

UTILITIES KINGSTON

2009

ANNUAL REPORT

January 1, 2009 – December 31, 2009

Drinking Water System Number: 220001851

Drinking Water System Name: Point Pleasant Water Treatment Plant (Formerly Kingston West Water Treatment Plant)

Drinking Water System Owner: City of Kingston

Drinking Water System Category: Large Municipal Residential

Utilities Kingston is proud to present this annual report on drinking water quality. This report has been prepared in accordance to Section 11 of Ontario Regulation 170/03. Regulation 170/03 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. Free copies of this report and the Summary report prepared in accordance to Schedule 22 of Ontario Regulation 170/03, are available by public request at any City of Kingston offices, at our waterplant locations and at www.utilitieskingston.com. Notices of availability are generally made through the local newspapers and radio. Further information on the Drinking Water Regulations can be found on the Ministry of the Environment web site at www.ene.gov.on.ca.

For further information about this report please contact Philip Emon at pemon@utilitieskingston.com, or call 613-389-0562.

Plant Description & Treatment Processes

Raw Water Source.

The source of water treated by this 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.

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.

Screening.

A revolving screen and a coarse screen in the suction well of the low lift building remove 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 flocculation tanks.

Floc Tanks.

Devices called flocculators agitate the water in these tanks allowing proper mixing of the chlorine and Poly Aluminum Chloride (PACl) with the water. The dirt particles in water will join together with the PACl to form larger particles called floc.

Filters.

Three ‘rapid sand’ filters with Granular Activated Carbon (GAC) remove the floc particles formed in the floc 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.

Backwash.

Filters are washed regularly to remove the particulates they have collected. The filter is air scoured to break up any large particles, and clean water from the clear well is pumped backwards through the filter to wash it.

Post Chlorination.

Chlorine gas is added to the water as it enters the contact tanks to ensure proper disinfection is achieved through adequate chlorine Contact time (CT), and to provide a chlorine residual which remains in the distribution system. This ensures protection to the customers’ tap.

Clear Well/Treated Water Reservoir.

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

High Lift Pumps.

Four high lift pumps move treated water from the treated water reservoir into the distribution system, industrial park 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 capacity 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.

Reservoirs

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

Elevated Tanks

There are two elevated tanks in the Kingston West drinking water system which are located at O’Connor Dr. and Creekford Rd. with approximate volumes of 1.0 million litres (250,000 gallons) and 6.8 million litres (1,500,000 gallons) of water storage capacity. The height of the water stored in the towers, as well as high lift and booster pumps, provides system pressure.

Distribution System.

The serviced population for this Point Pleasant WTP and King St. WTP is approximately 124,000. In June 2009, operational changes and regulatory changes were implemented within the distribution system. These changes have connected the two previously separate distribution systems formerly known as the Kingston West Distribution System and Kingston Central Distribution System, creating one distribution system known as the Kingston Drinking Water System which receives water from both the King St. Water Treatment Plant and the Point Pleasant Water Treatment Plant. There are approximately 430 km of water mains, and over 2500 fire hydrants in the system.

Monetary expenses incurred during this reporting period

Under Section 11 of Ontario Reg. 170/03, a description of any major expenses incurred during this reporting period must be included in the annual report. The details of major expenses for this drinking water system are listed below.

Watermain replacement projects throughout the city were continued throughout 2009, with extensive leakage testing, hydrant maintenance and valve operations also conducted on the system.

Continued development of a 25 year master plan for the drinking water systems within the City of Kingston.

Implementing the lead sampling program within the City of Kingston.

Development of the City of Kingston's Drinking-Water Quality Management Standard.

Design upgrades to the Point Pleasant Water Treatment Plant were commenced in 2009.

Construction of the new O'Connor Dr. Storage Reservoir began in 2009.

Notifications submitted in accordance to the Safe Drinking Water Act

Under Ontario Reg. 170/03, notifications are required for any instances where a sample result indicates that a parameter used to measure water quality exceeds a Maximum Acceptable Concentration (MAC). Once a notification is received from a laboratory or an observation of any other indicator of adverse water quality is made by operations personnel, corrective action as dictated by the regulations is initiated in an effort to confirm the initial result. If confirmed, further action may be recommended by the Medical Officer of Health. If not confirmed sampling will typically return to the normal schedule, or depending on the parameter, Utilities Kingston may choose to increase the sampling frequency to more closely monitor the parameter for a period of time.

