Kingston Central Water Treatment Plant
Quarterly Report on
Drinking Water Quality

April 2003 – June 2003

Kingston Central Water Treatment Plant
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Submitted By

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Treatment Group

Table of Contents

1. Drinking Water Quality

Ontario Drinking Water Protection Regulations.

Utilities Kingston is proud to present this quarterly report on drinking water quality. This report has been prepared in response to Operation Clean Water, an initiative of Ontario's Ministry of the Environment to ensure high quality drinking water for the residents of Ontario. The 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 Drinking Water Regulations can be found on the Ministry of the Environment web site at www.ene.gov.on.ca. This will be the last report prepared under O. Reg. 459/00, however Utilities Kingston will continue to make this information available to its customers in a similar manner. O. Reg. 170/03, which replaced Reg. 459, requires that an annual report be prepared for drinking water systems. The annual reports will be available in the same locations as were the quarterly reports.

For further information about this report please contact Randy Whan at *rwhan@utilitieskingston.com* or Philip Emon at *pemon@utilitieskingston.com* , *or call 613-389-0562*. Free copies of this report are available at 211Counter St. or City Hall.

2. Plant Description & Treatment Processes

2.1 Raw Water Source.

The source of water treated by this plant is Lake Ontario at the mouth of the St. Lawrence River. Our intake is located 1km directly south of the treatment plant, 4m off the lake bottom, at a depth of approximately 18m. A great deal of testing was carried out in choosing the location for the intake. This has ensured that the treatment process begins by using the best and most consistent quality source water available, and reduces it's susceptibility to contamination. Known sources of potential problems are few, and contingency plans are in place in the event of raw water contamination.

2.2 Zebra Mussel Control.

When the water temperature rises above 10^0 C (above this temperature zebra mussels are active), pre-chlorination takes place at the mouth of the intake. This protects the intake from becoming encrusted with zebra mussels, which would restrict the flow of water through the intake.

2.3 Pre Chlorination.

The purpose of chlorination is to provide disinfection. 12% Sodium Hypochlorite is applied to the raw water in solution form.

2.4 Screening.

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

2.5 Low Lift Pumps.

These pumps lift the water from lake level to the main plant. There are two pipes from the low lift building directing the water to the mixing chambers.

2.6 Coagulation / Flocculation.

Aluminum Sulphate (alum) is added to the water as it leaves the low lift building. Particles in the water are attracted to the alum.

2.7 Mixing Tanks.

Water flows rapidly in these tanks in a spiral motion, allowing proper mixing of the chlorine and alum with the water. The particles in the water will collide with the alum particles, and then join together to form larger particles called floc.

2.8 Settling Tanks.

These are large tanks designed to reduce the velocity of water allowing the heavier floc particles to settle out. They also provide detention time, allowing the chlorine time to achieve disinfection.

2.9 Filters.

Six 'rapid sand' filters with Granular Activated Carbon (GAC) and anthracite remove the particles that did not settle out in the settling tanks, as well as compounds that may cause tastes and odours. Water flows through the filters to a clean water reservoir called the clear well.

2.10 Backwash.

Filters are washed daily to remove the particulates they have collected over the previous 24 hrs. Clean water from the clear well is pumped backwards through the filter, and the top layer of the filter is agitated to break up any large particles.

2.11 Post Chlorination.

Sodium hypochlorite is added to the water as it enters the clear well to create a 'chlorine residual' which remains throughout the distribution system. This ensures protection to the point of the customers' tap.

2.12 Clear Well.

Filtered water is stored here before being pumped to the distribution system or used for filter washing.

2.13 High Lift Pumps.

Five high lift pumps move treated water from the clear well into the distribution system.

2.14 Standby Equipment.

Diesel driven pumps are maintained to provide a continuous supply of water during power failures. These provide enough capacity to meet fire-fighting requirements as well as normal flows during power outages. A diesel generator provides electricity to run metering equipment and lighting in the water plant. Standby equipment is maintained for all critical processes.

2.15 Reservoir and Pumping Station.

This reservoir has a capacity of 22,700 m^3. It also contains two electric pumps, and one diesel pump. Water is pumped into this reservoir during the night and out of it during the day.

