

**CITY OF ORILLIA  
WATER DISTRIBUTION AND FILTRATION PLANT**

**QUARTERLY REPORT  
JANUARY 1, 2003 TO MARCH 31, 2003**

Submitted to: Ed Piché, Director, Environmental Monitoring and Reporting  
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M.O.E. Waterworks #22 000 1183

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Information on opportunities for public participation:

- Council meetings
- Local press
- Plant tours (326-4671)
- Daily phone conversations (326-4671)
- Water billing mail-outs
- Web site

**Plant Information**

Present plant is a mixed media filtration plant using a combination of pre-chlorination, chemically assisted flocculation/coagulation, filtration and post-chlorination to treat surface water from Lake Couchiching. The water intake is about 4.5m (15 ft) below the surface and 370m (1200 ft) from the shore. In addition to filtration, the plant is supplemented by two wells adjacent to Couchiching Park. At present, the wells are not in service. The well water (when in service) is combined with treated surface water and receives post chlorination before leaving the plant.

The daily rated capacity for the plant is 27,300 m<sup>3</sup>/d (6.0 imgd) from surface water and 5,700 m<sup>3</sup>/d (1.25 imgd) from the wells.

This water plant was constructed originally in 1914 with a major additional expansion in 1976-78. The wells were constructed in 1939-40. There are many modifications and improvements which have been accomplished over the years and continue until this day.

From the Water Filtration Plant, the treated water is pumped into the distribution system. The City's distribution system is divided into two pressure zones at this time. Zone #1 has two reservoirs on Rosemary Road with combined capacity of 10,500 m<sup>3</sup>. This zone supplies water to most of the lower elevations in the City. Zone #2 has one reservoir on Harvie Settlement Road and has a capacity of 9,100 m<sup>3</sup> which supplies water to the higher elevations in the City.

**Compliance Information:**

List of accredited laboratories used:

Areco Canada Inc., Nepean  
M.O.E. Main Laboratory – Resources Rd., Etobicoke, ON.  
D.W.S.P. Program  
Central Ontario Analytical Laboratory, Orillia, ON

M.O.E. has been notified of the accredited laboratories used by the City for water sample analysis.

Plant is staffed 24 hours/day, 365 days/year with licensed operators. Staffing consists of a Superintendent, 4 full time operators on 12 hour rotating shifts, 2 swing shift operators to cover for holidays, sick days and maintenance.

In-plant monitoring consists of on-line total and free chlorine analyzers. These operate on a continual basis and are confirmed by operator performed analysis every 4 hours. Chlorine levels are adjusted accordingly dependent on flow and bacteriological loading. Also, all 4 filters have on-line turbidimeters plus two with additional particle counters. Turbidity levels are also confirmed by the operators using laboratory equipment. Raw lake turbidity is also monitored on-line and is monitored by the operators. In addition the raw-lake and clear-well turbidities are measured in the laboratory during each shift. The water temperature, pH and threshold odour testing are also done on a daily basis.

Bacteriological sampling is done on a weekly schedule at the plant and throughout the distribution system and sample points are also analyzed for free and total Chlorine. The bacteriological analysis is performed by Central Ontario Analytical Laboratory in Orillia.

Physical/chemical parameters are currently analyzed quarterly by Areco Canada Inc. Additional sampling is undertaken by the Ministry of Environment as part of the Drinking Water Surveillance Program (DWSP).

Laboratory results are available for public review at the Water Filtration Plant during regular business hours. This report will be available free of charge at the City Centre (50 Andrew St. S.) and at the Water Filtration Plant (Jarvis St. and Bay St.)

and on the City web site ([www.city.orillia.on.ca](http://www.city.orillia.on.ca)). As well, notices have been provided in the local daily paper.

### **Water Sample Analysis Results**

Weekly sample results from distribution system for microbiological parameters are presented below.

<b>Microbiological Parameters</b>	<b>Number of Samples</b>	<b>Number of Detectable Results</b>	<b>Sampling Date</b>
E. Coli (counts/100 ml)	121	0	Jan 1/03 – Mar 31/03
Total Coliform (counts/100 ml)	121	0	Jan 1/03 – Mar 31/03
Background (counts/100 ml)	121	3	Jan 1/03 – Mar 31/03

Of the 3 Background Counts with detectable results, none exceeded 200 which is considered an indication of “Adverse Water Quality”.

