The Corporation of the Municipality of Port Hope

Port Hope

Water Treatment Plant

New Water Treatment Plant

2006

Summary Report

March 15, 2007

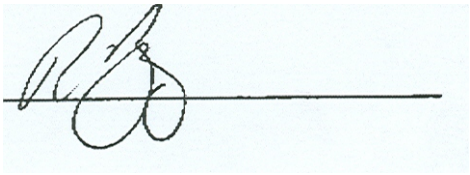
Municipality of Port Hope
P.O. Box 117
56 Queen Street
Port Hope, ON
L1A 3V9

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

Dear Peter:

RE: 2006 Summary Report – Port Hope Water Treatment Plant

We are pleased to provide the *2006 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 2006 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

Part No.	Heading
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^3/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	II	II	I	13137	15294	11998	10/30/09	03/31/07	05/31/07
Geoff Morgan	Treatment Operator	II	II	-	9907	14148	-	06/30/09	06/30/09	-
Jerry Lord	Treatment Operator	II	II	-	11529	15321	-	05/31/07	04/30/07	-
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	-	OIT	-	-	OT28 752	-	-	08/31/08	-

T = Treatment License

D = Distribution License

WQA = Water Quality Analyst License

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 2006 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:

- *Maximum flow rate = 20,000 m^3/d (Phase II)"*

Currently, there is sufficient membrane modules installed to produce Phase 1 flows of 14,000 m^3/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 membrane 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^3/d.

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

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

A summary of above is provided below:

- Current plant rated capacity (net treated water production)= 12,000 m^3/d
- Current instantaneous flow rate from membranes = 175 L/s (15,120 m^3/d)
- Current daily net raw water volume = 13,333 L/m (relevant to PTTW)
- Ultimate plant rated capacity (net treated water production)= 31,700 m^3/d
- Ultimate instantaneous flow rate from membranes = 521 L/s (45,000 m^3/d)
- 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 13,167m^3/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^3/d)	Max. Day (m^3/d)
January	6,369	7,915
February	6,638	7,963
March	6,451	7,799
April	5,976	7,250
May	7,234	9,523
June	8,280	9,847
July	8,587	13,167
August	9,643	12,059
September	8,802	10,381
October	8,630	10,962
November	7,245	8,423
December	7,553	9,688
Avg.	**7617.3**	**9,581**
Max.	**9,643**	**13,167**
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^3/d) has not exceeded the anticipated maximum flow rate of 175 L/s (15,120 m^3/d) per Section 3.1.

Table 3-2 Combined Instantaneous Flow rate from Membranes

Item	Average	Maximum	
	m^3/d	L/s	m^3/d
January	5,558	220.21	6,915
February	5,891	198.47	6,920
March	5,717	175.09	6,881
April	5,406	174.82	6,691
May	6,747	181.24	8,470
June	8,280	284.03	9,847
July	7,627	203.85	11,369
August	8,451	215.08	10,517
September	7,784	199.54	9,124
October	7,374	256.84	9,407
November	6,500	200.62	7,453
December	6,166	179.23	7,333
Avg.	**6,791.7**	**207.42**	**8410.6**
Max.	**8,451**	**284.03**	**11,369**
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^3/d was not exceeded. The maximum daily water demand has reached 57.0% of the plant rated capacity.

The maximum day factor (ratio of maximum day demand to average day demand) was approximately 1.68, while the peak hour factor (ratio of maximum peak hour demand to average day demand) was approximately 9.62.

