

ANNUAL SUMMARY REPORT 2004

KINGSTON WEST WATER TREATMENT PLANT

WATERWORKS NUMBER: 220001851

Reporting Period

January 1, 2004 – December 31, 2004

Submitted by:
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President & CEO



ANNUAL SUMMARY REPORT 2004

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WATERWORKS NUMBER: 220001851

This annual summary report has been prepared as required under Ontario Reg. 170/03 of the Safe Drinking Water Act to acknowledge compliance with the terms and conditions of the Certificate of Approval issued for the Kingston West Water Treatment Plant, to comment on any incidents of non-compliance during the reporting period, to summarize the quantities of the water supplied and to compare the summaries to the rated capacity and flow rates approved in the system's permits and approvals during the reporting period.

This report is specific to the Kingston West Water Treatment Plant located at 80 Sunny Acres Road, and its associated distribution system which serves Kingston's municipal water customers in the areas west of Little Cataraqui Creek, North to Cataraqui Arena, Hwy#2 west to Westbrook, and Bath Road to Coronation Blvd. The WTP and its associated distribution system are owned by the city of Kingston, with Utilities Kingston acting as the operating authority.

Non-Compliance with Terms and Conditions of the Certificate of Approval (COA)

There were no incidents of non-compliance during this reporting period.

Compliance with the Terms and Conditions of the COA

The Treatment Group of Utilities Kingston, for the City of Kingston, operates and maintains the Kingston West Water Treatment Plant (WTP) and complies with the terms and conditions of the Certificate of Approval (COA) issued for the WTP. The Underground Infrastructure Department and the Treatment Group of Utilities Kingston operate and maintain the associated distribution system and storage and pumping facilities. Staffing is maintained at levels to ensure adequate numbers of trained and licensed personnel are available for proper operations during emergency or upset conditions, vacation/sick relief, or to deal with equipment breakdown.

Contingency plans and operations manuals are established and are located in the appropriate facilities and available to appropriate staff. Operations manuals include information necessary for the day to day operations and maintenance of the WTP and Distribution

system as well as information that may not be regularly used but that might be required to be accessed quickly for various purposes. Contingency plans include information that may be required for proper operation of the WTP or Distribution system during emergency or upset conditions, and contain items such as emergency plans and contact lists, alternate materials supply sources and notification lists.

The operations strategy of Utilities Kingston includes ensuring that permits and approvals are in place, that efficient maintenance and operations ensures the quality of water supplied to its customers meets or exceeds the minimum requirements as set out in the Safe Drinking Water act, and that permissible flow rates are not exceeded. The City of Kingston, as a means of source water protection, considers the impact of decisions made within its authority on the drinking water supply source for the WTP.

Flow measuring devices for measuring the amount of water taken from Lake Ontario, and the amount of water supplied to the distribution system are calibrated annually by a third party. Accuracy in these measurements ensures that treatment chemicals are precisely applied and that flows do not exceed the capacity at which the WTP is designed to be effective. These flows are recorded to provide current and historical information which is used for operational decision making, and to allow both the public and the Ministry of the Environment (Ministry) the ability to review WTP operations.

Water quality analyzers that monitor parameters such as chlorine residual and turbidity of critical process streams and of the water directed to the distribution system are alarm equipped, and are maintained in accordance with the manufacturer's recommendations as well as the conditions of the COA.

Water sampling is conducted in exceedance to the minimum requirements of schedule 13 of Ontario Reg. 170/03 of the Safe Drinking water Act, and includes additional sampling as well as sampling recommended in the first Engineers Report for the WTP. Raw water sampling is conducted to give operational staff information required to determine the level of treatment required to make the water potable. In-plant process stream samples provide monitoring of treatment processes. Treated and distribution system sampling provides information regarding the quality of water delivered to customers. All of these samples are analyzed by either licensed staff or by laboratories accredited by the Standards Council of Canada through the Canadian Association for Environmental Analytical Laboratories.

All sampling information, annual reports, and all other documentation required by the COA and regulations are available for public viewing at the WTP during normal business hours. Annual Reports are also available on the Utilities Kingston website as well as at the Utilities Kingston and City of Kingston offices. Residents of the City of Kingston are encouraged to review this information, the availability of which is advertised through various local media.

Notifications of Adverse Water Quality Results

Under Ontario Reg. 170/03, notifications were required for any instances where a sample result indicated that a parameter used to measure water quality exceeded a Maximum Acceptable Concentration (MAC). Once a notification is received from a laboratory 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.

The details of any events requiring notifications are listed below.