There were no events requiring notifications during this reporting period.

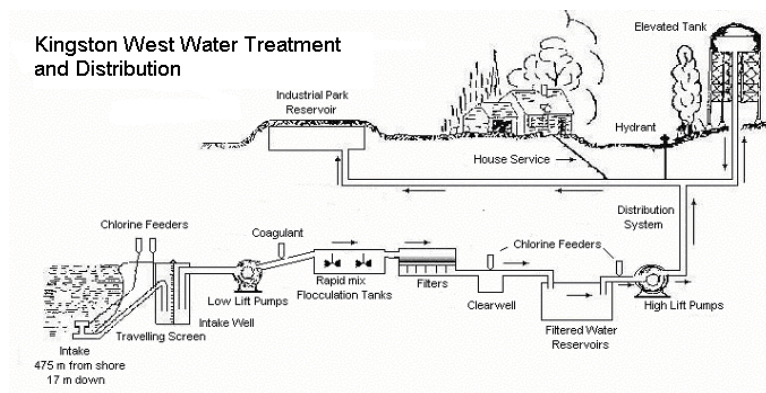
Definition & Terms

° C	- degrees Celsius	° F	- degrees Fahrenheit
kg	- kilogram	l	- litre
m	- meter	m³	- cubic meter=1000 litres.
TCU	- True Colour Units	CaCO₃	-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.

Flow Diagram



Microbiological Testing Done Under Schedule 10, 11 or 12 of Regulation 170/03, During This Reporting Period

	Number of Samples	Range of E. Coli or Fecal Results (min # - max #)	Range of Total Coliform Results (min # - max #)	Number of HPC Samples	Range of HPC Results (min # - max #)
Raw	53	0 - >200	0 - >200	0	
Treated	53	0	0	52	0 - 90
*Kingston West Distribution System (Jan.1/09 - May 31/09)	270	0	0	126	0 - 560
*Kingston Drinking Water System (Jun.1/09 - Dec.31/09)	811	0	0 - 2	416	0 - <2000

* In June 2009, operational changes and regulatory changes were implemented within the distribution system. These changes have connected the two previously separate distribution systems formerly known as the Kingston West Distribution System and Kingston Central Distribution System, creating one distribution system known as the Kingston Drinking Water System which receives water from both the King St. Water Treatment Plant and the Point Pleasant Water Treatment Plant.

Operational Testing Done Under Schedule 7, 8 or 9 of Regulation 170/03 During This Reporting Period

Parameter	Number of Samples	Range of Results (min # - max #)	Unit of Measure	Parameter Description
Raw Water Turbidity	Continuous	0.06 - 2.55	NTU	Turbidity is a measure of particles in water.
Treated Water Turbidity	Continuous	0.04 - 0.29	NTU	Turbidity is a measure of particles in water.
Chlorine (Treated)	Continuous	1.10 - 2.11	mg/l	Recommended level of at least 0.20 mg/l in distribution system to maintain microbiological quality. 0.05 mg/l minimum.
Chlorine Residual (Distribution System)	Continuous	0.26 - 2.67	mg/l	Recommended level of at least 0.20 mg/l in distribution system to maintain microbiological quality.

				0.05 mg/l minimum.
Filter # 1 Effluent Turbidity	Continuous	0.04 – 1.0	NTU	Turbidity is a measure of particles in water.
Filter # 2 Effluent Turbidity	Continuous	0.04 – 0.84	NTU	Turbidity is a measure of particles in water.
Filter # 3 Effluent Turbidity	Continuous	0.03 – 0.87	NTU	Turbidity is a measure of particles in water.

