



**STAFF REPORT  
ACTION REQUIRED**

**Supplementary Report: Biosolids Master Plan Update –  
Highland Creek Treatment Plant**

<b>Date:</b>	June 8, 2010
<b>To:</b>	City Council
<b>From:</b>	General Manager, Toronto Water
<b>Wards:</b>	All Wards
<b>Reference Number:</b>	P:\2010\Cluster B\TW\cc10019

**SUMMARY**

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On May 18, 2010, Public Works and Infrastructure (PWI) Committee recommended that the March 31, 2010 staff report entitled “Biosolids Master Plan Update – Highland Creek Treatment Plant” be received and that City Council approve the Beneficial Use Option as outlined in the September 2009 Biosolids Master Plan (BMP) Update Environmental Assessment, for the Highland Creek Treatment Plant. This Beneficial Use Option was not identified, evaluated and selected as the ‘preferred’ biosolids management strategy for the Highland Creek Treatment Plant as part of the BMP process since many of the beneficial use options presently available to the City would be exhausted with the implementation of beneficial use at the Ashbridges Bay Treatment Plant as earlier approved by Council.

In addition, the PWI Committee recommended that City Council approve the completion of the Scarborough Waterfront Trail with an additional \$2 million for fisheries habitat improvements and authorized the General Manager, Toronto Water, to make the necessary provisions in the 2011 Capital Budget to expedite the implementation of the Scarborough Waterfront Trail, funded at a rate of \$7 million per year for an estimated total cost of over \$45 million.

The Scarborough Waterfront Trail project is unrelated to the BMP and was not part of the public consultation process. The amounts required to fund this recommendation are presently not within Toronto Water’s 10-year Capital Budget.

The BMP process spanned eight years of public consultation. City Council has provided approval throughout this process including specific direction of a peer review process for the decision-making model used to assess the various biosolids management options. For

the BMP process, the scoring criteria weightings to assess the impacts were as follows: environmental (40%), social (40%) and financial (20%). It must be emphasized that the same decision-making model was used to assess biosolids management options for each of the City's four wastewater treatment plants. Council has already approved the biosolids management strategies for the Ashbridges Bay, Humber and North Toronto Treatment Plants.

This report is submitted in response to the PWI Committee recommendations that significantly amended the BMP proposed strategies for the Highland Creek Treatment Plant from the 'preferred' newer incineration technology to beneficial use of biosolids options. Should Council adopt a change in the proposed BMP strategy, then staff suggests that an amendment be made to one of the PWI Committee recommendations necessary to successfully implement a future beneficial use program. This report also provides updated information (preliminary) on the financial and operational implications of implementing the PWI Committee recommendations for the Highland Creek Treatment Plant.

## **RECOMMENDATIONS**

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### **The General Manager of Toronto Water recommends that:**

1. City Council amend recommendation (2) contained in Public Works and Infrastructure Committee Report No. 33, Item PW33.4 so that it now reads as follows:
  - a. "City Council approves both the Beneficial Use Option as the primary biosolids management strategy and the Landfill Disposal Option as a contingency option as outlined in the Biosolids Master Plan Update Environmental Assessment, dated September 2009, for the Highland Creek Treatment Plant and direct the appropriate staff to implement the recommended beneficial use biosolids management strategy contained therein."

### **Financial Impact**

There will be adverse financial implications to Toronto Water's 10 Year Capital and Operating Budgets if City Council adopts the PWI Committee proposed recommendations, as written, since the amounts needed to fund the projects are not within either Toronto Water's 10 year Capital or Operating Budgets.

#### *Scarborough Waterfront Trail Funding*

The Scarborough Waterfront Trail project is unrelated to the BMP and was not part of the public consultation process. The amounts required to fund this project have never been considered by the Budget Committee and are presently not within Toronto Water's 10-year Capital Budget. Completion of the Scarborough Waterfront Trail has been

estimated by the Toronto and Region Conservation Authority to cost over \$45 million. A further \$2 million for fisheries habitat improvements is also being recommended.