On May 18/04, on-line instrumentation and grab samples indicated that the treated water turbidity had exceeded 1.0 Nephelometric Turbidity Unit (NTU), a measurement of water clarity. The exceedance had been caused by hydraulic testing within the plant which disrupted sediment in the reservoirs. The turbidity exceedance lasted from 13:00 until 15:48, with a maximum turbidity during this time of 2.67 NTU. The affected reservoir tanks were isolated and the sediment allowed to settle, and once flow conditions throughout the plant had returned to normal and the turbidity was below 1.0 NTU, the tanks were returned to service. Notifications were made to the Spills Action Center and Medical Officer of Health. Treated and distribution water samples were collected and submitted to the lab for bacteriological analysis, and grab samples were collected and analyzed to ensure the free chlorine was greater than 1.70 mg/l.

Notification of an indicator of adverse water quality was received from Caduceon Environmental Laboratories regarding a treated water sample collected on June 15/04 for a presence of total coliforms. Free chlorine residual tested at the time the sample was collected was 1.36 mg/l. Notifications were made to the Spills Action Center and to the Environmental Health Division of the local Ministry of Health. Re-sampling of the same location, and downstream was conducted on two consecutive days and samples sent to the lab for analysis. With the high free chlorine residual in the original sample, and all consecutive samples not indicating any adverse conditions, a contaminated bottle or lab accident is suspected.

On Sept.28/04, a sample collected in the distribution system indicated that the concentration of free chlorine residual was less than 0.05 mg/l. The watermain servicing the affected area was flushed for 10 minutes to achieve a free chlorine residual of 0.78 mg/l. Notifications were made to the Spills Action Center and to the Environmental Health Division of the local Ministry of Health. The area which initially indicated a low residual has been monitored and flushed accordingly to maintain the required free chlorine residual.

Notification of an indicator of adverse water quality was received from Caduceon Environmental Laboratories regarding a distribution water sample collected on Dec.15/04 for a presence of total coliforms. Free chlorine residual tested at the time the sample was collected was 1.21 mg/l. Notifications were made to the Spills Action Center and to the

Environmental Health Division of the local Ministry of Health. Re-samples of the same location, and upstream and downstream samples were taken and sent to the lab for analysis. With the high free chlorine residual in the original sample, and all consecutive samples not indicating any adverse conditions, a contaminated bottle or lab accident is suspected.

Summary of the Quantity of Water Supplied During the Reporting Period

Listed in the tables following this report are the treated water flows for the Kingston West Water Treatment Plant for the year 2004. The serviced population for this WTP is 44,000. With the annual average daily use at 23,008 cubic meters per day, per capita use at 523 litres per day in the distribution system served by this plant is above the typical Canadian average of 400 – 500 litres per day. The city has imposed limitations or restrictions on water use when necessary. While the number of high-use industrial customers has not risen significantly in the recent past few years, industrial/commercial use is still believed to partly contribute to the higher than expected flows. System losses through leakage, mainly due to the age of the distribution system infrastructure, also account for a significant portion of the 'unaccounted for' water. Leak detection surveys are typically undertaken on a bi-annual basis or when system losses become noticeably high.

Summary of Flow Rate Exceedances

There were no instances during this reporting period where flows exceeded the maximum allowable flow rate of 45,455 m³/d. Listed in the tables following this report are the raw water flows (water taken from Lake Ontario) and treated water flows (water pumped to the distribution system) for the Kingston West Water Treatment Plant for the year 2004.

Summary of Treatment Chemicals Used

There are two treatment chemicals in use at this treatment plant. Chlorine is used as the disinfectant, and Poly Aluminum Chloride (PAC) is used as the coagulant for the WTP. A more detailed description of the function of each of these chemicals and where they fit in the treatment processes is contained in the quarterly reports produced for this treatment plant.

Chlorine is dosed at the treatment plant at a rate which ensures; an adequate residual is maintained at those points in the distribution system that are farthest from the point of entry of treated water to the system and, that an adequate CT value is maintained for the rate of flow. Average chlorine dosages for this treatment plant are approximately 2.18 mg/l. Residuals are routinely measured in the distribution system and the treatment plant chlorine

dosages are adjusted as required to meet the distribution system target residuals and the required CT values.

Typical PAC dosages for this treatment plant are in the range of 0.50 – 0.90 mg/l. This dosage is also adjusted to ensure efficiency in the coagulation process as various changes occur in the raw water. Changes are based on things such as pH, temperature, turbidity, and the aluminum residual in the treated water.