Summary Of Raw Water Testing Analyzed By Accredited Laboratories During This Reporting Period

Parameter	Number of Samples	Results Range	Unit of Measure	MAC Exceedance	Parameter Description
Alkalinity (as CaCO ₃)	4	84 – 90	mg/l	No	A measure of the resistance of the water to the effects of acids. Expressed as calcium carbonate.
Aluminum	2	<0.01	mg/l	No	May be naturally present.
Ammonia N	2	<0.05	mg/l	No	Occurs naturally from organic nitrogen containing compounds.
Arsenic	2	0.0008 – 0.0010	mg/l	No	Naturally occurring in surface waters / mine drainage
Calcium	3	32.3 – 33.9	mg/l	No	Naturally occurring.
Chloride	2	22 – 23	mg/l	No	A common naturally occurring non-toxic material that may produce a salty taste in water.
Colour	11	<2 – 4	TCU	No	Typically the result of organic matter in surface waters.
Conductivity	2	302 - 311	Us/cm	No	A measure of ability of water to carry an electric current due to the presence of ions.
Copper	2	<0.002 – 0.012	mg/l	No	Domestic plumbing (Aesthetic objective)

Dissolved Organic Carbon	4	2 – 2.3	mg/l	No	High DOC is an indicator of potential for chlorination by-product problems.
Fluoride	4	0.2 – 0.3	mg/l	No	Naturally occurring.
Hardness	4	115 – 120	mg/l	No	Naturally occurring from dissolved calcium and magnesium.
Iron	2	<0.005	mg/l	No	Leaching from natural deposits and plumbing materials, industrial wastes. (Aesthetic objective)
Lead	2	<0.00002 – 0.00008	mg/l	No	Internal corrosion of household plumbing, erosion of natural deposits.
Manganese	2	<0.001 – 0.001	mg/l	No	Erosion of natural deposits.
Nitrate	4	0.3 – 0.4	mg/l	No	Runoff from fertilizer use, erosion of natural deposits
Nitrite	4	<0.1	mg/l	No	A natural component of water at this level.
Nitrilotriacetic acid -NTA	1	<0.05	mg/l	No	Used in laundry detergents.
Nitrosodimethylamine - NDMA	1	<0.002	ug/l	No	Rarely used industrially but has been used as an antioxidant, and an additive for lubricants
pH	10	7.45 – 8.49		No	An indicator of the acidity of water.
Phenols	2	<0.001	mg/l	No	
Sodium	4	12.5 – 13.3	mg/l	No	Occurs naturally in the earth's crust.
Sulphate	4	23 – 24	mg/l	No	An inorganic constituent that may cause tastes at high levels.
Total Kjeldahl Nitrogen	3	0.1 – 0.9	mg/l	No	Indicator of organic contamination or the potential for taste and odour problems.
Zinc	2	<0.005	mg/l	No	An inorganic constituent that may cause tastes.

Summary Of Treated Water Inorganic Parameters Tested During This Reporting Period

Parameter	Number of Samples	Results Range	Unit of Measure	MAC Exceedance	Parameter Description
Antimony	2	<0.0001 - 0.0002	mg/l	No	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
Arsenic	3	0.0007 – 0.0009	mg/l	No	Naturally occurring in surface waters / mine drainage
Barium	2	0.017 - 0.019	mg/l	No	Erosion of natural deposits. Discharge from metal refineries, oil drilling wastes.
Boron	1	0.015	mg/l	No	Erosion of natural deposits, industrial waste effluents.
Cadmium	2	<0.00002	mg/l	No	Industrial discharge
Chromium	2	<0.002	mg/l	No	Industrial residues
Lead	4	<0.00002 – 0.00007	mg/l	No	Internal corrosion of household plumbing, erosion of natural deposits.
Mercury	2	<0.00002	mg/l	No	Erosion of natural deposits, industrial discharges.
Selenium	2	0.0003 – 0.0008	mg/l	No	Discharge from refineries, mines, chemical manufacture
Sodium	10	12 – 13.3	mg/l	No	Occurs naturally in the earth's crust.
Uranium	2	0.00021 – 0.00024	mg/l	No	Erosion of natural deposits.
Fluoride	4	0.2	mg/l	No	Naturally occurring.
Nitrite	12	<0.1	mg/l	No	A natural component of water at this level.
Nitrate	12	0.2 – 0.4	mg/l	No	Runoff from fertilizer use, erosion of natural deposits

