

# QUARTERLY REPORT ON DRINKING WATER QUALITY

*Jul. - Sep. 2001, Kingston West Water Plant - Serving West of Little Cataraqui Creek*

## Kingston West Drinking Water Quality

### *Ontario Drinking Water Protection Regulations*

The Ontario Clean Water Agency, as the contract operator of the Kingston West Water Treatment Facility on behalf of Utilities Kingston, is pleased to present its quarterly report on drinking water quality. This report has been prepared in response to legislative changes brought about by "Operation Clean Water", an initiative of Ontario's Ministry of Environment to ensure high quality drinking water for the residents of Ontario. The new regulations put into law what was formerly the Ontario Drinking Water Objectives (ODWO), and sets requirements for public waterworks with regard to sampling and testing, levels of treatment, licensing of staff, and notification of authorities and the public about water quality.

Further information on the Ontario Drinking Water Regulations can be found on the Ministry of Environment web site at [www.ene.gov.on.ca](http://www.ene.gov.on.ca)

### Where to contact us for information



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Free copies of this report are available at  
211 Counter Street, City Hall or the City  
of Kingston website at

[city.kingston.on.ca](http://city.kingston.on.ca)



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## **Plant Description & Treatment Processes**

### ***Raw Water Source***

The source of water treated by the Kingston West water plant is Lake Ontario at the mouth of the St. Lawrence River. The 1.2 m diameter intake extends about 570 m and is located directly south of the treatment plant, at a depth of approximately 18 m.

### ***Zebra Mussel Control***

Throughout the year, pre-chlorination takes place at the mouth of the intake. This system protects the intake from being encrusted with zebra mussels, which would restrict the flow of water through the intake. This also protects the granular activated carbon from chlorine.

### ***Screening***

A revolving screen and a coarse screen in the suction well of the low lift building removes any large debris such as weeds, fish, etc.

### ***Low Lift Pumps***

There are four low lift pumps that lift the water from lake level to the main plant. There is one header from the low lift building directing the water to the mixing chambers.

### ***Mixing Tanks***

Water flows rapidly in these six tanks in a spiral motion, allowing proper mixing of the chlorine and Poly Aluminum Chloride with the water. These particles will join together to form larger particles called floc.

### ***Filters***

Three sand filters, with Granular Activated Carbon (GAC), remove particles that did not settle out in the settling tanks, as well as compounds that cause taste and odours. Filters are washed regularly on a backwash cycle to prevent any buildup on the filters.

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## ***Post Chlorination***

Chlorine gas is added to the water as it enters the clearwell to provide a chlorine residual which remains in the distribution system. This ensures protection to the customers' location.

## ***Clearwell***

Filtered water is stored here before being pumped to the distribution system.

## ***High Lift Pumps***

Four high lift pumps move treated water from the clearwell into the distribution system, reservoir, and elevated tank.

## ***Standby Equipment***

Two diesel driven pumps are maintained to provide a continuous supply of water during power failures. These provide enough power to meet fire fighting requirements as well as normal flows during power outages. A diesel generator provides electricity to run the necessary operational components of the plant.

## ***Reservoir***

There is a reservoir at the plant site that holds approximately 14.0 million litres (3.0 million gallons). There is another reservoir located at the Industrial Park storing approximately 9.0 million litres (2.0 million gallons).

## ***Elevated Tank***

There is approximately 1.0 million litres (250,000 gallons) of water in the elevated water tower located at Gardiners Road and Hwy # 2.

## ***Distribution System***

Approximately 44,000 people are supplied with water from the Kingston West Water Treatment Plant. There are approximately 180 km of water mains, and over 1300 hydrants in the system. The distribution system is the responsibility of Utilities Kingston.

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## Quality Control & Compliance With Provincial Regulations

This plant provides multiple barriers against bacteriological contamination. Bacteriological testing is carried out on raw water, treated water and distribution samples on a regular frequency. On-line analysers for chlorine residuals and turbidity ensure continuous monitoring of water leaving the plant. Chlorine levels in the distribution system are also checked on a regular basis. More specialized testing occurs monthly and quarterly and includes pesticides, heavy metals, disinfection by-products, volatiles and organics.

