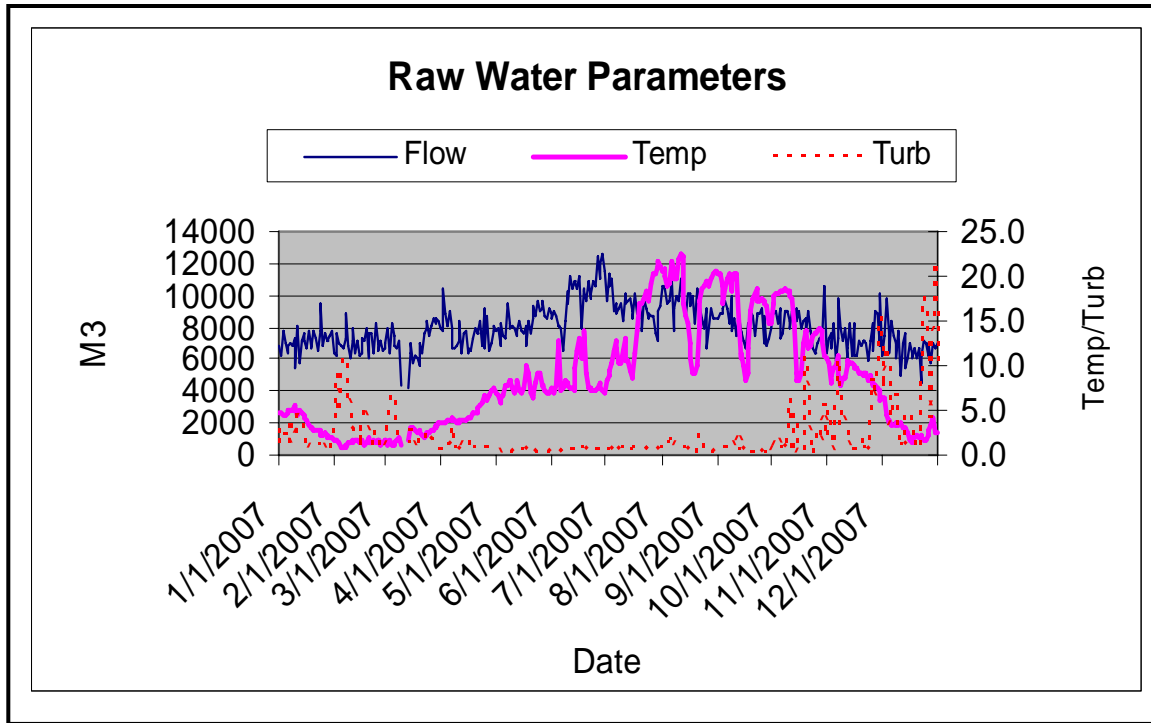
**Table 5-1 Adverse Microbiological Samples**

Date	Location	Exceedances	Comments
-	-	-	-

### 5.3 TURBIDITY

Figure 5-1 plots raw water turbidity with raw water temperatures and flows between January 1 and December 31, 2007. As shown, turbidity is greatest during the spring run-off and fall turnover when temperatures and flows are low.

Based on an hourly analysis, the raw water turbidity reached as high as 99.98 NTU, and had an average of 1.99 NTU.



**Figure 5-1 Plot of Raw Water Turbidity, Temperature and Flow**

Statistical analyses of the hourly permeate water turbidity data is presented in Table 5-2. As shown, treated water turbidity readings from all of the four membrane trains averaged between 0.05 – 0.07 NTU. Further optimization of Train sampling lines with regard to air removal will allow us to further optimize this criterion.

**Table 5-2 Analysis of Hourly Permeate Water Turbidity Data**

Train No.	Sample Count	Average	Maximum	% of time < 0.1 NTU
1	On-line	0.07	1.0	87
2	On-line	0.06	1.0	86
3	On-line	0.05	1.0	94
4	On-line	0.06	1.0	91

**5.4 DISTRIBUTION CHLORINE RESIDUALS**

The Procedure for Disinfection of Drinking Water in Ontario states that “The distribution system must be operated such that at all times and at all locations within the distribution system there is at least a detectable free chlorine residual of 0.05 mg/L at a pH 8.5 or lower, or where monochloramine is used, a combined chlorine residual of 0.25 mg/L”.



O. Reg. 170/03, Schedule 16-3.4 requires and states that the distribution water quality is considered to be adverse if the free chlorine residual is measured to be less than 0.05 mg/L. The corrective action is to restore chlorination immediately and follow the instructions as directed by the Medical Officer of Health.

The Municipality has implemented the following procedures to comply with Reg. 170/03:

- Scheduled flushing of dead end water mains;
- Chlorine addition at the Zone two (2) Reservoir; and,
- Initiation of a “Capital Works” program to replace all 100 mm cast iron water main and loop dead ends within the next ten (10) years.

A statistical analysis of the free chlorine residuals measured in the distribution system is presented in Table 5-3. Table 5-3 shows 1 sample being below 0.2 mg/L.

**Table 5-3 Distribution Free Chlorine Residuals**

Location	Sample Count	Minimum mg/L	Maximum mg/L	Average mg/L	% of time < 0.05 mg/L <sup>2</sup>	% of time < 0.2 mg/L <sup>1</sup>
Distribution System	364	0.15	1.15	0.96	0	0.27
Notes:						
1. 1 sample was below 0.20 mg/L.						
2. 0 samples were below 0.05 mg/L						

## 5.5 SUPERNATANT TOTAL SUSPENDED SOLIDS

Condition 4.4 in the CofA states that the annual average concentration of suspended solids (TSS) in the effluent discharged from the backwash wastewater facilities shall not exceed 25 mg/L. Condition 5.6 requires sampling to occur monthly.

A statistical analysis of the supernatant total suspended solids (Table 5-4) shows that the annual average concentration of suspended solids has not exceeded the discharge limit of 25 mg/L.