Table 3-3 Treated Water Flows[1]

Item	Avg. Day (m^3/d)	Max. Day (m^3/d)	% Max/ Rated Capacity	Max. Peak Hour (m^3/h)
January	5,655	6,581	32.9	683.91
February	5,858	6,454	32.3	655.94
March	5,692	6,340	31.7	638.14
April	5,406	6,699	33.5	619.71
May	6,769	8,165	40.8	679.70
June	7,475	9,076	45.4	645.47
July	7,666	11,387	57.0	763.88

Item	Avg. Day (m^3/d)	Max. Day (m^3/d)	% Max/ Rated Capacity	Max. Peak Hour (m^3/h)
August	8,563	10,263	51.3	886.75
September	7,820	8,947	44.7	823.04
October	7,500	9,335	46.7	861.02
November	6,566	7,272	36.4	902.29
December	6,166	7,333	36.7	915.55
Avg.	**6,761.3**	**8,154.33**	**40.78**	**702.49**
Max.	**8,563**	**11,387**	**57.0**	**915.55**
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 16.0% of the raw water flows, which is 6% more than the anticipated 10% wastewater production.

Table 3-4 Wastewater Flows

Item	Total Monthly Raw Water Volume (m^3)	Total Monthly Wastewater Volume (m^3)	% Wastewater/ Raw
January	197,451	288.0	0.15
February	185,859	22,693	12.21
March	199,977	384,962*	-
April	179,282	9,951	5.55
May	224,264	28,569	12.74
June	248,393	41,728	16.8
July	266,183	45,698	17.17
August	298,947	46,091	15.42
September	264,070	55,783	21.12
October	267,523	69,793	26.1
November	217,335	44,987	20.70
December	234,140	66,804	28.5
Avg.	**197,524**	**39,307.7**	**16.04**
Max.	**263,869**	**69,793**	**28.5**
Notes: * Meter malfunction for January, March and part of April			

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 ♦ Primary disinfection ♦ Touch-up chlorination	100	- -	♦ 1.2 ♦ 1.0 ♦ 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	0.88 – 2.02	September	-
Secondary Disinfection Chlorine Gas	kg	0.18 – 0.96	September	-
Sodium Bisulphite	L	.41 – 10.39	April	–

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 the treated or distribution water contains more than 500 colonies per mL on a HPC analysis or more than 200 BKG colonies on a total coliform membrane filter analysis, then the sample is considered adverse. Moreover, 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 three (3) adverse samples for 2006.

Table 5-1 Adverse Microbiological Samples

Date	Location	Exceedances	Comments
August 24,2005	Plant	> 1 NTU	**Air entrained in plant discharge mains when Highlift pumps change duty. Install equipment to remove air.**
August 21,2006	ESCO Ltd. Hope St. S.	Cleaning solutions in plumbing system	**Flush internal plumbing system and resample**
May 18, 2006	Sampling station located on Hamilton Road just south of Croft St.	One (1) Total Coliform	**Resample the same location, upstream and down stream of station.**

5.3 TURBIDITY

Figure 5-1 plots raw water turbidity with raw water temperatures and flows between January 1 and December 31, 2006. 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 100 NTU, and had an average of 2.78 NTU.