Summary

The Kingston West Water treatment Plant supplied water to residents of Kingston at rates which allowed adequate treatment while not exceeding permitted flows. Water of good quality which is safe to drink was produced by the treatment plant during this reporting period. Further information is available for this system and is included in the annual reports which can be accessed from the Utilities Kingston Website or is available at Kingston City Hall or the Utilities Kingston offices.



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Kingston West Water Treatment Plant - **Raw Water Flows** 2004
 m³

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	22,350	27,680	24,050	22,810	23,870	24,220	24,880	21,730	21,390	20,510	20,220	20,220
2	22,560	27,020	23,470	22,640	21,760	23,890	25,160	23,520	22,270	20,470	18,830	20,520
3	22,450	25,100	23,300	24,610	22,880	24,820	25,570	23,600	22,820	21,090	20,450	20,160
4	24,270	24,010	23,790	22,090	23,060	25,780	26,240	22,970	22,090	20,310	19,920	22,190
5	23,820	23,950	23,480	21,060	22,720	26,260	23,880	23,570	23,020	18,210	19,630	22,040
6	23,530	24,260	24,180	22,860	23,290	26,660	25,090	23,030	24,290	21,060	20,370	21,770
7	23,350	26,770	24,330	22,610	23,510	29,860	23,400	23,290	22,610	24,930	20,880	20,490
8	23,380	23,220	25,100	23,880	23,500	30,000	22,970	23,220	20,920	20,030	20,510	21,420
9	23,390	24,540	23,200	22,600	24,350	28,670	23,460	28,120	20,890	19,860	20,340	20,910
10	23,830	23,390	24,600	22,730	23,960	24,910	25,120	25,320	20,950	20,780	21,260	20,640
11	24,300	23,910	23,750	22,320	25,440	25,740	24,290	24,790	20,450	21,620	21,400	22,190
12	23,090	23,600	23,700	24,040	24,660	27,550	25,250	24,830	20,950	21,270	21,520	21,960
13	23,610	24,350	23,700	22,450	25,660	26,640	27,260	21,525	22,330	21,730	20,780	20,960
14	23,660	24,150	23,660	22,460	25,800	27,720	25,310	21,760	21,390	19,290	21,750	21,550
15	24,380	24,570	23,410	22,620	24,430	27,650	24,730	22,002	22,270	19,310	21,670	21,390
16	23,880	24,130	23,040	22,040	25,060	25,900	23,310	22,247	21,380	19,510	21,750	21,850
17	24,820	23,140	22,990	24,060	25,370	24,560	23,690	25,510	20,510	20,930	21,940	21,500
18	25,410	23,710	23,030	23,120	24,510	25,730	24,970	26,610	20,800	20,610	21,530	21,990
19	24,690	25,750	23,520	22,730	28,200	26,460	25,790	23,670	21,130	19,760	21,130	21,970
20	24,060	24,920	22,970	22,300	25,100	25,980	27,280	21,850	21,490	20,180	21,570	21,380
21	24,780	25,550	24,330	22,220	24,470	27,400	27,760	22,390	21,140	20,220	21,170	21,910
22	24,380	24,290	23,590	22,280	23,890	24,550	27,210	23,220	21,610	19,880	21,980	21,700
23	24,420	24,380	22,300	22,620	23,200	25,500	24,670	24,120	21,580	20,500	20,780	22,530
24	25,060	23,980	24,180	25,240	25,070	26,470	26,620	23,910	21,330	20,600	20,770	22,070
25	25,790	23,890	23,690	20,470	22,260	24,690	26,660	24,850	21,930	20,460	20,390	19,010
26	26,920	24,200	23,690	23,060	23,480	24,600	28,440	23,570	22,000	20,010	20,250	20,740
27	24,840	25,860	24,290	22,750	24,280	23,760	22,960	22,590	21,880	19,980	20,760	21,350
28	24,200	25,270	22,840	22,400	24,110	24,160	22,550	21,380	20,950	20,180	21,350	21,100
29	25,070	24,700	25,000	21,830	25,020	24,250	23,480	20,790	21,290	20,160	21,910	21,340
30	26,530		22,850	22,410	25,140	25,020	24,290	21,200	21,270	20,220	20,800	22,170
31	27,250		22,950		25,970		21,640	22,000		20,430		22,010
Total	754,070	714,290	732,980	681,310	754,020	779,400	773,930	723,184	648,930	634,100	627,610	663,030
Average	24,325	24,631	23,645	22,710	24,323	25,980	24,965	23,329	21,631	20,455	20,920	21,388
Min	22,350	23,140	22,300	20,470	21,760	23,760	21,640	20,790	20,450	18,210	18,830	19,010
Max	27,250	27,680	25,100	25,240	28,200	30,000	28,440	28,120	24,290	24,930	21,980	22,530