**Table 5-4 Supernatant Total Suspended Solids**

Location	Sample Count	Minimum	Maximum	Average	% of time < 25 mg/L
Supernatant Discharge at Outfall	12	3.0	84	21.0	75



**5.6 OTHER PARAMETERS**

Table 5-5 lists the deviations or exceedances of other water samples summarized in **Appendix B** and deviations from Ontario Drinking Water Quality Standards (ODWQS) and Ontario Drinking Water Quality Objectives and Guidelines (ODWQOG).

**Table 5-5 Deviations from ODWQS and ODWQOG**

Parameter	Location	Limit	Exceedances	Comments
<b>Raw Water</b>				
Aluminum	Plant	0.1 mg/L (OG)	0.135 mg/L	Uncontrolled parameter
Organic Nitrogen	Plant	0.15 mg/L (OG)	0.77 mg/L	Uncontrolled parameter
Temperature	Plant	15 C (OG)	0.45 – 22.75	Uncontrolled parameter
<b>Treated Water</b>				
Turbidity	Plant	1 NTU	Rusty in plant discharge mains when Highlift pump No. 1 started, change pump sequence to keep pump more active. >1 NTU	Pump sequence changed to allow higher frequency of pump operation.
Hardness (as CaCO <sub>3</sub> )	Plant	80-100 (AO)	122	Uncontrolled parameter
Organic Nitrogen	Plant	0.15 (OG)	0.21	Uncontrolled parameter
Temperature	Plant	15 (OG)	1.0 – 24.0	Uncontrolled parameter
<b>Distribution Water</b>				
-	-	-	-	-

**5.7 MINISTRY OF THE ENVIRONMENT ORDERS**

Table 5-6 lists Ministry of the Environment orders and actions taken to resolve these orders.

**Table 5-6 Ministry of the Environment Orders**

Date of notification	Location	Order No.	Description	Comments
N/A	-	-	-	-



**6. COMPLIANCE WITH TERMS AND CONDITIONS OF THE CERTIFICATE OF APPROVAL (COFA)**

This section provides a statement as to compliance with all of the terms and conditions of the Certificate of Approval (CofA), and a detailed description of the measures taken to ensure compliance with the CofA, including any supporting data or other information.

Statement as to Compliance with Terms and Conditions of CofA

- 6.1.1 A checklist was used throughout the year to determine compliance with the latest CofA. This checklist includes the requirements of all the Terms and Conditions of this Certificate.

**6.2 MEASURES TAKEN TO ENSURE COMPLIANCE WITH TERMS AND CONDITIONS OF COFA**

Section 7 lists all the non-compliance items extracted from the checklist with explanations for the non-compliance.



7. **NON-COMPLIANCE WITH TERMS AND CONDITIONS OF THE CERTIFICATE OF APPROVAL (COFA)**

This section provides details of any non-compliance in 2007 with the Terms and Conditions of the latest Certificate of Approval (CofA), as well as details of how and when the non-compliance was corrected.

**Table 7-1 Non-Compliance Items in the Terms and Conditions of the CofA**

Item No.	Description	Date of Occurrence	Date of Correction	Method of Correction
1	-	-	-	-
2	-	-	-	-

As shown, the Port Hope Water Treatment Plant **is fully compliant** with the Terms and Conditions of the latest CofA.



**8. REFERENCES**

- |                    |   |
|--------------------|---|
| KMK, 2003          | KMK Consultants Limited. January 2003. New 20 ML/D Ultrafiltration Water Treatment Plant, Design Brief.   |
| MOE, Sept. 1, 2007 | Ontario Ministry of the Environment, Ontario Water Resources Act  |
| MOE, Aug. 20, 2007 | Ontario Ministry of the Environment, Safe Drinking Water Act.   |
| MOE, June 2006     | Ontario Ministry of the Environment, Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines. PIBS #4449e.                             |
| MOE, 2003          | Ontario Ministry of the Environment, Ontario Regulation 170/03 Drinking-Water Systems.  |
| MOE, June 4/06     | Ontario Ministry of the Environment, Procedure for Disinfection of Drinking Water in Ontario.   |
| MOE, 2005          | Ontario Ministry of the Environment, Drinking Water Surveillance Reports.   |
| MOE Aug. 1/04      | Ontario Ministry of the Environment, Certification Guide for Operators and Water Quality Analysts of Drinking Water Systems. Ont. Reg. 128/04 (Amended to O. Reg. 256/05) |

# APPENDICES

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# APPENDICES

# **APPENDIX A**

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## ***SAMPLING PROGRAM***

# APPENDIX A

**Table A-1 Sampling Protocol**

Parameter	Frequency	Parameters Analyzed
<b>Raw Water</b>		
<b>Required</b>		
Microbiological	Weekly	E. Coli, Total Coliform, (excluding HPC or BKG), Ont. Reg. 170/03, Schedule 10
Turbidity	Continuous	Turbidity
pH	Continuous	pH
Sodium	Twice Daily	Sodium
Temperature	Continuous at Low Lift, Twice Daily	Temperature
<b>Additional</b>		
Inorganics	Annually	Ont. Reg. 170/03, Schedule 23
Pesticides & PCB	Annually	Ont. Reg. 170/03, Schedule 24
Radionuclide	Annually	Gross alpha, gross beta and tritium
Objective Parameters	Annually	Table 4 in Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines.
TOC/DOC	Bi-weekly	Operational guideline
<b>Treated Water</b>		
<b>Required</b>		
Microbiological	Weekly	E. Coli, Total Coliform, HPC, Ont. Reg. 170/03, Schedule 10
Turbidity	Continuous	Turbidity
Chlorine (primary and secondary disinfection)	Continuous	Free Chlorine
Volatile Organics	Annual (THMs monthly) <sup>1</sup>	Ont. Reg. 170/03, Schedule 24
Inorganics	Annually	Ont. Reg. 170/03, Schedule 23
Nitrates/Nitrites	Quarterly	Nitrates/Nitrites
Pesticides & PCB	Annually	Ont. Reg. 170/03, Schedule 24
pH	Continuous	pH
Sodium	Twice Daily	Sodium
Temperature	Twice Daily	Temperature
Arsenic <sup>2</sup>	Weekly	Arsenic
Uranium <sup>2</sup>	Weekly	Uranium
<b>Additional</b>		

