



AUDITOR GENERAL'S REPORT ACTION REQUIRED

The Deep Lake Water Cooling Project – Total City Costs and Benefits Need to Be Reported

Date:	October 10, 2011
To:	Audit Committee
From:	Auditor General
Wards:	All
Reference Number:	

SUMMARY

This report includes the results of the Auditor General's Review of the agreement between the City of Toronto and Enwave Energy Corporation in regards to the City's financial involvement in the Deep Lake Water Cooling Project. The focus of the review has been on whether or not the City costs of the project as well as the environmental benefits of the project have been clearly articulated and reported to City Council.

In summary there needs to be a clear and complete disclosure of all City costs to City Council and in particular for those City buildings subject to deep lake water cooling there needs to be an analysis to determine if costs and benefits have met original objectives.

RECOMMENDATIONS

1. City Council request the General Manager Toronto Water to report to Council all operating and capital costs incurred by Toronto Water on the Deep Lake Water Cooling Project along with the estimated benefits.
2. City Council request the Executive Director, Facilities Management, to conduct an evaluation of City facilities to determine whether or not financial and environmental benefits from deep lake cooling have been achieved.

Financial Impact

The recommendations in this report have no financial impact.

ISSUE BACKGROUND

The Auditor General's audit work plan included a review of the contract between Enwave Energy Corporation (Enwave) and the City of Toronto in relation to the Deep Lake Water Cooling project. The major purpose of the review was to determine whether or not the benefits outlined in the agreement, both financial and environmental were achieved.

In conducting this review we:

- Reviewed various Committee and Council Reports
- Reviewed the Energy Transfer Agreement between Enwave and the City
- Reviewed other documentation
- Interviewed various City staff
- Reviewed management controls and practices

COMMENTS

Enwave is a private corporation owned by the Ontario Municipal Employees Retirement System and the City of Toronto. The Ontario Municipal Employees Retirement System owns 57 per cent of Enwave with the City owning the remaining 43 per cent. Enwave operates a district energy system that provides heating and cooling to downtown Toronto buildings.

In 2002, the City of Toronto entered into a 50 year energy transfer agreement with Enwave to provide cold water from Lake Ontario to air condition a number of downtown buildings. This particular project is known as the Deep Lake Water Cooling project and is part of an integrated district cooling system that covers the City's downtown core. The energy transfer agreement sets out the relationship and responsibilities between the City and Enwave in order to make the infrastructure changes necessary for the Deep Lake Water Cooling Project.

Customers of Enwave include:

- The Toronto Dominion Centre
- The Royal Bank Plaza
- RBC Centre
- Air Canada Centre
- Steam Whistle Brewery
- Mount Sinai Hospital

How the Deep Lake Water System Works

In simple terms, Enwave's intake pipes draw cold water from five kilometres off the shore of Lake Ontario at a depth of 83 metres below the surface. The naturally cold water is directed to the John Street Pumping Station where Enwave's facilities are ultimately used to air condition the various buildings in the system.

The Origin of the Deep Lake Water Project

The planning and approval for the Deep Lake Water Cooling Project was initiated by the former Municipality of Metropolitan Toronto. In 1997, the Council of the former Municipality of Metropolitan Toronto authorised staff to execute an energy transfer agreement with the Toronto District Heating Corporation (now Enwave) and to proceed with a pre-design study and an environmental assessment. In 2000, the City of Toronto approved funding for the pre-design study and environmental study.

The 2002 Energy Transfer Agreement required that Enwave pay for the costs of upgrading the Toronto Island Filtration Plant and the costs for expanding the John Street Pumping Station which was required for the implementation of the Deep Lake Water Cooling Project. The Agreement also provided that incremental costs incurred by the City were to be reimbursed by Enwave.

Benefits to the City of Toronto

Both environmental and economic benefits were the impetus for implementing the Deep Lake Water Cooling Project. The 2000 report entitled, "Deep Lake Water Cooling Project Pre-design Study" stated that "using deep lake water as a cooling source would reduce the demand for electricity and enable removal of ozone depleting refrigerants from existing building cooling systems".

<http://www.toronto.ca/legdocs/2000/agendas/council/cc/cc000607/wks12rpt/cl004.pdf>

In addition, operational benefits were stated to be as follows:

- New intake source for the Toronto Island Filtration Plant
- Addition of a backup power supply for the John Street Pumping Station
- Year round operation of the Toronto Island Filtration Plant
- Fifth water pump at the Toronto Island Filtration Plant which increased the volume of water pumped from the lake

Costs to the City of the Deep Lake Water Cooling project

The Energy Transfer Agreement with Enwave had the following financial conditions:

- Enwave was to construct at its own expense a new intake facility to the Toronto Island Filtration Plant, as well as the costs relating to the modification and the expansion to the John Street Pumping Station
- Enwave was required to reimburse the City for all incremental operating, maintenance and repair costs associated with the deep lake water cooling system
- Enwave was required to pay the City an energy transfer fee based on the cooling energy generated.

The 2001 “Deep Lake Water Cooling Project Energy Transfer Agreement” report to City Council which authorised the Deep Lake Water Cooling Project included information on certain costs and benefit elements including costs relating to the pre-design study, easement fees for the new intake facilities and the winterization costs of the Toronto Island Filtration plant.

<http://www.toronto.ca/legdocs/2003/agendas/council/cc030722/pof8rpt/cl012.pdf>

However, other costs and benefits such as the projected energy transfer fees and additional operating costs incurred by the City were not included in the report.

The original budget approved by City Council for the Deep Lake Water Cooling Project was \$12.3 million. Certain costs incurred in connection with the project were significantly in excess of original estimates. While these increased estimates were reported to Council through the budget process there has not been a final and complete accounting for all deep lake water cooling project costs. While such reporting of final costs was not a requirement, it would be useful information for Council given the scope of the project.

Deep Lake Water Cooling at City Buildings

The City has entered into 20 year agreements with Enwave to provide deep lake water cooling in five City buildings consisting of:

- Metro Hall
- City Hall
- Police Service headquarters
- Old City Hall and
- Union Station

The estimated costs to install deep lake water cooling systems in these five facilities are in the range of \$14 million.

At the time of the conversion to the deep lake water cooling system of each of the above facilities a business case was developed which itemised both operating and capital costs. Each of the business cases also articulated significant environmental benefits. For example, a “Metro Hall Cooling System – Legislative Requirements” 2005 report relating to Metro Hall indicated that “as a clean and renewable energy resource, the deep lake water cooling system would enable the City to reduce its demand for electricity by approximately 2 million kilowatt hours annually. This would translate into an annual reduction of CO2 emissions of approximately 340 tonnes, equivalent to a 75 per cent reduction compared to conventional chillers”.

<http://www.toronto.ca/legdocs/2005/agendas/council/cc050517/pof5rpt/cl016.pdf>

There has been no detailed validation of benefits achieved in existing City buildings in order to determine whether or not the financial and environmental benefits have in fact been achieved.

Management’s response to each of the recommendations contained in this report is attached as Appendix 1.

CONCLUSION

Final costs relating to the City’s investment in the Deep Lake Water Cooling Project have not been reported to City Council. Further the actual environmental benefits of the project, while difficult to measure have not been identified or reported to Council.

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SIGNATURE

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ATTACHMENT

Appendix 1: Management’s Response to the Auditor General’s Review of
The Deep Lake Water Cooling Project – Total City Costs and Benefits
Need to Be Reported