Summary Of Treated Water Organic Parameters Tested During This Reporting Period

Parameter	Number of Samples	Results Range	Unit of Measure	MAC Exceedance	Parameter Description
Alachlor	2	<0.3	ug/l	No	Agricultural herbicide
Aldicarb	2	<3	ug/l	No	Agricultural insecticide
Aldrin + Dieldrin	2	<0.02	ug/l	No	Residue from banned insecticide
Atrazine + N-dealkylated metabolites	2	<0.5	ug/l	No	Agricultural herbicide
Azinphos-methyl	2	<1	ug/l	No	Insecticide
Bendiocarb	2	<3	ug/l	No	Insecticide
Benzene	2	<0.5	ug/l	No	Discharge from plastics manufacturing, leaking fuel tanks
Benzo(a)pyrene	2	<0.005	ug/l	No	Formed from the incomplete burning of organic matter.
Bromoxynil	2	<0.3	ug/l	No	Agricultural herbicide
Carbaryl	2	<3	ug/l	No	Agricultural/Forestry/ Household insecticide
Carbofuran	2	<1	ug/l	No	Agricultural insecticide
Carbon Tetrachloride	2	<0.2	ug/l	No	Discharge from chemical and industrial activities
Chlordane (Total)	2	<0.04	ug/l	No	Residue from banned insecticide
Chlorpyrifos	2	<0.5	ug/l	No	Agricultural/ Household insecticide
Cyanazine	2	<0.5	ug/l	No	Agricultural/ Residential herbicide
Diazinon	2	<1	ug/l	No	Agricultural/ Livestock Operation/ Residential insecticide

Dicamba	2	<5	ug/l	No	Agricultural herbicide
1,2-Dichlorobenzene	2	<0.1	ug/l	No	Discharge from industrial chemical factories
1,4-Dichlorobenzene	2	<0.2	ug/l	No	Discharge from industrial chemical factories
Dichlorodiphenyltric hloroethane (DDT) + metabolites	2	<0.1	ug/l	No	Residue from banned insecticide
1,2-Dichloroethane	2	<0.1	ug/l	No	Discharge from industrial chemical factories
1,1-Dichloroethylene (vinylidene chloride)	2	<0.1	ug/l	No	Discharge from industrial chemical factories
Dichloromethane	2	<0.3	ug/l	No	Discharge from pharmaceutical and chemical factories
2-4 Dichlorophenol	2	<0.1	ug/l	No	Industrial contamination/ reaction with chlorine
2,4-Dichlorophenoxy acetic acid (2,4-D)	2	<5	ug/l	No	Agricultural/ Residential herbicide
Diclofop-methyl	2	<0.4	ug/l	No	Agricultural herbicide
Dimethoate	2	<1	ug/l	No	Agricultural/ Livestock Operation/ Forestry insecticide
Dinoseb	2	<0.5	ug/l	No	Herbicide residue
Diquat	2	<5	ug/l	No	Agricultural/ Aquatic herbicide
Diuron	2	<5	ug/l	No	Agricultural/ Industrial/ herbicide
Glyphosate	2	<25	ug/l	No	Agricultural/Forestry/ Household herbicide
Heptachlor + Heptachlor Epoxide	2	<0.1	ug/l	No	Residue from banned insecticide
Lindane (Total)	2	<0.1	ug/l	No	Agricultural/ Pharmaceutical insecticide

Malathion	2	<5	ug/l	No	Fruit & Vegetable / pest control insecticide
Methoxychlor	2	<0.1	ug/l	No	Agricultural/ Livestock Operation/ Residential insecticide
Metolachlor	2	<3	ug/l	No	Agricultural herbicide
Metribuzin	2	<3	ug/l	No	Agricultural herbicide
Monochlorobenzene	2	<0.2	ug/l	No	Discharge from industrial and agricultural chemical factories and dry cleaning facilities
Paraquat	2	<1	ug/l	No	Agricultural/ Aquatic herbicide
Parathion	2	<3	ug/l	No	Agricultural insecticide
Pentachlorophenol	2	<0.1	ug/l	No	Pesticide/ wood preservative residue
Phorate	2	<0.3	ug/l	No	Agricultural insecticide
Picloram	2	<5	ug/l	No	Industrial herbicide
Polychlorinated Biphenyls(PCB)	2	<0.05	ug/l	No	Residue from various industrial uses
Prometryne	2	<0.1	ug/l	No	Agricultural herbicide
Simazine	2	<0.5	ug/l	No	Agricultural herbicide or its residue
Total Trihalomethanes (NOTE: show latest annual average)	11	18.6	ug/l	No	By-product of chlorination. * The MAC for THMs of 100 ug/l is based on a running annual average.
Temephos	2	<10	ug/l	No	Insecticide for Mosquito/Black fly control
Terbufos	2	<0.3	ug/l	No	Agricultural insecticide
Tetrachloroethylene	2	<0.2	ug/l	No	Leaching from PVC pipes; discharge from factories, dry cleaners and auto shops (metal degreaser)