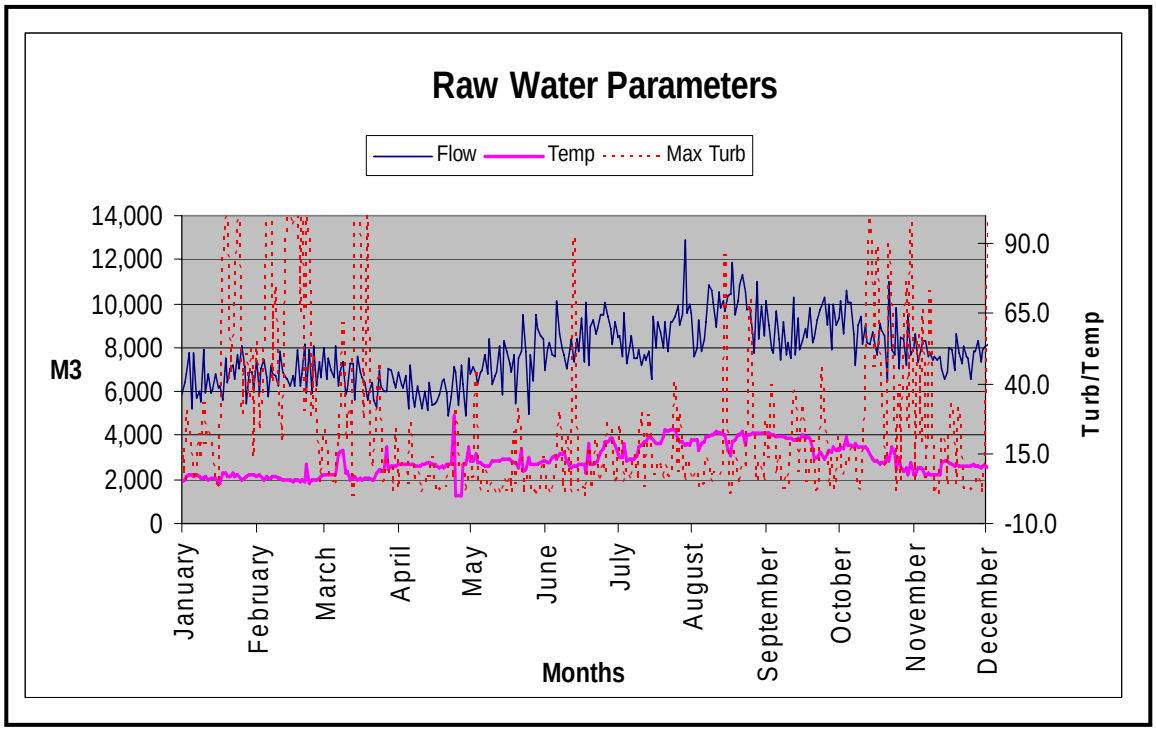

Figure 5-1 Plot of Raw Water Turbidity, Temperature and Flow

MOE Disinfection Procedure requires membrane plants to achieve the following treated water turbidity criteria per membrane train:

- <0.1 NTU, 95% of measurements of each month

A statistical analysis of the hourly treated water turbidity data is presented in Table 5-2. As shown, treated water turbidity from 2 of the four membrane trains met the above criteria. Further optimization of Train sampling lines with regard to air removal will allow us to meet this criteria.

Table 5-2 Analysis of Hourly Treated Water Turbidity Data[1]

Train No.	Sample Count	Average	Maximum	% of time < 0.1 NTU
1	On-line	0.046	1.0	95
2	On-line	0.021	1.0	92
3	On-line	0.032	1.0	95
4	On-line	0.027	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 five (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[2]	% of time < 0.2 mg/L[1]
Distribution System	318	0.19	1.31	0.83	0	0.31

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	15	<2	57	10.8	86.67

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
Treated Water				
Temperature	Treated water	15 C	**339 out of 1460 samples above 15 C.**	**This is an Operational Guideline, which we have no control over.**
Turbidity	Treated Water	1.0	**High Turbidity, Discharge header Turbidity >1.0 NTU for various times in the year**	**Air entrained in plant discharge mains when Highlift pumps change duty. Install equipment to remove air.**
Distribution Water				
-	-	-	**-**	**-**

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 2006 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, 2002	Ministry of the Environment. June 2002. Ontario Safe Drinking Water Act. Toronto, ON, Ontario Ministry of the Environment.
MOE, 2003	Ministry of the Environment. June 2003. Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines. Toronto, ON, Ontario Ministry of the Environment, PIBS #4449e.
MOE, 2003	Ministry of the Environment. 2003. Ontario Regulation 170/03 Drinking-Water Systems. Toronto, ON, Ontario Ministry of the Environment.
MOE, June 1/03	Ministry of the Environment. June 1, 2003. Procedure for Disinfection of Drinking Water in Ontario. Toronto, ON, Ontario Ministry of the Environment.
MOE, 2005	Ministry of the Environment. 2005. Drinking Water Surveillance Reports. Toronto, ON, Ontario Ministry of the Environment, Central Laboratory.
MOE Aug. 1/04	Certification Guide for Operators and Water Quality Analysts of Drinking Water Systems. Ont. Reg. 128/04 (Amended to O. Reg. 256/05)