Turbidity (an indication of particles in water) and free chlorine residual (indicator of complete disinfection and ongoing protection) are summarized below.

<b>Parameters Related to Microbiological Quality</b>	<b>Number of Samples</b>	<b>Sampling Date</b>	<b>Range</b>
Turbidity (Clear Well) (NTU)	180	Jan 1/03 – Mar 31/03	0.09 – 0.25
Free Chlorine – Plant (mg/l)	540	Jan 1/03 – Mar 31/03	0.68 – 1.52
Free Chlorine – System (mg/l)	121	Jan 1/03 – Mar 31/03	0.07 – 0.88

Note: Turbidity should not exceed 1 NTU. (Nephelometric Turbidity Unit)  
Free Chlorine residual should be 0.05 mg/l. (milligram per litre) or above

The following table summarizes results for other parameters that require monitoring by Regulation 459/00. Only samples with detectable results are reported here.

### WATER SAMPLING AND ANALYSIS REQUIREMENTS

Parameter	Units	Objective	AO IMAC MAC	No. of Samples	Number of Detectable Results	Sampling Date	Result Or Range
Fluoride	mg/L	1.5	MAC	1	1	Nov 27/02	0.06
Trichloroethylene	mg/L	0.05	MAC	2	1	Nov 27/02/March 13	0.0006
Trihalomethanes							
Treated	mg/L	0.100	MAC	2	2	Nov 27/02/March 13	0.038-0.042
Distribution	mg/L	0.100	MAC	2	2	Nov 27/02/March 13	0.058-0.059
Arsenic	mg/L	0.025	IMAC	1	1	Nov 27/02	0.0009
Barium	mg/L	1.0	MAC	1	1	Nov 27/02	0.028
Boron	mg/L	5.0	IMAC	1	1	Nov 27/02	0.013
Chromium	mg/L	0.05	MAC	1	1	Nov 27/02	0.0013
Copper	mg/L	1.0	AO	1	1	Nov 27/02	0.0007
Iron	mg/L	0.3	AO	1	1	Nov 27/02	0.003
Lead							
Treated	mg/L	0.01	MAC	1	1	Nov 27/02	0.00002
Distribution	mg/L	0.01	MAC	1	1	Nov 27/02	0.00009
Manganese	mg/L	0.05	AO	1	1	Nov 27/02	0.00024
Nitrate	mg/L	10.0	MAC	1	1	March 13	0.1
Uranium	mg/L	0.10	MAC	1	1	Nov 27/02	0.00035
Sodium	mg/L	200	AO	1	1	Nov 27/02	19.2

AO Aesthetic Objective  
 MAC Maximum Acceptable Concentration  
 IMAC Interim Maximum Acceptable Concentration  
 mg/L milligrams per litre  
 pg/L picograms per litre  
 ug/L micrograms per litre

#### **Upgrade of Water Filtration Plant**

The City of Orillia is presently working with Marshall, Macklin, Monaghan, and Hargrave and Burdick, engineering firms specializing in Environmental Engineering. Out of these professionals will be developed an upgrade for the Water Filtration Plant that will address the City's future expansion in growth, and meet the new requirements set out by the Ministry of Environment and the Drinking Water Protection Regulation 459/00. The upgrade will include disinfection and clearwell modifications with a plant expansion along the north side of the existing facility to accommodate these additions.

The disinfection requirements for the Water Filtration Plant come from the requirements for control of viruses and Giardia in Ontario Regulation 459/00. Through a combination of filtration and continuous disinfection, a minimum 3-log removal/inactivation of Giardia cysts and a 4-log removal/inactivation of viruses is required. This can be accomplished only through a clearwell expansion using our present clearwell as a separate unit process dedicated to Chlorine Contact Time only. This, in turn, creates the necessity for a new clearwell upgrade which will be constructed to meet future expected plant capacities and filter backwash requirements.

The City at this time will also look at the use of ultraviolet (UV) disinfection which will address the disinfection requirements for Cryptosporidium which is not yet a requirement but is pending. At this time, a feasible arrangement is a combination of chlorine disinfection for inactivation of viruses and UV disinfection for Giardia cysts and to provide future capability for inactivation of Cryptosporidium.

The proposed upgrade is expected to proceed in July of this year (2003) if all funding requirements are approved.