OCWA uses internal compliance auditing techniques by teams from within the organization but not from within the facility work team. OCWA operates the Kingston West Water Treatment Facility in accordance with provincial regulations. Here is how we do it:

- Use of Accredited Labs. Analytical tests to monitor your water quality are conducted by a laboratory audited by the Canadian Association for Environmental Analytical Laboratories (CAEAL) and accredited by the Standards Council of Canada (SCC). Accreditation ensures that the laboratory has acceptable laboratory protocols and test methods in place. It also requires the laboratory to provide evidence and assurances of the proficiency of the analysts performing the test methods.
- Operation by Licensed Operators. Your water treatment plant is operated and maintained by the Ontario Clean Water Agency's competent and licensed staff. The mandatory licensing program for operators of drinking water facilities is regulated under the Ontario Water Resources Act (OWRA) Regulation 435/93. Licensing means that an individual meets the education and experience requirements and has successfully passed the certificate exam.
- Sampling and Analytical requirements. OCWA follows a sampling and analysis schedule required by OWRA regulation 459/00, the Ontario Drinking water Standards. More information on sampling and analysis including results are available in this report and from your municipal office
- Adherence to Ministry Guidelines and Procedures. To ensure the protection of the health and operational excellence, the OCWA adheres to the guidelines and procedures developed by the Ministry of Environment and the Ministry of Health.

### **Did We Exceed the Standards?**

We did not exceed any health related Ontario Drinking Water Standards for this reporting period.

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## Characteristics of Kingston Water (Avg. Values)

Turbidity	0.23 NTU
Colour	2.16 TCU
Alkalinity	84.69 mg/l as CaCO <sub>3</sub>
PH	7.75
Hardness	116.39 mg/l CaCO <sub>3</sub> .
Water Temperature (for July - September)	16.7 - 23.3 Degrees C (Average 20.466)

## Definitions & Terms

**m<sup>3</sup>** - Cubic Meter, 1m<sup>3</sup> - 1000 litres

**TCU** - True Colour Units

**CaCO<sub>3</sub>** - Calcium Carbonate

**mg** - milligram

**mg/l** - milligrams per litre.

**ug/l** - micrograms per litre.

**ng/l** - nanograms per litre.

**NTU** - Nephelometric Turbidity Units.

**MAC** - Maximum Acceptable Concentration

**MAC** - Interim Maximum Acceptable Concentration

**Coliform Bacteria** - a group of commonly occurring rod shaped bacteria. Their presence in a water sample is indicative of inadequate filtration and/or disinfection.

**Fecal Coliform Bacteria** - refers to a subgroup of coliform bacteria present in the digestive system of warm blooded animals and humans

**Heterotrophic Plate Count** - a method of measuring bacterial content in water samples. Also known as Standard Plate Count.

**Organic Parameter** - a group of chemical compounds containing carbon

**Inorganic Parameter** - a group of chemical compounds not containing carbon

**Raw Water** - Surface or ground water available as a source of drinking water that has not received any treatment

## Required Testing

The Ontario Drinking Water Regulations and Certificates of Approval (C of A) set sampling requirements for the plant. The C of A for the Kingston West Water Treatment Plant specify only that Trihalomethanes (THMs) be samples on a monthly basis during the time the zebra mussel control system is in use. All other sampling conforms to the Drinking Water Protection Regulation schedule for sampling and analysis.

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## Kingston West Water Quality Test Results

Microbiological Parameters	MAC or MAC	# of Samples	# of Detectable Results	Sampling Dates	Range	Exceedence?	Typical Source of Containment
Total Coliform (counts/100ml)	0	190	0	07/01-09/30	n/a	no	Indicate possible presence of coliform
Escherichia Coliform (counts/100 ml)	0	190	0	07/01-09/30	n/a	no	Definite indicator of fecal contamination
Hetrotrophic Plate Count (count/100 ml)	500	70	0	07/01-09/30	n/a	no	Indicator of water quality deterioration

Parameters related to Microbiological Quality	MAC or MAC	# of Samples	# of Detectable Results	Sampling Dates	Range	Exceedence?	Typical Source of Containment
Turbidity (NTU)	1	Continuous	Continuous	07/01-09/30	0.08 - 0.37	no	Turbidity is a measure of particles in water
Free Chlorine – Plant Effluent (mg/l)	-	Continuous	Continuous	07/01-09/30	0.93 - 1.29	no	Chlorine added for Disinfection
Free Chlorine-Distribution (mg/l min 0.2 & max. 4.0)	-	177	177	07/01-09/30	0.13 - 0.30	no	Requirement for 0.20 mg/l in the dist. system