2.16 James St. Booster Station.

This station is supplied by a water main running from the city central, under the Cataraqui River, to James St. in Barriefield village. Three electric pumps are available to pump water into the distribution system east of the Cataraqui River, including Canadian Forces Base (CFB) Kingston. Fluoride is added at the James St. station for CFB Kingston, as a requirement of the Department of National Defense, to help prevent tooth decay. As well, sodium hypochlorite is added to ensure adequate chlorine residuals in this part of the system. The city east system has three elevated tanks for storage, and two control valves to regulate flows to and from the towers.

2.17 Central Elevated Tank.

Built in 1955 this steel tank is used for storage, to provide system pressure, and to act as a buffer to pressure fluctuations.

2.18 Distribution System.

Approximately 80,000 people are supplied with water from the Kingston Central Water Treatment Plant. There are approximately 250 km of water mains, and over 1200 fire hydrants in the system. Average daily flows are approximately 50,000 m^3/day, with summer time peaks of up to 72,000 m^3/day.

3. What Was Done to Meet the Regulations?

Utilities Kingston has taken several measures to comply with the Drinking Water Regulations, including the use of accredited labs and licensed operators, making sampling results available to the public, and implementing the notification protocol as part of standard operating procedures. Other measures include the installation of turbidity analyzers on all filter effluents, filter to waste capability to prevent turbidity break-through in the filters, and an upcoming project to increase chlorine contact time with additional monitoring equipment to further ensure water quality.

4. Quality Control

This plant provides multiple barriers against bacteriological contamination. Four different chlorine application points are available, and the coagulation/flocculation process along with filtration provides additional barriers. Bacteriological testing is carried out on raw water, treated water and distribution samples on a regular basis. On-line analyzers for chlorine residuals and turbidity ensure safe, clear water leaving the plant. Chlorine levels in the distribution system are checked at the same time as bacteriological samples are collected. More specialized testing occurs weekly, monthly and quarterly, and includes parameters such as pesticides, heavy metals, disinfection by-products, volatiles and organics.

5. Required Testing

The Ontario Drinking Water Regulations and our Certificates of Approval (COA) set sampling requirements for this plant. The COAs for the Central Water Treatment Plant specify only that Total Suspended Solids in the backwash wastewater be tested on a monthly basis. All other sampling conforms to the Drinking Water Protection Regulation schedule for sampling and analysis.

What is in your water?

Some parameters may be present in source water before it is treated. Here is a description of the various groups of parameters.

Microbiological parameters such as bacteria may come from wastewater treatment plants, livestock operations, septic systems and wildlife. Microbiological quality is the most important aspect of drinking water quality because of its association with dangerous water-borne diseases which can strike quickly.

Inorganic parameters such as salts and metals can be naturally occurring or as a result of urban storm runoff, industrial or domestic wastewater discharges, mining, or agriculture. Some may be the result of the treatment and distribution of water (for example, lead from solder in plumbing).

Organic parameters can be naturally occurring, but most organics of concern are synthetic. They originate from industrial discharges, urban storm runoff and other sources. Included in this group are pesticides that originate from both rural and urban areas. Some may originate from treatment of drinking water (for example, chlorination byproducts such as trihalomethanes). ***Volatile*** *organics* such as solvents and certain industrial chemicals are often the result of vehicle emissions or industrial discharges.

6. Results of Testing

The Tables below summarize the results from monitoring we were required (by the regulations) to do for this quarter, as well as testing required in our COA. Also listed are results for additional testing which was carried out during this quarter.

The presence of some of these substances in drinking water does not necessarily mean that the water poses a health risk. It is important that this information be reviewed carefully to determine if there are any risks involved in using this water supply. A summary of these results follows to help you determine any risks.

The frequency for monitoring different parameters varies, so some of the data in this table may be several months old. However, the sampling requirements have been set to ensure a representative picture of water quality.

7. Did We Exceed the Standards?

On May 2, one distribution system sample tested positive for the presence of total coliform bacteria and on June 13 a treated water sample tested positive for the presence of total coliform bacteria. Re-samples collected at these locations as well as others nearby did not confirm the positive results. Also on June 5, there was one unconfirmed exceedance for a health-related parameter as listed in the Ontario Drinking Water Standards for this reporting period. NDMA (*n*-nitrosodimethylamine) was found to be above the IMAC (interim maximum acceptable concentration) on a sample collected. Re-sampling was conducted immediately upon receiving the initial results; however the re-samples did not confirm that NDMA exceeded the IMAC. As per the regulations, the local Ministry of Health and the Ministry of the Environment were notified. Test results can be found on page 14 of this report.

n-Nitrosodimethylamine is rarely manufactured, but is unintentionally formed during various manufacturing processes and in air, water, and soil from reactions involving other chemicals called alkylamines. It is also found in some foods and may be formed in the body. In consultation with the local Ministry of Health and the Ministry of the Environment, Utilities Kingston has increased sampling and monitoring for this parameter.