2,3,4,6-Tetrachlorophenol	2	<0.1	ug/l	No	Wood preservative
Triallate	2	<10	ug/l	No	Agricultural herbicide
Trichloroethylene	2	<0.1	ug/l	No	Discharge from metal degreasing sites and other factories
2,4,6-Trichlorophenol	2	<0.1	ug/l	No	Pesticide manufacturing
2,4,5-Trichlorophenoxy acetic acid (2,4,5-T)	2	<10	ug/l	No	Industrial herbicide residue
Trifluralin	2	<0.5	ug/l	No	Agricultural herbicide
Vinyl Chloride	2	<0.2	ug/l	No	Leaching from PVC pipes; discharge from plastics factories

Summary Of Additional Treated Water Testing Analyzed By Accredited Laboratories During This Reporting Period

Parameter	Number of Samples	Results Range	Unit of Measure	MAC Exceedance	Parameter Description
Alkalinity (as CaCO ₃)	4	82 - 90	mg/l	No	A measure of the resistance of the water to the effects of acids. Expressed as calcium carbonate.
Aluminum	12	0.05 – 0.18	mg/l	No	May be naturally present or a residual from the coagulation process.
Ammonia N	4	<0.05	mg/l	No	Occurs naturally from organic nitrogen containing compounds.
Calcium	4	31.7 – 33.9	mg/l	No	Naturally occurring.
Chloride	4	24 – 25	mg/l	No	A common naturally occurring non-toxic material that may produce a salty taste in water.
Colour	12	<2 - 2	TCU	No	Typically the result of organic matter in surface waters.

Conductivity	3	306 – 323	Us/cm	No	A measure of ability of water to carry an electric current due to the presence of ions.
Cyanide	1	<0.005	mg/l	No	Industrial discharge
Dissolved Organic Carbon	4	1.3 – 2	mg/l	No	High DOC is an indicator of potential for chlorination by-product problems.
Gross Alpha	1	<0.1	Bq/l	No	Decay of natural deposits.
Gross Beta	1	<0.1	Bq/l	No	Decay of natural deposits.
Hardness	4	114 – 120	mg/l	No	Naturally occurring from dissolved calcium and magnesium.
Iron	4	<0.005	mg/l	No	Leaching from natural deposits and plumbing materials, industrial wastes. (Aesthetic objective)
Manganese	4	<0.001	mg/l	No	Erosion of natural deposits.
Nitrilotriacetic acid -NTA	1	<0.05	mg/l	No	Used in laundry detergents.
Nitrosodimethylamine - NDMA	1	<0.000002	mg/l	No	Rarely used industrially but has been used as an antioxidant, and an additive for lubricants
pH	13	7.30 – 8.30		No	An indicator of the acidity of water.
Sulphate	4	23 – 25	mg/l	No	An inorganic constituent that may cause tastes at high levels.
Tritium (Bq/l)	1	<1000	Bq/l	No	Decay of natural & man made deposits.
Total Kjeldahl Nitrogen	4	<0.1 – 0.2	mg/l	No	Indicator of organic contamination or the potential for taste and odour problems.
Zinc	4	<0.005	mg/l	No	An inorganic constituent that may cause tastes.

* In June 2009, operational changes and regulatory changes were implemented within the distribution system. These changes have connected the two previously separate distribution systems formerly known as the Kingston West Distribution System and Kingston Central Distribution System, creating one distribution system known as the Kingston Drinking Water System which receives water from both the King St. Water Treatment Plant and the Point Pleasant Water Treatment Plant.

