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TO:	CHAIR AND MEMBERS CIVIC WORKS COMMITTEE MEETING ON FEBRUARY 2, 2016
FROM:	JOHN LUCAS, P.ENG. DIRECTOR – WATER & WASTEWATER
SUBJECT:	2015 DRINKING WATER ANNUAL REPORT AND SUMMARY REPORT FOR THE CITY OF LONDON DISTRIBUTION SYSTEM

RECOMMENDATION

That, on the recommendation of the Director, Water & Wastewater, the 2015 Drinking Water Annual Report and Summary Report for the City of London Distribution System **BE RECEIVED** for information.

PREVIOUS REPORTS PERTINENT TO THIS MATTER

- [“2014 Drinking Water Annual Report and Summary Report for the City of London Distribution System” presented to CWC on February 3, 2015. Agenda Item #6;](#)

2015 – 2019 STRATEGIC PLAN

The 2015 – 2019 Strategic Plan identifies this objective under *Strengthening Our Community: 5(J) – Help Londoners understand how we provide safe drinking water.*

BACKGROUND

Ontario Regulation 170/03 (Drinking Water Systems) requires the owner of a municipal drinking water system to ensure that an Annual Report and a Summary Report be prepared, covering the period of January 1 through to December 31 of the previous year.

The Annual Report is to contain:

- A brief description of the drinking water system, including a list of water treatment chemicals used by the system;
- A summary of the results of required tests;
- A summary of any adverse test results reported and corrective actions taken; and
- A description of any major expenses incurred to install, repair or replace required equipment.

O. Reg. 170/03 further stipulates that:

- a) The Owner shall ensure that a copy of the Annual Report is given without charge to every person who requests a copy;
- b) Effective steps are taken to advise users of water from the system that copies of the Annual Report are available, without charge, and of how a copy may be obtained;
- c) The Owner of a large municipal residential system serving more than 10,000 people is required to post a copy of the Annual Report to the municipality’s website; and,
- d) A Summary Report is to be prepared and presented to the members of the Municipal Council by no later than March 31 of the following year.

The Summary Report is to contain:

- A list of any regulatory requirements applicable to the system that were not met at any time during the period covered by the report, the duration of the failure, and

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- the measures that were taken to correct the failure; and,
- A summary of the quantities and flow rates of the water supplied during the period covered by the report, including monthly average and maximum daily flows and compared to the rated capacity of the system.

Due to the large number of pages, the 2015 Drinking Water Summary Report for the City of London Distribution System has been provided to members of Council in electronic format, with the 2015 Annual Report attached as an appendix. The Summary Report (without appendices) is attached as Appendix 'A' to this report.

The Elgin-Middlesex Pumping Station (EMPS) is jointly owned by the City of St. Thomas, the Town of Aylmer, and the City of London, and is operated by the Ontario Clean Water Agency (OCWA). The Annual Report for the EMPS (London portion) was not yet available at the time of writing this report. Therefore, it will be provided to members of Council under separate memo prior to the reporting deadline of February 28, 2016.

SUMMARY

Receipt of Appendix 'A' of this report by members of Council fulfils the reporting requirements of O. Reg. 170/03, Schedule 22. The 2015 Drinking Water Summary Report is available to members of the public through the Water Engineering Division (8th Floor, City Hall), and will be posted on the City's website.

Acknowledgements:

This report has been prepared with input from Scott Koshowski, P. Eng. - Environmental Services Engineer, and Dan Huggins - Water Quality Manager, both in Water Operations Division.