8. Summary of Results

The data presented in the tables below lists the results of testing that was done to meet the regulations, as well as some additional testing that was carried out. Our interpretation of these results is that good quality water which is safe to drink was produced by this plant during this reporting period. To review this information yourself, look in the exceedance column to determine if there are any parameters to be concerned about. Then compare the result to the MAC/IMAC or AO/OG value. At that point you should investigate the particular parameters' potential health or aesthetic effects, the potential for sampling and laboratory or detection method errors, and then considering your own health situation, decide if there is cause for concern. Contact us at the numbers listed on page 3 if you have any questions, or talk to your doctor if you have specific health concerns.

9. Vulnerable Populations

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as those who may have cancer and are undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers.

Many homes built in Kingston prior to 1945 may have a lead service (the pipe that runs from the water-main in the street to your home). Although many of these have been replaced, some are still in use. It is possible that lead levels at your home may be higher than at other homes in the community as a result of this pipe or the materials used in your home's plumbing. Infants and young children are typically more vulnerable to lead in drinking water than the general population. If you are concerned about elevated lead

levels in your home's water, you may wish to have your water tested and/or flush your tap for 30 seconds to 2 minutes before using tap water.

10. Definition & Terms

^{O} C	- degrees Celsius	^{O} F	- degrees Fahrenheit
kg	- kilogram	l	- litre
m	- meter	m^3	- cubic meter=1000 litres.
TCU	- True Colour Units	$CaCO_3$	-Calcium carbonate
mg	- milligram	psi	- pounds per square inch
N/A	- Not Applicable	N/D	- Non -Detectable

NTU - Nephelometric Turbidity Units - A measure of the amount of particles in water.

mg/l - Milligrams per litre. This is a measure of the concentration of a parameter in water, also called parts per million (ppm).
ug/l - Micrograms per litre, also called parts per billion. ng/l - Nanograms per litre, parts per trillion.

Parameter-A substance that we sample and analyze for in the water.

AO - Aesthetic objective. AOs are not health related, but may affect the taste, odour, colour or clarity of the water
OG - Operational guideline. Set to ensure efficient treatment and distribution of water.
MAC - Maximum Acceptable Concentration. This is a health-related drinking water standard established for contaminants having known or suspected adverse health effects when above a certain concentration. The length of time the MAC can be exceeded without injury to health will depend on the nature and concentration of the parameter.
IMAC - Interim Maximum Acceptable Concentration. This is a health related drinking water standard established for contaminants when there is insufficient toxicological data to establish a MAC with reasonable certainty, or when it is not practical to establish a MAC at the desired level.

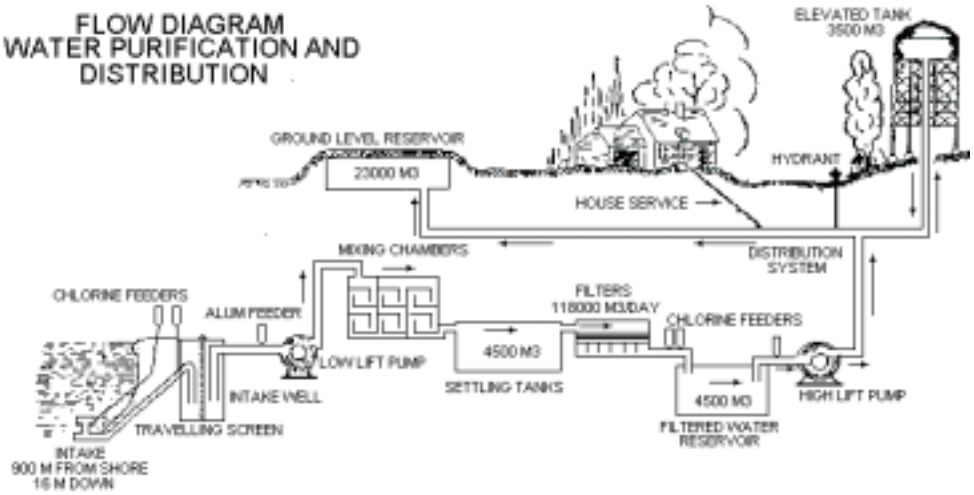
11. Characteristics of Kingston Water

(Average values)