***Summary Of The Kingston West Distribution System Water Inorganic Parameters Tested During Jan. 1/09 – May 31/09**

Parameter	Number of Samples	Results Range	Unit of Measure	MAC Exceedance	Parameter Description
Lead	8	<0.00002 – 0.00425	mg/l	No	Internal corrosion of household plumbing, erosion of natural deposits.
Sodium	1	13.1	mg/l	No	Occurs naturally in the earth's crust.
Fluoride	1	0.2	mg/l	No	Naturally occurring.
Nitrite	1	<0.1	mg/l	No	A natural component of water at this level.
Nitrate	1	0.4	mg/l	No	Runoff from fertilizer use, erosion of natural deposits

***Summary Of The Kingston Drinking Water System Inorganic Parameters Tested During Jun. 1/09 – Dec 31/09**

Parameter	Number of Samples	Results Range	Unit of Measure	MAC Exceedance	Parameter Description
Lead	21	<0.00002 – 0.00555	mg/l	No	Internal corrosion of household plumbing, erosion of natural deposits.
Sodium	4	12.4 – 14.8	mg/l	No	Occurs naturally in the earth's crust.

*Summary Of The Kingston West Distribution System Water Organic Parameters Tested During Jan. 1/09 – May 31/09

Parameter	Number of Samples	Result Value	Unit of Measure	MAC Exceedance	Parameter Description
Total Trihalomethanes (NOTE: shows latest annual average)	2	22.2	ug/l	No	By-product of chlorination. * The MAC for THMs of 100 ug/l is based on a running annual average.

*Summary Of The Kingston Drinking Water System Organic Parameters Tested During Jun. 1/09 – Dec 31/09

Parameter	Number of Samples	Result Value	Unit of Measure	MAC Exceedance	Parameter Description
Total Trihalomethanes (NOTE: shows latest annual average)	6	51.7	ug/l	No	By-product of chlorination. * The MAC for THMs of 100 ug/l is based on a running annual average.

*Summary Of Additional Kingston West Distribution System Water Testing Analyzed By Accredited Laboratories During Jan. 1/09 – May 31/09

Parameter	Number of Samples	Result Value	Unit of Measure	Exceedance	Parameter Description
Alkalinity (as CaCO ₃)	8	88 - 92	mg/l	No	A measure of the resistance of the water to the effects of acids. Expressed as calcium carbonate.
Aluminum	2	0.05 – 0.08	mg/l	No	May be naturally present or a residual from the coagulation process.

Ammonia N	2	<0.05	mg/l	No	Occurs naturally from organic nitrogen containing compounds.
Arsenic	1	0.0007	mg/l	No	Naturally occurring in surface waters / mine drainage
Benzo(a)pyrene	1	<0.005	ug/l	No	Formed from the incomplete burning of organic matter.
Calcium	2	33.8 – 35.6	mg/l	No	Naturally occurring.
Chloride	2	24 - 25	mg/l	No	A common naturally occurring non-toxic material that may produce a salty taste in water.
Colour	1	<2	TCU	No	Typically the result of organic matter in surface waters.
Conductivity	2	306 - 325	Us/cm	No	A measure of ability of water to carry an electric current due to the presence of ions.
Copper	2	<0.002	mg/l	No	Domestic plumbing (Aesthetic objective)
Cyanide	1	<0.005	mg/l	No	Industrial discharge
Dissolved Organic Carbon	2	2.0 – 2.1	mg/l	No	High DOC is an indicator of potential for chlorination by-product problems.
Gross Alpha	1	<0.1	Bq/l	No	Decay of natural deposits.
Gross Beta	1	<0.1	Bq/l	No	Decay of natural deposits.
Hardness	2	119 – 124	mg/l	No	Naturally occurring from dissolved calcium and magnesium.
Iron	2	<0.005	mg/l	No	Leaching from natural deposits and plumbing materials, industrial wastes. (Aesthetic objective)
Manganese	1	<0.001	mg/l	No	Erosion of natural deposits.
Nitrilotriacetic acid -NTA	1	0.20	mg/l	No	Used in laundry detergents.
Nitrosodimethylamine - NDMA	1	<0.000002	mg/l	No	Rarely used industrially but has been used as an antioxidant, and an additive for lubricants

pH	2	7.40 – 7.68		No	An indicator of the acidity of water.
Sulphate	2	23 - 25	mg/l	No	An inorganic constituent that may cause tastes at high levels.
Tritium (Bq/l)	1	<1000	Bq/l	No	Decay of natural & man made deposits.
Total Kjeldahl Nitrogen	2	<0.1 – 0.2	mg/l	No	Indicator of organic contamination or the potential for taste and odour problems.
Zinc	2	<0.005	mg/l	No	An inorganic constituent that may cause tastes.