# APPENDIX A

Parameter	Frequency	Parameters Analyzed
Radionuclide	Annually	Gross alpha, gross beta and tritium
Objective Parameters	Annually	Table 4 in Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines.
<b>Distribution Water</b>		
<b>Required</b>		
Microbiological	Weekly (Total of 21 Monthly) <sup>3</sup>	E. Coli, Total Coliform, HPC, Ont. Reg. 170/03, Schedule 10
Chlorine	Grab samples simultaneous to microbiological samples and continuous measurement at Jocelyn St. Reservoir	Free Chlorine
Volatile Organics	Quarterly (THMs at a point reflecting maximum residence time in the distribution system)	Only THMs
Inorganics	Annually (Lead at a point reflecting maximum residence time in the distribution system)	Only Lead
<b>Additional</b>		
-	-	-
<b>Backpulse/Process Wastewater Effluent to Lake Ontario</b>		
<b>Required</b>		
Total Suspended Solids	Monthly (composite)	Total Suspended Solids
Total Chlorine	Twice daily	Total Chlorine
<b>Additional</b>		
-	-	-
<p>Note:</p> <ol style="list-style-type: none"> <li>Monthly sampling of THMs required in amended CofA.</li> <li>Sampled by Port Hope staff weekly for the Health Protection Branch of Health Canada, and quarterly when inorganic sampling is done.</li> <li>Ont. Reg. 170/03, 10-2,(a) if the system serves 100,000 people or less, at least eight distribution samples, plus one additional sample for every 1000 people served by the system, are taken every month, with at least one of the samples being taken in each week . Given a population of 12,500, this equals to a minimum of 21 samples.</li> </ol>		

# APPENDIX A

**Table A-2 Schedules 23 and 24 in Regulation 170/03, Drinking Water Systems made under Safe Drinking Water Act.**

<b>Schedule 23 – Inorganic Parameters</b>		
Antimony Arsenic Barium	Boron Cadmium Chromium	Mercury Selenium Uranium
<b>Schedule 24– Organic Parameters</b>		
Alachlor Aldicarb Aldrin + Dieldrin Atrazine+N-dealkylated metabolites Azinphos-methyl Bendiocarb Benzene Benzo(a)pyrene Bromate Bromoxynil Carbaryl Carbofuran Carbon Tetrachloride Chlordane (Total) Chlorpyrifos Cyanazine Diazinon 1,2-Dichlorobenzene 1,4-Dichlorobenzene Dicamba Dichlorodiphenyltrichloroethane(DDT)+metab-olites	1,2-dichloroethane 1,1-Dichloroethylene (vinylidene chloride) Dichloromethane 2-4-Dichlorophenol 2,4-Dichlorophenoxy acetic acid (2,4-D) Diclofop-methyl Dimethoate Dinoseb Diquat Diuron Glyphosate Heptachlor+ Heptachlor Epoxide Lindane (Total) Malathion Methoxychlor Metolachlor Metribuzin	Monochlorobenzene Paraquat Parathion Pentachlorophenol Phorate Picloram Polychlorinated Biphenyls (PCB) Prometryne Simazine Temephos Terbufos Tetrachloroethylene (perchloroethylene) 2,3,4,6-Tetrachlorophenol Triallate Trichloroethylene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenoxy acetic acid- (2,4,5-T) Trifluralin Vinyl Chloride

# **APPENDIX B**

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## ***SAMPLING RESULTS***

# APPENDIX B

## SAMPLING RESULTS

This Appendix contains the following tables:

Table No.	Title
A-1	Legends for Tables
B-1	Schedule 23, Raw Water
B-1A	Schedule 24, Raw Water
B-1B	Parameters not previously identified, Raw water
C-2	Schedule 23, Treated Water
C-2A	Schedule 24, Treated Water
C-2B	Parameters not previously identified, Treated Water
D-4	Schedule 23, Distribution Water
D-4A	Schedule 24, Distribution Water
D-4B	Parameters not previously identified, Distribution Water
B-5	Bacteriological Data, Raw Water
C-6	Bacteriological Data, Treated Water
D-7	Bacteriological Data, Distribution Water
B-8	Radionuclide Analysis for the Raw Water
C-9	Radionuclide Analysis for the Treated Water
D-10	Radionuclide Analysis for the Distribution Water
B-11	Non-Health Related Chemical/Physical Characteristics for the Raw Water, Table 4
C-12	Non-Health Related Chemical/Physical Characteristics for the Treated Water, Table 4
D-13	Non-Health Related Chemical/Physical Characteristics for the Distribution Water, Table 4

**Table A-1 Legends for Tables B-2 to B-13**

Legend	Definition
AO	Aesthetic Objective
Average	Refers to the Average value measured
D	Deteriorating
Exceed.'s	Refers to the number of exceedances detected for the sample period described
IMAC	Interim Maximum Acceptable Concentration
MAC	Maximum Acceptable Concentration
Maximum	Refers to the maximum value measured
Minimum	Refers to the minimum value measured
<MDL	Parameter results are lower than the method detectable limit

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NA	Not Applicable
ND	Not Detected
NT	Not Tested
OG	Operational Guideline
S	Safe
SC	Samples Collected
US	Unsafe