APPENDICES

APPENDIX A

SAMPLING PROGRAM

APPENDIX A

Table A-1 Sampling Protocol

Parameter	Frequency	Parameters Analyzed
Raw Water		
Required		
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
Additional		
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
Treated Water		
Required		
Microbiological	Weekly	E. Coli, Total Coliform, HPC, Ont. Reg. 170/03, Schedule 10
Turbidity	Continuous	Turbidity
Chlorine	Continuous	Free Chlorine
Volatile Organics	Annual (THMs monthly)[1]	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[2]	Weekly	Arsenic
Uranium[2]	Weekly	Uranium
Additional		
Radionuclide	Annually	Gross alpha, gross beta and

APPENDIX A

Parameter	Frequency	Parameters Analyzed
		tritium
Objective Parameters	Annually	Table 4 in Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines.
Distribution Water		
Required		
Microbiological	Weekly (Total of 21 Monthly)[3]	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
Additional		
-	-	-
Backwash/Wastewater Effluent to Lake Ontario		
Required		
Total Suspended Solids	Monthly (composite)	Total Suspended Solids
Total Chlorine	Twice daily	Total Chlorine
Additional		
-	-	-

Note:

1. Monthly sampling of THMs required in amended CofA.
2. Sampled by Port Hope staff weekly for the Health Protection Branch of Health Canada, and quarterly when inorganic sampling is done.
3. 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.

APPENDIX A

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

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

APPENDIX B

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
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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
Exeed.'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	(mg/L unless noted)	2006		
		# 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	(mg/L unless noted)	# 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	-	-

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Parameter	(mg/L unless noted)	# 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	-	-

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Parameter	(mg/L unless noted)	# 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	(mg/L unless noted)	2006				
		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	(mg/L unless noted)	# of Samples	Results (mg/L)	Exceedance
Antimony	0.006 (MAC)	1	0.0004<MDL	NO
Arsenic	0.025 (IMAC)	1	0.0015<MDL	NO
Barium	1.0 (MAC)	1	0.0225	NO
Boron	5.0 (IMAC)	1	0.024	NO
Cadmium	0.005 MAC)	1	0.00006MDL	NO

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Parameter	(mg/L unless noted)	# of Samples	Results (mg/L)	Exceedance
Chromium	0.05 (MAC)	1	0.003<MDL	NO
Mercury	0.001(MAC)	1	0.00002<MDL	NO
Selenium	0.01 (MAC)	1	0.003<MDL	NO
Uranium	0.02 (MAC)	1	0.00032	NO

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

Parameter	(mg/L unless noted)	# of Samples	Results (mg/L)	Exceedance
Alachlor	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
Dichlorodiphenyltrichloroethane (DDT) + metabolites	0.03 (MAC)	1	0.00014 <MDL	NO

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Parameter	(mg/L unless noted)	# of Samples	Results (mg/L)	Exceedance
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	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	0.00084 <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
Simazine	0.01 (IMAC)	1	0.00015 <MDL	NO
Temephos	0.28 (IMAC)	1	0.00031 <MDL	NO

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Parameter	(mg/L unless noted)	# of Samples	Results (mg/L)	Exceedance
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)	2006				
		SC	Minimum	Maximum	Average	Exceed's
Fluoride	1.5	1	0.09	0.09	0.09	NO
Nitrite	1	4	0.005 <MDL	0.005 <MDL	0.005 <MDL	NO
Nitrate	10	4	0.038	0.603	0.305	NO
Trihalomethanes	0.100	4	.016	.079	.0284	NO
MIB	ng/L	1	3	3	3	NO
Geosmin	ng/L	1	7	7	7	NO

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

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

Parameter	(mg/L unless noted)	# of Samples	Results (mg/L)	Exceedance
Selenium	0.01 (MAC)	-	-	-
Uranium	0.02 (MAC)	-	-	-