*Biosolids Master Plan Funding*

At this time, the extent of the financial implications to the City of selecting the beneficial use option is a preliminary estimate as staff has had limited opportunity to review the impacts of these proposed recommendations. Staff have completed a preliminary update of the financial analysis contained within the BMP based on the most likely scenarios for beneficial use which do not include agricultural land application (i.e. alkaline stabilization for soil amendment and co-composting for degraded site application) and landfill disposal at various sites as a contingency option. The 20 year Net Present Value of the capital and operating costs for the practical beneficial use and landfill disposal options ranges from \$113 million to \$140 million (based on 3% inflation and 5% interest) depending on which destination site is ultimately used to manage the biosolids. This would include a capital investment of \$20 million required to construct an appropriate off-load facility at the Highland Creek Treatment Plant within five years and annual operating costs in the range from \$5.98-\$7.47 million.

An update of the costs presented in the BMP for the fluidized bed incineration option indicates that two units would cost \$75 million to construct and annual operation and maintenance costs are estimated to be approximately \$3.4 million. The 20 year Net Present Value of the capital and operating costs for this option is estimated at \$129 million (3% inflation, 5% interest). Further sensitivity analysis shows that by deferring construction of one unit as recommended by the BMP (i.e. build one unit during the first five years and another during the second five years of a ten year plan) will lower the Net Present Value of this option even further.

<b>OPTION</b>	<b>ANNUAL OPERATING COSTS (will vary depending on sites used)</b>	<b>CAPITAL COSTS</b>	<b>20 YEAR NET PRESENT VALUE CALCULATION (3% inflation, 5% interest rate)</b>
Beneficial Use and Landfill Disposal	\$5.98-\$7.47 million	\$20 million	\$113-\$140 million
Fluidized Bed Incineration	\$3.4 million	\$75 million	\$129 million

The Deputy City Manager and Chief Financial Officer has not been consulted on this report.

## DECISION HISTORY

Public Works and Infrastructure (PWI) Committee, at its meeting on May 18, 2010, in considering a staff report titled “Biosolids Master Plan Update – Highland Creek Treatment Plant” dated March 31, 2010, recommended that the report be received and that City Council approve the Beneficial Use Option for the Highland Creek Treatment Plant and direct the appropriate staff to implement the beneficial use biosolids management strategy. In addition, the PWI Committee recommended that City Council approve the completion of the Scarborough Waterfront Trail with an additional \$2 million for fisheries habitat improvements and authorize the General Manager, Toronto Water, to make the necessary provisions in the Toronto Water 2011 Capital Budget to expedite the implementation of the Scarborough Waterfront Trail, funded at a rate of \$7 million per year.

The PWI Committee Decision Document can be found at:

<http://www.toronto.ca/legdocs/mmis/2010/pw/decisions/2010-05-18-pw33-dd.htm>

## ISSUE BACKGROUND

In the fall of 2002, the City of Toronto initiated a Biosolids and Residuals Master Plan (BRMP) that was to provide direction on the future management of biosolids and water residuals generated by the City’s water and wastewater treatment plants to the year 2025. The BRMP was undertaken in accordance with the Municipal Class EA process as defined in the *Environmental Assessment Act*. A draft of the BRMP was released for 30-day public comment on September 16, 2004. The public comment period was extended by Works Committee until a peer review of the process could be completed.

As a result of public concerns regarding the recommended biosolids management strategies identified in the draft BRMP, Works Committee requested that the General Manager of Toronto Water, together with the Medical Officer of Health, undertake a peer review of the decision-making model and methodology used to assess the various biosolids management options in the BRMP.

The Panel met during the fall of 2007 and concluded that the decision-making model used in the draft BRMP was reasonable and commonly used in master plans and Environmental Assessments.

A Terms of Reference based on the panel’s recommendations was prepared by staff in 2008. The City’s consultant, AECOM, completed the work in accordance with the Terms of Reference in the fall of 2009 as part of the original BRMP project.