**Table B-1 Schedule 23, Inorganic Parameters, Raw Water**

Parameter	ODWQS (mg/L unless noted)	2007		
		# of Samples	Results (mg/L)	Exceedance
Antimony	0.006 (MAC)	0	-	-
Arsenic	0.025 (IMAC)	0	-	-
Barium	1.0 (MAC)	0	-	-
Boron	5.0 (IMAC)	0	-	-
Cadmium	0.005 (MAC)	0	-	-
Chromium	0.05 (MAC)	0	-	-
Mercury	0.001 (MAC)	0	-	-
Selenium	0.01 (MAC)	0	-	-
Uranium	0.02 (MAC)	0	-	-

**Table B-1A Schedule 24, Organic Parameters, Raw Water**

Parameter	ODWQS (mg/L unless noted)	2007		
		# of Samples	Results (mg/L)	Exceedance
Alachlor	0.005 (IMAC)	0	-	-
Aldicarb	0.009 (MAC)	0	-	-
Aldrin + Dieldrin	0.0007 (MAC)	0	-	-
Atrazine + N-dealkylated metabolites	0.005 (IMAC)	0	-	-
Azinphos-methyl	0.02 (MAC)	0	-	-
Bendiocarb	.04 (MAC)	0	-	-
Benzene	0.005 (MAC)	0	-	-
Benzo(a)pyrene	0.00001 (MAC)	0	-	-
Bromoxynil	0.005 (MAC)	0	-	-
Carbaryl	0.09 (MAC)	0	-	-
Carbofuran	0.09 (MAC)	0	-	-

# APPENDIX B

Parameter	ODWQS (mg/L unless noted)	2007		
		# of Samples	Results (mg/L)	Exceedance
Carbon Tetrachloride	0.005 (MAC)	0	-	-
Chlordane (Total)	0.007 (MAC)	0	-	-
Chlorpyrifos	0.09 (MAC)	0	-	-
Cyanazine	0.01 (IMAC)	0	-	-
Diazinon	0.02 (MAC)	0	-	-
Dicamba	0.12 (MAC)	0	-	-
1,2-Dichlorobenzene	0.2 (MAC),	1	0.00050<MDL	No
1,4-Dichlorobenzene	0.005 (MAC), 0.001 (AO)	1	0.00021<MDL	No
Dichlorodiphenyltrichloroethane (DDT) + metabolites	0.03 (MAC)	0		-
1,2-dichloroethane	0.005 (IMAC)	0		-
1,1-Dichloroethylene (vinylidene chloride)	0.014 (MAC)	0	-	-
Dichloromethane	0.05 (MAC)	0		-
2,4-Dichlorophenol	0.9 (MAC), 0.0003 (AO)	1	.00015<MDL	No
2,4-Dichlorophenoxy acetic acid (2,4-D)	0.1 (IMAC)	0	-	-
Diclofop-methyl	0.009 (MAC)	0	-	-
Dimethoate	0.02 (IMAC)	0	-	-
Dinoseb	0.010 (IMAC)	0	-	-
Diquat	0.07 (MAC)	0	-	-
Diuron	0.15 (MAC)	0	-	-
Glyphosate	0.28 (IMAC)	0	-	-
Heptachlor + Heptachlor Epoxide	0.003 (MAC)	0	-	-
Lindane (Total)	0.004 (MAC)	0	-	-
Malathion	0.19 (MAC)	0	-	-
Methoxychlor	0.9 (MAC)	0	-	-
Metolachlor	0.05 (IMAC)	0	-	-
Metribuzin	0.08 (MAC)	0	-	-
Monochlorobenzene	0.08 (MAC), 0.03 (AO)	1	.000058<MDL	No
Paraquat	0.01 (IMAC)	0	-	-
Parathion	0.05 (MAC)	0	-	-

# APPENDIX B

Parameter	ODWQS (mg/L unless noted)	2007		
		# of Samples	Results (mg/L)	Exceedance
Pentachlorophenol	0.06 (MAC) 0.03 (AO)	1	.00015<MDL	No
Phorate	0.002 (IMAC)	0	-	-
Picloram	0.19 (IMAC)	0	-	-
Polychlorinated Biphenyls (PCB)	0.003 (IMAC)	0	-	-
Prometryne	0.001 (IMAC)	0	-	-
Simazine	0.01 (IMAC)	0	-	-
Temephos	0.28 (IMAC)	0	-	-
Terbufos	0.001 (IMAC)	0	-	-
Tetrachloroethylene (perchloroethylene)	0.030 (MAC)	0	-	-
2,3,4,6-Tetrachlorophenol	0.10 (MAC) .001 (OG/AO)	0	.00014<MDL	No
Triallate	0.23 (MAC)	0	-	-
Trichloroethylene	0.05 (MAC)	0	-	-
2,4,6-Trichlorophenol	0.005 (MAC) 0.002 (AO)	0	.00025<MDL	No
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	0.28 (MAC) 0.02 (AO)	1	0.00022 <MDL	-
Trifluralin	0.045 (IMAC)	0	-	-
Vinyl Chloride	0.002 (MAC)	0	-	-

**Table B-1B Parameters not previously identified, Raw Water**

Parameter	ODWQS (mg/L unless noted)	2007				
		SC	Minimum	Maximum	Average	Exceed's
MIB	ng/L	1	3	3	3	NO
Geosmin	ng/L	1	3	3	3	NO

**Table C-2 Schedule 23, Inorganic Parameters, Treated Water**

Parameter	ODWQS (mg/L unless noted)	2007		
		# of Samples	Results (mg/L)	Exceedance
Antimony	0.006 (MAC)	1	0.0002<MDL	NO
Arsenic	0.025 (IMAC)	1	0.0011<MDL	NO
Barium	1.0 (MAC)	1	0.0213	NO
Boron	5.0 (IMAC)	1	0.023	NO

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Parameter	ODWQS (mg/L unless noted)	2007		
		# of Samples	Results (mg/L)	Exceedance
Cadmium	0.005 (MAC)	1	0.00006MDL	NO
Chromium	0.05 (MAC)	1	0.0002<MDL	NO
Mercury	0.001(MAC)	1	0.00002<MDL	NO
Selenium	0.01 (MAC)	1	0.001<MDL	NO
Uranium	0.02 (MAC)	1	0.00029	NO