PREPARED BY:	RECOMMENDED BY:
JOHN SIMON, P.ENG. DIVISION MANAGER, WATER OPERATIONS	JOHN LUCAS, P.ENG. DIRECTOR – WATER & WASTEWATER
CONCURRED BY:	
JOHN BRAAM, P.ENG. MANAGING DIRECTOR – ENVIRONMENTAL & ENGINEERING SERVICES & CITY ENGINEER	

Appendix 'A' – City of London 2015 Drinking Water Summary Report

- c.c. Cathy Saunders - City Clerk
 John Simon – Division Manager – Water Operations
 Roland Welker - Division Manager – Water Engineering
 Andrew Henry - Division Manager – Regional Water Supply
 Dan Huggins - Water Quality Manager
 Dr. Christopher Mackie, Medical Officer of Health and Chief Executive Officer –
 Middlesex-London Health Unit

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APPENDIX ‘A’

CITY OF LONDON
2015 DRINKING WATER SUMMARY REPORT

System Name: City of London Distribution System

Mailing Address: Corporation of the City of London
P.O. Box 5035, 300 Dufferin Ave.
London, ON N6A 4L9



System Rating: Water Distribution Subsystem Class IV
Water Treatment Subsystem Class II
Average Day Demand: 120.33 MLD
Peak Day Demand: 151.45 MLD (July 28, 2015)
Population Served: 381,000 (approx.)
Source Water: Surface Water (Lake Huron, Lake Erie)
Drinking Water System Number: 260004917
Municipal Drinking Water Licence: 006-101

CONTACT INFO:
Owner:
Corporation of the City of London
300 Dufferin Avenue, London, Ontario N6A 4L9
Contact: Mr. John Simon, P.Eng. Division Manager Water Operations
519-661-2500 ext. 4938



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Reporting Requirements

Schedule 22-2 of O. Reg. 170/03 requires that the City of London prepare a Summary Report for its water works system for the preceding calendar year and submit it to the members of the Municipal Council by March 31 of each year. This report, presented to Municipal Council's Civic Works Committee on February 2, 2016 serves to fulfill that requirement.

On February 26, 2016, a copy of the 2015 Annual Report and Summary Report for the City of London's water works will be submitted to the local office of the Ministry of the Environment and Climate Change (MOECC) as a courtesy for information purposes.

The Elgin-Middlesex Pumping Station (EMPS) is jointly owned by the City of St. Thomas, the Town of Aylmer, and the City of London, and is operated by the Ontario Clean Water Agency (OCWA). The Annual Report for the EMPS (London portion) was not yet available at the time of writing this report. Therefore, it will be provided to members of Council under separate memo prior to the reporting deadline of February 28, 2016.

Ministry of the Environment and Climate Change Annual Inspection (MOECC)

MOECC inspections can be in the form of comprehensive detailed inspections, or less intensive focused inspections. The MOECC selected London's Water Distribution System for a detailed inspection in 2015.

The MOECC inspection included staff interviews and facility inspections, as well as a review of operating procedures, water analysis reports, operational records, and staff certification and training records.

On December 22, 2015, the MOECC issued the *City of London Water Distribution System Inspection Report*. The report summarizes the inspection findings, and lists any incidents of non-compliance with regulatory requirements. The City of London received a Final Inspection Rating of 100.00% for 2015.

A full report on this MOECC Inspection is being presented to the Civic Works Committee on February 2, 2016.

Water Operations Staff Complement and Training

In 2015, the distribution system was operated and maintained by four (4) Water Supply staff, thirty-one (31) Operations and Maintenance staff, three (3) Water Works Inspectors, nine (9) Meter Shop staff, five (5) Supervisors, two (2) Technologists, two (2) Administrative staff, and four (4) Management staff. This complement does not include senior administrative staff of the Water Service Area. The majority of the City of London's operational and maintenance staff are based at the A.J. Tyler Operations Centre, located at 663 Bathurst Street. Water Supply staff are based out of the London Hydro building at 111 Horton Street.

All employees with Drinking Water Operator Certificates receive a minimum of 14 hours of Director-approved training and an additional 36 hours of practical, on-the-job training each year, as mandated by Regulation.