Turbidity	- 0.08 NTU	***Colour***	- 2.1 TCU
Alkalinity	- 95 mg/l as $CaCO_3$	***pH***	- 7.5 - 7.7
Hardness	- 120 mg/l $CaCO_3$ or 7.3 grains per gal.	***Fluoride***	- 0.15 mg/l Naturally occurring.

(Fluoride is added to Kingston East water as a requirement of CFB Kingston, to 0.55 mg/l.)

12. Flow Diagram



13.1 Central Water Treatment Plant - Raw, Treated and Distribution System Bacteriological and Related Sample Results

Microbiological Parameters	MAC or IMAC	AO or OG	Number of Samples	Number of Positive Results	Sampling Dates	Max. Result *	Exceedance?	Typical Source of Contaminant
Raw Water Total Coliform (counts/100ml)	**		57	30	4/01/03 - 6/30/03	138	N/A	Indicates possible presence of fecal matter. ** Raw water results are used for operational purposes.
Raw Water Escherichia coliform (counts/100ml)	**		57	7	4/01/03 - 6/30/03	6	N/A	Definite indicator of fecal contamination. ** Raw water results are used for operational purposes.

Microbiological Parameters	MAC or IMAC	AO or OG	Number of Samples	Number of Positive Results	Sampling Dates	Max. Result *	Exceedance?	Typical Source of Contaminant
Plant Effluent Total Coliform (P/A or counts/100ml)	*		104	1	4/01/03 - 6/30/03	N/A	Yes	Indicates possible presence of fecal matter. *Indicator of adverse water quality if detected
Plant Effluent Escherichia coliform (P/A or counts/100ml)	*		104	0	4/01/03 - 6/30/03	N/A	No	Definite indicator of fecal contamination. *Indicator of adverse water quality if detected
Plant Effluent Background (counts/100ml)	>200		0	0	4/01/03 - 6/30/03	N/A	No	Indicator of Deteriorating water quality.
Plant Effluent heterotrophic plate count (counts/ml)	>500		102	0	4/01/03 - 6/30/03	N/A	No	Indicator of Deteriorating water quality.

Microbiological Parameters	MAC or IMAC	AO or OG	Number of Samples	Number of Positive Results	Sampling Dates	Max. Result *	Exceedance?	Typical Source of Contaminant
Distribution System Total Coliform (P/A or counts/100ml)	*		283	1	4/01/03 - 6/30/03	N/A	Yes	Indicates possible presence of fecal matter. *Indicator of adverse water quality if detected
Distribution System Escherichia coliform (P/A or counts/100ml)	*		283	0	4/01/03 - 6/30/03	N/A	No	Definite indicator of fecal contamination. *Indicator of adverse water quality if detected
Distribution System Background (counts/100ml)	>200		0	0	4/01/03 - 6/30/03	N/A	No	Indicator of Deteriorating water quality.
Distribution System heterotrophic plate count (counts/ml)	>500		121	0	4/01/03 - 6/30/03	N/A	No	Indicator of Deteriorating water quality.

Parameters Related to Microbiological Quality	MAC or IMAC	AO or OG	Number of Samples	Number of Detectable Results	Sampling Dates	Range	Exceedance?	Typical Source of Contaminant
Turbidity (NTU)	1		Continuous	Continuous	4/01/03 - 6/30/03	0.02 - 0.1	No	Turbidity is a measure of particles in water.
Free chlorine - Plant effluent (mg/l)	-		Continuous	Continuous	4/01/03 - 6/30/03	1.17 - 2.00	N/A	See below
Free chlorine - Distribution system (mg/l)	-		290	290	4/01/03 - 6/30/03	0.22 - 1.8	N/A	Recommended level of at least 0.20 mg/l in distribution system to maintain microbiological quality. 0.05 mg/l min.