PTTW Amount **39,560 m³ /day**

Yearly Average **23,188**
Yearly Min **18,210**
Yearly Max **30,000**



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Kingston West Water Treatment Plant - **Treated Water Flows** 2004
m³

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	21,820	26,890	23,150	22,390	22,930	23,500	24,870	21,970	21,380	20,510	20,180	20,080
2	22,270	25,870	22,420	22,290	21,890	24,650	25,540	24,140	22,720	20,780	18,600	20,260
3	21,910	24,070	22,640	24,330	22,820	25,240	26,050	23,740	23,080	21,030	20,460	20,280
4	23,770	23,440	22,840	21,520	23,010	25,980	26,710	23,380	22,200	20,440	20,090	21,980
5	23,280	23,430	22,620	20,940	22,540	26,470	23,780	23,920	23,540	18,250	19,450	22,260
6	23,010	23,330	23,200	22,740	23,050	26,900	25,210	23,200	24,590	21,440	20,370	21,320
7	22,770	26,120	23,660	22,220	23,580	28,080	23,670	23,530	22,930	24,660	21,210	20,300
8	22,820	22,500	23,700	23,470	23,220	28,160	23,090	23,480	21,040	20,070	20,290	20,890
9	22,830	23,790	22,900	22,360	24,220	26,130	23,500	28,850	21,070	20,020	20,350	20,660
10	23,100	22,550	24,160	22,420	24,020	24,620	25,680	25,670	21,160	20,780	21,240	20,700
11	23,810	23,180	23,430	22,070	25,340	26,090	23,920	25,310	20,590	21,790	21,350	21,880
12	22,500	22,700	23,540	23,910	24,770	27,610	25,890	25,110	21,160	21,370	21,170	21,840
13	23,040	22,610	23,330	21,950	25,860	26,580	27,830	21,563	22,490	21,830	21,150	20,920
14	23,260	22,960	23,370	22,260	25,630	27,760	25,620	21,810	21,730	19,270	22,060	21,520
15	23,140	23,870	22,840	22,350	24,490	24,450	25,130	22,063	22,280	19,280	21,370	21,390
16	22,900	23,540	22,720	21,720	25,220	25,680	23,380	22,318	21,560	20,010	21,650	21,390
17	23,900	22,280	22,670	23,800	25,210	25,310	24,050	23,510	20,470	20,930	22,000	21,300
18	24,210	22,950	22,810	23,000	24,750	25,880	25,460	24,610	20,980	20,520	21,410	22,040
19	23,710	23,070	23,120	22,340	28,900	26,460	26,230	23,950	21,270	19,580	21,090	21,900
20	23,280	22,390	22,790	22,200	25,000	26,720	27,990	22,050	21,810	20,280	21,670	21,250
21	23,690	24,180	24,140	21,930	24,750	27,630	28,090	22,680	21,230	20,220	22,220	21,690
22	23,340	22,930	23,140	22,110	24,000	24,870	27,900	23,390	21,800	19,860	21,490	21,870
23	23,570	23,010	22,650	22,280	23,180	25,750	24,930	24,610	21,640	20,500	20,710	21,970
24	24,090	22,630	23,570	25,180	25,060	26,610	27,430	24,290	21,520	21,060	20,570	21,940
25	24,950	22,660	23,480	20,070	22,690	24,750	27,080	25,100	21,980	20,240	20,410	19,030
26	25,970	23,280	23,340	22,830	23,380	24,780	28,680	23,990	21,970	19,910	20,080	20,480
27	23,640	22,780	23,790	22,680	24,550	24,210	23,000	22,710	22,030	20,000	20,890	21,450
28	23,210	23,270	23,140	22,170	24,000	24,150	23,050	22,000	21,340	20,180	21,520	20,960
29	24,180	23,650	24,000	22,370	25,030	24,590	23,740	20,880	21,490	20,180	21,250	20,920
30	25,730		22,450	22,150	25,630	25,300	24,540	21,730	21,030	20,080	20,770	22,160
31	26,100		21,690		25,500		21,800	22,280		20,520		21,650
Total	729,800	679,930	717,300	674,050	754,220	774,910	783,840	727,834	654,080	635,590	627,070	658,280
Average	23,542	23,446	23,139	22,468	24,330	25,830	25,285	23,479	21,803	20,503	20,902	21,235
Min	21,820	22,280	21,690	20,070	21,890	23,500	21,800	20,880	20,470	18,250	18,600	19,030
Max	26,100	26,890	24,160	25,180	28,900	28,160	28,680	28,850	24,590	24,660	22,220	22,260