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Water Budget

Water rate increases have been 8% (2013), 8% (2014), 7% (2015), and 3% (2016). The Water Service Area reached financial sustainability in 2016, and is projecting an annual 3% rate increase in the 2016–19 Multi-year Budget.

The total Water budget for 2015 was \$73.6 million, which includes long term infrastructure renewal and replacement plans. The Water Budget helps maintain *London's Advantage* of a safe, clean and secure water supply. The Water Service Area remains proactive in initiatives to ensure that this service continues to meet the demands and expectations of customers. Existing infrastructure requires significant renewal (replacement and rehabilitation) work to close the infrastructure gap ensuring future generations and businesses are not faced with a water system that is failing, unreliable, and expensive to maintain.

Emerging Trends in Water Treatment & Regulations

Water Treatment: The City of London purchases its treated drinking water from the Joint Boards of Management (Lake Huron and Elgin Area Primary Water Supply Systems). The Joint Boards of Management, through the Regional Water Supply Division, stay abreast of emerging trends in water treatment and monitor upcoming regulation changes. Current areas of interest include Microbiological (E. coli and Total Coliform), Disinfection By-Products (Trihalomethane -THM, Haloacetic Acids – HAA), Lead and Copper, and Emerging Pathogens and Chemicals.

Currently, there are no water quality concerns requiring process modification at the Regional Water Supply treatment facilities. The area of emerging contaminants including pharmaceuticals and personal care products (PPCP's) and endocrine disruptors (EDC's) will be the focus of much research in the coming decades. At this time, there is no evidence to suggest that the Joint Board of Management should conduct further investigations into the implementation of advanced or enhanced treatment processes at either the Lake Huron or Elgin Area Treatment Plants.

For further information on emerging trends in water treatment and Regulations, refer to the Lake Huron and Elgin Area Water Supply Systems Master Plans, which can be found at <http://www.watersupply.london.ca/reports.html> .

Proposed Changes to O. Reg. 169/03 and O. Reg. 170/03: Ontario has established a comprehensive safety net for drinking water that starts at the source and continues until you turn on your tap. This multi-barrier approach includes an extensive network of safeguards to help prevent contamination, detect and solve water quality problems, enforce laws and regulations, and increase people's awareness of the importance of safe and high quality drinking water. The safety net for drinking water includes strong legislation, stringent standards, regular and reliable testing, highly trained operators, regular inspections, and the most comprehensive source protection program in the country, all working together to protect the safety of our drinking water.

The MOECC previously proposed new regulatory amendments to Schedule 2 of O. Reg. 169/03, adopting new Ontario Drinking Water Quality Standards for chlorate, chlorite, 2-methyl-4-chlorophenoxyacetic acid (MCPA), and haloacetic acids (HAAs), and to revise the existing Ontario Drinking Water Quality Standards for arsenic, benzene, carbon tetrachloride, and vinyl chloride.

The proposal has gone through the public consultation process, resulting in minor changes to the original proposal. Staff have evaluated the impact of these changes to

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London's operations. Additional sampling for Chlorite, Chlorate, MCPA and HAAs will cost London approximately \$1,000 per year. It is not anticipated that these new and revised standards will have a significant impact on London's Water Service Area.

Staff previously reported on this to Civic Works Committee on September 9, 2015. The full report can be found at:

<http://sire.london.ca/mtgviewer.aspx?meetid=984&doctype=AGENDA> , under Consent Item #6, "Proposed Regulatory Amendments to Update Ontario Drinking Water Quality Standards and Testing and Reporting Requirements".

The MOECC filed the amended regulations on December 1, 2015 and will be phasing them in between January 1, 2016 and January 1, 2020.

Proposed Changes to Ontario's Drinking Water Quality Management System

Ontario municipalities are required to maintain Quality Management Systems (QMSs) that meet the requirements of Ontario's Drinking Water Quality Management Standard (DWQMS). The MOECC is proposing revisions to the Drinking Water Quality Management Standard (DWQMS) in response to input from municipal stakeholders, including London.