**Table C-2A Schedule 24, Organic Parameters, Treated Water**

Parameter	ODWQS (mg/L unless noted)	2007		
		# of Samples	Results (mg/L)	Exceedance
Aalachlor	0.005 (IMAC)	1	0.00011 <MDL	NO
Aldicarb	0.009 (MAC)	1	0.00030 <MDL	NO
Aldrin + Dieldrin	0.0007 (MAC)	1	0.000067 <MDL	NO
Atrazine + N-dealkylated metabolites	0.005 (IMAC)	1	0.00012 <MDL	NO
Azinphos-methyl	0.02 (MAC)	1	0.00021 <MDL	NO
Bendiocarb	.04 (MAC)	1	0.00013 <MDL	NO
Benzene	0.005 (MAC)	1	0.00037<MDL	NO
Benzo(a)pyrene	0.00001 (MAC)	1	0.000004 <MDL	NO
Bromoxynil	0.005 (MAC)	1	0.00033 <MDL	NO
Carbaryl	0.09(MAC)	1	0.00016 <MDL	NO
Carbofuran	0.09 (MAC)	1	0.00037 <MDL	NO
Carbon Tetrachloride	0.005 (MAC)	1	0.00041 <MDL	NO
Chlordane (Total)	0.007 (MAC)	1	0.00011 <MDL	NO
Chlorpyrifos	0.09 (MAC)	1	0.00018 <MDL	NO
Cyanazine	0.01 (IMAC)	1	0.00018 <MDL	NO
Diazinon	0.02 (MAC)	1	0.000081 <MDL	NO
Dicamba	0.12 (MAC)	1	0.00020 <MDL	NO
1,2-Dichlorobenzene	0.2 (MAC),	1	0.00050<MDL	NO
1,4-Dichlorobenzene	0.005 (MAC), 0.001 (AO)	1	0.00021<MDL	NO

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Parameter	ODWQS (mg/L unless noted)	2007		
		# of Samples	Results (mg/L)	Exceedance
Dichlorodiphenyltrichloroethane (DDT) + metabolites	0.03 (MAC)	1	0.00014 <MDL	NO
1,2-dichloroethane	0.005 (IMAC)	1	0.00043 <MDL	NO
1,1-Dichloroethylene (vinylidene chloride)	0.014 (MAC)	1	0.00041 <MDL	NO
Dichloromethane	0.05 (MAC)	1	0.00034 <MDL	NO
2,4-Dichlorophenol	0.9 (MAC), 0.0003 (AO)	1	0.00015 <MDL	NO
2,4-Dichlorophenoxy acetic acid (2,4-D)	0.1 (IMAC)	1	0.00019 <MDL	NO
Diclofop-methyl	0.009 (MAC)	1	0.00040 <MDL	NO
Dimethoate	0.02 (IMAC)	1	0.00012 <MDL	NO
Dinoseb	0.010 (IMAC)	1	0.00036 <MDL	NO
Diquat	0.07 (MAC)	1	0.001 <MDL	NO
Diuron	0.15 (MAC)	1	0.00087 <MDL	NO
Glyphosate	0.28 (IMAC)	1	0.006 <MDL	NO
Heptachlor + Heptachlor Epoxide	0.003 (MAC)	1	0.00011 <MDL	NO
Lindane (Total)	0.004 (MAC)	1	0.000056 <MDL	NO
Malathion	0.19 (MAC)	1	0.000091 <MDL	NO
Methoxychlor	0.9 (MAC)	1	0.00014 <MDL	NO
Metolachlor	0.05 (IMAC)	1	0.000092 <MDL	NO
Metribuzin	0.08 (MAC)	1	0.00012 <MDL	NO
Monochlorobenzene	0.08 (MAC), 0.03 (AO)	1	0.00058 <MDL	NO
Paraquat	0.01 (IMAC)	1	0.001 <MDL	NO
Parathion	0.05 (MAC)	1	0.00018 <MDL	NO
Pentachlorophenol	0.06 (MAC) 0.03 (AO)	1	0.00015 <MDL	NO
Phorate	0.002 (IMAC)	1	0.00011 <MDL	NO
Picloram	0.19 (IMAC)	1	0.00025 <MDL	NO
Polychlorinated Biphenyls (PCB)	0.003 (IMAC)	1	0.00004 <MDL	NO
Prometryne	0.001 (IMAC)	1	0.00023 <MDL	NO

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Parameter	ODWQS (mg/L unless noted)	2007		
		# of Samples	Results (mg/L)	Exceedance
Simazine	0.01 (IMAC)	1	0.00015 <MDL	NO
Temephos	0.28 (IMAC)	1	0.00031 <MDL	NO
Terbufos	0.001 (IMAC)	1	0.00012 <MDL	NO
Tetrachloroethylene (perchloroethylene)	0.030 (MAC)	1	0.00045 <MDL	NO
2,3,4,6-Tetrachlorophenol	0.10 (MAC)	1	0.00014	NO
Triallate	0.23 (MAC)	1	0.00010 <MDL	NO
Trichloroethylene	0.05 (MAC)	1	0.00038 <MDL	NO
2,4,6-Trichlorophenol	0.005 (MAC) 0.002 (AO)	1	0.00025	NO
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	0.28 (MAC) 0.02 (AO)	1	0.00022	NO
Trifluralin	0.045 (IMAC)	1	0.00012 <MDL	NO
Vinyl Chloride	0.002 (MAC)	1	0.00017 <MDL	NO

**Table C-2B Treated Water Parameters not previously identified**

Parameter	(mg/L unless noted)	2007				
		SC	Minimum	Maximum	Average	Exceed's
Fluoride	1.5	1	0.16	0.16	0.16	NO
Nitrite	1	4	0.005 <MDL	0.005 <MDL	0.005 <MDL	NO
Nitrate	10	4	0.217	0.587	0.395	NO
Trihalomethanes	0.100	12	.015	.037	.0214	NO
MIB	ng/L	1	3 <MDL	3 <MDL	3 <MDL	NO
Geosmin	ng/L	1	4	4	4	NO