Inorganic Parameters (mg/l)	MAC or MAC	# of Samples	# of Detectable Results	Sampling Dates	Range	Exceedence?	Typical Source of Contaminant
Aluminum	0.1	61	61	07/01-09/30	0.004 - 0.019	no	Erosion of natural products
Lead - Distribution (ug/l)	10	1	1				Leached from lead solder or brass plumbing fixtures
Nitrate	10	1	1	07/04/2001	<0.05	no	Natural component of water
Nitrite	1	1	1	07/04/2001	0.3	no	
Arsenic	IMAC= 0.025	1	1				Collected and analyzed in the second quarter.  Fluoride is naturally occurring in the environment.
Barium	1	1	1				
Boron	IMAC= 5.0	1	1				
Cadmium	0.005	1	1				
Chromium (Total)	0.05	1	1				
Copper	1	1	1				
Iron	0.3	1	1				
Selenium	0.01	1	1				
Uranium	0.1	1	1				
Sodium	20	1	1				
Fluoride	2.4	1	1				

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Volatile Organics (ug/l)	MAC or MAC	# of Samples	# of Detectable Results	Sampling Dates	Range	Exceedence?	Typical Source of Contaminant
Trihalomethanes - Plant	100	3	3	07/01-09/30	19.7 - 31.8	no	
Trihalomethanes - Dist.	100	3	3	07/01-09/30	34.4 - 46.4	no	
Benzene	0.005	1	1	07/04/2001	<0.5	no	
Carbon Tetrachloride	0.005	1	1	07/04/2001	<0.2	no	
Dichloromethane	0.05	1	1	07/04/2001	<3	no	
1,2 - Dichlorobenzene	0.2	1	1	07/04/2001	<0.1	no	
1, 4 - Dichlorobenzene	0.005	1	1	07/04/2001	<0.2	no	
1,2 - Dichloroethane	IMAC = 0.005	1	1	07/04/2001	<0.1	no	
1,1 - Dichloroethylene	0.014	1	1	07/04/2001	<0.1	no	
Ethylbenzene	0.024	1	1	07/04/2001	<0.5	no	
Monochlorobenzene	0.08	1	1	07/04/2001	<0.2	no	
Tetrachloroethylene	0.03	1	1	07/04/2001	<0.2	no	
Toluene	0.024	1	1	07/04/2001	<0.5	no	
Trichloroethylene	0.05	1	1	07/04/2001	<0.1	no	
Vinyl chloride	0.002	1	1	07/04/2001	<0.3	no	
Xylene	0.3	1	1	07/04/2001	<2	no	
Bromodichloromethane	100	1	1	07/04/2001	6.1	no	
Bromoform	100	1	1	07/04/2001	0.2	no	
Chloroform	100	1	1	07/04/2001	10.7	no	
Dibromochloromethane	100	1	1	07/04/2001	2.7	no	