CoA Amount **45,455 m³ /day**

Yearly Average **22,997**
Yearly Min **18,250**
Yearly Max **28,900**



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Kingston West Water Treatment Plant - **Peak (Treated) Flows** 2004
m³

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	38,100	39,000	30,000	38,100	40,200	37,900	37,900	37,800	37,900	37,000	36,900	36,900
2	37,700	30,000	30,000	38,500	38,400	40,200	37,900	39,200	38,600	36,700	33,100	36,300
3	38,400	30,000	30,000	37,800	38,600	41,300	40,000	37,400	38,300	36,200	36,400	36,700
4	38,400	30,000	30,000	40,000	38,200	38,500	39,700	37,800	37,600	37,700	34,700	38,600
5	39,000	30,000	30,000	38,300	38,300	30,000	38,000	37,900	37,700	36,100	36,900	36,100
6	38,800	30,000	30,000	41,800	38,000	39,700	39,900	37,700	38,900	34,900	36,700	36,400
7	38,800	30,000	30,000	38,100	38,200	40,200	37,300	37,000	38,500	40,600	36,700	38,300
8	38,600	30,000	30,000	40,700	37,900	39,700	37,500	37,900	37,300	38,700	37,000	36,700
9	30,000	30,000	38,400	39,100	38,200	38,700	38,200	46,700	37,200	37,400	36,500	35,900
10	30,000	30,000	38,200	40,500	36,200	39,100	38,000	38,500	37,100	37,400	36,300	37,000
11	30,000	30,000	38,000	38,300	40,900	39,600	37,600	37,800	36,700	36,400	37,300	36,900
12	30,000	30,000	37,900	38,400	37,900	41,000	40,900	39,900	37,100	37,200	37,200	36,900
13	30,000	30,000	37,700	38,100	40,500	37,200	40,700	29,000	37,800	36,800	37,300	37,100
14	30,000	30,000	38,000	38,300	40,700	40,500	42,100	29,200	37,200	37,000	36,200	38,600
15	30,000	30,000	38,000	38,000	38,600	38,600	42,000	29,200	36,800	38,000	36,000	36,400
16	30,000	30,000	37,400	38,200	40,300	39,800	37,600	29,000	37,100	36,900	37,400	36,500
17	30,000	30,000	38,000	38,200	40,100	38,700	37,600	29,200	37,000	37,000	37,600	38,400
18	30,000	30,000	37,700	38,000	41,600	38,900	37,700	29,200	37,200	37,000	37,100	41,900
19	30,000	30,000	38,200	38,300	43,500	40,300	40,300	37,100	37,200	36,900	37,200	37,800
20	30,000	30,000	37,900	37,900	38,000	41,000	40,300	37,600	36,800	36,800	36,800	38,000
21	30,000	30,000	37,900	38,200	36,600	41,100	40,700	37,400	37,800	36,900	37,300	37,400
22	30,000	30,000	38,300	38,200	40,000	38,400	41,300	37,200	37,300	37,000	37,300	37,200
23	30,000	30,000	38,000	44,700	39,600	39,100	40,800	38,200	36,600	36,600	36,700	37,300
24	30,000	37,700	38,000	40,600	40,300	38,000	40,700	39,600	36,700	34,800	36,900	37,700
25	30,000	30,000	40,500	38,800	38,000	38,100	41,000	39,200	41,000	35,400	37,000	36,800
26	30,000	38,100	38,600	38,200	37,600	39,800	42,000	38,400	34,500	36,700	36,300	37,200
27	30,000	37,900	39,900	38,400	38,300	37,900	38,300	39,100	36,700	37,000	36,200	36,100
28	30,000	40,200	38,200	38,000	37,800	37,700	37,600	37,100	36,700	36,800	36,700	36,700
29	39,300	30,000	40,000	38,200	38,300	38,500	42,600	37,600	37,500	35,900	36,300	37,100
30	30,000		38,300	15,700	39,700	37,900	37,800	37,600	37,200	37,700	36,500	37,700
31	30,000		38,200		37,900		37,500	37,900		36,800		36,200
Total												
Average												
Min												
Max	39,300	40,200	40,500	44,700	43,500	41,300	42,600	46,700	41,000	40,600	37,600	41,900
CoA Amount		45,455 m³ /day										
Yearly Average								36,711				
Yearly Min								15,700				
Yearly Max								46,700				