***Summary Of Additional Kingston Drinking Water System Testing Analyzed By Accredited Laboratories During Jun. 1/09 – Dec. 31/09**

Parameter	Number of Samples	Result Value	Unit of Measure	Exceedance	Parameter Description
Alkalinity (as CaCO ₃)	18	84 - 88	mg/l	No	A measure of the resistance of the water to the effects of acids. Expressed as calcium carbonate.
Aluminum	2	0.05 – 0.1	mg/l	No	May be naturally present or a residual from the coagulation process.
Ammonia N	2	<0.05	mg/l	No	Occurs naturally from organic nitrogen containing compounds.
Calcium	2	31.5 – 33.4	mg/l	No	Naturally occurring.
Chloride	2	24	mg/l	No	A common naturally occurring non-toxic material that may produce a salty taste in water.
Conductivity	1	323	Us/cm	No	A measure of ability of water to carry an electric current due to the presence of ions.
Copper	2	<0.002 – 0.018	mg/l	No	Domestic plumbing (Aesthetic objective)

Dissolved Organic Carbon	1	1.5	mg/l	No	High DOC is an indicator of potential for chlorination by-product problems.
Hardness	2	11 – 118	mg/l	No	Naturally occurring from dissolved calcium and magnesium.
Iron	2	0.017 – 0.070	mg/l	No	Leaching from natural deposits and plumbing materials, industrial wastes. (Aesthetic objective)
Manganese	2	0.001 – 0.003	mg/l	No	Erosion of natural deposits.
pH	2	7.43 – 7.60		No	An indicator of the acidity of water.
Sulphate	2	29	mg/l	No	An inorganic constituent that may cause tastes at high levels.
Total Kjeldahl Nitrogen	2	<0.1	mg/l	No	Indicator of organic contamination or the potential for taste and odour problems.
Zinc	2	0.038 – 0.093	mg/l	No	An inorganic constituent that may cause tastes.

Summary Of Residential & Non-Residential Plumbing Lead Testing Carried Out In Accordance With Schedule 15.1 of Regulation 170/03 During This Reporting Period

	Number of Sample locations (Dec.15/08- Dec.31/09)	Number of Sample Locations Results Exceeding Standard (0.01 mg/l)	Lead Results Range (mg/l)	pH Results Range
Residential	171	*16	<0.00002 – 0.0481	6.46 – 7.74
Non-Residential	21	*1	0.00012 – 0.0225	6.70 – 8.14

*Notification of lead exceedance results and advice by the medical officer of health were given to the occupants of the locations which exceeded the standard for lead in accordance to Schedule 15.1-9 of Regulation 170/03.

Summary Of Raw Water Testing Analyzed By In House Laboratory During This Reporting Period

Parameter	Number of Samples	Results Range	Unit of Measure	Exceedance	Parameter Description
Alkalinity	45	73 - 120	mg/l	No	A measure of the resistance of the water to the effects of acids. Expressed as calcium carbonate.
Turbidity	312	0.1 – 2.55	NTU	No.	Turbidity is a measure of particles in water.
Hardness	45	100 - 155	mg/l	No	Naturally occurring from dissolved calcium and magnesium.
pH	246	6.74 – 8.99		No	An indicator of the acidity of water.
Temperature	324	0.4 – 23.4	Degrees Celcius	No	

Summary Of Treated Water Testing Analyzed By In House Laboratory During This Reporting Period

Parameter	Number of Samples	Results Range	Unit of Measure	Exceedance	Parameter Description
Alkalinity	44	70 - 114	mg/l	No	A measure of the resistance of the water to the effects of acids. Expressed as calcium carbonate.
Aluminum	242	0.01 – 0.2	mg/l	No	May be naturally present or a residual from the coagulation process.
Turbidity	313	0.04 – 0.25	NTU	No.	Turbidity is a measure of particles in water.

Hardness	44	90 - 144	mg/l	No	Naturally occurring from dissolved calcium and magnesium.
pH	278	6.53 – 8.76		No	An indicator of the acidity of water.
Temperature	324	0.4 – 25.4	Degrees Celcius	No	