**Table D-4 Schedule 23, Inorganic Parameters, Distribution Water**

Parameter	ODWQS (mg/L unless noted)	2007		
		# of Samples	Results (mg/L)	Exceedance
Antimony	0.006 (MAC)	-	-	-
Arsenic	0.025 (IMAC)	-	-	-
Barium	1.0 (MAC)	-	-	-
Boron	5.0 (IMAC)	-	-	-

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Parameter	ODWQS (mg/L unless noted)	2007		
		# of Samples	Results (mg/L)	Exceedance
Cadmium	0.005 (MAC)	-	-	-
Chromium	0.05 (MAC)	-	-	-
Mercury	0.001(MAC)	-	-	-
Selenium	0.01 (MAC)	-	-	-
Uranium	0.02 (MAC)	-	-	-

**Table D-4A Schedule 24, Organic Parameters, Distribution Water**

Parameter	ODWQS (mg/L unless noted)	2007		
		# of Samples	Results (mg/L)	Exceedance
Alachlor	0.005 (IMAC)	0	-	-
Aldicarb	0.009 (MAC)	0	-	-
Aldrin + Dieldrin	0.0007 (MAC)	0	-	-
Atrazine + N-dealkylated metabolites	0.005 (IMAC)	0	-	-
Azinphos-methyl	0.02 (MAC)	0	-	-
Bendiocarb	.04 (MAC)	0	-	-
Benzene	0.005 (MAC)	1	-	-
Benzo(a)pyrene	0.00001 (MAC)	0	-	-
Bromoxynil	0.005 (MAC)	0	-	-
Carbaryl	0.09(MAC)	0	-	-
Carbofuran	0.09 (MAC)	0	-	-
Carbon Tetrachloride	0.005 (MAC)	1		
Chlordane (Total)	0.007 (MAC)	0	-	-
Chlorpyrifos	0.09 (MAC)	0	-	-
Cyanazine	0.01 (IMAC)	0	-	-
Diazinon	0.02 (MAC)	0	-	-
Dicamba	0.12 (MAC)	0	-	-
1,2-Dichlorobenzene	0.2 (MAC),	1		
1,4-Dichlorobenzene	0.005(MAC), 0.001 (AO)	1	-	-
Dichlorodiphenyltrichloro ethane (DDT) + metabolites	0.03 (MAC)	0	-	-

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Parameter	ODWQS (mg/L unless noted)	2007		
		# of Samples	Results (mg/L)	Exceedance
1,2-dichloroethane	0.005 (IMAC)	1		
1,1-Dichloroethylene (vinylidene chloride)	0.014 (MAC)	0	-	-
Dichloromethane	0.05 (MAC)	1		
2,4-Dichlorophenol	0.9(MAC), 0.0003 (AO)	0	-	-
2,4-Dichlorophenoxy acetic acid (2,4-D)	0.1 (IMAC)	0	-	-
Diclofop-methyl	0.009 (MAC)	0	-	-
Dimethoate	0.02 (IMAC)	0	-	-
Dinoseb	0.010 (IMAC)	0	-	-
Diquat	0.07 (MAC)	0	-	-
Diuron	0.15 (MAC)	0	-	-
Glyphosate	0.28 (IMAC)	0	-	-
Heptachlor + Heptachlor Epoxide	0.003 (MAC)	0	-	-
Lindane (Total)	0.004 (MAC)	0	-	-
Malathion	0.19 (MAC)	0	-	-
Methoxychlor	0.9 (MAC)	0	-	-
Metolachlor	0.05 (IMAC)	0	-	-
Metribuzin	0.08 (MAC)	0	-	-
Monochlorobenzene	0.08(MAC), 0.03 (AO)	0	-	-
Paraquat	0.01 (IMAC)	0	-	-
Parathion	0.05 (MAC)	0	-	-
Pentachlorophenol	0.06(MAC) .03(AO)	0	-	-
Phorate	0.002 (IMAC)	0	-	-
Picloram	0.19 (IMAC)	0	-	-
Polychlorinated Biphenyls (PCB)	0.003 (IMAC)	0	-	-
Prometryne	0.001 (IMAC)	0	-	-
Simazine	0.01 (IMAC)	0	-	-
Temephos	0.28 (IMAC)	0	-	-

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Parameter	ODWQS (mg/L unless noted)	2007		
		# of Samples	Results (mg/L)	Exceedance
Terbufos	0.001 (IMAC)	0	-	-
Tetrachloroethylene (perchloroethylene)	0.030 (MAC)	0	-	-
2,3,4,6-Tetrachlorophenol	0.10 (MAC)	0	-	-
Triallate	0.23 (MAC)	0	-	-
Trichloroethylene	0.05 (MAC)	2		
2,4,6-Trichlorophenol	0.005(MAC) 0.002 (AO)	0	-	-
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	0.28 MAC) 0.02 (AO)	0	-	-
Trifluralin	0.045 (IMAC)	0	-	-
Vinyl Chloride	0.002 (MAC)	0	-	-

**Table D-4B Distribution Water Parameters not previously identified**

Parameter	(mg/L unless noted)	2007				
		SC	Minimum	Maximum	Average	Exceed's
Lead	0.010	1	0.00023	0.00023	0.00023	No
Trihalomethanes	0.100	4	0.022	0.032	0.025	No

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**Table B-5 Raw Water Bacteriological Data**