The final Biosolids Master Plan can be viewed at the following web sites:

[http://www.toronto.ca/wes/techservices/involved/wws/biosolids/pdf/master\\_plan\\_report\\_with\\_app\\_a\\_vol\\_1\\_to\\_m.pdf](http://www.toronto.ca/wes/techservices/involved/wws/biosolids/pdf/master_plan_report_with_app_a_vol_1_to_m.pdf)

[http://www.toronto.ca/wes/techservices/involved/wws/biosolids/pdf/master\\_plan\\_app\\_a\\_vol\\_2.pdf](http://www.toronto.ca/wes/techservices/involved/wws/biosolids/pdf/master_plan_app_a_vol_2.pdf)

[http://www.toronto.ca/wes/techservices/involved/wws/biosolids/pdf/master\\_plan\\_app\\_a\\_vol\\_3.pdf](http://www.toronto.ca/wes/techservices/involved/wws/biosolids/pdf/master_plan_app_a_vol_3.pdf)

## **COMMENTS**

The BMP recommended strategy for the Highland Creek Treatment Plant is to continue to operate the existing multiple hearth incinerators over the next 5-10 years to take advantage of the major maintenance and refurbishment work currently underway, and to commence within five years the process of replacing them with new modernized fluidized bed incinerators with energy recovery and state of the art scrubbing technology that meets/exceeds current and future MOE emission standards.

This strategy maximizes the remaining useful life of the existing infrastructure, ensures that a reasonable return on investment in major maintenance works is achieved and ensures replacement infrastructure is in place before the end of the 10 year useful life of the existing equipment. This option was presented to the public for review and comment as part of the BMP consultation process and the local community adjacent to the Highland Creek Treatment Plant were supportive of the fluidized bed option.

On May 18, 2010, PWI Committee recommended a significant departure from this recommended strategy and a marked change in the identified and evaluated ‘preferred’ option for the Highland Creek Treatment Plant; namely seeking approval from City Council to implement the Beneficial Use Option as outlined in the September 2009 BMP Update Environmental Assessment.

There are significant implications associated with the recommendations of the PWI Committee as follows:

### **Scarborough Waterfront Trail**

The PWI Committee proposed recommendations will have a significant financial impact on Toronto Water’s 10 Year Capital Budget. Completion of the Scarborough Waterfront Trail has been estimated by the Toronto and Region Conservation Authority to cost over \$45 million. A further \$2 million for fisheries habitat improvements is also being recommended. This project is a new capital project that is unrelated to the BMP and has not previously been considered by the Budget Committee. Furthermore, these amounts are presently not within Toronto Water’s 10 year Capital Budget.

### **Beneficial Use Options**

The BMP presented a cost analysis for beneficial use options, which include agricultural land application of biosolids cake, and alkaline stabilization, composting or pelletization followed by agricultural land application.

However, the BMP recognized that there is a significant shortfall of beneficial use capacity available to the City for agricultural land application of biosolids cake. This has been well documented over the last few years as the City has been able to manage only about 12-14% of biosolids generated at the Ashbridges Bay Treatment Plant through a long term land application contractor.

As a result, several short-term contracts have been established for biosolids management from the Ashbridges Bay Treatment Plant, and those contractors have used a number of biosolids management outlets, including a small portion of beneficial use (agricultural land application, alkaline stabilization and degraded site application), and a much larger portion to a number of landfills in New York state. The short-term contracts are significantly more expensive, since the ultimate management sites (land or disposal) are varied and at significant distances from the City, many outside Ontario.

While the BMP identified beneficial use as a potential option for Highland Creek Treatment Plant, it also recognized that since it was selected as a preferred management option for the Ashbridges Bay Treatment Plant, the capacity for beneficial use for land application to agricultural fields would be completely exhausted (page 147, last paragraph of the BMP Document). Therefore, while the lower prices for long-term contracts was presented in the BMP, managing biosolids at this lower rate is not feasible for the Highland Creek Treatment Plant, as it is not compatible with the implementation of maximizing beneficial use at the Ashbridges Bay Treatment Plant.

