

## **COMMITTEE OF THE WHOLE – JUNE 19, 2006**

### **FOUNTAINS AND AERATION DEVICES IN STORMWATER MANAGEMENT PONDS**

#### **Recommendations**

The Commissioner of Engineering and Public Works recommends:

1. That aeration devices be installed in stormwater management ponds where water conditions are positively identified as breeding grounds for mosquitoes, as determined by the Region of York's Health Unit or where water quality concerns have been identified by Staff, and then only if a more economical solution can not be found;
2. That water fountains be installed in stormwater management ponds to visually enhance and promote the City of Vaughan in highly visible areas adjacent to arterial roads and/or within key district centre areas of the City, provided that the pond is deemed to be a suitable candidate for a water fountain as assessed by Staff on a site specific basis;
3. That a Stormwater Management Pond Water Fountain Pilot Project be implemented at the Sugarbush Pond located just north of Highway 7 between Bathurst Street and Thornhill Woods Drive to fully assess the installation, operation and maintenance requirements of electrically driven water fountains; and,
4. That the Five Year Implementation Strategy for the installation, operation and maintenance of fountains and aeration devices in stormwater management ponds and all associated financial implications be deferred for consideration to a future Budget Committee meeting, following the completion of the Stormwater Management Pond Water Fountain Pilot Project.

#### **Economic Impact**

There are no immediate economic impacts resulting from the adoption of this report. The financial implications resulting from the installation, operation and maintenance of fountains and aeration devices in stormwater management ponds will be assessed upon completion of the City's proposed pilot project.

#### **Purpose**

This report has been prepared in response to Council's requests respecting the installation of water fountains and aeration devices in stormwater management ponds.

#### **Background – Analysis and Options**

Item 47, Report No. 57, of the Committee of the Whole, which was adopted without amendment by the Council of the City of Vaughan on August 25, 2003, recommended:

"That Council agrees in principle with installing water fountains in stormwater management ponds and directs staff to assess and evaluate the operation of electrically driven and wind driven fountains and provide a report to Council."

Also, Item 2, Report No. 9, of the Budget Committee, which was adopted without amendment by the Council of the City of Vaughan on May 25, 2004, recommended:

"That staff provide a report on a Five Year Plan for implementation of aeration devices for stormwater management ponds."

## Water Fountains & Aeration Devices

The objective of both water fountains and aeration devices is to mix the water column in each pond so that the movement at the surface is sufficient to discourage the reproduction of mosquitoes (thereby potentially decreasing the threat of mosquitoes carrying the West Nile virus), potentially increase the oxygen level in the pond to reduce stagnant water and the accompanying odour, and in the case of fountains, provide some visual enjoyment.

Over the past year, Public Works has hosted two wind driven units at the Joint Operation Centre. A wind driven fountain and a wind driven aeration pump were provided by the manufacturer, at no cost, for demonstration purposes. The wind driven aeration unit has operated without fault since installation, and has kept the surface water in the pond moving sufficiently to discourage the reproduction of mosquitoes and to control the odour.

Although electrically driven fountains are significantly more expensive to purchase and operate, they are much more reliable and robust for fountain applications as compared to wind driven fountains. The wind driven fountains would not produce consistent spray heights for sustained periods and were found to be better suited for aeration applications only.

Accordingly, it has been determined that where aeration devices are being considered, the wind driven device is the most appropriate, and where fountains are being considered, the electrically driven device is the most appropriate.

The City has purchased one electrically driven water fountain unit with the intent of conducting a pilot project to accurately assess the financial, operational and maintenance implications of its use. The electrically driven fountain was temporarily set up in the stormwater management pond at the City's Joint Operations Centre on a trial basis, last month. During this trial, a few issues were identified in regards to proximity of the fountain's spray to parked vehicles, during high wind days.