Year	Total Coliform (org/100 mL)					Fecal Coliform/ <i>Escherichia coli</i> (org/100 mL)				
	SC	0	< 200	> 200	> 300	SC	0	< 200	> 200	> 300
January	5	2	3	0	0	5	4	1	0	0
February	4	2	2	0	0	4	4	0	0	0
March	4	1	2	1	0	4	3	1	0	0
April	4	2	2	0	0	4	4	0	0	0
May	5	2	3	0	0	5	5	0	0	0
June	4	4	0	0	0	4	4	0	0	0
July	5	4	1	0	0	5	4	1	0	0
August	4	0	4	0	0	4	4	0	0	0
September	4	2	2	0	0	4	4	0	0	0
October	5	1	4	0	0	5	5	0	0	0
November	4	2	2	0	0	4	4	0	0	0
December	4	2	2	0	0	4	4	0	0	0
<b>TOTAL</b>	<b>52</b>	<b>24</b>	<b>27</b>	<b>1</b>	<b>0</b>	<b>52</b>	<b>49</b>	<b>3</b>	<b>0</b>	<b>0</b>

**Table C-6 Treated Water Bacteriological Data**

Year	Total Coliform			Fecal Coliform/ <i>Escherichia coli</i>			BKG/HPC			
	SC	S	US	SC	S	US	SC	S	US	D
January	5	5	0	5	5	0	5	5	0	0
February	4	4	0	4	4	0	4	4	0	0
March	4	4	0	4	4	0	4	4	0	0
April	4	4	0	4	4	0	4	4	0	0
May	5	5	0	5	5	0	5	5	0	0
June	4	4	0	4	4	0	4	4	0	0
July <sup>1</sup>	5	4	0	4	4	0	5	4	0	0
August	4	5	0	5	5	0	4	3	0	0
September	4	4	0	4	4	0	4	4	0	0
October	5	5	0	5	5	0	5	5	0	1
November	4	4	0	4	4	0	4	4	0	0
December	4	4	0	4	4	0	4	4	0	0
<b>TOTAL</b>	<b>52</b>	<b>52</b>	<b>0</b>	<b>52</b>	<b>52</b>	<b>0</b>	<b>52</b>	<b>52</b>	<b>0</b>	<b>1</b>

Notes:

1. For Treated and Distribution waters, sampling for Background colonies was changed in June to

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sampling for Heterotrophic Plate Count analysis.

**Table D-7 Distribution Water Bacteriological Data**

Year	Total Coliform			Fecal Coliform/ <i>Escherichia coli</i>			BKG/HPC			
	SC	S	US	SC	S	US	SC	S	US	D
January	35	35	0	35	35	0	35	35	0	4
February	28	28	0	28	28	0	28	28	0	2
March	28	28	0	28	28	0	28	28	0	2
April	28	28	0	28	28	0	28	28	0	1
May	35	35	0	35	35	0	35	35	0	1
June <sup>1</sup>	28	28	0	28	28	0	28	28	0	6
July	35	35	0	35	35	0	35	35	0	15
August	28	28	0	28	28	0	28	28	0	9
September	28	28	0	28	28	0	28	28	0	14
October	35	35	0	35	35	0	35	35	0	11
November	28	28	0	28	28	0	28	28	0	1
December	28	28	0	28	28	0	28	28	0	3
<b>TOTAL</b>	<b>364</b>	<b>364</b>	<b>0</b>	<b>364</b>	<b>364</b>	<b>0</b>	<b>364</b>	<b>364</b>	<b>0</b>	<b>69</b>
Notes:										
1. For Treated and Distribution waters, sampling for Background colonies was changed in June to sampling for Heterotrophic Plate Count analysis.										

# APPENDIX B

**Table B-8 Radionuclide Analysis for the Raw Water**

Parameter	ODWQS	2007				
		SC	Minimum	Maximum	Average	Exceedances
Gross Alpha Emissions	0.1 Bq/L	1	-	<0.1	0.10	No
Gross Beta Emissions	1 Bq/L	1	-	0.1	0.10	No
Tritium	7000 Bq/L	1	-	<1000	1000.00	No

**Table C-9 Radionuclide Analysis for the Treated Water**

Parameter	ODWQS	2007				
		SC	Minimum	Maximum	Average	Exceedances
Gross Alpha Emissions	0.1 Bq/L	1	-	-	-	-
Gross Beta Emissions	1 Bq/L	1	-	-	-	-
Tritium	7000 Bq/L	1	-	-	-	-

**Table D-10 Radionuclide Analysis for the Distribution Water**

Parameter	ODWQS	2007				
		SC	Minimum	Maximum	Average	Exceedances
Gross Alpha Emissions	0.1 Bq/L	0	-	-	-	-
Gross Beta Emissions	1 Bq/L	0	-	-	-	-
Tritium	7000 Bq/L	0	-	-	-	-

# APPENDIX B

**Table B-11 Non-Health Related Chemical/Physical Characteristics for the Raw Water**

Parameter	ODWQS Table 4 (mg/L unless noted)	2007		
		# of Samples	Results	Exceedances
Alkalinity (as CaCO <sub>3</sub> )	30-500 (OG)	1	89	No
Aluminium	0.1 (OG)	1	0.135	Yes
Calcium	-	-	-	-
Chloride	250 (AO)	1	23	No
Colour	5 TCU (AO)	1	3<MDL	No
Copper	1.0 (AO)	1	0.0063	No
Dissolved Organic Carbon	5.0 (AO)	1	1.5	No
Ethylbenzene	0.0024 (AO)	1	.00036<MDL	No
Hardness (as CaCO <sub>3</sub> )	80-100 (AO)	1	126	No
Iron	0.3 (AO)	1	0.092	No
Magnesium	-	-	-	-
Manganese	0.05 (AO)	1	.0124	No
Methane	3 L/m3 (AO)	1	0.006<MDL	No
Odour	-	-	-	-
Organic Nitrogen	0.15 (OG)	1	0.77	Yes
pH	6.5-8.5 (OG)	continuous	7.96	No
Sodium	200 (OG)	620	5.44 – 16.34	No
Sulphate	500 (OG)	1	26	No
Sulphide	0.05 (OG)	1	0.004<MDL	No
Taste	inoffensive	-	-	-
Temperature	15 (OG)	continuous	0.45 – 22.75	Yes
Toluene	0.024 (OG)	1	0.00039<MDL	No
Total Dissolved Solids	500 (OG)	1	163	No
Turbidity	NTU	continuous	0.0 – 100.0	No
Xylenes	0.3 (OG)	1	.00079<MDL	No
Zinc	5.0 (OG)	1	0.0102<MDL	No