13.3 Central Water Treatment Plant - Treated Water

Table B - Volatile Organics	MAC or IMAC	AO or OG	Number of Samples	Number of Detectable Results	Sampling Dates	Max. Result	Exceedance?	Typical Source of Contaminant
Benzene (ug/l)	5		2	0	4/07/03 - 6/05/03	<0.5	No	Discharge from plastics manufacturing, leaking fuel tanks
Carbon tetrachloride (ug/l)	5		2	0	4/07/03 - 6/05/03	<0.2	No	Discharge from chemical and industrial activities
1,2-dichlorobenzene (ug/l)	200		2	0	4/07/03 - 6/05/03	<0.1	No	Discharge from industrial chemical factories
1,4-dichlorobenzene (ug/l)	5		2	0	4/07/03 - 6/05/03	<0.2	No	Discharge from industrial chemical factories
1,2-dichloroethane (ug/l)	5		2	0	4/07/03 - 6/05/03	<0.1	No	Discharge from industrial chemical factories
1,1-dichloroethene (ug/l)	14		2	0	4/07/03 - 6/05/03	<0.1	No	Discharge from industrial chemical factories
Dichloromethane (ug/l)	50		2	0	4/07/03 - 6/05/03	<3.0	No	Discharge from pharmaceutical and chemical factories
Ethylbenzene (ug/l)	24		2	0	4/07/03 - 6/05/03	<0.5	No	Discharge from refineries, industrial chemical factories
Monochlorobenzene (ug/l)	80		2	0	4/07/03 - 6/05/03	<0.2	No	Discharge from industrial and agricultural chemical factories and dry cleaning facilities
Tetrachloroethylene (ug/l)	30		2	0	4/07/03 - 6/05/03	<0.2	No	Leaching from PVC pipes; discharge from factories, dry cleaners and auto shops (metal degreaser)
Toluene (ug/l)	24		2	0	4/07/03 - 6/05/03	<0.5	No	Discharge from petro-chemical factories, leaking fuel tanks
Trichloroethylene (ug/l)	50		2	0	4/07/03 - 6/05/03	<0.1	No	Discharge from metal degreasing sites and other factories
Chloroethene (Vinyl chloride) (ug/l)	2		2	0	4/07/03 - 6/05/03	<0.3	No	Leaching from PVC pipes; discharge from plastics factories
Xylenes (ug/l)	300		2	0	4/07/03 - 6/05/03	<2.0	No	Discharge from petro-chemical factories; fuel solvent

13.3 Central Water Treatment Plant - Treated Water and Distribution System

Table B - Volatile Organics (THMs)	MAC or IMAC	AO or OG	Number of Samples	Number of Detectable Results	Sampling Dates	Max. Result *	Exceedance?	Typical Source of Contaminant
Trihalomethanes, total: Treated Water (ug/l)	100		12	12	6/04/02 - 6/05/03	12.93	No	By-product of chlorination. * The MAC for THMs is based on a running annual average.
Bromodichloromethane: Treated Water (ug/l)			12	12	6/04/02 - 6/05/03	4.0	N/A	By-product of chlorination. * (Running annual average - included above in total THMs)
Bromoform: Treated Water (ug/l)			12	7	6/04/02 - 6/05/03	0.3	N/A	By-product of chlorination. * (Running annual average - included above in total THMs)
Chloroform: Treated Water (ug/l)			12	12	6/04/02 - 6/05/03	6.4	N/A	By-product of chlorination. * (Running annual average - included above in total THMs)
Dibromochloromethane: Treated Water (ug/l)			12	12	6/04/02 - 6/05/03	2.3	N/A	By-product of chlorination. * (Running annual average - included above in total THMs)
Trihalomethanes, total: Distribution System (ug/l)	100		7	7	6/04/02 - 6/05/03	35.84	No	By-product of chlorination. The MAC for THMs is based on a running annual average.
Bromodichloromethane: Distribution System (ug/l)			7	7	6/04/02 - 6/05/03	10.7	N/A	By-product of chlorination. * (Running annual average - included above in total THMs)
Bromoform: Distribution System (ug/l)			7	5	6/04/02 - 6/05/03	0.5	N/A	By-product of chlorination. * (Running annual average - included above in total THMs)
Chloroform: Distribution System (ug/l)			7	7	6/04/02 - 6/05/03	19.7	N/A	By-product of chlorination. * (Running annual average - included above in total THMs)
Dibromochloromethane: Distribution System (ug/l)			7	7	6/04/02 - 6/05/03	4.9	N/A	By-product of chlorination. * (Running annual average - included above in total THMs)