In light of the above, management options for hauling biosolids from the Highland Creek Treatment Plant that include beneficial use can be considered to include:

- Utilizing the existing short-term contracts, which include beneficial uses as well as landfilling at a variety of sites besides the Greenland Landfill Site; and
- Alkaline stabilization or composting at City owned or private facility off-site.

The costs to beneficially use biosolids generated at the Highland Creek Treatment Plant (or dispose of at various landfills) would range from \$140 to \$175 per wet tonne, with the lower range being a short-term landfill or beneficial use contract, and the higher end being alkaline stabilization at an off-site facility. The annual operating costs could range from \$5.98-\$7.47 million.

In addition, an on-site truck loading facility would need to be constructed at the Highland Creek Treatment Plant to accommodate 4 to 5 large tractor trailers per day (based on 5 days per week). Due to the potential odours during loading of the trucks, and the need for short-term storage (for weekends, holidays) etc., a covered facility that allows trucks to fill inside from storage hoppers would be required. Air collected in the facility would be directed to an odour control filter before the air can be released to the environment.

A similar facility was constructed at the Ashbridges Bay Treatment Plant in 2001 and cost approximately \$45 million. For the Highland Creek Treatment Plant, this facility

would have a capital cost in the range of \$20 to 25 million (\$20 million assumed for analysis purposes). An implementation time frame to construct the facility is estimated at 4-5 years depending on the conditions of approval required by the Ministry of the Environment. It is unknown at this time if the project would require the completion of a Schedule “C” Class Environmental Assessment delaying implementation of this option.

Therefore, the 20 year Net Present Value of the capital and operating costs for a beneficial use option, which includes disposing at various landfills, would range from \$113 million to \$140 (based on 3% inflation and 5% interest).

### **Fluidized Bed Incineration**

Significant information has been provided on the fluidized bed incineration option for biosolids management. This incineration technology would replace the older multiple hearth technology and include advanced emission control equipment. This option would result in lower greenhouse gas generation, lower operating costs and a more reliable biosolids management approach, relative to the existing incineration equipment. The operating cost of a fluidized bed incinerator is estimated at \$72 per wet tonne. Annual operation and maintenance costs are estimated to be approximately \$3.4 million for fluidized bed incineration.

The capital and net present value costs have been updated to include the construction and operation of the facility and emission control equipment. The capital cost is estimated at a total of \$75 million in present day dollars. The 20 year Net Present Value of the capital and operating costs for fluidized bed incineration is estimated at \$129 million (3% inflation, 5% interest). Capital costs are based on construction costs of recent (within last 4 years) fluidized bed incineration facilities in Ontario.

A sensitivity analysis of the Net Present Value for the fluidized bed incineration option indicates that the amount can be further reduced if calculated based on the BMP recommendation of phasing the construction of the two units over ten years. The BMP recommends constructing one unit for an estimated \$35 million during the first five years and another unit for an estimated \$40 million during the second five years of a 10 year time period. This strategy maximizes the remaining useful life of the existing infrastructure and ensures replacement infrastructure is in place before the end of the 10 year useful life of the existing equipment.

Furthermore, an Environmental Assessment study would not be required for this option, since the fluidized bed technology would replace/upgrade the existing multiple hearth technology, with no increase to capacity. The estimated implementation schedule for this option is approximately 3.5 to 4 years.

### **Legal Implications**

There may also be legal implications arising from PWI Committee's recommendations related to whether this proposed change in ‘preferred’ biosolids management strategy raises any procedural issues under the requirements of the Municipal Class EA process.

Staff are reviewing the potential legal implications with the City Solicitor and a report back to City Council will be prepared if there are any significant concerns.

## **CONTACT**

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## **SIGNATURE**

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