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

Parameter	ODWS (mg/L unless noted)	# 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	-	-
Dichlorodiphenyltrichloroethane (DDT) + metabolites	0.03 (MAC)	0	-	-
1,2-dichloroethane	0.005 (IMAC)	1		
1,1-Dichloroethylene (vinylidene chloride)	0.014 (MAC)	0	-	-

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Parameter	ODWS (mg/L unless noted)	# of Samples	Results (mg/L)	Exceedance
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	-	-
Terbufos	0.001 (IMAC)	0	-	-
Tetrachloroethylene (perchloroethylene)	0.030 (MAC)	0	-	-

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Parameter	ODWS (mg/L unless noted)	# of Samples	Results (mg/L)	Exceedance
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)	2006				
		SC	Minimum	Maximum	Average	Exceed's
Lead	0.010	1	0.00027	0.00027	0.00027	No
Trihalomethanes	0.100	1	.031	.040	.0355	No

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Table B-5 Raw Water Bacteriological Data

Year	Total Coliform (org/100 mL)					Fecal Coliform/*Escherichia coli* (org/100 mL)				
	SC	0	< 200	> 200	> 300	SC	0	< 200	> 200	> 300
January	5	0	3	0	2	5	3	2	0	0
February	4	0	4	0	0	4	3	1	0	0
March	4	1	2	0	1	4	3	1	0	0
April	4	0	4	0	0	4	4	0	0	0
May	5	3	2	0	0	5	5	0	0	0
June	4	1	3	0	0	4	3	1	0	0
July	4	2	2	0	0	4	3	1	0	0
August	5	3	2	0	0	5	5	0	0	0
September	4	0	4	0	0	4	3	1	0	0
October	5	1	4	0	0	5	3	2	0	0
November	4	0	4	0	0	4	1	3	0	0
December	4	0	4	0	0	4	1	3	0	0
TOTAL	**52**	**11**	**38**	**0**	**3**	**52**	**37**	**15**	**0**	**0**

Table C-6 Treated Water Bacteriological Data

Year	Total Coliform			Fecal Coliform/ *Escherichia coli*			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 [1]	4	4	0	4	4	0	4	4	0	0
August	5	5	0	5	5	0	5	3	0	2
September	4	4	0	4	4	0	4	4	0	0
October	5	5	0	5	5	0	5	5	0	0
November	4	4	0	4	4	0	4	4	0	0
December	4	4	0	4	4	0	4	4	0	0
TOTAL	**52**	**52**	**0**	**52**	**52**	**0**	**52**	**50**	**0**	**2**

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

sampling for Heterotrophic Plate Count analysis.

Table D-7 Distribution Water Bacteriological Data

Year	Total Coliform			Fecal Coliform/ *Escherichia coli*			BKG/HPC			
	SC	S	US	SC	S	US	SC	S	US	D
January	30	30	0	30	30	0	30	30	0	0
February	24	24	0	24	24	0	24	24	0	0
March	24	24	0	24	24	0	24	24	0	0
April	24	24	0	24	24	0	24	24	0	0
May	36	35	1	36	36	0	36	36	0	0
June [1]	24	24	0	24	24	0	24	19	0	5
July	24	24	0	24	24	0	24	20	0	4
August	30	30	0	30	30	0	30	16	0	14
September	24	24	0	24	24	0	24	18	0	6
October	30	30	0	30	30	0	30	25	0	5
November	24	24	0	24	24	0	24	20	0	4
December	24	24	0	24	24	0	24	22	0	2
TOTAL	**318**	**317**	**1**	**318**	**318**	**318**	**318**	**278**	**0**	**40**

Notes:

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

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Table B-8 Radionuclide Analysis for the Raw Water

Parameter	ODWS	2006				
		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 C-9 Radionuclide Analysis for the Treated Water

Parameter	ODWS	2006				
		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 D-10 Radionuclide Analysis for the Distribution Water

Parameter	ODWS	2006				
		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	-	-	-	-