13.3 Central Water Treatment Plant - Treated Water

Table C - Inorganics	MAC/ IMAC	AO/ OG	Number of Samples	Number of Detectable Results	Sampling Dates	Maximum Result	Exceedance?	Typical Source of Contaminant
Arsenic (ug/l)	25		1	0	4/07/03	<1	No	Naturally occurring in surface waters / mine drainage
Barium (ug/l)	1000		1	1	4/07/03	23	No	Erosion of natural deposits. Discharge from metal refineries, oil drilling wastes.
Boron (ug/l)	5000		1	1	4/07/03	10	No	Erosion of natural deposits, industrial waste effluents.
Cadmium (ug/l)	5		1	0	4/07/03	<0.1	No	Industrial discharge
Chromium (ug/l)	50		1	0	4/07/03	<10	No	Industrial residues
Copper (ug/l)	1000		1	0	4/07/03	<10	No	Domestic plumbing (Aesthetic objective)
Iron (ug/l)		300	1	0	4/07/03	<20	No	Leaching from natural deposits and plumbing materials, industrial wastes. (Aesthetic objective)
Lead (ug/l) Treated Water	10		1	0	4/07/03	<0.2	No	Internal corrosion of household plumbing, erosion of natural deposits.
Lead (ug/l) Distribution System	10		3	2	4/07/03 - 6/05/03	1	No	Internal corrosion of household plumbing, erosion of natural deposits.
Manganese (ug/l)		50	1	0	4/07/03	<10	No	Erosion of natural deposits.
Mercury (ug/l)	0.1		1	0	4/07/03	<0.1	No	Erosion of natural deposits, industrial discharges.
Nitrate (N) (mg/l)	1		3	0	4/07/03 - 6/05/03	<0.1	No	Runoff from fertilizer use, erosion of natural deposits
Nitrite (N) (mg/l)	10		3	3	4/07/03 - 6/05/03	0.4	No	A natural component of water at this level.
Selenium (ug/l)	10		1	0	4/07/03	<1	No	Discharge from refineries, mines, chemical manufacture
Uranium (ug/l)	20		1	0	4/07/03	<1	No	Erosion of natural deposits.

13.3 Central Water Treatment Plant - Treated Water

Table D - Pesticides & PCBs	MAC or IMAC	AO or OG	Number of Samples	Number of Detectable Results	Sampling Dates	Max. Result	Exceedance?	Typical Source of Contaminant
Alachlor (Lasso) (ug/l)	5		2	0	4/07/03 - 6/05/03	<0.5	No	Agricultural herbicide
Aldicarb (ug/l)	9		2	0	4/07/03 - 6/05/03	<6	No	Agricultural insecticide
Aldrin+dieldrin (ug/l)	0.7		2	0	4/07/03 - 6/05/03	<0.05	No	Residue from banned insecticide
Atrazine (ug/l)	5		2	0	4/07/03 - 6/05/03	<1	No	Agricultural herbicide
Azinphos-methyl (Guthion) (ug/l)	20		2	0	4/07/03 - 6/05/03	<2	No	Insecticide
Bendiocarb (ug/l)	40		2	0	4/07/03 - 6/05/03	<5	No	Insecticide
Bromoxynil (ug/l)	5		2	0	4/07/03 - 6/05/03	<0.5	No	Agricultural herbicide
Carbaryl (ug/l)	90		2	0	4/07/03 - 6/05/03	<5	No	Agricultural/Forestry/ Household insecticide
Carbofuran (ug/l)	90		2	0	4/07/03 - 6/05/03	<2	No	Agricultural insecticide
Chlordane (Total) (ug/l)	7		2	0	4/07/03 - 6/05/03	<0.6	No	Residue from banned insecticide
Chlorpyrifos (Dursban) (ug/l)	90		2	0	4/07/03 - 6/05/03	<1	No	Agricultural/ Household insecticide
Cyanazine (Bladex) (ug/l)	10		2	0	4/07/03 - 6/05/03	<1	No	Agricultural/ Residential herbicide
Diazinon (ug/l)	20		2	0	4/07/03 - 6/05/03	<2	No	Agricultural/ Livestock Operation/ Residential insecticide
Dicamba (ug/l)	120		2	0	4/07/03 - 6/05/03	<10	No	Agricultural herbicide
2,4-dichlorophenol (ug/l)	900		2	0	4/07/03 - 6/05/03	<0.2	No	Industrial contamination/ reaction with chlorine
DDT (ug/l)	30		2	0	4/07/03 - 6/05/03	<1	No	Residue from banned insecticide
2,4-dichlorophenoxyacetic acid (2,4-D) (ug/l)	100		2	0	4/07/03 - 6/05/03	<10	No	Agricultural/ Residential herbicide
Diclofop-methyl (ug/l)	9		2	0	4/07/03 - 6/05/03	<0.9	No	Agricultural herbicide
Dimethoate (ug/l)	20		2	0	4/07/03 - 6/05/03	<2	No	Agricultural/ Livestock Operation/ Forestry insecticide
Dinoseb (ug/l)	10		2	0	4/07/03 - 6/05/03	<1	No	Herbicide residue
Diquat (ug/l)	70		2	0	4/07/03 - 6/05/03	<5	No	Agricultural/ Aquatic herbicide
Diuron (ug/l)	150		2	0	4/07/03 - 6/05/03	<10	No	Agricultural/ Industrial/ herbicide
Glyphosate (ug/l)	280		2	0	4/07/03 - 6/05/03	<25	No	Agricultural/Forestry/ Household herbicide