# APPENDIX B

**Table C-12 Non-Health Related Chemical/Physical Characteristics for the Treated Water**

Parameter	ODWQS Table 4 (mg/L unless noted)	2007		
		# of Samples	Results	Exceedances
Alkalinity (as CaCO <sub>3</sub> )	30-500 (OG)	1	84	No
Aluminium	0.1 (OG)	1	.0126 <MDL	No
Calcium	-	-	-	-
Chloride	250 (AO)	1	26	No
Colour	5 TCU (AO)	1	3<MDL	No
Copper	1.0 (AO)	1	0.0033	No
Dissolved Organic Carbon	5.0 (AO)	1	1.6	No
Ethylbenzene	0.0024 (AO)	1	.00036<MDL	No
Hardness (as CaCO <sub>3</sub> )	80-100 (AO)	1	122	Yes
Iron	0.3 (AO)	1	0.038	No
Magnesium	-	-	-	-
Manganese	0.05 (AO)	1	0.00071	No
Methane	3 L/m (AO)	1	.007	No
Odour	Inoffensive (AO)	-	-	-
Organic Nitrogen	0.15 (OG)	1	0.21	Yes
pH	6.5-8.5 (OG)	Continuous	8.12	No
Sodium	20 (OG)	620	7.45 – 18.62	Yes <sup>1</sup>
Sulphate	500 (OG)	1	26	No
Sulphide	0.05 (OG)	1	.004<MDL	No
Taste	(OG)	-	-	-
Temperature	15 (OG)	730	1.0 – 24.0	Yes
Toluene	0.024 (OG)	1	.00039<MDL	No
Total Dissolved Solids	500 (OG)	1	171	No
Turbidity	1 NTU	Continuous	0.022 – 2.002	No
Xylenes	.3 (OG)	1	.00079<MDL	No
Zinc	5	1	0.0033	No

# APPENDIX B

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Parameter	ODWQS Table 4 (mg/L unless noted)	2007		
		# of Samples	Results	Exceedances
Notes: <sup>1</sup> Instrumentation error, recalibrated.				

# APPENDIX B

**Table D-13 Non-Health Related Chemical/Physical Characteristics for the Distribution Water**

Parameter	ODWQS Table 4 (mg/L unless noted)	2007		
		# of Samples	Results	Exceedances
Alkalinity (as CaCO <sub>3</sub> )	30-500 (OG)	0	-	-
Aluminium	0.1 (OG)	0	-	-
Chloride	250 (AO)	0	-	-
Colour	5 TCU (AO)	0	-	-
Copper	1.0 (AO)	0	-	-
Dissolved Organic Carbon	5.0 (AO)	0	-	-
Ethylbenzene	0.0024 (AO)	0	-	-
Hardness (as CaCO <sub>3</sub> )	80-100 (AO)	0	-	-
Iron	0.3 (AO)	0	-	-
Manganese	0.05 (AO)	0	-	-
Methane	3 L/m (AO)	0	-	-
Odour	Inoffensive (AO)	0	-	-
Organic Nitrogen	0.15 (OG)	0	-	-
pH	6.5-8.5 (OG)	0	-	-
Sodium	200 (OG)	0	-	-
Sulphate	500 (OG)	0	-	-
Sulphide	0.05 (OG)	0	-	-
Taste	(OG)	0	-	-
Temperature	15 (OG)	1	-	-
Toluene	0.024 (OG)	0	-	-
Total Dissolved Solids	500 (OG)	0	-	-
Xylenes	0.3 (OG)	0	-	-
Zinc	5.0 (OG)	0	-	-

# APPENDIX C

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## *Correspondence*

# APPENDIX C

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## Memorandum

**To:** Whom it my concern  
**CC:** Peter Angelo  
**From:** Rick Trumper  
**Date:** November 14, 2007  
**Re:** Adverse water quality, **AWQI # 76695**

---

Hello,

This is written notice of adverse water quality incident that has occurred at Water Treatment Plant in the Community of Port Hope.

We have experienced a Turbidity reading from an online turbidimeter that exceeded 1.0 NTU. This meter is located on our Treated water discharge line that feeds the Distribution system. We feel the cause of this adverse was due to the start-up of a pump that was out of service for some time, thus creating rusty water. If you or any of the MOE staff have any questions please call me at the numbers provided.

Yours Truly,

Rick Trumper  
Water Treatment Supervisor  
Municipality of Port Hope  
Water Department

Phone (905) 885 -2209  
Fax (905) 885-7509  
Cell (905) 375-8004

# APPENDIX C

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## Memorandum

**To:** Whom it my concern  
**CC:** Peter Angelo  
**From:** Rick Trumper  
**Date:** November 14, 2007  
**Re:** Resolution to adverse water quality, **AWQI # 76695**

---

Hello,

This is written notice of resolution to an adverse water quality incident that has occurred at Water Treatment Plant in the Community of Port Hope.

We have experienced a Turbidity reading from an online turbidimeter that exceeded 1.0 NTU. This meter is located on our Treated water discharge line that feeds the Distribution system. We feel the cause of this adverse was due to the start-up of a pump that was out of service for some time, thus creating rusty water.

We will rotate this pump in and out of duty to avoid future problems.

If you or any of the MOE staff have any questions please call me at the numbers provided.

Yours Truly,

Rick Trumper  
Water Treatment Supervisor  
Municipality of Port Hope  
Water Department

Phone (905) 885 -2209  
Fax (905) 885-7509  
Cell (905) 375-8004

# APPENDIX C

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