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

Parameter	ODWS (mg/L unless noted)	# of Samples	Results	Exceedances
Alkalinity (as $CaCO_3$)	30-500 (OG)	1	93	No
Aluminium	0.1 (OG)	1	.005 <MDL	No
Calcium		1	35.2	No
Chloride	250 (AO)	1	25	No
Colour	5 TCU (AO)	1	3<MDL	No
Copper	1.0 (AO)	1	0.011	No
Dissolved Organic Carbon	5.0 (AO)	1	21	No
Ethylbenzene	0.0024 (AO)	1	.00036<MDL	No
Hardness (as $CaCO_3$)	80-100 (AO)	1	126	No
Iron	0.3 (AO)	1	0.040	No
Magnesium	-	1	9.28	No
Manganese	0.05 (AO)	1	.001	No
Methane	3 L/m3 (AO)	1	0.006<MDL	No
Odour		-	-	-
Organic Nitrogen	0.15 (OG)	1	0.08	No
pH	6.5-8.5 (OG)	continuous	8.11 – 8.39	No
Sodium	200 (OG)	730	6.64 – 24.70	No
Sulphate	500 (OG)	1	26	No
Sulphide	0.05 (OG)	1	0.004<MDL	No
Taste	inoffensive	-	-	-
Temperature	15 (OG)	continuous	0.0 – 28.5	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	0.025<MDL	No

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

Parameter	ODWS (mg/L unless noted)	# of Samples	Results	Exceedances
Alkalinity (as $CaCO_3$)	30-500 (OG)	1	89	No
Aluminium	0.1 (OG)	1	.0005 <MDL	No
Calcium		1	33.4	No
Chloride	250 (AO)	1	24	No
Colour	5 TCU (AO)	1	3<MDL	No
Copper	1.0 (AO)	1	0.004	No
Dissolved Organic Carbon	5.0 (AO)	1	21	No
Ethylbenzene	0.0024 (AO)	1	.00036<MDL	No
Hardness (as $CaCO_3$)	80-100 (AO)	1	122	No
Iron	0.3 (AO)	1	.010<MDL	No
Magnesium	-	1	9.48	No
Manganese	0.05 (AO)	1	.001<MDL	No
Methane	3 L/m (AO)	1	.006<MDL	No
Odour	Inoffensive (AO)	-	-	-
Organic Nitrogen	0.15 (OG)	1	.0.07	No
pH	6.5-8.5 (OG)	Continuous	7.81	No
Sodium	200 (OG)	781	8.15 – 25.30	Yes [1]
Sulphate	500 (OG)	1	26	No
Sulphide	0.05 (OG)	1	.004<MDL	No
Taste	(OG)	-	-	-
Temperature	15 (OG)	730	4.0 – 23.0	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	0.010<MDL	No

APPENDIX B

Parameter	ODWS (mg/L unless noted)	# of Samples	Results	Exceedances
Notes: [1] Instrumentation error, recalibrated.				

APPENDIX B

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

Parameter	ODWS (mg/L unless noted)	# of Samples	Results	Exceedances
Alkalinity (as $CaCO_3$)	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 $CaCO_3$)	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

Correspondence

APPENDIX C

Memorandum

To: Whom it my concern

CC: Peter Angelo

From: Rick Trumper

Date: Aug. 24, 2005

Re: Adverse water quality, **AWQI # 58424**

Hello,

This is written notice of an Adverse water quality incident at the "new" Port Hope Water Treatment Plant. Plant ID Number is 260058006.
Air is being entrained in the sampling system and as a result it has a direct affect on our on-line instrumentation.
We will be installing additional equipment to remove the air from the system and flushing the sampling system at this location due to a parameter exceedance on August 23, 2005, AWQI No. 58424, of Turbidity.
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