13.3 Central Water Treatment Plant - Treated Water

Table D - Pesticides & PCBs	MAC or IMAC	AO or OG	Number of Samples	Number of Detectable Results	Sampling Dates	Max. Result	Exceedance?	Typical Source of Contaminant
Heptachlor+heptachlor epoxide (ug/l)	3		2	0	4/07/03 - 6/05/03	<0.1	No	Residue from banned insecticide
Lindane (Total) (g-BHC Hexachlorocyclohexane) (ug/l)	4		2	0	4/07/03 - 6/05/03	<0.1	No	Agricultural/ Pharmaceutical insecticide
Malathion (ug/l)	190		2	0	4/07/03 - 6/05/03	<10	No	Fruit & Vegetable / pest control insecticide
Methoxychlor (ug/l)	900		2	0	4/07/03 - 6/05/03	<10	No	Agricultural/ Livestock Operation/ Residential insecticide
Metolachlor (ug/l)	50		2	0	4/07/03 - 6/05/03	<5	No	Agricultural herbicide
Metribuzin (Sencor) (ug/l)	80		2	0	4/07/03 - 6/05/03	<5	No	Agricultural herbicide
Paraquat (ug/l)	10		2	0	4/07/03 - 6/05/03	<1	No	Agricultural/ Aquatic herbicide
Parathion (ug/l)	50		2	0	4/07/03 - 6/05/03	<5	No	Agricultural insecticide
Pentachlorophenol (ug/l)	60		2	0	4/07/03 - 6/05/03	<0.2	No	Pesticide/ wood preservative residue
Phorate (Thimet) (ug/l)	2		2	0	4/07/03 - 6/05/03	<0.5	No	Agricultural insecticide
Picloram (ug/l)	190		2	0	4/07/03 - 6/05/03	<10	No	Industrial herbicide
PCB; total (ug/l)	3		2	0	4/07/03 - 6/05/03	<0.05	No	Residue from various industrial uses
Prometryne (ug/l)	1		2	0	4/07/03 - 6/05/03	<0.2	No	Agricultural herbicide
Simazine (ug/l)	10		2	0	4/07/03 - 6/05/03	<1	No	Agricultural herbicide or its residue
Temephos (ug/l)	280		2	0	4/07/03 - 6/05/03	<25	No	Insecticide for Mosquito/Black fly control
Terbufos (ug/l)	1		2	0	4/07/03 - 6/05/03	<0.7	No	Agricultural insecticide
2,3,4,6-tetrachlorophenol (ug/l)	100		2	0	4/07/03 - 6/05/03	<0.1	No	Wood preservative
Triallate (ug/l)	230		2	0	4/07/03 - 6/05/03	<20	No	Agricultural herbicide
2,4,6-trichlorophenol (ug/l)	5		2	0	4/07/03 - 6/05/03	<0.2	No	Pesticide manufacturing
Trifluralin (ug/l)	45		2	0	4/07/03 - 6/05/03	<1	No	Agricultural herbicide
2,4,5-trichlorophenoxyacetic acid (2,4,5-T) (ug/l)	280		2	0	4/07/03 - 6/05/03	<22	No	Industrial herbicide residue