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Pesticides & PCB (ug/L)	MAC or MAC	# of Samples	# of Detectable Results	Sampling Dates	Range	Exceedence?	Typical Source of Contaminant
Alachlor	IMAC=5	1	1	07/11/2001	<0.019	no	
Aldicarb	9	1	1	07/11/2001	2.03	no	
Aldrin+Dieldrin	0.7	1	1	07/11/2001	<0.050	no	
Atrazine	IMAC=5	1	1	07/11/2001	<0.071	no	
Azinphos-methyl	20	1	1	07/11/2001	<0.076	no	
Bendiocarb	40	1	1	07/11/2001	<0.044	no	
Bromoxynil	IMAC=5	1	1	07/11/2001	<0.018	no	
Carbaryl	90	1	1	07/11/2001	<0.052	no	
Carbofuran	90	1	1	07/11/2001	<0.056	no	
Chlordane	7	1	1	07/11/2001	<0.036	no	
Chorpyrifus	90	1	1	07/11/2001	<0.079	no	
Cyanazine	IMAC=10	1	1	07/11/2001	<0.079	no	
Diaznon	20	1	1	07/11/2001	<0.045	no	
Dicamba	120	1	1	07/11/2001	<0.084	no	
2,4 Dichlorophenol	900	1	1	07/11/2001	<0.14	no	
DDT + Metapolites	30	1	1	07/11/2001	<0.069	no	
2,4 - Dichlorophenexy acid (2,4 -D)	100	1	1	07/11/2001	0.153	no	
Diclofop-methyl	9	1	1	07/11/2001	<0.047	no	
Dimethoate	IMAC=20	1	1	07/11/2001	<0.034	no	
Dinoseb	10	1	1	07/11/2001	<0.022	no	
Diquat	70	1	1	07/11/2001	<1	no	
Diuron	1,550	1	1	07/11/2001	<0.066	no	
Glyphosate	IMAC=280	1	1	07/11/2001	<6	no	
Heprachlor + Heptachlor epoxide	3	1	1	07/11/2001	<0.042	no	
Lindane	4	1	1	07/11/2001	<0.031	no	
Malathion	190	1	1	07/11/2001	<0.036	no	
Methoxychlor	900	1	1	07/11/2001	<0.047	no	
Metolachlor	IMAC=50	1	1	07/11/2001	<0.14	no	
Metribuzin	80	1	1	07/11/2001	<0.25	no	
Paraquat	10	1	1	07/11/2001	<1	no	
Parathion	50	1	1	07/11/2001	<0.079	no	
Pentachlorophenol	60	1	1	07/11/2001	<0.31	no	
Phorate	IMAC=2	1	1	07/11/2001	<0.073	no	
Picloram	IMAC=190	1	1	07/11/2001	<0.043	no	
Polychlorinated Biphenyls	IMAC=3	1	1	07/11/2001	<0.04	no	
Prometryne	IMAC=1	1	1	07/11/2001	<0.16	no	
Simazine	IMAC=10	1	1	07/11/2001	<0.078	no	
Temephos	IMAC=280	1	1	07/11/2001	<0.12	no	
Terbufos	IMAC=1	1	1	07/11/2001	<0.056	no	
2,3,4,6 Tetrachlorophenol	100	1	1	07/11/2001	<0.2	no	
Traillate	230	1	1	07/11/2001	<0.094	no	
2,4,6-Trichlorophenol	5	1	1	07/11/2001	<0.2	no	
2,4,5 - Trichlorophenoxy acedic acid	IMAC=20	1	1	07/11/2001	<0.028	no	
Trifuralin	45	1	1	07/11/2001	<0.031	no	

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## Questions & Answers

Q. I live in what used to be called Kingston/Pittsburgh Township. Where does my water come from?

A. The part of the city now referred to as Kingston West is serviced by the water plant located on Sunny Acres Road. The treatment plant is operated by the Ontario Clean Water Agency (OW) who produced this quarterly report on water quality.

The part of the city now referred to as Kingston East is serviced by the central water plant, located on King St. West, through a pipe running under the Cataraqui River.

Q. What is an Accredited Laboratory?

A. Accredited labs must have undergone an on-site assessment and performance review of their methods by the Canadian Association of Environmental and Analytical Laboratories. The Standards Council of Canada grants accreditation to the lab based on the recommendation of the CAEAL. The accreditation requirements are repeated every two years.

Q. What had to be done to meet the new regulations?

A. The Kingston West Water Treatment Plant was following the Ontario Drinking Water Objectives (ODWO) before they became law, so little change was required to meet the new regulations. Our chlorine residual in the water leaving the plant was raised slightly to achieve the (0.20 mg/l free chlorine) required level in the distribution system, and some changes were required in the way results are reported. This report to the public is also the result of the new regulations.

Q. What parameters did you test for?

A. Micro biological parameters, volatile organic, inorganic and pesticides & PCBs have been tested. The results are included in this report.

Q. Sometimes my water looks rusty or coloured. Why is that, and what should I do about it?

A. This is quite often caused when the tanks in older water heaters start to decay. If the colour is seen only in your hot water, this may be the problem. If the colour is also noticed in your cold water it could be coming from the water main. Various maintenance procedures in the distribution system - such as fire hydrant and valve maintenance, or main break repairs - require flushing of the water mains. Since most of the water mains in Kingston are cast or ductile iron, a type of rust forms on the inside of the mains. Normal flows are not high enough to disturb this, but high flows during flushing can cause small particles to break off adding colour to the water. Please note that there is no health risk associated with this problem. This is usually only temporary, and opening your taps for a while to flush out your service line (the pipe from the water main to your house) should take care of the problem. Let the water run until the colour disappears.

Q. Why does the water sometimes have a strange smell?

A. Tastes and odours in drinking water are usually the result of the chemicals produced by algae in source water. Granular Activated carbon (GAC) was added to our filters in 1997 to remove these chemicals. GAC should remove up to 90% of the taste and odour causing compounds, although some people may still be able to detect the small amounts of these compounds which remain after treatment. Certain medications may also enhance your ability to detect taste and odours. There is no health risk associated with these taste and odour causing compounds, and our bacteriological sampling program ensures that your drinking water is safe.