Memorandum

To: Whom it my concern

CC: Peter Angelo

From: Rick Trumper

Date: January 29, 2007

Re: Adverse water quality, **AWQI # 58424**

Hello,

This is written notice of Resolution to an Adverse water quality incident at the "new" Port Hope Water Treatment Plant. Plant ID Number is 260058006, due to a parameter exceedance on August 23, 2005, AWQI No. 58424, of Turbidity.
Air was being entrained in the sampling system and as a result it has a direct affect on our on-line instrumentation.
We exhaustingly searched for a resolution to this problem which included installing additional equipment to remove the air from the system and flushing the sampling system at this location. We have finally found that slowing down the start-up sequence of the Highlift pumps allowed the air to be removed so not to cause any more turbidity events.
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

Memorandum

To: Whom it my concern

CC: Peter Angelo

From: Rick Trumper

Date: December 21, 2005

Re: Adverse water quality, **AWQI # 61696**

Hello,

This is written notice of an Adverse water quality incident at the "new" Port Hope Water Treatment Plant. Plant ID Number is 260058006.
Air is being entrained in the sampling system for train 2 and as a result it has a direct affect on our on-line instrumentation.
We will be installing additional equipment to remove the air from the system and flushing the sampling system at this location due to a parameter exceedance on December 21, 2005, AWQI No. 61696, of Turbidity.
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

Memorandum

To: Whom it my concern

CC: Peter Angelo

From: Rick Trumper

Date: January 21, 2006

Re: Adverse water quality, **AWQI # 61696**

Hello,

This is written notice of a resolution to an Adverse water quality incident at the "new" Port Hope Water Treatment Plant. Plant ID Number is 260058006.
Air was being entrained in the sampling system for all trains and as a result it had a direct affect on our on-line instrumentation.
We have adjusted and installed additional equipment to remove the air from the system at this location due to a parameter exceedance on December 21, 2005, AWQI No. 61696, of Turbidity.
We would therefore request that the incident be resolved.
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

Memorandum

To: Whom it my concern

CC: Peter Angelo

From: Rick Trumper

Date: May 18, 2006

Re: Adverse water quality, **AWQI # 64086**

Hello,

This is written notice of Adverse water quality incident that has occurred at a permanent sampling station located on the west side of Hamilton Road just south of Croft St. East in the Community of Port Hope.

We will be sampling the system at the original location and at up stream and down stream locations due to a parameter exceedance on May 18, 2006, AWQI No. 64086, for Total Coliform (1 colony).
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

Memorandum

To: Whom it my concern

CC: Peter Angelo, Rick Trumper

From: Mike Stewart

Date: May 24, 2006

Re: Resolution to Adverse water quality **AWQI #64086**

Hello,

This is written notice of resolution to an adverse water quality incident dated May 18, 06 at a permanent sampling location on Hamilton Rd. south of Croft St. E. in the Municipality of Port Hope.

We have sampled the system at the original and other locations and the results returned showed that the parameter in question has returned below the MAC value.

We are requesting that this adverse incident be resolved.

If you or any of the MOE staff have any questions please contact 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

Memorandum

To: Whom it my concern

CC: Peter Angelo

From: Rick Trumper

Date: August 21, 2006

Re: Adverse water quality, **AWQI # 67154**

Hello,

This is written notice of an adverse water quality incident that has occurred at a local business (Esco Ltd.) located on Hope St. in the Municipality of Port Hope. A soap and de-scum solution has entered the factories plumbing system due to lack of back flow protection at this business.

We are sampling the system at this location and at up stream locations due to this problem, all indications are that this has only affected the internal plumbing system and has not entered into the distribution system.

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

Memorandum

To: Whom it my concern

CC: Peter Angelo, Rick Trumper

From: Mike Stewart

Date: August 26, 2006

Re: Resolution to Adverse water quality **AWQI #67154**

Hello,

This is written notice of resolution to an adverse water quality incident dated August 21, 2006 at a local business (Esco Ltd.) located on Hope St. in the Municipality of Port Hope.

We have sampled the system at the original and other locations and the results returned showed that the parameters in question are below the MAC value, and that the chemicals in question did not enter the distribution system.

We are requesting that this adverse incident be resolved.

If you or any of the MOE staff have any questions please contact Rick Trumper or myself 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