13.3 Central Water Treatment Plant - Treated Water

Additional Sample Results	MAC or IMAC	AO or OG	Number of Samples	Number of Detectable Results	Sampling Dates	Max. Result	Exceedance?	Parameter Description
Alkalinity (mg/l as $CaCO_3$)		500	1	1	4/07/03	97	No	A measure of the resistance of the water to the effects of acids. Expressed as calcium carbonate.
Aluminum (ug/l)		100	3	3	4/07/03 - 6/05/03	150	OG Exceedance	May be naturally present or a residual from the coagulation process.
Ammonia N (mg/l)			1	0	4/07/03	<0.05	No	Occurs naturally from organic nitrogen containing compounds.
Benzo(a)pyrene (ug/l)	0.01		0	0		N/A	No	Formed from the incomplete burning of organic matter.
Calcium (mg/l)			1	1	4/07/03	42.6	N/A	Naturally occurring.
Chloride (mg/l)		250	1	1	4/07/03	23.3	No	A common naturally occurring non-toxic material that may produce a salty taste in water.
Colour (TCU)		5	3	0	4/07/03 - 6/05/03	<2	No	Typically the result of organic matter in surface waters.
Conductivity (Us/cm)			1	1	4/07/03	268	N/A	A measure of ability of water to carry an electric current due to the presence of ions.
Cyanide (mg/l)	0.2		0	0		N/A	No	Industrial discharge
Dioxin and Furan (pg/l)	15		0	0		N/A	No	Formed in very small amounts in combustion processes
Dissolved Organic Carbon (mg/l)		5	1	1	4/07/03	2.4	No	High DOC is an indicator of potential for chlorination by-product problems.
Fluoride (mg/l) (City Central)	1.5		0	0		N/A	No	Naturally occurring.
Fluoride (mg/l) (City East)	1.5		Continuous	Continuous	4/01/03 - 6/30/03	0.59	No	* Added to prevent tooth decay, but may be naturally occurring.
Gross Alpha (Bq/l)			0	0		N/A	No	Decay of natural deposits.
Gross Beta (Bq/l)			0	0		N/A	No	Decay of natural deposits.
Hardness (mg/l)		100	1	1	4/07/03	140	AO Exceedance	Naturally occurring from dissolved calcium and magnesium.
Nitrilitriacetic acid -NTA (ug/l)	400		0	0		N/A	No	Used in laundry detergents.
Nitrosodimethylamine -NDMA (ug/l)	0.009		2	2	6/05/03 - 6/18/03	0.0098	IMAC Exceedance	Rarely used industrially but has been used as an antioxidant, and an additive for lubricants
Orthophosphate (mg/l)			1	0	4/07/03	<0.01	No	From agricultural runoff or as a result of residential use.
pH		8.5	3	3	4/07/03 - 6/05/03	7.77	No	An indicator of the acidity of water.
Silica (mg/l)			1	1	4/07/03	0.69	N/A	Naturally occurring.
Sodium (mg/l)		200	3	3	4/07/03 - 6/05/03	15	No	Occurs naturally in the earth's crust.

13.3 Central Water Treatment Plant - Treated Water

Additional Sample Results	MAC or IMAC	AO or OG	Number of Samples	Number of Detectable Results	Sampling Dates	Max. Result	Exceedance?	Parameter Description
Sulphate (mg/l)		500	1	1	4/07/03	29.6	No	An inorganic constituent that may cause tastes at high levels.
Tritium (Bq/l)	7000		1	1	4/07/03	0.2	No	Decay of natural & man made deposits.
Total Kjeldahl Nitrogen (mg/l)			1	1	4/07/03	0.2	N/A	Indicator of organic contamination or the potential for taste and odour problems.
Zinc (ug/l)	5000		1	0	4/07/03	<10	No	An inorganic constituent that may cause tastes.

13.5 Central Water Treatment Plant - Filter Backwash Water

Backwash Water Parameters	MAC or IMAC	AO or OG	Number of Samples	Number of Detectable Results	Sampling Dates	Max. Result	Exceedance?	Parameter Description
Total Suspended Solids (mg/l)			3	3	4/07/03 - 6/05/03	98	N/A	A measure of the particulates collected in the filtration process.