The revisions are intended to clarify existing requirements and to ensure that consideration is given to the potential impacts of climate change when the risks to a drinking water system are being assessed by the system owner or operating authority.

The proposed revisions were posted for review and commentary on Ontario's Environmental Registry for a 45-day period ending on December 24, 2015.

Sampling & Water Quality Monitoring

During 2015, the MOECC required large municipal drinking water systems to sample their water for 70 different organic, inorganic and chemical parameters. The City of London's water sampling regime consists of staff taking monthly samples from 57 standard locations across the City, testing for microbiological indicators and chlorine residuals. In addition, analysis is performed for up to 122 parameters, including organics, inorganics, chemicals, pesticides and metals at 13 standard locations around the City. This far exceeds the MOECC's minimum sampling requirements. 8,625 routine grab samples were taken from the distribution system, 795 samples taken from the stand-by wells, and nearly 2,700 chlorine residual tests conducted by London staff. London also has 10 locations throughout the City where continuous in-line sampling of chlorine residual and pH is monitored. Staff also perform approximately 4,000 additional chlorine tests each year related to construction and maintenance activities. All of these efforts help ensure that the water within the distribution system is always of high quality.

There were fourteen (14) adverse microbiological results out of 2,694 samples taken. Eight (8) due to unacceptable levels of Total Coliform bacteria (ranging from 1 to 8 cfu/100 mL). Three (3) were due to results of "No Data – Overgrown with Non-target Bacteria". Two (2) were due to an unacceptable levels of E. Coli. (ranging from 1 to 2) and Total Coliform (ranging from 1 to 2). In these instances, all sites were re-sampled immediately, and the re-sample results revealed no adverse indicators.

In all instances it is highly unlikely that there were 'actual' water quality issues at these sites, as the thirteen adverse samples were identified as having free chlorine residuals which were well above the minimum acceptable level at the time of the sampling (ranging between 0.23 to 0.93 mg/L). E. coli and Coliform bacteria cannot survive in chlorinated

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water; therefore, it is suspected that post-sampling contamination occurred, attributing to these adverse results. The re-sampling results support this conclusion. The microbiological testing procedure is extremely sensitive; accidental sample contamination can occur through operator or laboratory error, despite the specific procedures and precautions being adhered to while processing samples.

In one instance, two separate samples taken by the same operator on the same day resulted in unacceptable levels of E. Coli. (1) and Total Coliform (1), and the other sample had unacceptable levels of Total Coliform (1040). In this instance, both sites were re-sampled immediately, and the re-sample results revealed no adverse indicators. Staff investigation of this event determined that Operator error occurred, contaminating the samples. The Operator was provided additional training on proper sampling technique, and no further occurrences resulting thereafter.

System Statistics and Major Events

During the period from January 1, 2015 through to December 31, 2015 a total of 44,341,663,000 litres of water were purchased, at a cost of nearly \$21,500,000, from the Joint Water Boards and subsequently pumped into London via the Arva Pumping Station and EMPS. Average day demand was 120,330,000 litres. Peak day pumpage of 151,450,000 litres occurred on July 28, 2015.

Listed below are some 2015 statistics for the City of London Distribution System.

Approximate Replacement Value of Drinking Water System	\$2,700,000,000
Number of Pumping Stations	8
Number of Fire Hydrants	9,053
Number of Watermain Valves	13,018
Total Number of Water Services	113,627
Length of Watermain	1,582 km
Number of Watermain Breaks	104

Municipalities Receiving London Water

In the Municipality of Middlesex Centre, the villages of Arva, Ballymote, and Delaware continued to receive their drinking water under contract from the City of London during 2015. The Municipality of Middlesex Centre has been provided a copy of the Annual Report as per O. Reg 170/03.

Several residences within Central Elgin also continued to receive drinking water from the transmission watermain that supplies the City of London from the EMPS. For this reason, Central Elgin has also been provided a copy of the report.