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UNIVERSITY OF TORONTO DRINKING WATER RESEARCH GROUP PARTNERSHIP RENEWAL

The Environmental Services Committee recommends the adoption of the recommendations contained in the following report dated July 26, 2011, from the Commissioner of Environmental Services.

1. RECOMMENDATIONS

It is recommended that:

1. Regional Council enter into agreement with the Governing Council of the University of Toronto, Drinking Water Research Group, to renew York Region's partnership in the Natural Sciences and Engineering Research Council of Canada Senior Industrial Research Chair for a total cost of \$400,000 split evenly over five years.
2. The term of the agreement be in effect from April 1, 2012 until March 31, 2017.
3. The Commissioner of Environmental Services be authorized to sign this agreement.

2. PURPOSE

This report outlines the benefits of continued partnership with the Drinking Water Research Group for the Environmental Services Department and seeks Council endorsement of the agreement.

3. BACKGROUND

Drinking Water Research Group puts York Region at the leading edge of innovative water treatment research in the Canadian water industry

York Region, through collaboration with the Drinking Water Research Group, is engaged in an innovative approach to advance research and technology for our drinking water systems. The Drinking Water Research Group partners with municipalities and industry leaders to explore new technologies and develop expertise in drinking water treatment and delivery. York Region entered into a partnership with the Drinking Water Research Group endorsed by Regional Council October 23, 2008 (Report No. 8 of the Transportation and Works Committee) to advance and optimize water treatment operations by linking treatment with source water quality and enabling the use of emerging technology. York Region has participated for three years and completed a number of beneficial projects. York Region's partnership in the Natural Sciences and

Engineering Research Council of Canada Senior Industrial Research Chair and the Drinking Water Research Group is now up for renewal and this report is seeking a commitment for continued partnership for the next five years.

York Region partnership in industry leading research studies has assisted in process and water quality improvements

The following briefly describes partnership projects and programs as well as the benefits to York Region.

- Granular Activated Carbon Research - Both the Georgina and Keswick Water Treatment Plants include granular activated carbon as part of the treatment process to control organics especially during taste and odour events. Research has enabled York Region to select carbon filter media based on raw water source. The Region is instituting a program that will effectively monitor the carbon for longevity and renewal resulting in a more effective carbon replacement program. As a result, it is expected the Region will save \$270,000 at the Keswick Water Treatment Plant over a 10 year period.
- Keswick Water Treatment Plant Disinfection Study - research has enabled York Region to verify and enhance current treatment practices and engineering studies against regulatory requirements. This has and will continue to provide benefit during annual drinking water inspections conducted by the Ministry of the Environment.
- Keswick Water Treatment Plant Ferrate Study – The use of ferrate as treatment chemical yielded positive results related to disinfection by-product reduction and zebra mussel control. This industry leading study may result in lower chlorine use at Region intakes and reduction in disinfection by-products. The study is scheduled for completion Fall 2012.
- Yonge Street Aquifer Chloramine Residual Studies - Studies were conducted with the Drinking Water Research Group to examine chloramine residual formation and decay within the local distribution systems in Newmarket and East Gwillimbury. The studies focused on water treatment process and distribution system operation and maintenance practices.
- Quantitative Microbial Risk Analysis – Quantitative Microbial Risk Analysis is a risk analysis tool that determines the effectiveness of treatment processes based on pathogens in the raw water source. The tool was developed by Health Canada in association with the City of Ottawa and the Drinking Water Research Group. York Region has been participating in the Ontario pilot study at the Georgina Water Treatment Plant over the last two years. Preliminary results indicate Lake

Simcoe water to be high quality and risk is ably reduced by treatment processes at the Georgina Water Treatment Plant.

4. ANALYSIS AND OPTIONS

Working with the Drinking Water Research Group exposes staff to valuable learning opportunities and participation in important research

York Region staff have been actively involved in all projects with the Drinking Water Research Group and have had the opportunity to learn first-hand from industry research leaders. Staff have had the opportunity to attend and present research papers at the Drinking Water Research Group's annual Technical Transfer Day which consists of presentations on leading edge research and advanced technologies. This also provides staff opportunity to network and share information with other Chair partners including the Cities of Toronto and Peterborough as well as the Regions of Durham and Peel.

