

**COMMITTEE OF THE WHOLE AUGUST 18, 2003**

**STANDING WATER IN STORM WATER MANAGEMENT PONDS**

**Recommendation**

The Commissioner of Engineering and Public Works, in consultation with the Director of Public Works, recommends that this report be received for information.

**Purpose**

The purpose of this report is to provide information to Council on the feasibility, need and cost of installing fountains in storm water management ponds to reduce the potential of stagnant water and the potential breeding grounds for mosquitoes.

**Background - Analysis and Options**

Council, at its meeting of May 26, 2003, requested staff to investigate the feasibility, need and costs to install water fountains in the City's storm water management ponds. The purpose of the fountains is to reduce stagnant water and associated odours and discourage the reproduction of mosquitoes.

The City currently operates 55 storm water management ponds of which 37 are wet ponds that retain water. Another 59 ponds have been constructed awaiting assumption and new ponds are being considered. The quality of water and the tendency for mosquitoes to reproduce in a storm water management pond depends on various factors such as oxygen content, mixing of the water column and movement of the surface water. By installing a pumping device, the movement of the water will achieve these objectives.

As such, these factors were considered by staff when investigating various options available as follows:

**Option # 1 – Electrically Driven Water Fountains**

Air-o-lator Corporation specializes in the manufacture of water fountain pumping systems. Their device is a submergible electric motor and pump suspended in the pond. It can be operated 24 hours per day during the temperate seasons. This device typically circulates 115,000 gallons of water per day.

The purchase price per unit ranges between \$2,500.00 and \$4,000.00 depending on the shape and height of the fountain water column. The range of prices is due to the pump component that is designed for each fountain type and priced accordingly. Installation cost for per pump is approximately \$1,500.00. The installation of a hydro service will vary depending on the site conditions but is estimated to be \$1,000.00. The annual cost of electricity at today's rates assuming a 6-month operating period is approximately \$70.00 and maintenance costs are estimated at \$1,300.00 annually.

The estimated cost of this option is:      Capital Cost (each)      \$ 6,500.00 plus GST

Annual Operating Cost      \$ 1,370.00 plus GST

**Option # 2 – Wind Driven Water Fountains**

Priceville Windmill Company specializes in the manufacture of wind driven water-pumping devices used in various applications including water fountains. Their device is a wind driven pump

mounted on a steel frame ranging in height from 4 to 14 metres (12' to 46') above the ground. The pump draws water through a pipe from the lower level of the pond, passes it through the pump and pipes it to a discharge nozzle located at the surface of the pond. This unit can be operated throughout the temperate season and is dependant on wind as its source of power. It is capable of circulating up to 36,000 gallons of water per day.

A wind speed of 15 kilometers per hour (9 MPH) is an optimum velocity for operating this equipment efficiently. Records indicate that, in this region of Ontario, an average wind speed of 15 kph is achieved 5 to 6 days per week.

The purchase price per unit ranges between \$4,500.00 and \$9,000.00 depending on the volume of water to be pumped. Installation costs range between \$750.00 and \$2,500.00 depending on the unit chosen. Hydro is not required for the operation of this equipment. Maintenance is provided by the manufacturer at a cost of \$350.00 plus GST annually.

The estimated cost of this option is:

Capital Cost (each)	\$ 11,500.00 plus GST
Annual Operating Cost	\$ 350.00 plus GST

The manufacturer will reduce the prices dependant on purchase volume.

#### Option # 3 – Wind Driven Aeration Pump

Priceville Windmill Company also specializes in the manufacture of a wind driven air pump to improve the quality of water in ponds. This device is mounted on a steel frame similar to the water pump at a height range of 4 to 6 metres (12' to 20') above the ground. The pump is designed to pump air into the lower level of the pond, which mixes the water column and creates turbulence across the surface of the pond. Optimum efficiency is achieved at a speed of 15 kilometers per hour similar to the water pump unit.

The purchase price per unit is \$ 1,850.00 per unit. Installation costs range between \$750.00 and \$2,500.00 depending on the height of the steel frame. The windmill and pump head can be purchased separately at a unit price of \$675.00. Plumbing is estimated to be \$500.00. These units can be mounted on recycled concrete streetlight poles at an estimated unit cost of \$250.00. Hydro is not required for the operation of this equipment. Maintenance is provided by the manufacturer at a cost of \$350.00 plus GST annually.

The estimated cost of this option is:

Frame Mounted	Capital Cost (each)	\$ 4,350 plus GST
	Annual Operating Cost	\$ 350.00 plus GST
Pole Mounted	Capital Cost (each)	\$ 1,425.00 plus GST
	Annual Operating Cost	\$ 350.00 plus GST

The manufacturer will reduce the prices dependant on purchase volume.

In May of this year, the manufacture installed an air pump unit at the JOC storm water management pond as a demonstration unit. Staff has noted a distinct improvement in the quality of the water and the movement in the surface water.

The air pump achieves the objectives of adding oxygen to the water, mixing of the water column and creating surface disturbance. As well, the introduction of air into the water creates less noise

than a water fountain so the unit can run during the evening hours without disturbing those living near the pond.

**Conclusion**

Three effective options to achieve improved water quality and discourage the reproduction of mosquitoes have been explored for Council's consideration. The City currently operates 37 wet ponds and have 59 awaiting assumption.

Fountains are an attractive feature that will achieve the objectives. However, the most economical option of accomplishing the water quality goal and creating surface turbulence is the air pump option.

**Attachments**

N/A

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Respectfully submitted,

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Commissioner of Engineering and Public Works

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