In order to gain a better understanding of the operational issues concerning installation of electrically driven fountains in stormwater ponds, the City's electrically driven fountain will be installed and operated for a period of two years at an existing stormwater management pond. The recommended candidate pond for the pilot project is the Sugarbush Pond located just north of Highway 7 between Bathurst Street and Thornhill Woods Drive. This pond has not yet been assumed, is set back significantly from any homes or roadways, will allow good visibility of the fountain from both Highway 7 and Highway 407, has hydro electricity available to it from the surrounding residential community, and is easily accessible for installation, operation and maintenance. It is anticipated that the fountain will be installed during the summer months after the power source and all related infrastructure is secured.

## Evaluation Criteria

As part of the Region of York's Health Unit West Nile virus surveillance program regular testing of stormwater management ponds is being undertaken. Where the virus is detected, larviciding is typically considered. If a pond is identified as a breeding grounds for mosquitoes, and a more economical solution can not be achieved, a wind driven aeration device or electrically driven water fountain may be considered based on the following criteria:

1. Depth of permanent water pool in the pond.
2. Existing silt build up in the pond.
3. Availability of hydro electricity to the pond area.
4. Feasibility of bringing a power supply to the pond site.
5. Accessibility for installation, operation and maintenance.
6. Potential disruption in water quality functionality of the pond.
7. Susceptibility to vandalism.
8. Overall public safety.

9. Aesthetic value/benefits.
10. Visibility in the community.

Similar criteria may be used to assess the suitability of aeration devices or electrically driven water fountains in ponds where odours caused by stagnant water has been noted.

### Financial Implications

There are currently 70 assumed stormwater management ponds throughout the City. Of these 70 facilities, 36 are wet ponds providing water quality control and therefore designed to accommodate a permanent pool of water. It is anticipated that approximately 25 new stormwater management wet ponds will be added to the inventory within the next five years. As such, a total of 61 ponds may be further evaluated based on the above noted criteria, to determine suitability for installation of water fountain or aeration devices.

Based on discussions with Staff from the Town of Milton's Operations Department, one of the only municipalities in the area that has had an electrically driven water fountain operating within a stormwater management pond for the last 20 years, the cost associated with the yearly operation and maintenance is approximately \$10,000. This cost will vary depending on the size of the fountain and its operating schedule. As the unit is susceptible to damage from freezing, labour is required to place and remove the unit in the spring and fall so that it is not subject to freezing. Storage space is also required during the winter months when the unit is not in operation. The initial capital cost to purchase and install a typical unit appropriate for this type of use is approximately \$20,000.

The capital costs associated with a wind driven aeration device is approximately \$3,000, while the yearly operating and maintenance is approximately \$1,000.

### Relationship to Vaughan Vision 2007

In consideration of the strategic priorities related to the planning and management of growth as established by Vaughan Vision 2007, the recommendations of this report will assist in:

- Implementing the environmental policies contained within the various official plans;
- Ensuring that municipal installations and operations are undertaken in an environmentally responsible manner;
- Implementing the policies established by OPA No. 600

Specifically, the recommendations support Vaughan Vision A-2 "Promote Community Safety, Health and Wellness", and A-3 "Safeguard Our Environment".

This report is consistent with the priorities previously set by Council and the necessary resources have been allocated and approved.

### Conclusion

It is anticipated that the City will operate approximately 61 wet ponds over the next 5 years. Should conditions warrant, the installation of wind driven aeration devices or electrically driven water fountains may be considered on a site specific basis to potentially discourage the reproduction of mosquitoes, reduce stagnant water and associated odour, and/or aesthetically enhance wet ponds in highly visible areas of the City.

In order to fully assess the financial, operational, and maintenance implications of electrically driven water fountains it is recommended that a two year pilot project be initiated at the existing Sugarbush Pond located just north of Highway 7 between Bathurst Street and Thornhill Woods

Drive. Upon completion of this pilot project, a complete implementation strategy will be prepared by Staff for review and approval by Budget Committee.

**Attachments**

N/A

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