Partnership has increased industry leadership role of York Region in drinking water research and innovation

In 2011 York Region participated in four presentations at the annual Ontario Water Works Association conference on projects completed in collaboration with the Drinking Water Research Group. Partnering with Drinking Water Research Group has increased York Region's profile within the water industry as well as demonstrating leadership and due diligence. In 2012 Drinking Water Research Group partners will include the City of Toronto, Region of Peel and Region of Durham.

Advance knowledge of emerging issues a benefit of working with the Drinking Water Research Group

Association with the Drinking Water Research Group has provided York Region immediate access to industry insight, knowledge and expertise as well as developing key Federal, Provincial and industry contacts. This awareness has enabled York Region to anticipate and prepare for policy and regulatory changes (e.g. Quantitative Microbial Risk Analysis and disinfection by-product limits).

Partnership renewal key to York Region's continued industry leadership and ability to respond to emerging issues and regulatory changes

Continued participation in the Natural Sciences and Engineering Research Council of Canada Industrial Chair would permit the Region to further explore the subject areas previously mentioned plus have the ability to participate in important drinking water research. For the next five years the Drinking Water Research Group intends to investigate:

- Quantification and removal of endocrine disruptors, pharmaceuticals and personal care products and persistants through advanced oxidation processes and enhanced removal of total organic carbon
- Effects of enhanced total organic carbon removal on disinfection by-products and chemical demand for disinfection
- Utilizing ferrate as a molluscicide for zebra mussel control
- Potentially develop, in partnership with Health Canada, a Quantitative Chemical Risk Analysis tool to compliment the Quantitative Microbial Risk Analysis tool
- Collaborative drinking water quality and treatment research studies with the City of Toronto and Region of Peel

Renewal of the partnership will address business drivers and strategic objectives included in the Environmental Services Strategic Plan. It will strengthen existing partnerships with the City of Toronto, Region of Peel and Region of Durham on collaborative research studies. The partnership represents an uninterrupted improvement in our understanding of water treatment, emerging water quality issues as well as enhance high quality of service. This proactive approach positions York Region to respond to regulatory challenges and supports communication and increased confidence in our drinking water systems. The partnership advances York Region's standing with respect to the Provincial Water Opportunities Act.

5. FINANCIAL IMPLICATIONS

The total cost to the York Region to renew the partnership with the Drinking Water Research Group Natural Sciences and Engineering Research Council of Canada Industrial Research Chair is \$400,000 over a five year period from 2012 to 2017. The annual cost breakdown for the partnership is summarized in Table 1.

Table 1
Drinking Water Research Group Annual Cost Summary

York Region Costs	Year 1- 2012	Year 2- 2013	Year 3- 2014	Year 4- 2015	Year 5- 2016
Annual Costs	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000

The term of the agreement will be from April 1, 2012 to March 31, 2017. Sufficient funds are available in the Water and Wastewater operating budget.

6. LOCAL MUNICIPAL IMPACT

Partnership with the Drinking Water Research Group will continue to enhance York Region's treatment processes, provide efficiencies in operations and enhance water quality. Local municipal operations staff in Georgina, Newmarket and East Gwillimbury have participated in the research and have shared in the results. This has allowed for collaborative approaches to drinking water system operations and has strengthened the communication and partnership between York Region and municipal operations staff. Continued communication of study results to local municipalities will provide learning opportunities and knowledge for staff to enhance operational planning and practices.

7. CONCLUSION

Continued partnership with the Drinking Water Research Group will allow York Region to participate in key industry research areas, show leadership and proactive responsibility for emerging issues related to drinking water supply, provide process efficiencies, create strong position with regards to Federal and Provincial policy and regulatory changes and maintain public confidence in our drinking water supply. Regional Council is asked to approve the funding and cost of the five year agreement.

For more information on this report, please contact Brett Bloxam, Direction Operations Maintenance and Monitoring at ext. 5320.

The Senior Management Group has reviewed this report.